BOOK OF ABSTRACTS
AND PROGRAM

Limnologia 2012

XVI CONGRESS OF THE IBERIAN ASSOCIATION OF LIMNOLOGY

2 - 6 JULY 2012
UNIVERSITY OF MINHO
GUIMARÃES - PORTUGAL

CURRENT THREATS TO FRESHWATER ECOSYSTEMS: CHALLENGES AND OPPORTUNITIES

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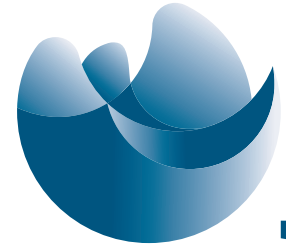

Limnologia 2012

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Welcome message

The Organizing Committee welcomes you to the XVIth Congress of the Iberian Association of Limnology under the focal theme of *Current threats to freshwater ecosystems: challenges and opportunities*.

Freshwaters provide vital services for humanity but increasing pressures, from a multitude of sources (e.g. climate change, invasive species, pollution, loss and fragmentation of habitat, overexploitation), threaten the future availability of those services, including basic commodities as the availability of drinking water. The XVIth AIL Congress will hopefully provide the opportunity to address those outstanding questions, and discuss the most up to date fundamental and applied knowledge on freshwater biology, ecology and environmental management.

The beautiful historical city of Guimarães, where the Portuguese nation was established in the early XII century, has a unique medieval city centre classified as World Heritage by UNESCO. Additionally, Guimarães hosts many cultural events, as it is the European Capital of Culture in 2012.

On the behalf of the organizing committee, we wish you a very fruitful and pleasant meeting.

Fernanda Cássio and Cláudia Pascoal

welcome

ACKNOWLEDGMENTS

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HOTEL DE GUIMARÃES ★★★★

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Welcome reception

The welcome reception will be held in the city centre of Guimarães at **Histórico by PapaBoa**. This event aims to welcome Limonologia 2012 participants with the history and culture of Guimarães.

Congress dinner

The congress dinner will be held at **Pousada de Santa Marinha** in Guimarães. This beautiful and historical place will certainly offer a wonderful evening to remember Portugal and Limnologia 2012.

The organization will provide buses to take participants from the University Campus to the congress dinner at Pousada de Santa Marinha.
Departure from the University Campus will be at 19h30.

Social

Technical/Scientific visits

KAYAK TOUR ALONG THE RIVER CÁVADO

Wednesday, July 4th, 9h00-17h00

Special needs: Footwear for walking on water, sunscreen and hat, swimsuit and snug t-shirt preferable in elastic material, extra clothes (there is a chance of turning your kayak and falling in the water).
Transport, food and beverages will be provided by the organization.

PEDESTRIAN TOUR THROUGH NATURAL LAGOONS IN THE NATIONAL PARK

Wednesday, July 4th, 9h00-22h30

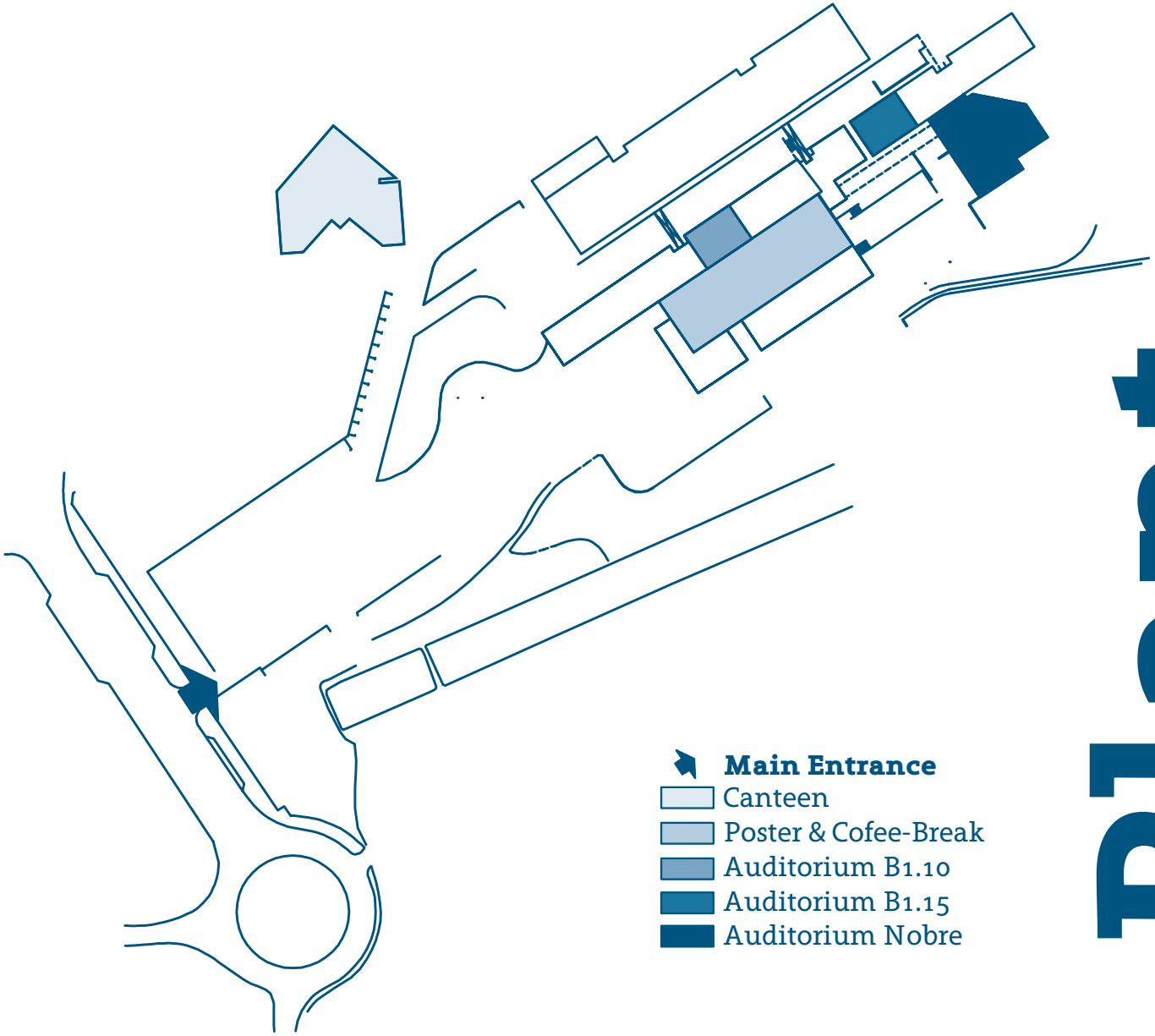
Special needs: Boots or shoes with good grip, hat, shorts or trousers, sunscreen, bathing suit and towel, camera (optional) and backpack to carry lunch provided by the organization.
Transport, food and beverages will be provided by the organization.

BERTIANDOS AND S. PEDRO DE ARCOS LAGOONS PROTECTED LANDSCAPE

Wednesday, July 4th, 9h00-18h00

Special needs: Walking shoes (tennis or trekking shoes), hat, discrete color clothes and sunscreen. Binoculars are advisable.
Transport, food and beverages will be provided by the organization.

PLANT OF THE LOCAL



Plant

ABOUT GUIMARÃES

Guimarães was settled in the IX century and it is a historical city with a key role in the foundation of the Portuguese Kingdom during the XII century. Guimarães is known as "the Cradle City" (*Cidade Berço*) and it was the birthplace of D. Afonso Henriques, the first king of Portugal. In 1128, the battle of São Mamede led to the independence of the *Condado Portucalense*, paving the way for the founding of the Portuguese Nation.

The medieval city centre of Guimarães was classified by UNESCO as World Cultural Heritage in 2001.

Guimarães invites all visitants to discover some emblematic places, such as:

Medieval Castle built in the X century by the Countess Mumadona Dias to protect the local population;

St Michael Chapel built in the XII century in the Romanesque style. It is thought to be the place where D. Afonso Henriques was baptized;

Palace of the Dukes of Bragança a majestic manor house of the XV century classified as a national monument. It has various pieces documenting the Age of Portuguese Discoveries and the Conquest of North Africa;

Alberto Sampaio Museum was created in 1928 to house the treasure of the church of the *Colegiada da Nossa Senhora de Oliveira* and other important collections of churches and convents of the region. It holds gold and silverware, wooden and stone sculptures, woodcarving, paintings, ceramics and textiles from XII-XIX centuries;

Martins Sarmento Archaeological Museum holds important collections of the pre-Roman Castreja culture (an ancient native society that settled along the Atlantic coast of the Iberian Peninsula) as well as other archaeological items;

Cultural Centre of Vila Flor was created in 2005 and incorporates the XVIII century Palace of Vila Flor. It brings together the rich history of a manor house, its magnificent gardens and lovely architecture, evoking the ideas of ancestral memories with touches of modernity. It currently hosts music concerts, theatre and temporary exhibitions.

You can go by suspended cable car from the city of Guimarães to the **Monte da Penha** where you can enjoy a wide range of facilities and services, exploit the natural environment and the historical-cultural heritage of the region.

Don´t miss the **Largo do Toural**, considered today as the heart of the city, a late afternoon light meal or drink at the **Praça de Santiago** or **Largo da Oliveira**, the **Rua de Santa Maria** one of the oldest streets in Guimarães, and the old houses famous for the wooden balusters of their balconies at the **Rua Dom João I**. You can also visit **churches** with different architectural styles from the Renaissance to the Gothic.

There is a great variety of restaurants where you can enjoy the local gastronomy and wines, especially the green wines of the region. You can also visit the Pastelaria Clarinha, in Largo do Toural, and taste the most famous "Toucinho do Céu".

Guimarães

SCHEDULE OVERVIEW

Schedule

Time	Sunday 01/07	Monday 02/07	Tuesday 03/07	Wednesday 04/07	Thursday 05/07	Friday 06/07
08:00				Tecnical Excursions		
08:15		Registration				
09:00			Keynote Lecture E. Martí		Keynote Lecture L. Guilhermino	Keynote Lecture D. Baird
09:30	Short Advanced Courses	Opening session				
10:00		Margalef Conference K. Tockner	Regular Talks		Regular Talks	Regular Talks
10:30						
11:00		Cofee-Break & Posters	Cofee-Break & Posters		Cofee-Break & Posters	Cofee-Break
11:20		Regular Talks	Regular Talks		Regular Talks	Regular Talks
12:00						
12:35						Closing & Awards
12:50		Lunch	Lunch		Lunch	
13:30						
14:00						
14:20		Keynote Lecture J. Olden	Keynote Lecture G. Woodward		PhD Prize Conference D. Soto	
15:00						
15:20		Regular Talks	Regular Talks		Regular Talks	
16:00						
16:35	Registration	Cofee-Break & Posters	Cofee-Break & Posters		Cofee-Break & Posters (16:20)	
16:40					Regular Talks	
17:00						
17:40					Posters	
18:00		Youth AIL get2gether	Youth AIL Assembly			
18:30						
19:00			AIL Assembly			
19:30		Welcome Reception			Congress Dinner	
20:00						

Activities

AIL YOUTH ACTIVITIES

Short course - Scientific Writing
Sunday, July 1st, 9:30-17:00, Room B 2.35

The objective of this course is to help Master and Ph.D. students and young researchers in the publication of their research in scientific journals.

Lecturer: Manuel Graça, Universidade de Coimbra, Portugal

Get 2gether: Meeting between junior and senior researchers
Monday, July 2nd, 18:00, Auditorium Nobre
This event intends to facilitate personal contacts between students and individual senior scientists with whom they would be specially interested in changing ideas about future work, scientific career or ask for suggestions regarding current research.

Students awards for best oral and poster presentations
Friday, July 6th, 12:45
Awards will be attributed to the 1st, 2nd and 3rd best oral and poster presentations by students, during the closure ceremony.

Best Cartoon
Friday, July 6th, 12:45
The cartoons must be print and delivered at the registration desk, in the first day of congress. The images will be exhibited and voted during the meeting and the winner will be announced during the closure ceremony.

Best Limnology Photo
Friday, July 6th, 12:45
The photos must be print in photo paper (size 15x20 cm) and delivered at the registration desk, in the first day of congress. The pictures will be exhibited and voted during the meeting and the best picture will be announced during the closure ceremony.

Youth AIL Assembly
Tuesday, July 3th, 18:00, Auditorium Nobre

AIL ASSEMBLY

AIL Assembly
Tuesday, July 3th, 19:00, Auditorium Nobre

All members are invited to join AIL general assembly.

OPENING SESSION

The opening session of Limnologia2012 will count on the presence of the Vice-Rector of the University of Minho, the Vice-Mayor of the city Hall of Guimarães, the President of the School of Sciences, the President of the Iberian Association of Limnology and the organization chairs.

It will include the participation of the *Ensemble of Trumpets of the University of Minho* with the Sonata in D major of Henry Purcell (1659-1695).

CLOSING SESSION

The closing session of Limnologia 2012 will count on the presence of the President and the Vice-President of the Iberian Association of Limnology, the Director of the CBMA research Centre, the Head of the Department of Biology of the University of Minho and the organization chairs.

PRESENTER GUIDELINES

All presenting authors must be registered for the conference

Instructions for oral presentation
Upload your presentation until 13h (1 p.m.) the day before your talk
Read the instruction carefully to avoid having your presentation file deleted.
Electronic **PowerPoint or PDF presentations** are the ONLY accepted forms for oral presentation

The electronic projection equipment provided in each auditorium will include a computer equipped with **Windows XP and PowerPoint 2007**. If you are a Macintosh user test your presentation on a PC to verify if it converts to WINDOWS format accurately. There will NOT be any MAC equipment available.

The participants are not allowed to use their own computers

Files admitted to upload are: PowerPoint (ppt, pptx, pps, ppsx) and PDF.
File size should be up to 40MB (megabytes).
Name your file with: your Abstract number + your last name+ the version of the file (optional).

Ex: Abstract268_Smith_version1.pdf
Ex: Abstract199-Robbins.ppt
Ex: Abstract305_Andersen.ppsx

Files should be submitted **until 13h (1 p.m.) the day before your talk** otherwise they will not be accepted.
Last minute changes are not permitted.
Sending the file via e-mail to the organization will NOT result in file acceptance.
Failure to follow these instructions can results in file deletion or presenting without sildes.

At the Congress, be in the session room at least 15 minutes before the beginning of your session and introduce yourself to the Session Chair. Give him/her some data to introduce you

Stay on schedule (13+2 min). The Session Chair has been instructed to require every speaker finish on time.

Instructions for poster presentation
Each poster will be on display for 1 day.
Please check the program to see the exact date on which your poster is to be displayed as well as the poster board number assigned to your poster.
Posters should be mounted by 08:30 h on the day on which they are scheduled to be presented and must be removed by the end of the same day (19:00).
Presenting authors are required to stand next to their posters for discussion during the dedicated poster session and during coffee breaks.
The organizers are not responsible for any posters that have not been removed by the end of the dedicated poster session.
Equipment for hanging your poster will be provided by the organization.

Guidelines

Overview and Oral Presentations

Monday 2 July Morning: Overview and Oral Presentations

MONDAY

8:15	**Registration**		
9:30	**Opening (Auditorium Nobre)**		
10:00	***Margalef Conference*** **Domesticated rivers and novel communities: a challenge for research and management** Klement Tockner (*IGB, Berlin, Germany*)		
11:00	**Coffee-break and Posters (Session 1)**		
	Auditorium Nobre	**Auditorium B1.10**	**Auditorium B1.15**
Session	**T16-Tropical rivers** M Graça	**T12- Microbial Ecology** C Borrego	**SS2-Carbon processing in freshwaters: approaches and perspectives** B Obrador, R Marcé
11:20	T16-O101 **Lixiviação e perda de massa inicial de espécies ripárias do cerrado brasileiro.** Pereira-Gomes P, Gonçalves Júnior J (Departamento de Ecologia, Universidade de Brasília, BR)	T12-O133 **Experimental approach to assess microbial food web interactions in the pelagic environment of stratified lakes**. Picazo A, Rochera C, Vicente E, Macek M, Camacho A (Microbiology and Ecology, Cavanilles Institute of Biodiversity and Evolutionary Biology, University of Valencia, ES)	SS2-O119 **Degradation of allochthonous and autochthonous material in river and salt marsh sediments: suitability and meaning**. Arrojo M, Niell F (University of Málaga, SP)
11:35	T16-O173 **Efeito do represamento de riachos do Cerrado na decomposição foliar.** Salomão V, Gonçalves Júnior J (Ecologia-Laboratório de Limnologia, Universidade de Brasília, BR)	T12-O131 **Dinámica estacional de Epsilonproteobacteria y Bacterias Verdes del Azufre en un lago cárstico meromíctico.** Noguerola I, Auguet O, Fillol M, Borrego C (University of Girona, SP)	SS2-O120 **Quantitative estimation of the organic matter origin in the sediments using ^{13}C, ^{15}N and C/N.** Arrojo M, Niell F (University of Málaga, SP)
11:50	T16-O388 **The role of invertebrate and microbial decomposers in two types of high-altitude tropical streams.** Encalada A, Ríos Touma B, Pontón J, Rendón M, Prat N, Graça M (Laboratorio de Ecología Acuática, Universidad San Francisco de Quito, EC; IMAR-CMA, Department of Life Sciences, Universidade de Coimbra, PT)	T12-O178 **Structure and function of bi-layered microbial mats from Byers Peninsula (Antarctica).** Rochera C, Villaescusa J, Fernández-Valiente E, Quesada A, Camacho A (Cavanilles Institute of Biodiversity and Evolutionary Biology, University of Valencia, Burjassot, SP)	SS2-O153 **Reactivity of allochthonous and autochthonous DOM sources in a Mediterranean coastal lagoon.** Catalán N, Obrador B, Felip M, Pretus J (University of Barcelona, SP)
12:05	T16-O418 **Microcrustáceos de sistemas lóticos da Chapada dos Veadeiros, Brasil central.** Padovesi-Fonseca C, Motta J, Mendes G, Oliveira S (Departamento de Ecologia, Instituto de Biologia, Universidade de Brasilia, Núcleo de Estudos Limnológicos, Núcleo Avançado de Estudo do Cerrado, Brasília, BR)	T12-O244 **Spatial variability of sediment microbial functioning in a mediterranean river.** Freixa A, Ejarque E, Butturini A, Amalfitano S, Fazi S, Romaní A (Department of Environmental Sciences, Institute of Aquatic Ecology, University of Girona, SP)	SS2-O163 **Granulometría inorgánica y contenido en carbono orgánico y nitrógeno en sedimento de embalses de Cataluña.** Casas JP, López P, Pompêo M, Armengol J (University of Barcelona, SP)
12:20	T16-O434 **Seasonality of phosphorus in the Madeira River (Brazil): implications for the Amazonian flux of phosphorus.** Almeida R, Boemer G, Huszar V, Barros N, Lima M, Durval J, Carvalho D, Gripp A, Roland F (Departamento de Limnologia, Ecology and Environment do Brasil Ltda., Rio de Janeiro, BR; Laboratório de Ecologia Aquática, Universidade Federal de Juiz de Fora, BR)	T12-O398 **Segregación de comunidades de archaea y diseño de herramientas moleculares específicas de linajes nocultivados.** Fillol M, Gich F, Borrego C (Department of Biology, Institute of Aquatic Ecology, University of Girona, SP)	SS2-O376 **Carbon sedimentation dominated over CO_2 emission in two net heterotrophic Mediterranean reservoirs.** Morales-Pineda M, Obrador B, Úbeda B, Cózar A, Gálvez J (University of Cádiz, SP)
12:35		T12-O460 **Exploring in aphanizomenon the relationship between cylindrospermopsin content and expression of AOA genes**. Baron A, Sanz-Alférez S, del Campo F (Universidad Autónoma de Madrid, SP)	SS2-O336 **Five-year CO_2 and O_2 variability in a subtropical coastal lake of the Atlantic Rainforest, Brazil.** Petrucio M, Fontes ML (Universidade Federal de Santa Catarina, Florianópolis, BR)
12:50	**Lunch**		

Monday 2 July Afternoon: Overview and Oral Presentations

MONDAY

14:20	**Keynote lecture: Invasive species in hot pursuit of Pacific salmon** Julian Olden (*University of Washington, Seattle, USA*) **Auditorium Nobre**		
	Auditorium Nobre	**Auditorium B1.10**	**Auditorium B1.15**
Session	**SS1-Biology and conservation of freshwater mussels: an Iberian perspective** M Lopes-Lima	**T5- Ecosystem Processes** M Abelho	**SS2-Carbon processing in freshwaters: approaches and perspectives** B Obrador, R Marcé
15:20	SS1-O63 **Massive die-offs of freshwater bivalves as resource pulses.** Sousa R, Varandas S, Teixeira A, Lopes-Lima M (CBMA, University of Minho, PT; CIMAR-LA/CIIMAR, University of Porto, PT)	T5-O93 **Impacto de los eucaliptales en las comunidades de macroinvertebrados de arroyos de la cuenca del río Lérez.** Martinez A, Landeira A, Alvarez M, Cordero-Rivera A (Departamento de Ecoloxía e Bioloxia Animal, Universidade de Vigo, ES)	SS2-O146 **The role of alkalinity on the relationship between lake metabolism and CO_2 saturation and its global relevance.** Marcé R, Obrador B, Riera J, López P, Armengol J (ICRA, Girona, SP; University of Barcelona, SP)
15:35	SS1-O67 **Rediscovery of two freshwater pearl mussel (*Margaritifera margaritifera*) populations in the Tâmega River Basin.** Varandas S, Lopes-Lima M, Teixeira A, Mariana Hinzmann M, Reis J, Cortes R, Machado J, Sousa R (CITAB-UTAD, University of Trás-os-Montes and Alto Douro, PT)	T5-O13 **FPOM is abundant in mountain low order streams in Central Portugal, but it has lower quality than leaf litter.** Graça M, Callisto M (Departamento de Ciências da Vida, Universidade de Coimbra, PT; IMAR-CMA, Universidade de Coimbra, PT)	SS2-O182 **Estimates of whole-lake metabolism in stratified lakes: relevance of the metalimnetic zone.** Obrador B, Staehr P, Christensen J (University of Barcelona, SP)
15:50	SS1-O71 **Ecological requirements of autochthonous mussel populations in Tâmega, Tua and Sabor rivers (Douro basin).** Teixeira A, Varandas S, Hinzmann M, Lopes-Lima M, Sousa R (CIMO-ESA-IPB, Polytechnic Institute of Bragança, PT)	T5-O140 **Efectos de la temperatura sobre la descomposición de hojarasca de diferente calidad en ríos de cabecera.** Martínez A, Pérez J, Larrañaga A, Molinero J, Basaguren A, Pozo J (Plant Biology and Ecology, UPV/EHU, Bilbao, SP)	SS2-O337 **Bacterial community regulates carbon variability in a subtropical coastal lake, Brazil.** Fontes ML, Dalpaz L, Antônio R, Petrucio M (Universidade Federal de Santa Catarina, BR)
16:05	SS1-O134 **Biology and overall distribution of the native freshwater mussels of Iberia.** Lopes-Lima M, Hinzmann M, Sousa R, Varandas S, Froufe E, Teixeira A, Machado J (CIMAR-LA/CIIMAR, University of Porto, PT; ICBAS, University of Porto, PT)	T5-O443 **Effects of pollution on leaf-litter breakdown in low-order streams.** Lopes M, Sampaio A, Varandas S, Hughes S, Cortes R (Department of Biology and Environment, CITAB, UTAD, Vila Real, PT)	SS2-O104 **Metabolism responses to flow regulation by dams in Mediterranean river ecosystems.** Aristi I, Arroita M, Flores L, Ponsatí L, von Schiller D, Acuña V, Sabater S, Elosegi A (University of the Basque Country, Bilbao, SP)
16:25	SS1-O194 **Rol de la herbivoría de bivalvos nativos y exóticos en un reservorio somero del Uruguay.** Marroni S, Clemente J, Iglesias C, Mazzeo N (CURE-Facultad de Ciencias, Montevideo, UY)	T5-O481 **Effects of riparian plant diversity on leaf-litter decomposition along an eutrophication gradient.** Lima-Fernandes E, Fernandes I, Pereira A, Geraldes P, Cássio F, Pascoal C (CBMA, University of Minho, PT)	SS2-O105 **Proyecto RIOTEM: efectos de la temperatura en el funcionamiento de ríos de cabecera de la cornisa cantábrica.** Molinero J, Larrañaga A, Pérez J, Martínez A, Basaguren A, Pozo J (University of País Vasco, Bilbao, SP)
16:35	**Coffee-break and Posters (Session 1)**		
18:00	**Youth AIL Get2Gether**		
19:30	**Welcome Reception**		

Tuesday 3 July Morning: Overview and Oral Presentations

TUESDAY

9:00	**Keynote lecture: Impacts of urban pressure on stream biogeochemical processes: revisiting H.B.N. Hynes' ideas** Eugènia Martí (*Centre d'Estudis Avançats de Blanes, SP*) **Auditorium Nobre**		
	Auditorium Nobre	**Auditorium B1.10**	**Auditorium B1.15**
Session	**T6-Environmental management and water quality** MJ Feio	**T10- Invasive species** P Anastácio	**SS7-Running without water: water scarcity implications for river functioning, conservation and management** A Elosegi, S Sabater
10:00	T6-O43 **Predicting water quality characteristics to entire river networks.** Álvarez-Cabria M, Barquín J, Peñas F, Fernández D, Booker D (Instituto de Hidráulica Ambiental de la Universidad de Cantabria "IH Cantabria", Universidad de Cantabria, Santander, ES)	T10-O15 **Remote sensing approaches to detect Arundo donax invasions in riparian habitats.** Fernandes R, Aguiar F, Neves Silva J, Ferreira T, Pereira JM (Instituto Superior de Agronomia, Technical University of Lisbon, PT)	SS7-O248 **Microbial community composition during desiccation of the streambed in an intermittent stream.** Timoner X, Acuña V, Borrego C, Sabater S (Institute of Aquatic Ecology, University of Girona, SP; Resources and Ecosystems, ICRA, Girona, SP)
10:15	T6-O156 **Managing macroinvertebrate communities seasonality in a national predictive model for Portugal.** Serra SR, Melo J, Costa C, Feio MJ (IMAR-CMA, Department of Life Sciences, University of Coimbra, PT)	T10-O169 **Waterfowl as potential vector enhancing spread of non-native amphipod *Crangonyx pseudogracilis*.** Rachalewski M, Banha F, Grabowski M, Anastácio P (IMAR-Centro de Mar e Ambiente, University of Évora, PT)	SS7-O99 **Fungal diversity affects streams recovery after drought periods.** Gonçalves A, Graça M, Canhoto C (IMAR-CMA, Department of Life Sciences, University of Coimbra, PT)
10:30	T6-O350 **Abordagem multimétrica com macroinvertebrados em uma bacia hidrográfica no Sudeste Brasileiro.** Sattamini A, Vieira C, Baptista D (Laboratório de Avaliação e Promoção da Saúde Ambiental, Instituto Oswaldo Cruz/ Fundação Oswaldo Cruz, Rio de Janeiro, BR)	T10-O205 **Consequences of the presence of the red swamp crayfish (*Procambarus clarkii*) on ecosystem functioning: a mesocosm study.** Rodríguez-Pérez H, Hilaire S, Mesléard F (Tour du Valat, Arles, FR)	SS7-O166 **Do extreme drought events in fluence diatom assemblages?** Elias C, Calapez A, Feio MJ, Almeida S (GeoBioSciences GeoTechnologies and GeoEngineering-GeoBioTec-Research Unit, University of Aveiro, PT)
10:45	T6-O171 **Best available conditions within common Mediterranean stream types from 7 countries.** Feio MJ, Aguiar F, Almeida S, Ferreira J, Ferreira T, Elias C, Serra SR, Buffagni A, Cambra J, Chauvin C, Delmas F, Dör finger G, Erba S, Flor N, Ferréol M, Germ M, Mancini L, Manolaki P, Marcheggiani S, Minciardi M, Munné A, Papastergiadou E, Prat N, Puccinelli C, Rosebery J, Sabater S, Ciadamidaro S, Tornés E, Tziortzis I, Urbanič G, Vieira C (IMAR-CMA, Department of Life Sciences, University of Coimbra, PT)	T10-O250 **Macro-scale drivers of crayfish invasions in Europe: the problematic Signal crayfish and Red swamp crayfish.** Capinha C, Brotons L, Anastácio P (IMAR, Centro de Mar e Ambiente c/o Departamento de Paisagem, Ambiente e Ordenamento, University of Évora, PT)	SS7-O247 **The role of chemical inputs in Mediterranean rivers biofilms.** Ponsatí L, Barceló D, Freixa A, Guasch H, Petrovic M, Ricart M, Romaní A, Tornés E, Sabater S (Resources and Ecosystems, ICRA, Girona, SP)
11:00	**Coffee-break and Posters (Session 2)**		

TUESDAY

	Auditorium Nobre	Auditorium B1.10	Auditorium B1.15
	T6-Environmental management and water quality J Armengol	**T5-Ecosystem processes** V Ferreira	**SS7-Running without water: water scarcity implications for river functioning, conservation and management** A Elosegi, S Sabater
11:20	T6-O129 **Evaluación del riesgo de incumplir los objetivos de la DMA en aguas superficiales de la cuenca del Ebro.** Angulo-Alconchel R, Navarro-Barquero P, Durán-Lalaguna C, Ormad-Melero MP (Área de Calidad de Aguas, Comisaría de Aguas, Confederación Hidrográfica del Ebro, Zaragoza, ES)	T5-O44 **The effect of sewage effluents on benthic communities and metabolism of three Atlantic rivers.** Barquín J, Álvarez-Cabria M, Peñas F and Fernández D (Instituto de Hidráulica Ambiental, Universidad de Cantabria, Santander, ES)	SS7-O94 **Does flow intermittency influence in-stream N processing rates in a Mediterranean stream?** Arce MI, Gómez R, Sánchez-Montoya MM, Vidal-Abarca MR, Suárez ML (Ecology and Hydrology, University of Murcia, SP)
11:35	T6-O145 **Assessment of the ecological status of the Ferreira River (North of Portugal).** Rodrigues C, Bio A, Vieira N (Department of Biology, University of Porto, PT)	T5-O122 **The light and the dark side of the force: relevance of different metabolisms on inorganic carbon assimilation.** Camacho A, Picazo A, Rochera C (Cavanilles Institute of Biodiversity and Evolutionary Biology, University of Valencia, Burjassot, SP)	SS7-O117 **Linking in-stream nutrient flux and removal to land use and climate variability in an impaired basin.** Aguilera R, Marcé R, Sabater S (ICRA, Girona, ES)
11:50	T6-O487 **Standardization of taxonomy used to classify ecological status in Spanish water bodies: TAXAGUA and ID-TAX**. Barcia EB, Codorníu AC, Infante AP, Rodríguez RJ. (Ministry of Agriculture, Food and Environment. Madrid, SP)	T5-O106 **Nitrogen uptake kinetics of stream biofilms in response to increased availability of ammonium and nitrate.** Ribot M, von Schiller D, Sabater F, Grimm N, Martí E (Biogeodynamics and biodiversity group, Centre Estudis Avançats de Blanes-CSIC, Blanes, ES)	SS7-O225 **Effects of salinity on wood breakdown and microbial activity in semiarid Mediterranean streams.** Gómez R, Asencio A, Del Campo-González R, Picón J, Arce MI, Sánchez-Montoya MM, Suárez ML, Vidal-Abarca MR (Department of Ecology and Hydrology, University of Murcia, SP)
12:05	T6-O201 **The MIRAGE 'Tool-Box": Linking hydrology and ecology to measure the Ecological Status of temporary streams.** Prat N, Francesc G, Jochen F (Departmen of Ecology, University of Barcelona, SP)	T5-O371 **Ciclagem de nutrientes via bioturbação e excreção de *Laeonereis culveri* em um gradiente trófico do sedimento.** Gonçalves F, Figueiredo Barros M, Caliman A, Carneiro L, Alfenas G, Rossi D (Instituto de Biologia, Universidade Federal do Rio de Janeiro, Macaé, BR)	SS7-O253 **Effects of long time drought on leaf litter decomposition in a Mediterranean stream.** Mora-Gómez J, Romaní A, Boix D (Environmental Sciences, University of Girona, SP)
12:20	T6-O123 **Effects of land use intensification on fish assemblages in Mediterranean climate streams.** Matono P, Sousa D, Ilhéu M (Departamento de Paisagem, Ambiente e Ordenamento, Universidade de Évora, PT; Instituto de Ciências Agrárias e Ambientais Mediterrânicas, Universidade de Évora, PT)	T5-O294 **Complexity of aquatic macrophytes on ostracods (Crustacea) community in a lake of neotropical floodplain.** Lansac-Tôha F, Matsuda J, Mormul R, Velho L, Martens K, Higuti J (Biology, Universidade Estadual de Maringá, BR)	SS7-O139 **Effects of flow scarcity on leaf-litter breakdown in streams from northern Spain**. Pérez J, Martínez A, Larrañaga A, Molinero J, Basaguren A, Pozo J (Plant biology and Ecology, University of Basque Country UPV/EHU, Bilbao, SP)
12:35	T6-O310 **Predicting changes in water quality before the construction of a dam in the River Alva (Portugal).** Ribeiro D, Mateus M, Martins G (MARETEC, Instituto Superior Técnico, Lisboa, PT)		
12:50	**Lunch**		

Tuesday 3 July Afternoon: Overview and Oral Presentations

TUESDAY

14:20	**Keynote lecture: Climate change in freshwaters: impact on higher levels of organization** Guy Woodward *(Queen Mary University of London, UK)* **Auditorium Nobre**		
	Auditorium Nobre	**Auditorium B1.10**	**Auditorium B1.15**
Session	**T6-Environmental management and water quality** N Prat	**T5- Ecosystem Processes** I Muñoz	**SS7-Running without water: water scarcity implications for river functioning, conservation and management** A Elosegi, S Sabater
15:20	T6-O478 **Structural and functional measures of invertebrate and fungal communities as predictors of eutrophication.** Pereira A, Geraldes P, Lima-Fernandes E, Fernandes I, Cássio F, Pascoal C (CBMA, University of Minho, Braga, PT)	T5-O420 **Leaf litter decomposition in a Mediterranean stream: dynamics from basal resource to consumers.** De Castro-Català N, Mora-Gómez J, Muñoz I, Romaní A (Department of Ecology, University of Barcelona, SP)	SS7-O82 **Efecto de la detracción de agua en la acumulación y descomposición de materia orgánica particulada gruesa.** Arroita M, Aristi I, Flores L, Díez JR, Elosegi A (Faculty of Science and Technology, University of the Basque Country, Bilbao, SP)
15:35	T6-O352 **Assessing the use of plant litter for uranium removal from contaminated streams.** Antunes P, Graça M, Pratas J (Department of Life Sciendes, University of Coimbra, PT)	T5-O222 **Avaliação da integridade ecológica de riachos através dos invertebrados aquáticos e da decomposição foliar**. Lemes da Silva A, Gonçalves Júnior J, Petrucio M, Lisboa L, Siegloch A, Pires J (Ecologia e Zoologia, Universidade de Brasília, BR)	SS7-O235 **Temporary streams in Spain: exploring flow regime typology and tendencies under water scarcity.** García de Jalón D, Gonzalez del Tanago M, Perez Gil E, Bejarano MD, Alonso C (Ingenieria Forestal, Universidad Politécnica Madrid, ES)
15:50	T6-O26 **Effect of temperature and vegetation on *E. coli* removal in non-conventional wastewater treatment technologies.** Martín I, Salas J (Water Quality, Foundation CENTA, Seville, SP)	T5-O341 **An alternative model for multiple stable states in shallow lakes of Argentina.** Momo F, Kranewitter V (Instituto de Ciencias, Universidad Nacional de General Sarmiento, Los Polvorines, AR)	SS7-O160 **Effects of flow regime alteration on fluvial and riparian habitats in a semiarid Mediterranean basin.** Belmar O, Velasco J, Bruno D, Martínez-Capel F, Barquín J (Ecology and Hydrology, University of Murcia, ES)
16:05	T6-O141 **A new quantitative fish index to the classification of ecological potential in Spanish reservoirs.** Monteoliva A, Alonso de Santocildes G, Criado A, Encina L, Rodríguez V (Ecohydros SL., Maliaño, Cantabria, SP)	T5-O16 **Effects of the fungicide pyrimethanil on biofilm and organic matter processing in outdoor aquatic mesocosms**. Abelho M, Ribeiro R (Ambiente, Escola Superior Agrária, Instituto Politécnico de Coimbra, PT; IMAR-CMA, Universidade de Coimbra, PT)	SS7-O466 **The challenge of restoring bi-national rivers: the Rio Grande/Rio Bravo and the Colorado River/Rio Colorado**. Schmidt J (Grand Canyon Monitoring and Research Center, US Geological Survey, USA)
16:25	T6-O282 **Estudio de la comunidad fitoplanctónica en embalses Gallegos a las puertas del invierno.** Reyes I, Martí T, Velo M, Pineiro R, Fompedriña D, de Anta A, Bueres A, Vadillo I (Asesoría Técnica, IPROMA S.L., Sevilla, ES)	T5-O325 **Spatial patterns of N_2O and CO_2 emissions during the growing season in a Mediterranean riparian zone.** Sabater F, Martín E, Porcher A, Cañas L, Poblador S, Romero C, Serra A, Gacia E, Martí E (Ecology Department, University of Barcelona, SP)	
16:35	**Coffee-break and Posters (Session 2)**		
18:00	**Youth AIL Assembly**		
19:00	**AIL Assembly**		

Thursday 5 July Morning: Overview and Oral Presentations

THURSDAY

9:00	**Keynote lecture: Assessing the effects of stressors on aquatic ecosystem functioning: old problems and new challenges** **Lúcia Guilhermino** (*ICBAS, University of Porto, Portugal*) **Auditorium Nobre**		
	Auditorium Nobre	**Auditorium B1.10**	**Auditorium B1.15**
Session	**T6-Environmental management and water quality** MJ Feio	**SS4-Diapause as invertebrate survival strategy in instable aquatic environments** C Crispim	**SS7-Running without water: water scarcity implications for river functioning, conservation and management** A Elosegi, S Sabater
10:00	T6-O186 **Limnological features and plankton communities of seven reservoirs in the Southeastern Brazil.** Castelo-Branco C, Sousa-Filho I, Guarino A, Palermo E, Portugal S, Huszar V, Costa A, Souza L, Santos P, Loureiro B, Rosa P, Cormack T, Farias D, Fintelman E, Rocha R (Zoologia, Universidade Federal do Estado do Rio de Janeiro, BR)	SS4-O96 **Where do they come from? The role of pools and resting eggs in the recovery of zooplankton in a shallow lake.** Araujo L, Santangelo J, Lopes P, Petry A, Bozelli R (Universidade Federal do Rio de Janeiro, BR)	SS7-O164 **Effects of extreme drought on macroinvertebrates communities in typically perennial Atlantic humid streams.** Calapez A, Elias C, Almeida S, Feio MJ (IMAR-CMA, University of Coimbra, PT)
10:15	T6-O167 **The algal group indexes (IGA, IGA2) for assessing ecological status of lakes and reservoirs within WFD.** Caraballo T, Pahissa J, De Hoyos C, Catalan J (Department of Limnology, CEAB-CSIC, Blanes, SP)	SS4-O183 **Past experiences and future research on diapause in Uruguay.** Iglesias C, Mazzeo N, Vidal N, Gerhard M, Arim M, Meerhoff M, Jeppesen E (Ecologia y Evolucion, CURE-Universidad de la Republica, UY)	SS7-O328 **Inter-annual hydrological variability: structural and functional responses of invertebrates**. Muñoz I, de Castro-Català N, Gaudes A, Lopez-Doval J, Mas-Martí E, Sanpera-Calbet I (University of Barcelona, SP)
10:30	T6-O316 **Inference models of environmental changes based on diatoms (Bacillariophyta) from sediments of Azorean lakes.** Pereira C, Raposeiro P, Gonçalves V (Departamento de Biologia, Universidade dos Açores, Ponta Delgada, PT; Centro de Investigação em Biodiversidade e Recursos Genéticos, CIBIO-Azores, Ponta Delgada, PT)	SS4-O184 **Estratégias de sobrevivência do zooplâncton em ecossistemas instáveis.** Crispim C, Ribeiro L, Vieira D (Universidade Federal da Paraíba, BR)	SS7-O174 **Can the river shrimp *Athyaephyra desmarestii* fly to escape to drought?** Banha F, Anastácio P (Department of Landscape, Environment and Planning, IMAR, University of Évora, PT)
10:45	T6-O80 **Mathematical modeling of P mobility in lake sediments: the effect of mineral composition in P retention**. Ribeiro D, Martins G, Nogueira R, Brito A (Biological Engineering, IBB - University of Minho, Braga, PT)	SS4-O297 **About the seasonally homeless aquatic invertebrates in the Amazon.** Santos-Silva E, Robertson B, Brandorff G, Ghidini A, Couto C, Vale L and Rimachi E (Lab. Plâncton - CBIO, INPA, BR)	SS7-O300 **Regional extinction risk of freshwater biota in Mediterranean and temperate climate regions**. Bonada N, Filipe A and Finn D (University of Barcelona, SP)
11:00	**Coffee-break and Posters (Session 3)**		
Session	**T6-Environmental management and water quality** J Soria	**T2-Biodiversity and biogeography** S Duarte, V Gonçalves	**T11-Lentic ecosystems** M Petrucio
11:20	T6-O393 **Automatic dammed water quality monitoring in Mediterranean reservoirs for management decision support.** Correcher E, Torán M, Picazo A, Rochera C, Álvarez-Troncoso R, Martínez E, Morales A, Camacho A (ADASA SISTEMAS, Barcelona, ES)	T2-O30 **Zoobentos de arroyos en condiciones extremas en la Puna Altoandina Argentina.** Rodrigues-Capítulo A, Spaccesi F, Armendáriz L (Instituto de Limnología-ILPLA/ Facultad de Ciencias Naturales, Universidad Nacional de La Plata, AR)	T11-O124 **Propuesta de mejora para el control del estado ecológico de los lagos de la cuenca del Ebro.** Rodríguez-Pérez MJ, Durán-Lalaguna C, Casanovas-Berenguer R, Alonso M, Romans-García E, Nolla-Querol P, García-Murcia A (Confederación Hidrográfica del Ebro, Zaragoza, ES)

	Auditorium Nobre	Auditorium B1.10	Auditorium B1.15
11:35	T6-O365 **Implantação de uma estação de monitoramento remoto em tempo real da qualidade da água no reservatório Billings.** Mizuno D, Nakahara L, Jo N, Hanisch W (Departamento de Ciências Exatas e da Terra, Instituto de Ciências Ambientais, Químicas e Farmacêuticas/Universidade Federal de São Paulo, Diadema, BR)	T2-O45 **Environmental drivers - spatial and temporal variation of macroinvertebrate communities in island streams.** Raposeiro P, Hughes S, Costa A (CIBIO-Azores, University of Azores, PT; Biology Department, University of Azores, PT)	T11-O237 **The additive partitioning of macroinvertebrate diversity in tropical reservoirs.** Molozzi J, Hepp L, Callisto M (Universidade Estadual da Paraíba, BR)
11:50	T6-O459 **Instrumental methods and remote sensing imagery as tools to establish the Ebro reservoirs ecological quality.** Vicente E, Soria J, Peña R, Soria X, Durán-Lalaguna C, Rodríguez-Pérez MJ (Instituto Cavanilles de Biodiversidad y Biología Evolutiva, Universitat de Valencia, Paterna, ES)	T2-O480 **Biogeography of aquatic fungi: preliminary conclusions.** Duarte S, Seena S, Bärlocher F, Cássio F, Pascoal C (University of Minho, PT)	T11-O358 **Dynamic of the phytoplankton functional groups during annual cyanobacterial dominance in a tropical reservoir.** Becker V, Medeiros L, Mattos A (Universidade Federal do Rio Grande do Norte, BR)
12:05	T6-O218 **About the influence of litoral barriers on the water quality of coastal lagoons: two study cases.** Jalón-Rojas I, Sánchez-Badorrey E, Rus-Carlborg G (Instituto del Agua. Departamento de Mecánica de Estructuras e Ingeniería Hidráulica, Universidad de Granada, ES)	T2-O286 **Taxonomic characterization of Fragilariaceae (Bacillariophyceae) from benthic communities of Azorean lakes.** Marques H, Fonseca A, Gonçalves V (University of Azores, Ponta Delgada, PT; CIBIO-Azores, PT)	T11-O397 **Identificação de zonas de transição em um reservatório no sul do Brasil.** Pereira-Filho W, Wachholz F, Barbieri D (Universidade Federal de Santa Maria, BR)
	T7-Estuarine ecology R Sousa		
12:20	T7-O107 **The carbon fluxes in a coastal area of northern Portugal.** Carvalho R and Duarte P (Universidade Fernando Pessoa, PT)	T2-O351 **Diversidade funcional de algas planctônicas e perifíticas em lago de planície de inundação tropical.** Dunck B, Bortolini J, Rodrigues L, Rodrigues LC, Jati S, Train S (Universidade Estadual de Maringá, BR)	T11-O437 **Limnological features of a tropical Amazonian reservoir (UHE Santo Antônio do rio Madeira) in its filling phase.** Durval J, Boemer G, Almeida R, Lima M, Carvalho D, Gripp A, Almeida L, Grandezi M, Rocha O (Universidade Federal de São Carlos, BR; Ecology and Environment do Brasil, Rio de Janeiro, BR)
12:35	T7-O411 **Distribuição e composição de macroinvertebrados bentônicos em lagoas costeiras de Restinga (RJ, Brasil).** Felix R, Cunha M, Soares B, Alfenas G, Gonçalves F, Dereczynski J, Ornelas N, Esteves B, Ruta C, Bozelli R, Esteves F, Figueiredo-Barros M (Universidade Federal do Rio de Janeiro, BR)		
12:50	**Lunch**		

Thursday 5 July Afternoon: Overview and Oral Presentations

THURSDAY

14:20	**PhD Prize Conference : Combining trace metal bioaccumulation and stable isotopes to reveal food web structure in freshwater ecosystems** **David Soto** (*University of New Brunswick, Canada*) **Auditorium Nobre**		
	Auditorium Nobre	**Auditorium B1.10**	**Auditorium B1.15**
Session	**T15-Restoration of aquatic ecosystems and ecological services** T Ferreira	**SS3-Challenges in assessing the ecological status of rivers and streams** A Rovira, C Ibáñez	**T3-Climate change** F Costa
15:20	T15-O74 **El Tancat de la Pipa (Parc Natural de L'Albufera de València) tras tres años desde su restauración.** Rodrigo M, Rojo C, Segura M, Rubio F, Calero S, Cortés F, Ferrer J (Universitat de València, ES)	SS3-O463 **Transitional and freshwater bioassessments: is the river continuum discontinued?** Neto J, Feio MJ, Teixeira H, Serra SR, Patrício J, Calapez A, Franco J, Constantino E (IMAR, University of Coimbra, PT)	
15:35	T15-O110 **Servicios ecosistémicos de los ríos y riberas Españoles desde la evaluación de los ecosistemas del Milenio.** Vidal-Abarca MR, Suárez ML, Gómez R, Sánchez-Montoya MM, Arce MI (University of Murcia, SP)	SS3-O213 **Selection of reference sites in Mediterranean temporary streams.** Sánchez-Montoya MM, García-Roger E, Martínez-López J, Karaouzas I, Gómez R, Vidal-Abarca MR, Suárez ML, Skoulikidis N, Brito D, Erba S, Buffagni A, Prat N (University of Murcia, SP)	T3-O298 **Regulación de la temperatura en ríos de montaña del centro de la Península Ibérica**. Santiago J, Alonso C, García de Jalón D (UD Zoología, ETSI. Montes. Universidad Politécnica de Madrid, ES)
15:50	T15-O149 **Metodologia de avaliação do estado ecológico e definição de medidas de requalificação: o caso do Rio Corgo.** Coelho D, Varandas S, Hughes S and Cortes R (CITAB, University of Trás-Os-Montes e Alto Douro, PT)	SS3-O331 **Global assessment of stream integrity based on aquatic communities.** Mendes T, Almeida S, Elias C and Feio MJ (GeoBioSciences GeoTechnologies and GeoEngineering-GeoBioTec- Research Unit, University of Aveiro, PT)	T3-O185 **Effects of global warming in leaf litter quality and detritivore performance: a stream manipulative experiment.** Mas-Martí E, Muñoz I, Canhoto C (Departament d'Ecologia, Universitat de Barcelona, ES)
16:05	T15-O289 **Modeling phosphorus binding capacity of Phoslock® for controlling cyanobacterial blooms in Cazalegas Reservoir.** Zaragüeta M, Robles S, Rodriguez J, Orío A (Cimera Estudios Aplicados S.L., Madrid, ES)		T3-O202 **Effect of an experimentally induced drought in a permanent stream ecosystem on the macroinvertebrate community.** Puig MA, Romero C, Martín E, Serra A, Sabater F and Martí E (Continental Ecosystems, CEAB-CSIC, Blanes, SP)
16:20	**Coffee-break and Posters (Session 3)**		
	T15-Restoration of aquatic ecosystems and ecological services A Brito	**SS3-Challenges in assessing the ecological status of rivers and streams** A Rovira, C Ibáñez	**T3-Climate change** A Camacho
16:40	T15-O305 **Predicting the occurrence of aquatic plant species for restoration purposes in Pyrenean lakes.** Pulido C, Riera J, Ballesteros E, Gacia E (CEAB, CSIC, Blanes, SP)	SS3-O233 **Securing water for the lower Ebro: environmental flows, invasive species and Water Framework Directive.** Caiola N, Ibáñez C, Antoni M, Verdú J (Aquatic Ecosystems, IRTA, Sant Carles de la Ràpita, ES)	T3-O214 **Assessing the effects of global warming: a stream manipulative experiment.** Canhoto C, Pedroso de Lima J, Traça de Almeida A (IMAR-CMA & Department of Life Sciences, University of Coimbra, PT)
16:55	T15-O348 **Aquatic plants as bioindicators of As, Cu, Pb, U and Zn in contaminated stream waters of Central Portugal.** Pratas J and Favas P (IMAR-CMA, Departamento de Ciências da Terra, Faculdade de Ciências e Tecnologia, Universidade de Coimbra, PT)	SS3-O210 **Building macroinvertebrate biotic indices from trait descriptions, an example for organic pollution.** Monaghan K, Soares AMVM (CESAM- Biology Department, University of Aveiro, PT)	T3-O39 **Warming stimulates macroinvertebrate- more than microbial-mediated litter decomposition in a temperate stream.** Ferreira V, Canhoto C (IMAR-CMA, University of Coimbra, PT)
17:10	T15-484 **La influencia de la implementación de un régimen de caudales ecológicos en la provisión de servicios ambientais.** Baeza D, Alcorlo P, López C, Martín B (Universidad Autónoma de Madrid, ES; Ecohidraulica SL, Madrid, ES)	SS3-O211 **Assessing stream macroinvertebrate responses to multiple pressures.** Cortes R, Hughes S, Varandas S, Pereira V, Santos C, Pinto A and Jesus J (CITAB-UTAD, University of Trás-os-Montes and Alto Douro, PT)	T3-O479 **Plant-litter decomposition by microbes increases with temperature and nutrient load in streams.** Fernandes I, Pascoal C, Sousa I, Seena S, Cássio F (CBMA, University of Minho, Braga, PT)
17:25		SS3-O269 **The multi-metric invertebrate index (I2M2): improving stream ecological assessment in multi-pressures context.** Ferréol M, Mondy C, Prieto-Montes M, Usseglio-Polatera P (UMR MALY, IRSTEA, Lyon, FR)	T3-O108 **Competitive outcome of *Daphnia-Simocephalus* experimental microcosms: salinity versus priority effects.** Castro B, Loureiro C, Pereira J, Cuco A, Pedrosa MA, Gonçalves F (Dept. Biologia & CESAM, Universidade de Aveiro, PT)
17:40	**Posters (Session 3)**		
19:30	**Congress Dinner (departure from the University)**		

Friday 6 July Morning: Overview and Oral Presentations

FRIDAY

9:00	**Keynote lecture: Traits, genes and Big Data: the brave new world of freshwater ecosystem assessment?** **Donald Baird** (*Environment Canada, University of New Brunswick, Canada*) **Auditorium Nobre**		
	Auditorium Nobre	**Auditorium B1.10**	**Auditorium B1.15**
Session	**T4-Ecohydraulics** R Cortes	**T13-Multiple stressors** B Castro	**T3-Climate change** C Canhoto
10:00	T4-O367 **Comparación del hábitat para la especie *Ictalurus punctatus*, en un tramo de río, respecto al tramo modificado.** Garcia E, Ochoa L, Manriquez P (Departamento de Ingeniería Sanitaria y Ambiental, Universidad Michoacana de San Nicolás de Hidalgo, Morelia, MX)	T13-O81 **Respuestas de los macrófitos a cambios en al nivel de eutrofización y de la radiación Ultravioleta-B.** Rubio F, Rojo C, Segura M, Calero S, Cortés F, Rodrigo M (Grupo de Ecología Integrativa, Institut Cavanilles de Biodiversitat i Biologia Evolutiva, Universitat de València, ES)	T3-O170 **Warming effects on stream biofilm function.** Ylla I, Romaní A and Canhoto C (Institute of Aquatic Ecology, University of Girona, SP)
10:15	T4-O32 **Performance of two cyprinid species upon distinct flow regimes in a pool-type fishway.** Branco P, Santos JM, Katopodis C, Pinheiro A, Ferreira T (CEF-Forest Research Centre, Technical University of Lisbon, PT)	T13-O409 **Regulation effects on riparian vegetation composition and structure in the Sado River basin (Portugal).** Stella J, Kondolf M, Rodríguez-González P, Anderson C, Albuquerque A, Walls S, Ferreira T (Centro de Estudos Florestais, Instituto Superior de Agronomia, Universidade Técnica de Lisboa, PT)	T3-O217 **The response of macroinvertebrate communities structure and trait composition to wildfire in upland Portuguese.** Machado L, Soares AMVM, Monaghan K (CESAM, Universidade de Aveiro, PT)
10:30	T4-O24 **Biotic contribution to the estimation of environmental flow downstream hydropower reservoirs.** Callisto M, Pompeu P, Tupinambás T, Castro D, França J, Santos H, Sampaio A, Gandini C, Alves C, Matta-Machado A (Biologia Geral, Universidade Federal de Minas Gerais, Belo Horizonte, BR)	T13-O121 **Concordance between realized and fundamental niche in Sigara along a salinity and anionic gradient.** Carbonell J, Millán A, Velasco J (Departamento de Ecología e Hidrología, Universidad de Murcia, ES)	T3-O270 **Using a community-level method for forecasting climate change impacts in freshwater fish.** Filipe A, Feio MJ, Bonada N (Grup de Recerca "Freshwater Ecology and Management" (FEM), Departament d'Ecologia, Universitat de Barcelona, ES)
10:45	T4-O90 **Predicting the hydrologic character of river networks: comparison of approaches.** Peñas F, Barquín J, Álvarez-Cabria M, Fernández D (Environmental Hydraulics Institute "IH Cantabria", Universidad de Cantabria, Santander, ES)		T3-O363 **Haematozoan prevalence in a water bird specialist (*Cinclus cinclus*) under climate change constraints.** Dias S, Campos F, Hernández MA, Rojo MA, Santos E, Santamaría T, Corrales L (Centro de Ecologia Aplicada Prof. Baeta Neves, Instituto Superior de Agronomia/ Universidade Técnica de Lisboa, PT)
11:00	**Coffee-break**		
	T4-Ecohydraulics P Ramísio	**T9-Food webs** N Bonada	**T1-Aquatic ecotoxicology and environmental risk assessment** A Quesada
11:20	T4-O245 **Transporte neto de sustancias y tiempos de renovación en estuarios convergentes con forzamiento mareal.** García-Anguita F, Sánchez-Badorrey E (Mecánica de Estructuras e Ingeniería Hidráulica, Instituto del Agua. Universidad de Granada, ES)	T9-O27 **Food web ecology of a small lake in central Spain using stable isotopes.** Ruiz C, Sanchez Carrillo S, Serrano Grijalva L (Museo Nacional de Ciencias Naturales, MNCN-CSIC, Madrid, ES)	T1-O364 **Detection of potential microcystin-producing cyanobacteria in São Miguel lakes using PCR methods.** Guerreiro J, Mendes R, Gonçalves V, Fonseca A (Department of Biology, University of the Azores, Ponta Delgada, PT)

FRIDAY

	Auditorium Nobre	Auditorium B1.10	Auditorium B1.15
11:35	T4-O285 **Factors influencing physical functions of instream wood following wildfires in central Portugal.** Vaz P, Pinto P, Robinson C, Rego F (Centre of Applied Ecology "Prof. Baeta Neves", Instituto Superior de Agronomia, Lisbon, PT)	T9-O98 **Estequiometría ecológica y homeostasis en la red trófica de un río pampeano rico en nutrientes.** Feijoó C, Leggieri L, Ocón C, Rodrigues-Capítulo A, Giorgi A, Colautti D, Muñoz I, Ferreiro N, Licursi M, Gómez N and Sabater S (Ciencias Básicas, Universidad Nacional de Luján, AR)	T1-O410 **Overwintering strategies of *Anabaena, Aphanizomenon* and *Microcystis* in Spanish freshwater reservoirs.** Cires S, Wormer L, Carrasco D, Agha R, Quesada A (Departamento de Biología, Universidad Autónoma de Madrid, ES)
11:50	T4-O349 **Estimativa da profundidade de mistura gerada por ventos severos no reservatório de Itaipu.** Marques M, Guetter A, Vital E, Okawa C, Pereira O (Departamento de Tecnologia, Universidade Estadual de Maringá, BR)	T9-O203 **What's for lunch? Density-dependant diet or high selectivity food choice of *Barbus meridionalis*?** Rodríguez-Lozano P, Verkaik I, Rieradevall M and Prat N (Department of Ecology, University of Barcelona, SP)	T1-O73 **Effects of zinc pollution on functional stream attributes at two different scales.** Serra A, Bonet B, Corcoll N, Guasch H, Merbt S, Proya L, Martí E (Continental Ecology, CEAB-CSIC, Blanes, SP)
12:05		T9-O413 **Allochthonous carbon increase the effects of filter feeding fishes on plankton communities.** Rocha E, Moura C, Amado A, Attayde J (Departamento de Ecologia, Universidade Federal do Rio Grande do Norte, Natal, BR)	T1-O467 **Humic acids and nanoparticle size change the toxicity of nano CuO to freshwater microbes and invertebrates.** Pradhan A, Geraldes P, Seena S, Pascoal C, Cássio F (CBMA, University of Minho, Braga, PT)
12:20		T9-O83 **DNA-based detection of toxic cyanobacteria *Planktothrix rubescens* in *Daphnia* diet.** Savichtcheva O, Sotton B, Anneville O, Guillard J, Villar C, Domaizon I (Centre Alpin de Recherche sur les Réseaux Trophiques des Ecosystèmes Limniques, INRA, Thonon les Bains, FR)	T1-O468 **Responses of freshwater microbial decomposers to copper oxide nanoparticles.** Pradhan A, Seena S, Helm S, Gerth K, Schlosser D, Krauss G-J, Wesenberg D, Pascoal C, Cássio F (CBMA, University of Minho, Braga, PT)
12:35	**Closing (Conclusions and Awards)**		

Poster Presentations

Monday 2 July Poster Presentations: Session 1

(One day exhibition)

T5-Ecosystem processes

T5-P35 **The indicative value of zooplankton in assessment of the ecological state of a highly eutrophic lake.** Haberman J and Haldna M (Centre for Limnology, Estonian University of Life Sciences, Tartu, EE)

T5-P75 **La alelopatía en macrófitos estructura la comunidad del fitoplancton: efectos indirectos en la restauración.** Segura M, Rodrigo M, Rubio F, Cortés F, Calero S and Rojo C (Grupo de Ecología Integrativa, Instituto Cavanilles de Biodiversidad y Biología Evolutiva, Universidad de Valencia, ES)

T5-P78 **Effects of light intensity on leaf litter quality for the shredder *Sericostoma vittatum*.** Santos I and Canhoto C (IMAR-CMA and Department of Life Sciences, University of Coimbra, PT)

T5-P85 **Effects of fine sediments on decomposition of chestnut leaves: a microscosm approach.** Lírio A and Canhoto C (Department of Life Sciences, University of Coimbra, PT)

T5-P240 **Colonização de folhiço em um riacho de Mata Atlântica, Brasil.** Yokoyama E, Gandolfo R and Bispo P (Programa de Pós Graduação em Entomologia, Universidade de São Paulo, Ribeirão Preto, BR)

T5-P241 **A fauna de folhiço em corredeiras e remansos de riachos de Mata Atlântica, Brasil.** Yokoyama E and Bispo P (Programa de Pós Graduação em Entomologia, Universidade de São Paulo, Ribeirão Preto, BR)

T5-P242 **Fauna de macroinvertebrados em folhas com diferentes características em um riacho de Mata Atlântica, Brasil.** Yokoyama E and Bispo P (Programa de Pós Graduação em Entomologia, Universidade de São Paulo, Ribeirão Preto, BR)

T5-P263 **Canopy cover influence on water temperature and macroinvertebrate communities in Mediterranean streams.** Romero C, Serra A, Puig MA and Martí E (Continental Ecology, Center of Advanced Studies of Blanes, SP)

T5-P320 **Temporal variability in hydrological and biogeochemical linkages in a Mediterranean stream-riparian interface.** Martín E, Romero C, Serra S, Sabater F and Martí E (Ecology Department, University of Barcelona, SP)

T5-P324 **Efecto de las plantaciones de *Platanus hybrida* Brot. en la descomposición en arroyos de cabecera.** Menéndez M and Riera T (Departamento de Ecología, Universidad de Barcelona, ES)

T5-P368 **Is there any bias between contemporary and subfossil cladoceran assemblages?** López-Blanco C, Miracle MR and Vicente E (Departamento de Microbiología y Ecología, Universidad de Valencia, ES)

T5-P385 **Ciclagem de nitrogênio em bacias de micro escala preservadas no nordeste brasileiro.** Silva L, Cintra J, Moreau M and Silva DM (Departamento de Ciências Biológicas, Universidade Estadual de Santa Cruz, Ilhéus-Ba, BR)

T5-P405 **How do hydrological linkages between riparian forests and streams affect biogeochemical properties of these zones?** Poblador S, Lupon A, Bumghar A, Gracia C, Sabaté S and Sabater F (Ecology Department, University of Barcelona, SP)

T5-P408 **Variação temporal da biomassa perifítica em lagos conectados de planície de inundação.** Zanon J, Dunck B and Rodrigues L (Departamento de Biologia, Universidade Estadual de Maringá, BR)

T5-P429 **Space-temporal variability of environmental variables in a subtropical floodplain wetland (São Paulo, Brazil).** Freire R, Benassi R and Calijuri M (Center of Engineering, Modelling and Social Applied Sciences - CECS, Federal University of ABC - UFABC, Santo André, BR)

T5-P470 **Does the age and composition of riparian stand affect ecosystem functioning in streams?** Carvalho F, Seena S, Pascoal C and Cássio F (CBMA, University of Minho, Braga, PT)

T5-P472 **Long-term effects of riparian-plant diversity loss on a stream invertebrate shredder.** Fernandes I, Duarte S, Pascoal C and Cássio F (CBMA, University of Minho, Braga, PT)

T6-Environmental management and water quality

(To be continued in Session 2)

T6-P7 **Does the phytoplankton community always follow the water quality heterogeneity in reservoirs?** Nishimura P, Moschini-Carlos V and Pompêo M (Departamento de Ecologia, Instituto de Biociências/Universidade de São Paulo, BR)

T6-P12 **Estudio de los peces como indicadores del potencial ecológico de los embalses españoles.** Encina L, Rodríguez-Ruiz A, Sánchez-Carmona R, Rodríguez-Sánchez V, Monteoliva A, Monná A and Alonso de Santocildes G (Department of Plant Biology and Ecology, University of Seville, SP)

T6-P14 **Calidad de aguas en la cuenca alta del río Águeda, W España.** Velasco T, Sanz G, Santos E, Campos F, Montequi I, Martínez-Alegría R and Rojo MA (Departamento de Ciencias Experimentales, Universidad Europea Miguel de Cervantes, Valladolid, ES)

T6-P21 **Effects of fish farm in net cages on phytoplankton structure in a subtropical reservoir, Paraná, Brazil.** Bueno N and Rodrigues Bartozek E (Departamento de Ciências Biológicas, Universidade Estadual do Oeste do Paraná, Mestrado em Conservação e Manejo de Recursos Naturais, Cascavel, BR)

T6-P64 **Estudo de alguns parâmetros relativos ao estado ecológico da ribeira da Granja (Vila do Conde, Portugal).** Reis F, Monteiro H, Martins M, Monteiro A, Dinis A, Caldeira F, Guerreiro M, Barros N and Jesus T (Faculdade de Ciência e Tecnologia, Universidade Fernando Pessoa, Porto, PT)

T6-P65 **Estudo de alguns parâmetros relativos ao estado ecológico do rio Este (Portugal).** Silva A, Silva D, Loureiro R, Mourão R, Monteiro Á, Dinis A, Guerreiro M, Barros N and Jesus T (Faculdade de Ciência e Tecnologia, Universidade Fernando Pessoa, Porto, PT)

T6-P87 **Strategy for monitoring cyanobacterial blooms using a stepwise approach based on sequential methodologies.** de Figueiredo D, Castro B, Correia A and Gonçalves F (Department of Biology and CESAM, University of Aveiro, PT)

T6-P95 **Evaluación integral de la cuenca del río Rivera de Huelva (SO España) con un Sistema de Información Geográfica.** Escot-Muñoz C, Muñoz-Reinoso J, Puerto-Marchena A, Cruces-Fraile F and Basanta-Alves A (Ecología y Gestión Ambiental, Empresa Metropolitana de Abastecimiento y Saneamiento de Aguas de Sevilla (EMASESA), Sevilla, ES)

T6-P102 **Características limnologicas de los embalses Alto Andinos.** Fuertes E (Empresa Pública Metropolitana de Agua Potable y Saneamiento de Quito, EC)

T6-P103 **Procedimiento para la evaluación del estado químico en los embalses de la C.H. Júcar (España).** Mañá M and Alabadí T (Confederación Hidrográfica del Júcar, Valencia, ES)

T6-P127 **Análisis del funcionamiento de pasos de peces existentes en la cuenca del Ebro.** Boné-Puyo P, Langa-Sánchez A, Dúran-Lalaguna C and Navarro-Barquero P (Área de Calidad de Aguas. Comisaría de Aguas, Confederación Hidrográfica del Ebro, Zaragoza, ES)

T6-P144 **Conservation status of the middle course of the Aulencia River.** Valle-Artaza J, García-Avilés J and Rovira J (Departamento de Ecología, Facultad de ciencias Biológicas, Universidad Complutense de Madrid, ES)

T6-P152 **Ecological state of Basque Country inland wetlands: comparison of two evaluation approaches.** Monteoliva J, Manzanos A and Monteoliva A (Ecohydros SL., Maliaño, Cantabria, ES)

T6-P154 **Uma ferramenta para avaliar o estado ecológico de um rio (Brasil): a pesquisa participativa na educação básica.** Silva C, Shimabukuro E, Hoffmann P, Suiberto M, Zerlin R, Souto A, Vidotto-Magnoni A, Alves R, Rodrigues H and Henry R (Departamento de Zoologia, Instituto de Biociências/UNESP, Botucatu, BR)

T6-P158 **Concentrações de metais em rios e reservatórios subtropicais: influência das formas de uso e ocupação do solo.** Ogura A, Calijuri M and Cunha D (Hidráulica e Saneamento, Escola de Engenharia de São Carlos/Universidade de São Paulo, São Carlos, BR)

T6-P161 **Análise espacial dos impactos sobre o Sistema Cantareira: São Paulo – Brasil.** Bitencourt M and Brandimarte A (Departamento de Ecologia, Universidade de São Paulo, BR)

T6-P180 **Abundância de cianobactérias na Represa Billings e sua relação com os parâmetros físico-químicos da água.** Tiir-Serico M, Pompêo M and Freire-Nordi C (Ciências Biologicas, Universidade Federal de São Paulo, BR)

T6-P181 **Road construction impact on the ecological quality of Caldeirões Stream (Azores, Portugal).** Cunha A, Cruz A, Ramos J, Raposeiro P, Costa AC and Gonçalves V (CIBIO-Azores and Biology Department, University of the Azores, Ponta Delgada, PT)

T6-P188 **Relação entre a assembléia de macroinvertebrados bentônicos e o estado trófico em um reservatório neotropical.** Beghelli F, dos Santos A, Urso-Guimarães M and Calijuri M (Departamento de Biologia, Universidade Federal de São Carlos, Sorocaba, BR)

T6-P190 **Glyphosate contamination in water: developing a methodology for aquatic ecosystem monitoring.** Portugal S, Sousa-Filho I, Cristófaro C, Castelo-Branco C, Palermo E and Guarino A (Ciências Naturais, Universidade Federal do Estado do Rio de Janeiro, BR)

T6-P195 **Assessment of the effects of paper mill effluent on water quality in the Gallego River, Spain.** Español C, Val J and Pino M (Environmental Institute, San Jorge University, Villanueva de Gállego - Zaragoza, ES)

T8-Fish ecology

T8-P143 **Comparing the performance of two fish sampling gears in a set of reservoirs of the Ebro basin.** Alonso de Santocildes G, Criado A, Durán-Lalaguna C, Monteoliva A and Rodríguez-Pérez MJ (Ecohydros SL, Maliaño, Cantabria, ES)

T8-P189 **Influência das trombas d'água na ictiofauna da encosta leste na região sul brasileira, Paraná-Brasil.** Aranha J and Peret A (Campus Palotina, Universidade Federal do Paraná, Palotina, BR)

T8-P239 **Benthophagous fishes as an ecological tool to evaluate benthic macroinvertebrate communities.** Tupinambás T, Pompeu P, Hughes R and Callisto M (Biologia Geral, Universidade Federal de Minas Gerais, Belo Horizonte, BR)

T8-P403 **Influencia das atividades antrópicas na ictiofauna em dois rios no estado do Paraná, Brasil.** Menezes M, Silveira E, Geahl A and Aranha J (Campus Palotina, Universidade Federal do Paraná, Palotina, BR)

T8-P482 **Dinâmina temporal do ictioplâncton em ambientes do Semiárido Paraibano, Brasil.** Montenegro A and Crispim C (Departamento de Sistemática e Ecologia, Universidade Federal da Paraíba, João Pessoa, BR)

T8-P483 **Estudo populacional de *Leporinus piau* (Fowler, 1941) em um açude do Semiárido Paraibano, Brasil.** A. Montenegro A, Torelli de Sousa J and Crispim C (Departamento de Sistemática e Ecologia, Universidade Federal da Paraíba, João Pessoa, BR)

T10-Invasive species

T10-P57 **Trophic relationships between introduced species and native fish community at the Lake Titicaca.** Monroy M, Maceda A, Ramírez F, Caiola N and de Sostoa A (Department of Animal Biology, University of Barcelona, SP)

T10-P97 **La presencia de depredadores (*Gambusia holbrooki*) no incrementa la mortalidad larvaria de *Ischnura genei*.** Sanmartín-Villar I and Cordero-Rivera A (Ecoloxía e Bioloxía Animal, Universidade de Vigo, Pontevedra, ES)

T10-P151 **Clonal reproduction and phenotypic variability of *Azolla filiculoides* Lam. in differentiated habitats.** Fernandez-Zamudio R, Cirujano S and Garcia-Murillo P (Biologia Vegetal y Ecologia, Universidad de Sevilla, ES)

T10-P168 **Estudo das variáveis ambientais que influenciam a direcção de dispersão terrestre de *Procambarus clarkii*.** Marques M, Banha F, Águas M and Anastácio P (Departamento de Paisagem Ambiente e Ordenamento, Centro de Mar e Ambiente, IMAR / Universidade de Évora, PT)

T10-P175 **Desiccation survival of two successful freshwater invaders in Portugal.** Banha F and Anastácio P (Department of Landscape, Environment and Planning, IMAR - Marine and Environmental Research Centre / University of Évora, PT)

T10-P179 ***Didymosphenia geminata* bloom as the main factor controlling invertebrate community in a regulated river.** Ladrera R and Prat N (Department of Ecology, University of Barcelona, SP)

T10-P255 **Predicting the potential distribution of decapod invaders under climate change: an analysis of uncertainty.** Capinha C, Anastácio P and Tenedório J (IMAR, Centro de Mar e Ambiente c/o Departamento de Paisagem, Ambiente e Ordenamento, Universidade de Évora, PT)

T10-P265 **Dispersão passiva de juvenis de *Procambarus clarkii* através de um vector animal.** Águas M, Banha F, Marques M and Anastácio P (Departamento de Paisagem Ambiente e Ordenamento, Centro de Mar e Ambiente, IMAR / Universidade de Évora, PT)

T10-P357 **Survival, growth, and physiological responses of red swamp crayfish (*Procambarus clarkii*) to hypoxia condition.** Vareia A, Soares M and Ilhéu M (Department of Landscape, Environment and Planning, School of Sciences and Technology, University of Évora, PT; Institute of Agrarian and Environmental Mediterranean Sciences (ICAAM), University of Évora, PT)

T10-P445 **Interações biológicas de *Dendrocephalus brasiliensis* (Anostraca) em ambientes naturais e experimentais.** Passos R, Paccagnella Y, Vieira B, da Silva L and Melão MG (Departamento de Hidrobiologia, Universidade Federal de São Carlos, BR)

T12-Microbial ecology

T12-P9 **Parasitic chytrid fungus affects rotifers populations in Rio Grande Reservoir (SP, Brazil).** Meirinho P, Nishimura P and Pompêo M (Departamento de Ecologia, Instituto de Biociências/ Universidade de São Paulo, BR)

T12-P36 **Effects of light, depth and seasonality on bacterial activity in a hypereutrophic shallow lagoon.** Onandía G, Miracle MR, Blasco C and Vicente E (Department of Microbiology and Ecology, I.C.B.I.B.E. University of Valencia, Burjassot, SP)

T12-P61 **Is litter breakdown affected by the identity of dominant species in fungal decomposer assemblages?** Ferreira V and Chauvet E (IMAR-CMA, University of Coimbra, PT)

T12-P137 **Influence of biotic and abiotic factors on the allelopathic activity of a *Cylindropermopsis raciborskii* strain.** Antunes J, Leão P and Vasconcelos V (Department of Biology, University of Porto, PT)

T12-P226 **Responses of microbial communities from Antarctic lakes to the increase in temperature.** Villaescusa J, Rochera C and Camacho A (Cavanilles Institute of Biodiversity and Evolutionary Biology, University of Valencia, Burjassot, SP)

T12-P334 **Fungal abundance and diversity during the decomposition of *Miconia* leaves in Brazilian Cerrado streams.** Morais P, Sousa F, Gonçalves-Júnior J and Medeiros AO (Lab Microbiologia Ambiental, Universidade Federal do Tocantins, Palmas, BR)

T12-P354 **Evaluation of the performance of extraction of oil from microalgae with different solvents.** Nascimento A, Peres S and Travassos A (Faculdade Frassinetti do Recife, BR)

T12-P362 Bacterial antibiotic resistance and resistance genes **in an impacted river.** Sidrach-Cardona R, Martí E, Balcazar J and Becares E (Instituto de Medio Ambiente, Universidad de León, ES)

T12-P380 **Picocyanobacteria-feeding *Spirostomum teres* in the oxycline of a meromictic and monomictic lakes.** Macek M, Picazo A, Montiel-Hernández J and Camacho A (Department of Microbiology and Ecology and Cavanilles Institute of Biodiversity and Evolutionary Biology, University of Valencia, Burjassot, SP)

T12-P382 **Comparación de fingerprints de RNA y DNA para la discriminación de poblaciones activas i latentes de Archaea.** Auguet O, Fillol M, Figueras M and Borrego C (Grup d'Ecologia Microbiana Molecular, Institut d'Ecologia Aquàtica, Universitat de Girona, Montilivi (Girona), ES)

T12-P469 **Intraspecific diversity affects plant-litter decomposition in freshwaters.** Antunes B, Trabulo J, Duarte S, Seena S, Cássio F and Pascoal C (CBMA, University of Minho, Braga, PT)

T12-P486 **Effects of inter and intraspecific diversity of aquatic fungi on leaf litter decomposition - a microcosm experiment.** Andrade R, Pascoal C and Cássio F (CBMA, University of Minho, Braga, PT))

T16-Tropical rivers

T16-P5 **Respostas do fitoplâncton à variação hidrológica em lagoas laterais a um rio tropical.** Granado D and Henry R (Coordenadoria do Curso de Turismo, UNESP, Rosana, BR)

T16-P18 **Variação sazonal da densidade e grupos funcionais fitoplanctônicos de um sistema em cascata -Bahia, Brasil.** Moura A, Severiano J, Aragão-Tavares N and Dantas E (Departamento de Biologia, Universidade Federal Rural de Pernambuco, Recife, BR)

T16-P23 **A comparative study of Odonata (Insecta) in aquatic ecosystems with distinct characteristics.** Fulan J (Educação, Agricultura e Ambiente, Universidade Federal do Amazonas, Humaitá, BR)

T16-P319 **Carbon and nitrogen dynamics in first order rivers in Atlantic Forest, São Paulo, Brazil.** Ravagnani E, Fracassi F, Andrade T, Coletta L, Lins S and Martinelli L (Laboratório de Ecologia Isotópica, Centro de Energia Nuclear na Agricultura - CENA/USP, Piracicaba, BR)

T16-P340 **Modelagem de variáveis ambientais de uma bacia hidrográfica do litoral sul do estado de São Paulo, Brasil.** Camargo A and Cancian L (Ecologia, Instituto de Biociências/ UNESP, Rio Claro, BR)

T16-P366 **Qualidade da água do Rio Tocantins na área de influência direta do UHE Estreito (MA, Brasil).** Peixoto R and Dourado J (Engenharia agronômica, UNITINS, Palmas, BR)

T16-P391 **Perturbação na comunidade fitoplanctônica em uma pequena lagoa marginal a um rio tropical.** Granado D and Henry R (Unesp, Rosana, BR)

T16-P399 **Valores basais de demanda bioquímica de oxigênio e concentrações de oxigênio dissolvido em rios subtropicais.** Ogura A, Calijuri M and Cunha D (Hidráulica e Saneamento, Escola de Engenharia de São Carlos/Universidade de São Paulo, São Carlos, BR)

T16-P423 **Eutrophication increases CH_4 concentration and flux in a river estuarine region in RJ, Brazil.** Sanches L (Ecologia, Universidade Federal do Rio de Janeiro, BR)

T16-P425 **Macroinvertebrados bentônicos como bioindicadores de qualidade de água do Distrito Federal.** Neiva A, Aoyama Y, Bueno A, Almo M and Martins MJ (Departamento de Zoologia, Instituto de Biologia, Universidade de Brasília, BR)

T16-P436 **Comunidades fitoplanctônicas do rio Sorocaba (SP/Brasil) e seus grupos funcionais: efeito de represas.** Magrin A, Borghi T and Moschini-Carlos V (Departamento de Biologia, CCTS/ UFSCar, Sorocaba, BR)

SS1-Biology and conservation of freshwater mussels: an Iberian perspective

SS1-P138 **Reproductive cycle and host fish determination of Portuguese native freshwater mussel species**. Hinzmann M, Lopes-Lima M, Teixeira A, Varandas S, Sousa R and Machado J (Laboratory of Ecophysiology, CIMAR-LA/CIIMAR, Porto, PT; Aquatic Production Department, ICBAS, University of Porto, PT)

SS2-Carbon processing in freshwaters: approaches and perspectives

SS2-P159 **Characterization of sedimentary fulvic and humic acids from a coastal lagoon by spectroscopic techniques.** Catalán N, Parlanti E, Obrador B and Pretus J (Department of Ecology, University of Barcelona, SP)

SS2-P252 **Carbon transport and use through Mediterranean river networks: the project CARBONET.** Obrador B, Sabater S, Muñoz I, Acuña V, López P, Marcé R, Menéndez M and Von Schiller D (Department of Ecology, University of Barcelona, SP)

SS7-Running without water: water scarcity implications for river functioning, conservation and management

SS7-P308 **Assessing drought impacts on biodiversity of European rivers and reservoirs under DROUGHT- R&SPI.** Dias S, Acácio V, Rego F and Bifulco C (Centro de Ecologia Aplicada Prof. Baeta Neves, Instituto Superior de Agronomia/Universidade Técnica de Lisboa, PT)

SS7-P343 **OASIS: How to run regulated rivers in semi-arid regions? Methods and approaches.** Aguiar F, Almeida A, Bejarano M, Fernandes R, Martins MJ, Merritt D, Nilsson C, Portela M and Segurado P (Forest Research Centre, Instituto Superior de Agronomia, Universidade Técnica de Lisboa, PT)

Tuesday 3 July Poster Presentations: Session 2

(One day exhibition)

T2-Biodiversity and biogeography

T2-P19 **Diversity of Charophytes in the Neotropical region: Southern Brazil.** Bueno N and Meurer T (Ciências Biológicas, Universidade Estadual do Oeste do Paraná, Cascavel, BR)

T2-P20 **Desmídias (Zygnemaphyceae) associada à *Utricularia foliosa* L. na represa Rio São João, Paraná, Brasil.** Bueno N, Menezes V, Sobjak T, Bortoloni J and Temponi L (Ciências Biológicas, Universidade Estadual do Oeste do Paraná, Cascavel, BR)

T2-P29 **Diatomáceas: Fragilariophyceae do rio Iguaçu, Parque Nacional do Iguaçu (Paraná, Brasil).** Nardelli M, Bueno N, Ludwig T and Tremarin P (Centro de Ciências Biologicas e da Saúde, Universidade Estadual do Oeste do Paraná, Cascavel, BR)

T2-P31 **Diatomoflórula do rio São João e lagoa Poço Preto, Parque Nacional do Iguaçu, Paraná, Brasil.** Sonsin P, Nardelli M, Bueno N and Tavares B (Centro de Ciências Biologicas e da Saúde, Universidade Estadual do Oeste do Paraná, Cascavel, BR)

T2-P38 **Composição da comunidade fitoplanctônica do rio Iguaçu, Parque Nacional do Iguaçu, Paraná, Brasil.** Bueno N and Menezes V (Ciências Biológicas, Universidade Estadual do Oeste do Paraná, Mestrado em Conservação e Manejo de Recursos Naturais, Cascavel, BR)

T2-P47 **Resposta da comunidade fitoplanctônica a gradientes tróficos em reservatórios mediterrâneos (Catalunha).** Moschini-Carlos V, Moyá B, Pompêo M, Ordoñez J, Garcia-Pradell J and Armengol J (Engenharia Ambiental, UNESP, Sorocaba, BR; Universitat de Barcelona, ES)

T2-P52 **Estoques de carbono do perifíton e seus fatores determinantes em um reservatório subtropical.** Taniwaki R, Magrin A, Calijuri M and Moschini-Carlos V (UNESP, BR)

T2-P72 **How to protect amphibians in medium-sized administrative areas: which ones, where and why**. García-Muñoz E, Ceacero F, Carretero M, Parra G and Guerrero F (Centro de Estudios de

Ambiente o do Mar, Universidade do Aveiro, PT; Departamento de Ciencia y Tecnología Agroforestal y Genética, Universidad de Castilla-La Mancha, Albacete, ES; CIBIO, Universidade do Porto, PT)

T2-P79 **Estructura del fitoplancton en 30 lagunas de la Costa Pacífica Tropical Seca (Costa Rica y Nicaragua).** Segura M, Monrós J, Armengol J, Piculo R, Bonilla F, Mesquita-Joanes F, Rueda R, Sasa M and Rojo C (Lab. Ecologia Integrativa, Instituto Cavanilles de Biodiversidad y Biología Evolutiva. Universidad de Valencia, Paterna (Valencia), ES)

T2-P157 **Influencia del hidroperíodo sobre las comunidades de invertebrados acuáticos de dos lagunas temporales.** Benetti C, Pérez-Bilbao A and Garrido J (Ecology and Animal Biology, University of Vigo, SP)

T2-P176 **Levantamento das espécies de macrófitas aquáticas do Açude Itans (Nordeste Semiárido do Brasil).** Macêdo R, Souza C, Medeiros LC, Costa D and De Medeiros Rocha R (Geografia, Universidade Federal do Rio Grande do Norte, Caicó, BR; Laboratório de Ecologia do Semiárido, BR)

T2-P220 **Amphibian assemblages and habitat structure in Portuguese low order streams affected by contrasting forests.** Costa M, Saro L, Medeiros J, Monteiro M, Soares AMVM and Monaghan K (CESAM and Departamento de Biologia, Universidade de Aveiro, PT)

T2-P228 **Influence of spatial position of small tributaries and confluences on aquatic insect assemblage.** Milesi S and Melo A (Departamento de Ecologia, Universidade Federal do Rio Grande do Sul - UFRGS, Porto Alegre, BR)

T2-P259 **Influência da vegetação na distribuição espacial de rotíferos no Açude Taperoá II, Paraíba (Brasil).** Crispim C and da Silva J (Departamento de Sistemática e Ecologia, Universidade Federal da Paraíba, João Pessoa, BR)

T2-P260 **Distribuición altitudinal de rotíferos planctónicos en lagos Altoandinos tropicales en Colombia.** Herrera Y and Rodríguez A (Universidad Pedagogica y Tecnologica de Tunja, CO)

T2-P267 **Influence of floating macrophytes on populations of planktonic microcrustaceans.** Roma-Stephan L and Castilho-Noll MS (Zoologia e Botânica, Unesp - São José do Rio Preto, BR)

T2-P276 **Distribution and ecology of some species of Rhodophyta in the Ebro River Basin.** Tomás P, Elbaile A, Moreno J, Aboal M, Oscoz J, Durán-Lalaguna C and Navarro-Barquero P (Área de Calidad de Aguas, Confederación Hidrográfica del Ebro, Zaragoza, ES)

T2-P291 **Distribuición altitudinal de rotíferos planctónicos en lagos Altoandinos Tropicales em Colombia.** Herrera Y, Rodríguez A and Rojas D (Biología, Universidad Pedagógica y Tecnológica de Colombia, Tunja, CO; Biología, Universidad Nacional de Colombia, Bogotá, CO)

T2-P295 **Long term phytoplankton dynamics and structure related to environmental variables in a meromictic lake.** Sendra MD, Picazo A, Camacho A, Vicente E and Miracle MR (Department of Microbiology and Ecology, Cavanilles Institute of Biodiversity and Evolutionary Biology. University of Valencia, SP)

T2-P296 **Riqueza e distribuição de macrófitas aquáticas em reservatório da região sudeste do Brasil.** Pavão A, dos Santos A, Benassi R and Calijuri M (Departamento de Biologia, Universidade Federal de São Carlos, Sorocaba, BR)

T2-P307 **Aguas termales, enclave peculiar para el desarollo de *Chroothece* sp. (Stylonemathopyceae, Rhodophyta).** Chapuis I, García-Fernández M, Sánchez-Castillo P and Aboal M (Botany, Universidad de Granada, ES)

T2-P330 **Diversidade de Cladocera em reservatórios e trechos lóticos da Bacia do rio da Prata (América do Sul).** Naliato D, Nogueira M and Elmoor-Loureiro L (Department of Zoology, UNESP, Botucatu, BR)

T2-P347 **Algas de los pastizales húmedos del nacimiento del río Genil (Sierra Nevada, Granada).** González-Díaz P, Sánchez Rojas C and Sánchez-Castillo P (Botánica, Universidad de Granada, ES)

T2-P369 **Heterópteros aquáticos e semiaquáticos dos lavrados de Roraima, Amazônia, Brasil.** Feitoza L and Kowalczuk V (Centro de Estudos da Biodiversidade, Universidade Federal de Roraima, Boa Vista, Roraima, BR)

T2-P370 **Anisoptera (Odonata) imaturos do igarapé Azul, Roraima, com ocorrência de uma nova espécie para o Brasil.** Fleck G, Feitoza L and Kowalczuk V (Centro de Estudos da Biodiversidade, Universidade Federal de Roraima, Boa Vista, Roraima, BR)

T2-P372 **Riqueza de macrófitas aquáticas e algas perifíticas no campus experimental do Água Boa – Embrapa, RR, Brasil.** Pacobahyba L, Silva M, Paiva R and Conceição A (Centro de Estudos da Biodiversidade, Universidade Federal de Roraima, Boa Vista, BR)

T2-P373 **Levantamento de macrófitas aquáticas no Igarapé Caranã – Boa Vista/Roraima.** Pacobahyba L and Tajujá L (Centro de Estudos da Biodiversidade, Universidade Federal de Roraima, Boa Vista, BR)

T2-P379 **Avaliação da ocorrência de cyanobacteria em microbacias com diferentes usos da terra na Amazônia Legal, Brasil.** Marques A, Morais P, Barros D, Bonatto G, Reis D and Pires M (Engenharia Ambiental, Universidade Federal do Tocantins, Palmas, BR)

T2-P401 **Diversidade gama da comunidade zooplanctônica e eventos climáticos em uma planície de inundação neotropical.** Leal C, Dias J, Simões N and Bonecker C (Biologia, Universidade Estadual de Maringá, BR)

T2-P406 **Padrão espacial e temporal conservativo da diversidade zooplanctônica em uma planície aluvial neotropical.** Dias J, Simões N, Leal C, Braghin L, Lansac-Tôha F and Bonecker C (Departamento de Biologia/Nupélia/PEA, Universidade Estadual de Maringá, BR)

T2-P407 **Comunidade zooplanctônica nos sistemas de uma planície de inundação: influência do pulso hidrossedimentológico.** Leal C, Simões N, Dias J and Bonecker C (Departamento de Biologia, Universidade Estadual de Maringá, BR)

T2-P426 **Distribuição de Bivalvia (Mollusca) no gradiente fluvial de um riacho subtropical brasileiro.** Souza-Franco G, Ulrich T, Franco R and Dal Magro J (Área de Ciências Exatas e Ambientais, Universidade Comunitária da Região de Chapecó, BR)

T2-P446 **Distribuição de larva de Coleoptera de corpos d'água em clima subtropical na bacia do Rio Uruguai, Brasil.** Souza-Franco G, Franco R and Dal Magro J (Área de Ciências Exatas e Ambientais, Universidade Comunitária da Região de Chapecó, BR)

T2-P473 **An ubiquitous perspective of the intraspecific diversity of the aquatic fungus *Articulospora tetracladia*.** Seena S, Duarte S, Pascoal C and Cássio F (CBMA, University of Minho, Braga, Portugal)

T6-Environmental management and water quality

T6-P198 **Estudio comparativo del efluente y la microfauna presente en sistemas de depuración de aguas residuales.** Martín I, Sardón N and Rodriguez M (Area Calidad del Agua, Fundación Nuevas Tecnologías del Agua, Sevilla, ES)

T6-P199 **Estudio de la comunidad zooplanctónica (microcrustáceos y rotíferos) en un humedal artificial de flujo libre.** Fahd-Draissi K and Martín I (Area Calidad del Agua, Fundación Nuevas Tecnologías del Agua, Sevilla, ES)

T6-P204 **Establishing physico-chemical reference conditions in Mediterranean streams according to the WFD.** Sánchez-Montoya MM, Arce MI, Vidal-Abarca MR, Suárez ML, Prat N and Gómez R (Department of Ecology and Hydrology, University of Murcia, SP)

T6-P212 **Caracterización espacio-temporal de variables físico-químicas y biológicas de un arroyo salino.** Rico E and el Anjoumi A (Departamento de Ecología, Universidad Autónoma de Madrid, ES)

T6-P215 **Effect of the catchment land use on macroinvertebrate assemblages in Neotropical streams.** Hepp L, Vasco A, Sensolo D, Decian V and Restello R (Ciências Biológicas, Universidade Regional Integrada - Erechim, BR)

T6-P216 **Estado das massas de água das Regiões Hidrográficas do Norte (RH1 e RH2) e medidas de requalificação.** Pereira V, Rocha R, Varandas S, Hughes S, Jesus J, Santos C, Pinto A, Martins J and Cortes R (CITAB, Universidade de Trás-os-Montes e Alto Douro, Vila Real, PT)

T6-P219 **Desarrollo de un índice multimétrico para la evaluación de la calidad ecológica de la Cuenca del Limarí, Chile.** Carvacho C and Prat N (Departamento de Ecología, Universidad de Barcelona, ES)

T6-P221 **The effects of Eucalypt, Pine and Broadleaf forests on river habitats in Portuguese upland streams.** Saro L, Costa M, Medeiros J, Monteiro M, Soares A and Monaghan K (CESAM and Departamento de Biologia, Universidade de Aveiro, PT)

T6-P232 **Avaliação da qualidade da água e do sedimento do rio: ênfase na caracterização da microbiota.** Duarte I, Giraldi L and Varesche B (Departamento de Biologia, Universidade Federal de São Carlos, Sorocaba, BR)

T6-P234 **Influencia de los descensos de nivel en la calidad biológica del agua en el Limnoembalse de Pareja.** Molina-Navarro E, Martínez-Pérez S and Sastre-Merlín A (Departamento de Geología, Universidad de Alcalá, Alcalá de Henares (Madrid), ES)

T6-P236 **Can phytoplankton be used as a DMA indicator in temporary lakes?** Fernández-Enríquez C, Martínez-López G, Verdugo-Althöfer M, García-Mengíbar F and Toro-Velasco M (Center of Hydrographic Studies, Center of Studies and Experimentation in Public Works, CEDEX, Madrid, SP)

T6-P251 **Perspectives on efficiency in monitoring networks for riparian habitats in the context of two EU Directives.** Cunha J, Vieira C, Gonçalves J, Formigo N and Honrado J (CIBIO, Vairão, PT)

T6-P256 **Utilização de microinvertebrados aquáticos em estudo de biomonitoramento: um estudo de caso no Parque Estadual.** Araújo T, Oliveira L, Alcântara F and Garraffoni A (Pós-Graduação em Ciência Florestal, Universidade Federal dos Vales do Jequitinhonha e Mucuri, Diamantina, BR)

T6-P277 **Qualidade da água do Rio Norte (Espírito Santo, Brasil) em área sob influência de central hidrelétrica.** Amaral A, Miranda M and Taliuli Y (Aquicultura, Instituto Federal de Educação, Ciência e Tecnologia do Espírito Santo, Alegre, BR)

T6-P278 **Estimation of water quality parameters through Landsat TM and Deimos-1 images.** Doña C, Sánchez J, Camacho A and Caselles V (Earth Physics and Thermodynamics, Faculty of Physics, University of Valencia, Burjassot (Valencia), SP)

T6-P283 **Valoracion del estado en masas de agua del programa de control operativo (Demarcacion hidrográfica Miño Sil).** Iglesias J, Ibañez M, Martí T, Fompedriña D, de Anta A, Bueres A and Vadillo I (Asesoría Técnica, IPROMA S.L., Vigo, ES)

T6-P284 **Aparicion y seguimiento de un afloramiento de cianobacterias en el embalse de Caldas de Reis (Pontevedra).** Reyes I, Sanchis D, Velo M and Pineiro R (Asesoría Técnica, IPROMA S.L., Sevilla, ES)

T6-P290 **Qualidade da água do Córrego do Capim, afluente do Rio Norte, Espírito Santo, Brasil.** Amaral A, Caetano M, Miranda M, Miranda F and Alves-Firmino E (Aquicultura, Instituto Federal de Educação, Ciência e Tecnologia do Espírito Santo, Alegre, BR)

T6-P292 **Tratamento de efluentes do cultivo de camarão da Amazônia por sistema com macrófita aquática.** Camargo A and Santos A (Departamento de Ecologia, Instituto de Biociências/ UNESP, Rio Claro, BR)

T6-P306 **Mountain's Mirrors.** Costa AC, Gonçalves V and Raposeiro P (Departamento de Biologia, CIBIO-Azores/Universidade dos Açores, Ponta Delgada, PT)

T6-P309 **Conservação e qualidade da água em uma grande área protegida de Mata Atlântica em perímetro urbano.** Brandimarte A, Rares C, Bitencourt M, Meirelles S, Zanardi B and Pompêo M (Departamento de Ecologia, Instituto de Biociências / Universidade de São Paulo, BR)

T6-P311 **Sugarcane agroecosystems and biofuel: dissolved inorganic nitrogen in streams and the role of riparian forest.** Andrade T, Silva R, Salemi L, Correia L, Medeiros G,

Fernandes RP, Fracassi F, Ravagnani E, Moraes J, Camargo P and Martinelli L (Laboratório de Ecologia Isotópica - Centro de Energia Nuclear na Agricultura (CENA), Universidade de São Paulo, Piracicaba, BR)

T6-P312 **Qualidade microbiológica da água do Rio Norte, ES, Brasil.** Amaral A and Miranda M (Aquicultura, Instituto Federal de Educação, Ciência e Tecnologia do Espírito Santo, Alegre, BR)

T6-P332 **Diagnóstico ambiental de organoclorados em sedimentos da Bacia do Rio Uberabinha, Minas Gerais, Brasil.** Guimarães-Souto R, Corbi J and Jacobucci G (Instituto de Biologia, Universidade Federal de Uberlândia, BR)

T6-P335 **Increase of eutrophication levels in rivers of the Ebro River Basin (NE Spain).** Val J, Pino M and Español C (Environmental Institute, San Jorge University, Villanueva de Gállego- Zaragoza, ES)

T6-P339 **Total dissolved phosphorus concentrations in streams of watersheds covered with sugarcane.** Silva R, Andrade T, Salemi L, Fernandes RP, Correia L, Fracassi F, Moraes J, Camargo P and Martinelli L (Laboratory of Isotope Ecology, Center of Nuclear Energy in Agriculture/University of São Paulo, Piracicaba, BR)

T6-P342 **Presença de *Aeromonas* em uma criação de tilápias do Nilo, Espírito Santo, Brasil.** Suhet M and Amaral A (Aquicultura, Instituto Federal de Educação, Ciência e Tecnologia do Espírito Santo, Alegre, BR)

T6-P345 **Parâmetros físico-químicos da água de uma piscicultura em tanques-rede.** Suhet M, Amaral A and Chagas E (Aquicultura, Instituto Federal de Educação, Ciência e Tecnologia do Espírito Santo, Alegre, BR)

T6-P353 **Development of a bioreactor system for carbon dioxide sequestration by microalgae.** Peres S, Travassos A, Castrillo L, Nunes A, Pereira R, Nascimento R, Alencar V and Nascimento A (Faculdade Frassinetti do Recife, BR)

T6-P355 **Soils under different land use as diffuse source of eutrophication in a tropical reservoir.** Oliveira J, Becker V, Mattos A and Cunha K (Centro de Tecnologia, Universidade Federal do Rio Grande do Norte, Natal, BR)

T6-P359 **Effects of macrophytes and internal loading on a freshwater shallow lake: a nutrient enrichment approach.** Murueta N, Rochera C, Picazo A and Camacho A (Cavanilles Institute of Biodiversity and Evolutionary Biology, University of Valencia, Burjassot, SP)

T6-P361 **El flujo invernal en sistemas someros hipertróficos: una vía para su recuperación.** Miracle MR, Alfonso T, Amorim A, Sendra MD and Soria J (Microbiología y Ecología, ICBiBE, Universidad de Valencia, Burjassot, ES)

T6-P374 **Oligochaeta as a tool in water resource monitoring: a study case in neotropical streams.** Bagatini Y, Souza A, Fogaça F and Higuti J (Colegiado de Biotecnologia, Universidade Federal do Paraná, Palotina, BR)

T6-P375 **The efficiency of an Environmental Management System at a technical school in Brazil.** Sereia D, Santos FC and Bagatini Y (Colegiado de Biotecnologia, Universidade Federal do Paraná, Palotina, BR)

T6-P414 **Temporal-spatial variation of limnological parameters in tropical reservoirs, northeastern Brazil.** Bezerra A, Torres L, Mattos A and Becker V (Centro de Tecnologia, Universidade Federal do Rio Grande do Norte, Natal, BR)

T6-P415 **Clasificación de los embalses de la Cuenca del Ebro según los índices de estado trófico y potencial ecológico.** Ferriol C, Soria X, Kramer O, Morata S, Soria J, Vicente E, Rodríguez-Pérez MJ and Durán-Lalaguna C (Microbiologia y Ecologia, ICBBE/ Universidad de Valencia, Burjassot, ES)

T6-P416 **A new Phytoplankton Biotic Integrity index for ecological status assessment of Azorean lakes.** Vilaverde J, Pereira C, Marques H and Gonçalves V (Departamento de Biologia, Universidade dos Açores, Ponta Delgada, PT; CIBIO-Azores, Ponta Delgada, PT)

T6-P419 **El disco de Secchi y el cuantómetro de PAR en la determinación de la zona fótica en los embalses del Ebro.** Soria J, Soria X, Vicente E, Rodríguez-Pérez MJ and Durán-Lalaguna C (Microbiología y Ecología, Universidad de Valencia, Burjassot, ES)

T6-P421 **Macroinvertebrados bentônicos da Chapada dos Veadeiros – importância dos organismos bioindicadores.** Neiva A, Puppin C, Valadão A, Aoyama Y and Martins MJ (Departamento de Zoologia, Instituto de Biologia, Centro de Estudos Avançados do Cerrado, Núcleo de Estudos Liminologicos, Universidade de Brasília, BR)

T6-P424 **Influencia del caudal en la abundancia y diversidad de larvas de Trichoptera en cuatro ríos de Galicia**. Álvarez-Troncoso R, Sarr A and Garrido J (Departamento de Ecología y Biología Animal, Universidad de Vigo, Lagoas Marcosende, Vigo, ES)

T6-P430 **Pesca artesanal e identidade dos pescadores do Alto Rio Uruguai, Brasil.** Pit Dal Magro M, Bertollo V, Rossato E, Renk A, Dal Magro J and Souza-Franco G (Área de Ciências Humanas e Juridicas, Universidade Comunitária da Região de Chapecó, BR)

T6-P431 **Distribuição espacial de metais em sedimentos da Represa Guarapiranga,** São Paulo-SP/Brasil. Monteiro L, Cotrim M, Bicudo D, Bicudo C, Ortiz N, Muchon G and Pires M (Ipen/CNEN-SP, Instituto de Pesquisas Energéticas e Nucleares, São Paulo, BR)

T6-P435 **The use of macroinvertebrate biotic indices in response to WFD in insular lentic system (Azores). Ramos** J, Cunha A, Cruz A, Raposeiro P, Costa AC and Gonçalves V (Department of Biology, University of the Azores, Ponta Delgada, PT; CIBIO-Azores, Ponta Delgada, PT)

T6-P438 **Seasonality of benthic diatom communities across a trophic gradient: biomoritoring implications.** Gomà J, Pastor a, Cañas L and Sabater F (Departamento de Ecologia, Universitat de Barcelona, ES)

T6-P447 **Efeito de diferentes coberturas vegetais sobre a qualidade microbiológica da água de nascentes.** Agrizzi D, Cecílio R, Amaral A and Santos-Junior A (Aquicultura, Instituto Federal de Educação, Ciência e Tecnologia do Espírito Santo, Alegre, BR)

T6-P448 **Monitoramento do desenvolvimento de *Azolla* sp. por meio de sensoriamento remoto terrestre.** Ferrari J, Miranda F and Amaral A (Aquicultura, Instituto Federal de Educação, Ciência e Tecnologia do Espírito Santo, Alegre, BR)

T6-P450 **Parâmetros físicos e químicos da água do Córrego Horizonte, Espírito Santo, Brasil.** Amaral A, Fernandes D and Valane M (Aquicultura, Instituto Federal de Educação, Ciência e Tecnologia do Espírito Santo, Alegre, BR)

T6-P451 **Índice de coliformes no Córrego Horizonte, afluente do Rio Norte, Espírito Santo, Brasil.** Amaral A, Fernandes D and Valane M (Aquicultura, Instituto Federal de Educação, Ciência e Tecnologia do Espírito Santo, Alegre, BR)

T6-P456 **Macroinvertebrate monitoring to evaluate sediments and waterways conservation in a protected ecosystem.** Morgado F, Malcato J, Figueiredo A, Gadelha J and Soares AMVM (Departamento de Biologia, Universidade de Aveiro, PT)

T6-P457 **Plankton communities in reservoirs of the Ebro River watershed as ecological status indicators.** Vicente E, Miracle MR, Soria J, Soria X, Ferriol C, Morata S, Mellado A, Durán-Lalaguna C and Rodríguez-Pérez MJ (Instituto Cavanilles de Biodiversidad y Biología Evolutiva, Universidad de Valencia, Paterna, ES)

T6-P464 **High-resolution automatic water quality monitoring of reservoirs from the Jucar River Basin Administration.** Correcher E, Torán M, Picazo A, Rochera C, Álvarez-Troncoso R, Martínez E, Morales A and Camacho A (Cavanilles Institute of Biodiversity and Evolutionary Biology, University of Valencia, Burjassot, SP)

T6-P485 **Caracterización horaria de los cambios producidos en el caudal por una central hidraúlica.** Baeza D, Novo P, Alcalde A and Marchamalo M (Departamento de Ecología, Universidad Autónoma de Madrid, ES; Ecohidraulica S.L., Madrid, ES)

Thursday 5 July Poster Presentations: Session 3

(One day exhibition)

T1-Aquatic ecotoxicology and environmental risk assessment

T1-P8 **Metals bioavailability and spatial pattern in a tropical reservoir's sediment.** Cardoso-Silva S, Nishimura P, Rosa A and Pompêo M (Departamento de Ecologia, Instituto de Biociências/ Universidade de São Paulo, BR)

T1-P10 **Bioaccumulation of microcystins in lettuce.** Bittencourt-Oliveira MC, Hereman T and Arruda-Neto J (Department of Biological Sciences, Luiz de Queiroz College of Agriculture, University of São Paulo, Piracicaba, BR)

T1-P11 **Effects of microcystins on *Microcystis panniformis* (Cyanobacteria) and *Monoraphidium convolutum* (Chlorophyta).** Bittencourt-Oliveira MC, Camargo-Santos D, Oliveira H, Dias C and Molica R (Department of Biological Sciences, Luiz de Queiroz College of Agriculture, University of São Paulo, Piracicaba, BR)

T1-P69 **Enhanced channel complexity in four streams through introduction of large wood: effects on macroinvertebrates.** Giorgi A, Flores L, Larrañaga A, Díez JR and Elosegi A (Department of Plant Biology and Ecology, University of the Basque Country, Leioa, SP)

T1-P70 **Evaluation of toxic effects of a single pulse of copper sulfate on wetland communities in microcosms.** del Arco A, Jiménez-Gómez F, Guerrero F and Parra G (Biología Animal, Biología Vegetal y Ecología, Universidad de Jaén, ES)

T1-P89 **Recente colapso das escombreiras das minas do Portelo (NE Portugal) e impactos potenciais nos ecossistemas aquáticos.** Geraldes A, Ramalhosa E, Caetano M and Teixeira A (CIMO/ESA/IPB, Bragança, PT)

T1-P128 **Enzymatic analysis of Chironomus sancticaroli (Diptera: Chironomidae) exposed to organophosphate.** Rebechi D, Vicentini M, Guiloski I, Silva de Assis H and Navarro-Silva M (Department of Zoology, Federal University of Paraná, Curitiba, BR)

T1-P135 **Deleterious effects in liver and gills of *Oncorhynchus mykiss* after acetaminophen chronic exposure.** Ramos A, Campos J, Antunes S, Nunes B, Gonçalves F and Correia A (CIIMAR, Porto, PT; CESAM, Aveiro, PT; Departamento de Biologia, Universidade de Aveiro, PT)

T1-P148 **Biomarkers evaluation in fishes of the Ave River.** Pinto AL, Pereira S, Cortes R, Fontainhas-Fernandes A, Coimbra A and Monteiro S (Departamento de Ciências Florestais e Arq. Paisagista, CITAB/UTAD, Vila Real, PT)

T1-P172 **Heterogeneidade na distribuição de metais em sedimentos de represas da Catalúnia (Espanha).** Pompêo M, López P, Moschini-Carlos V, Casas JP and Armengol J (Departamento de Ecologia, Universidad de Barcelona, ES; Departamento de Ecologia, Universidade de São Paulo, BR)

T1-P209 **Influence of temperature and florfenicol on *Daphnia magna* feeding behavior.** Martins A and Guilhermino L (Laboratory of Ecotoxicology, Department of Populations Studies, ICBAS, University of Porto, PT; Laboratory of Ecotoxicology and Ecology, CIIMAR, University of Porto, PT)

T1-P257 **Effects of cadmium and changes in resource quality (leaf species) on freshwater detritus based food webs.** Campos D, Lemos M, Alves A, Correia A, Soares AMVM and Pestana J (Department of Biology, Universidade de Aveiro, PT)

T1-P258 **Effects of Cadmium and the pesticide Movento on *Chironomus riparius* cellular energy allocation.** Santos S, Lemos M, Soares AMVM and Pestana J (Biology, CESAM/ Universidade de Aveiro, PT)

T1-P261 **Atrazine, glyphosate and quinclorac altering the metabolism and induce oxidative stress in bullfrog tadpoles.** Dornelles M, Dutra B, Fernandes F, Oliveira M, Pereira P, Rodrigues P, Sizer A and Oliveira G (Ciências Morfofisiológicas, Pontificia Universidade Católica do Rio Grande do Sul, Porto Alegre, BR)

T1-P266 **Hydrosoluble compounds of Coniferae in the respiratory electron transport system of *Hyalella castroi*.** Dutra B, Rodrigues P, Fernandes F, Santarém E, Astarita L and Oliveira G (Ciências Morfofisiológicas, Pontificia Universidade Católica do Rio Grande do Sul, Porto Alegre, BR)

T1-P272 **Analysis of the metabolism and reproductive effects of quinclorac in *Hyalella castroi*.** Oliveira G, Sizer A, Redel K, Pereira P, Fernandes F and Dutra B (Ciências Morfofisiológicas,

Pontificia Universidade Católica do Rio Grande do Sul, Porto Alegre, BR)

T1-P280 **Toxicity assessment of aqueous extracts of ashes from forest fires.** Silva V, Abrantes N, Pereira J, Campos I, Keizer J and Gonçalves F (CESAM and Department of Environment, University of Aveiro, PT)

T1-P281 **Subterranean karstic areas - characterization of groundwater and sediment's quality.** Gonçalves A, Bessa M, Reboleira A, Gonçalves F and Abrantes N (CESAM and Department of Environment and Planning, University of Aveiro, PT)

T1-P299 **Avaliação da presença de detergente (linear alquilbenzeno sulfonado) na água e sedimento do rio Tietê, Brasil.** Duarte I, Soares L, Okada D and Varesche M (Departamento de Biologia, Universidade Federal de São Carlos, Sorocaba, BR)

T1-P333 **Looking for a reliable method to evaluate toxicity in recreational waters with complex compound mixtures.** Hernández M, Hernández E and del Campo F (Departamento de Biología, Facultad de Ciencias, Universidad Autónoma de Madrid, ES)

T1-P422 ***Chironomus sancticaroli* Strixino & Strixino,1981 (Chironomidae) em ensaios agudos com a-cipermetrina e malathion.** Aranha J, Baldan L, Silva MA and Guimarães A (Campus Palotina, Universidade Federal do Paraná, Palotina, BR)

T1-P428 **Avaliação da citotoxicidade e genotoxicidade dos sedimentos de reservatórios subtropicais do Brasil.** Dal Magro J, Rambo C, Rosset M, Sirena J, Dalegrave D, Silva M, Ribeiros M and Souza-Franco G (Área de Ciências Exatas e Ambientais, Universidade Comunitária da Região de Chapecó, BR)

T1-P433 **Toxic effects of mercury to the microalgae *Rhodomonas baltica*.** Oliveira M, Ribeiro A, Martins A and Guilhermino L (ICBAS, Department of Populations Studies, Laboratory of Ecotoxicology, University of Porto, PT; CIIMAR, Laboratory of Ecotoxicology and Ecology, University of Porto, PT)

T1-P471 **Effect of two pesticides (imazalil & diazinon) in leaf litter breakdown and associated organisms.** Flores L, Larrañaga A and Elosegi A (Plant Biology and Ecology, University of the Basque Country, Leioa, SP)

T3-Climate change

T3-P6 **Riparian forest adaptations in European rivers: a response to altered flow regimes by climate change.** Rivaes R, Ferreira T, Egger G and Politti E (Forest Research Centre, ISA/UTL, Lisbon, PT)

T3-P33 **Effect of temperature and a dominant shredder in the variability patterns of macroinvertebrate assemblages.** Domingos C, Ferreira V, Swan C and Canhoto C (IMAR-CMA and Department Life Sciences, University of Coimbra, PT)

T3-P77 **Evaluation of the effect of drought in the benthic macroinvertebrate community structure.** Jesus T (Faculdade de Ciência e Tecnologia, Universidade Fernando Pessoa, Porto, PT)

T3-P115 **Diel changes in physiological damage and UV-B protection mechanisms of an aquatic liverwort in the field.** Fabón G, Monforte L, Tomás-Las-Heras R, Soriano G, Núñez-Olivera E and Martínez-Abaigar J (Complejo Científico-Tecnológico, Universidad de La Rioja, Logroño (La Rioja), ES)

T3-P116 **DNA damage in an aquatic liverwort can be induced by UV-B in the laboratory but not in the field.** Monforte L, Fabón G, Tomás-Las-Heras R, Martínez-Abaigar J and Núñez-Olivera E (Complejo Científico-Tecnológico, Universidad de La Rioja, ES)

T3-P200 **Ecological concepts and the management of semiarid freshwaters under climate change.** Barbosa J and Vasconcelos J (CCBS/DB/PPGEC, Universidade Estadual da Paraíba, Campina Grande, BR)

T4-Ecohydraulics

T4-P224 **Efeitos da colocação de substratos artificiais nos movimentos de *Luciobarbus bocagei* numa passagem para peixes.** Santos JM, Branco P, Silva A, Katopodis C, Pinheiro A and Ferreira T (CEF-Forest Research Centre, Technical University of Lisbon, PT)

T4-P246 **Does substrate density influences fish passage success in pool-type Fishways?** Branco P, Santos JM, Silva A, Katopodis C, Viseu T, Pinheiro A and Ferreira T (CEF-Forest Research Centre, Technical University of Lisbon, PT)

T4-P274 **Metodología cartográfica especialmente diseñada para embalses de pequeño tamaño aplicada en el levantamiento.** Iglesias J, Velo M, Pineiro R and Roy J (Asesoría Técnica, IPROMA SL, Vigo, ES)

T4-P356 **HIDRONDA: automated system for simulation of wave field in inland waters.** Marques M, Guetter A, Mannich M, Bernardo J, Okawa C and Pereira O (Departamento de Tecnologia, Universidade Estadual de Maringá, BR)

T4-P360 **Fetch distribution in the reservoir of Vossoroca.** Marques M, Fernandes CV, Bleninger T, Mannich M, Bernardo J and Okawa C (Departamento de Tecnologia, Universidade Estadual de Maringá, BR)

T4-P390 **Início do ano hidrológico em Portugal com base no balanço hídrico mensal de Thornthwaite.** Reis F, Jesus T, Abreu I, Lajinha T and Guerreiro M (Faculdade de Ciência e Tecnologia, Universidade Fernando Pessoa, Porto, PT)

T7-Estuarine ecology

T7-P321 **Estuaries from a meiofaunal perspective: biodiversity patterns of benthic nematodes.** Alves AS, Adão H, Ferrero T, Marques JC, Costa M and Patrício J (IMAR-CMA Department of Life Sciences, University of Coimbra, PT; Centre of Oceanography, Faculty of Sciences, University of Lisbon, PT)

T7-P449 **Comparison of the zooplankton communities in two estuaries with different levels of pollution (NW Portugal).** Vieira L, Morgado F and Guilhermino L (CIIMAR and ICBAS, University of Porto, PT)

T9-Food webs

T9-P22 **Aquatic food webs of the oxbow lakes in the Pantanal: a new site for fisheries?** Morais R, Angelini R, Catella A, Kawakami E and Libralatos S (Ecologia e Evolução, Universidade Federal de Goiás, Goiânia, BR)

T9-P42 **Variación estructural de las redes tróficas de ríos a múltiples escalas.** Sánchez-Carmona R, Rodríguez- Ruiz A, Encina L, Rodríguez-Sánchez V and Granado C (Biología Vegetal y Ecología, Universidad de Sevilla, ES)

T9-P187 **Efeitos da pluviosidade nas teias tróficas de macroinvertebrados em um riacho tropical no Brasil.** Menezes M and Calado-Tullio S (Campus Palotina, Universidade Federal do Paraná, Palotina, BR)

T9-P223 **Stable isotope analysis of food webs along a stream gradient: initial results.** Costas N and Pardo I (Ecología y Biología Animal, Universidad de Vigo, ES)

T9-P318 **Influência dos nutrientes sobre a taxa de herbivoria de *Ceriodaphnia cornuta* e de *Notodiaptomus cearensis*.** Medeiros A, Sousa C and Crispim C (Departamento de Sistemática e Ecologia, Universidade Federal da Paraíba, João Pessoa, BR)

T9-P387 **El bucle microbiano en la marisma de Doñana: influencia del gradiente hidrológico y trófico.** Avila N, López-Flores R and De.Quintana X (Instituto de Ecología Acuática, Universitat de Girona, ES)

T9-P439 **Reservatórios e nicho trófico: suas interações na UHE Serra da Mesa, Goiás, Brasil.** Cleiton-Dias A, Rodrigo-Pereira H, Fernandes-da-Silva LC and Leite-Pereira C (Universitat de Barcelona, ES)

T11-Lentic ecosystems

T11-P17 **Florações de *Planktothrix agardhii* e *Cylindrospermopsis raciborskii* em reservatório brasileiro.** Moura A and Dantas E (Departamento de Biologia, Universidade Federal Rural de Pernambuco, Recife, BR)

T11-P28 **Complexidade estrutural em lagoas marginais e sua importância na distribuição da fauna bentônica.** Shimabukuro E and Henry R (Departamento de Zoologia, Instituto de Biociências - Universidade Estadual Paulista (UNESP), Botucatu, BR)

T11-P34 **Circulação das águas do reservatório do Castanhão (NE-Brasil).** Dias F, Silva-Filho V, Fernandes-Bezerra M, Oliveira-Filho J and Valente-Marins R (Instituto de Ciências do Mar da Universidade Federal do Ceará, Fortaleza, BR)

T11-P55 **Modelação da dinâmica do zooplâncton das albufeiras: um complemento essencial aos planos de monitorização?** Geraldes A and Silva-Santos P (CIMO/ESA/IPB, Bragança, PT)

T11-P59 **Presença do Cladocera exótico *Bosmina coregoni* na Albufeira da Aguieira (Bacia do Mondego -Portugal).** Geraldes A and Alonso M (CIMO/ESA/IPB, Bragança, PT)

T11-P60 **Comunidade zooplanctónica da albufeira da Aguieira: variações sazonais e factores estruturantes.** Geraldes A and Silva-Santos P (CIMO/ESA/IPB, Bragança, PT)

T11-P68 **Resposta do fitoplâncton à hidrologia da planície de inundação do lago Janauacá (Amazonas, Brasil).** Miranda E, Bonnet M, Seyler P, Boaventura G, Vieira L, Kraus C and Ibanez S (Geociências Aplicadas, Universidade de Brasília, BR)

T11-P109 **Cálculo de escorrentías y aportes a los embalses del Río Rivera de Huelva.** Puerto-Marchena A, Escot-Muñoz C, Basanta-Alves A and Muñoz-Reinoso J (Ecología y Gestión Ambiental, Empresa de Abastecimiento y Saneamiento de Aguas de Sevilla, ES)

T11-P126 **Estado de conservación de los lagos de la cuenca del Ebro, selección y jerarquización de métricas.** Casanovas-Berenguer R, Rodríguez-Pérez MJ, Durán-Lalaguna C, Alonso M and Pla-Rabés S (Área de Calidad de Aguas. Comisaría de Aguas, Confederación Hidrográfica del Ebro, Zaragoza, ES)

T11-P130 **Efeitos do CDOM sobre a profundidade da camada de mistura e o clima de luz em pequenos lagos no Brasil.** Bezerra-Neto J, Barros C, Barbosa P and Barbosa F (Biologia Geral, Universidade Federal de Minas Gerais, Belo Horizonte, BR)

T11-P155 **Impacto de los grandes herbívoros en lagunas temporales mediterráneas.** Fernández-Zamudio R, Cirujano S, Kempin S and Garcia-Murillo P (Biologia Vegetal y Ecologia, Universidad de Sevilla, ES)

T11-P165 **Associação de macroinvertebrados aquáticos às raízes de uma macrófita flutuante em ambientes lacustres (Brasil).** Silva C and Henry R (Departamento de Zoologia, Instituto de Biociências/ UNESP, Botucatu, BR)

T11-P197 **Nutrients and organic matter load to Pinilla Reservoir (Madrid): water quality, and management implications.** Marcé R, Urrutia I and Armengol J (Canal de Isabel II, Madrid, ES)

T11-P268 **Produção de efípios em Cladocera: Interferência do habitat.** Vieira D, Santos-Silva E and Crispim C (Departamento de Sistemática e Ecologia, Universidade Federal da Paraíba, João Pessoa, BR)

T11-P273 **The role of light and nutrients on periphytic auto-heterotrophic balance.** Guimarães D, Franco D, Guariento R and Esteves F (Department of Ecology, UFRJ, Rio de Janeiro, BR)

T11-P279 **Patrones de productividad asociados a variables fisicoquímicas en lagos altoandinos tropicales de Colombia.** Ramos-Montaño C, Cárdenas-Avella M and Herrera Y (Biología, Universidad Pedagógica y Tecnológica de Colombia, Tunja, CO; Biología, Universidad Nacional de Colombia, Bogotá, CO)

T11-P287 **Estructura de los crustáceos zooplanctónicos de alta montaña tropical en la cordillera oriental de Colombia.** Herrera Y, Paggi J and Henao E (Departamento de Biología, Universidad Pedagógica y Tecnológica de Colombia, Tunja, CO; Biología, Universidad Nacional de Colombia, Bogotá, CO)

T11-P288 **Eutrophication gradient in cascade reservoirs in semiarid region, northeastern Brazil.** Rosa R, Oliveira J, Torres L, Miranda K, Costa MR, Mattos A and Becker V (Centro de Tecnologia, Universidade Federal do Rio Grande do Norte, Natal, BR)

T11-P329 **Knowledge, prediction and management of toxic Cyanobacteria blooms in the Sardinian reservoirs (Mediterranean).** Mariani MA (Dipartimento di Scienze della Natura e del Territorio, Università di Sassari, IT)

T11-P389 **Caracterização limnológica de reservatório produtor de energia elétrica na Amazônia Legal.** Marques A, Morais P, Barros D, Bonatto G and Reis D (Departamento de Engenharia Ambiental, Universidade Federal do Tocantins, Palmas, BR)

T11-P394 **Influência da precipitação pluviométrica na reflectância espectral da água do reservatório Passo Real (RS), Brasil.** Barbieri D, Pereira-Filho W and Wachholz F (Geociências, Universidade Federal de Santa Maria, BR)

T11-P395 **Is zooplankton community structure affected by physical, chemical and environmental changes in Azorean lakes?** Cruz A, Raposeiro P, Costa AC and Gonçalves V (Department of Biology, University of Azores, Ponta Delgada, PT; CIBIO-Azores, Ponta Delgada, PT)

T11-P396 **Mapeamento de variáveis limnológicas no reservatório da usina hidrelétrica (UHE) Dona Francisca, RS – Brasil.** Corazza R and Pereira-Filho W (Geociências, Universidade Federal de Santa Maria, BR)

T11-P427 **Características limnológicas e a reflectância da água do reservatório Passo Real, Rio Grande do Sul, Brasil.** Santos F and Pereira-Filho W (Geociências, Universidade Federal de Santa Maria, BR)

T11-P458 **La Albufera de Valencia: flujos hídricos y cargas de nutrientes, elementos clave en la calidad del agua.** Vicente E, Soria J, Miracle MR, Soria X and Peña R (Instituto Cavanilles de Biodiversidad y Biología Evolutiva, Universitat de Valencia, Paterna, ES)

T11-P462 **Chironomids communities in the twin lakes of Sete Cidades (S. Miguel, Azores).** Gonzalez A, Raposeiro P and Costa AC (Departamento de Biologia, Universidade dos Açores, Ponta Delgada, PT)

T13-Multiple stressors

T13-P86 **Tolerance and behavioural responses of saline water beetles to acute heat and osmotic stress.** Pallarés S, Arribas P, Céspedes V, Millán A and Velasco J (Departamento de Ecología e Hidrología, Universidad de Murcia, ES)

T13-P111 **Saline water beetles tolerance to salinity and anionic composition in relation to habitat occupancy.** Céspedes V, Pallarés S, Arribas P, Millán A and Velasco J (Departamento de Ecología e Hidrología, Universidad de Murcia, ES)

T15-Restoration of aquatic ecosystems and ecological services

T15-P76 **Factores que determinan el éxito de la revegetación con macrófitos: el caso del Tancat de la Pipa (Valencia).** Calero S, Cortés F, Segura M, Rojo C and Rodrigo M (Grupo de Ecología Integrativa, Institut Cavanilles de Biodiversitat i Biologia Evolutiva, Universitat de València, ES)

T15-P112 **El ciclo del agua y nosotros. ¡¡¡Cómo hemos cambiado!!!** Suárez ML, Gómez R, Sánchez-Montoya M, Arce MI and Vidal-Abarca MR (Department of Ecology and Hidrology, University of Murcia, SP)

T15-P150 **Efeitos bioquímicos de extractos de alfazema (*Lavandula* sp.) no crescimento de *Chlorella vulgaris*.** Fernandes C and Geraldes A (CIMO/ESA/IPB, Bragança, PT)

T15-P231 **Linking land use changes in Doñana to water demand: needs and implication for water planning.** Alcorlo P, Willaarts B, Palomo I, Torres A and Montes C (Departmento de Ecología, Universidad Autónoma de Madrid, ES)

T15-P254 **Uso de biofilme como bioremediador ambiental na remoção de nutrientes e aumento da transparência da água.** Crispim C and Clemente B (Departamento de Sistemática e Ecologia, Universidade Federal da Paraíba, João Pessoa, BR)

T15-P275 **DeltaNet: an European network for sustainable management of deltas and estuaries.** Ibáñez C, Caiola N and Rovira A (Aquatic Ecosystems, IRTA, Sant Carles de la Ràpita, ES)

T15-P304 **Effects of the anesthetic eugenol (clove oil) on mosquitofish (*Gambusia* sp). A tool for restoration?** Toja J, León D and Peñalver P (Department of Plant Biology and Ecology, University of Seville, SP)

T15-P327 **Do oxbow wetlands recover their biological structure and functions after restoration?** Español C, Gallardo B, Pino M, Martín A and Comín F (Environmental Institute, San Jorge University, Villanueva de Gállego- Zaragoza, SP; Department of Conservation of Biodiversity and Ecosystem Restoration, Pyrenean Institute of Ecology (IPE-CSIC), Zaragoza, SP)

T15-P378 **Prioritizing river connectivity rehabilitation actions: a graph-based approach.** Segurado P, Branco P and Ferreira T (CEF-Forest Research Centre, Technical University of Lisbon, PT)

T15-P455 **Recolonization patterns by benthic invertebrates after restoration of degraded sediments and waterways.** Morgado F, Malcato J, Figueiredo A, Gadelha J and Soares AMVM (Departamento de Biologia, Universidade de Aveiro, PT)

SS3-Challenges in assessing the ecological status of rivers and streams

SS3-P84 **Water quality assessment of the Mauriver: a multi-stressor case study.** Vidal T, Santos J, Claro T, Pereira J, Marques C, Pereira R, Castro B, Soares AMVM and Gonçalves F (Department of Biology, University of Aveiro, PT)

SS3-P113 **Assessing the hydrologic status of headwater streams from bryophyte functional diversity.** Vieira C and Ferreira T (CIBIO, Vairão, PT)

SS3-P136 **Choosing the sharpest tool in the box: taxon-weighting improves the precision of family level trait assignment.** Monaghan K and Soares AMVM (CESAM and Biology Department, University of Aveiro, PT)

SS3-P162 **Biological surveys of aquatic invertebrate communities in arid basins of northern Chile.** Alvial I, Squeo F, Durán B, Orth K, Castro M and Tapia D (Centro de Estudios Avanzados en Zonas Áridas, La Serena, CL; Departamento de Biología, Universidad de La Serena, CL)

Keynote Lectures

KEYNOTE LECTURES

Domesticated rivers and novel communities: a challenge for research and management

Klement Tockner

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Throughout the last centuries rivers have increasingly become human-dominated ecosystems as a result of land reclamation, floodplain drainage, flow regulation, and channelization. Their domestication, i.e. the optimization for few ecosystem services, has led to the formation of novel biotic communities and to the truncation of vital ecosystem processes. This is particularly true for large European rivers. Domestication, combined with the rapid turnover of biotic communities, calls for a fundamental rethinking in future ecosystem management. Conservation will need to be complemented by, or perhaps even replaced by, increasing levels of management intervention, in order to create and maintain the desired ecological values of river-floodplain ecosystems.

Invasive species in hot pursuit of Pacific salmon

Julian Olden

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Cumulative effects and complex interactions among multiple agents of environmental change continue to limit our ability to forecast with certainty how freshwater ecosystems and their biota will respond in the future. Consequently, the prospect of dramatic climate change over the next century underscores the need for innovative science and new decision-support tools for efficiently managing and conserving freshwater ecosystems. Using salmon (*Oncorhynchus* spp.) in the Pacific Northwest of the United States as an example, I will present an analytical framework for linking climate change, riparian land-use, stream thermodynamics, and species invasions for the management and conservation of freshwater ecosystems. This framework will be demonstrated by illustrating how human-induced stream warming is promoting the range expansion of invasive smallmouth bass (*Micropterus dolomieu*) and northern pikeminnow (*Ptychocheilus oregonensis*) into formerly uninhabitable reaches that contain critical migration, spawning, and rearing habitat for endangered Chinook salmon (*Oncorhynchus tshawytscha*). I will explore predictive models that forecast spatiotemporal patterns of riverine thermal regimes in response to future climate change and riparian land-use, forecast species-specific responses (range contractions and invasions) to projected future thermal regimes, and evaluate alternative scenarios of climate change to identify critical areas for riparian habitat restoration and protection to mediate future climate-induced warming of streams and species invasions.

Impacts of urban pressure on stream biogeochemical processes: revisiting H.B.N. Hynes' ideas

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In 1975, Professor H.B.N. Hynes gave a key seminal lecture to stream ecologists, in which he emphasized the importance of the catchment characteristics in ruling stream structure and function. In that lecture he also suggested that human activities operating at catchment scale could modify this link. Nowadays, for the first time in human history, half of the human population lives in urban areas, and this percentage is expected to increase up to 60% by 2030. As more people concentrate in cities, the load of urban wastewater (whether treated or not) will increase as well. Despite an array of significant technological advances, effluents from wastewater treatment plants (WWTP) are still one of the major sources of nutrients to freshwater ecosystems. These point source inputs generate abrupt physical and chemical discontinuities along the fluvial continuum; and thus not only alter the water quality, but also affect fluvial ecosystem structure and function. The WWTP effects may be additionally exacerbated in some regions due to increasing water scarcity conditions that will reduce stream discharge in comparison to WWPT inputs. In this talk, I will revisit Hynes' ideas within the context of urban development and expand them to provide some insights on the urban effects on stream ecosystems. In particular, I will focus on in-stream nutrient retention, an important ecosystem service, and provide evidence from existing knowledge about how it is influenced by WWTP inputs. I will argue that, as urban development continues to grow, river networks will be less "controlled by their valleys" (*sensu* Hynes 1975) and more by the valley's population. Within this context, the integration of knowledge from both WWTP operation and stream nutrient dynamics may be critical to manage and preserve these aquatic ecosystems, while at the same time balance the societal demand for high quality water resources.

Climate change in freshwaters: impact on higher levels of organization

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To date, most of the focus on assessing the ecological consequences of climate change has been directed towards the lower levels of biological organisation (individuals, species populations) rather than the higher levels (communities, food webs, ecosystems). I will focus on examples of recent and ongoing research designed to address this research gap, and I will explain why it is critically important to measure responses to change at these higher levels, which often cannot be simply extrapolated to from the lower levels. Several of the key component parts of climate change will be considered here, including the effects of warming, atmospheric change, and hydrological perturbations, using a range of techniques, from theoretical models to field and laboratory experiments. A selection of case studies will be used to highlight the effect of each of these aspects of climate change on multispecies systems, and I will also consider possible synergies among components and with other stressors that are also likely to increase in the near future. Finally, I will highlight some likely avenues for future research where activity could be most effectively targeted to help improve our (currently limited) predictive abilities in this challenging and rapidly field of ecology.

Assessing the effects of stressors on aquatic ecosystem functioning: old problems and new challenges

Lúcia Guilhermino

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All over the world, aquatic ecosystems have been receiving for decades

different types of chemicals used in anthropogenic activities, including pesticides, metals, pharmaceuticals, polycyclic aromatic hydrocarbons, among several others. Some of these chemicals, their degradation products and/or their metabolites resulting from biotransformation by organisms are toxic at ecologically relevant concentrations and their presence may disrupt interspecies relationships (e.g. competition, predation), nutrient cycles and energy fluxes, potentially resulting in changes in ecosystem functioning. In addition, usually, the pressure over organisms, populations and communities is due to complex mixtures of chemicals resulting in toxicological interactions difficult to assess and understand. Furthermore, due to global climate changes, environmental conditions (e.g. temperature, pH, oxygen levels) are expected to change considerably in several regions; in some of them, seasonal differences may become more notorious than they used to be. These changes will act as additional stress factors and may considerably modify the toxicity of pollutants in aquatic ecosystems. Thus, our strategies to assess the effects of stressors on ecosystem functioning will need to take into consideration both old problems and new challenges. The importance of understanding the mechanisms of toxic action of individual chemicals and mixtures, how they can be modified by "natural" stressors variation, and how both environmental contaminants and natural stressors can disrupt interspecies relationships, nutrient cyclic and energy fluxes will be discussed. Furthermore, the value of this basic knowledge for an adequate choice of endpoints and bioindicators to be used in field studies and to a proper understanding of long-term field monitoring programmes that are fundamental to assess the effects of stressors on ecosystem functioning over time will be analysed based on freshwater and saltwater case-studies.

Traits, genes and Big Data: the brave new world of freshwater ecosystem assessment?

Donald Baird

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Biomonitoring science in freshwater ecosystems has expanded rapidly over the past century, from concerns over organic pollution in cities towards the investigation of more subtle and recalcitrant effects of changing landscapes and chemical emissions. New challenges require new, robust techniques, yet our current tools are blunted by an inability to move beyond simple binary assessment - are sites 'impacted' or not? -towards more nuanced, diagnostic analysis. While new statistical methods (both multi-metric and multivariate) allow degradation to be expressed in 'shades of grey', stressor separation and diagnosis of cause remains elusive.
Traits-based ecological analysis is hardly a new approach, yet a recent upsurge in research in this area has been stimulated by the possibility that it could provide a key to unlock the inner workings of ecosystems. It offers new insight into how specific drivers (including stressors) interact with phenotypic characters to determine species distribution and abundance. However, progress has been limited for two reasons: the poor taxonomic resolution of most biomonitoring data, and the fact that most ecological traits do not respond independently to specific drivers, as they are co-evolved complexes, and are subject to phylogenetic constraints. This may relate to the rather general nature of the traits originally selected for study, and some have proposed the development of more purposeful trait-driver relationships, based on known response mechanisms, with some limited success.
I will argue that to use traits-based approaches to develop diagnostic methods, will require a complete reboot of the science of biomonitoring. Morphological identification of individual organisms would be replaced by short sequences of DNA as the new method of observation. With the advent of new high-throughput gene sequencing platforms, it is now possible to obtain high-resolution taxonomic information of an unprecedented breadth and accuracy from standard biomonitoring samples. While this yields immediate benefits in terms of resolving traits information at the species level, we can go further. Using examples from our own work in this area, and from related studies around the world, I will illustrate the potential of these new techniques to deliver 'data on an epic scale' to begin the task of developing a new generation of diagnostic tools for investigation of impacts on river, lake and wetland ecosystems.

PhD prize Conference

Combining trace metal bioaccumulation and stable isotopes to reveal food web structure in freshwater ecosystems

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La red trófica considera la complejidad de relaciones e interacciones tróficas que se dan en el ecosistema. Los isótopos estables han sido utilizados en ecología durante las últimas décadas, pero la popularidad ganada por los isótopos estables como indicadores tróficos, hasta cierto punto, ha enmascarado sus limitaciones y la necesidad de ampliar los trazadores de flujo de materia en los ecosistemas. El progreso en el entendimiento de la complejidad dinámica de las redes tróficas requiere el desarrollo de nuevos marcos de trabajo teórico y operativo. Para ello, el uso de nuevas herramientas para evaluar las redes tróficas es un importante campo de estudio, tales como otros isótopos estables o substancias que se acumulan a través de la dieta (e.g., metales traza). Esta tesis es una contribución en este campo de estudio emergente.
La principal hipótesis de esta tesis es que los metales traza pueden emplearse para evaluar las relaciones tróficas en los ecosistemas acuáticos, lo cual hasta ahora se aproximaba usando isótopos estables del C y N ($\delta^{13}C$ y $\delta^{15}N$), o por el análisis directo de contenidos estomacales. Para ello, se ha estudiado la red trófica del embalse de Flix en un único muestreo intensivo (peces y sus potenciales fuentes de alimento).
Las especies de peces con diferentes modos de alimentación pueden solaparse en el espacio $\delta^{15}N$-$\delta^{13}C$ cuando las redes tróficas son complejas. Efectivamente, el estudio detallado de los metales traza y los isótopos estables en cuatro especies de peces de diferentes formas de vida y sus potenciales fuentes de alimento han permitido concluir que las relaciones tróficas pueden evaluarse más apropiadamente combinando ambos tipos de trazadores usando modelos de mezcla bayesianos.
En cuanto al uso de otros isótopos (i.e., isótopos estables del hidrógeno, $\delta^{2}H$), se conocen escasamente los mecanismos que controlan la variabilidad de $\delta^{2}H$. Sin embargo, las observaciones de este estudio indican que la talla de los peces es un factor de mucha influencia y otros efectos relacionados con la posición trófica pueden ser también relevantes.
En general, se puede concluir que la utilización de múltiples trazadores proporcionará resultados más fiables y robustos para resolver las conexiones en redes tróficas complejas. El tradicional uso de los isótopos estables del C y N puede reforzarse con otros isótopos estables (e.g., $\delta^{2}H$) y substancias que se acumulan a través de la dieta (e.g., metales traza).

Oral Abstracts

ORAL ABSTRACTS

SS1- Biology and conservation of freshwater mussels: an Iberian perspective

SS1-O63 **Massive die-offs of freshwater bivalves as resource pulses**

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The winter of 2009-2010 was particularly severe in Northern Portugal resulting in higher river flow levels. A study was undertaken to assess the impact of this situation on several populations of freshwater bivalves (e.g. *Anodonta anatina*, *Corbicula fluminea*, *Margaritifera margaritifera*, *Potomida littoralis* and *Unio delphinus*) in the catchments of the rivers Minho, Douro, Tâmega, Tua and Sabor. Massive die-offs occurred for all species in all rivers, resulting in the removal of great numbers and biomass from the riverbed to the adjacent riverbanks, reaching maximum values of 2,280 individuals m^{-2} and 10,225 g wet weight m^{-2}, respectively. The invasive Asian clam *C. fluminea* had both highest density and biomass. Results show that the quantitative and qualitative importance of this carrion transfer to the riverbank should be incorporated in future studies on the assessment of ecosystem function, contributing to a better understanding of the role of freshwater bivalves as resource pulses in adjacent terrestrial habitats. Some of the affected species have conservational importance and these extreme climatic events are predicted to increase in the future. These massive die-off events should be incorporated into management plans and selected restoration measures such as rapid relocation of endangered native mussels back to the riverbed can be easily applied to lessen possible impacts.

SS1-O67 **Rediscovery of two freshwater pearl mussel (*Margaritifera margaritifera*) populations in the Tâmega River Basin**

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From 1986 to 2001 *Margaritifera margaritifera* (L., 1758) was considered extinct in Portugal but in 2001 six populations were discovered. In this study we report the rediscovery of another two populations in the Rivers Beça and Terva (tributaries of the River Tâmega). Surveys were conducted in 2010/2011 in order to characterize the ecological status of these populations and advance with possible conservation measures to be applied. In general both Rivers are in good environmental condition but River Beça has higher biological, physico-chemical and hydromorphological quality. A population of 450 individuals was estimated for the River Beça and of just 14 adults for River Terva. The maximum inhabited length in Rivers Beça and Terva was 10 km and 1 km, respectively. Mean mussel density was considerably low in both rivers with maximum values of 0.01 m^{-2} 0.002 m^{-2} for Rivers Beça and Terva, respectively. The shell length (Lmax) values were distinct between populations (ranging from 123 mm in Beça to 114 mm in Terva) and also among sampling sites (from 90 mm in Beça 3 to 123 mm in Beça 6). A relatively large number of juveniles (<65 mm) were only found in the River Beça (26% in Beça 5). Given these results, a high susceptibility for extirpation exists in both populations (mainly for River Terva given the very low density and any sign of recent recruitment). In fact, the small number of juveniles found and the existence of several threats in both rivers (e.g. fragmentation and loss of habitat due to the presence of weirs for watering and hydroelectric power, organic pollution and bank erosion due to fires) implies an urgent need for effective conservation measures.

SS1-O71 **Ecological requirements of autochthonous mussel populations in Tâmega, Tua and Sabor rivers (Douro basin)**

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Ecological requirements of autochthonous mussel populations present in three Portuguese northeastern water courses, Tâmega, Tua and Sabor rivers (Douro basin), were studied. *Margaritifera margaritifera*, *Potomida littoralis*, *Unio delphinus* and *Anodonta anatina* populations were sampled during spring/summer of 2009, 2010 and 2011. Water quality, habitat (using River Habitat Survey methodology) and microhabitat used by mussel populations were analyzed. The ecological characterization was complemented recurring to the algae, macroinvertebrate and fish communities, following the Water Framework Directive procedures. Preference curves were developed for the juvenile and adult of the different species. *M. margaritifera* populations occupied permanent current and highly shaded microhabitats, buried in the fine sediments (gravel and sand) deposited in the interstices of coarse substrate (cobbles and boulders). *Unio delphinus* and *A. anatina* are naturally distributed along the middle and lower sections, reaching high densities in sediment zones located in the lateral arms of the main river. *Potomida littoralis* was typically found in pebble zones of middle channel arms, with higher water currents. Many of these populations are threatened by the future reduction in

the available habitat and by biotic shifts (authochtonous fish displaced by alien species) that can be expected from big dam constructions established by Portuguese governmental policies. Conservation measures must consider ecological monitoring, specific legislation and translocation programs for threatened mussel populations and a global ecosystem protection, namely in high ecological integrity areas.

SS1-O134 **Biology and overall distribution of the native freshwater mussels of Iberia**

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The Unionoida, commonly known as freshwater pearly mussels or naiads, is a diverse order of bivalved mollusks. Comprised of over 150 genera and widely distributed upon all continents except Antarctica, the Unionoida is a conspicuous member of the macrobenthos of the world's rivers and stable lacustrine habitats. Over the last 20 years, there has been a renaissance in European freshwater mussel studies, especially in Iberia. Most of that research has dwelt on taxonomy and evolution but also in other topics as fine-scale, intra-drainage, distribution patterns and life history traits relevant to applied conservation and propagation issues. In Iberia we recognize the presence of ten species of native Naiads: *Margaritifera auricularia* (Spengler, 1793), *M. margaritifera* (L., 1758), *Potomida littoralis*; (Cuvier, 1798), *Unio mancus* (Lamarck, 1819), *U. gibbus* (Spengler, 1793), *U. delphinus Spengler*, 1793, *U. tumidiformis* (Castro, 1885), *U. ravoisieri* (Deshayes, 1847), *Anodonta anatina* (L., 1758) and *A. cygnea* (L., 1758). The present study will review the taxonomy, biology, distribution, and conservation status of the native Iberian naiads and will present challenges and perspectives for future conservation efforts.

SS1-O194 **Rol de la herbivoría de bivalvos nativos y exóticos en un reservorio somero del Uruguay**

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La biomanipulación es una de las principales herramientas para mitigar los efectos de la eutrofización. Modificando la comunidad de peces se pretende intensificar indirectamente el consumo del fitoplancton por parte del zooplancton. La aplicación de esta estrategia presenta serias limitaciones en sistemas subtropicales en parte por la alta complejidad registrada en los peces. Los bivalvos filtradores son organismos que consumen fitoplancton, zooplancton, bacterias y material particulado de la columna de agua, su control por parte de los peces es significativamente menor que el del zooplancton y podrían potencialmente utilizarse para la biomanipulación en sistemas más cálidos. El objetivo de este trabajo fue estimar la tasa de filtración e ingestión de forma experimental de *Diplodon parallelopipedon* (nativo), *Corbicula fluminea* (exótico) y del zooplancton. Esta se estimó en diferentes condiciones: presencia/ausencia de sedimento, talla de los organismos (grande/chica) y oferta alimentaria (*Ankistrodesmus* sp./ *Planktothtrix agardii*/ comunidad fitoplanctónica natural). Las tasas de filtración e ingestión fueron mayores en la especie nativa *D. parallelopipedon*. El zooplancton de gran tamaño tiene mayor presión de consumo que los bivalvos. Mientras que el zooplancton de pequeño tamaño es menos eficiente en la filtración del fitoplancton en comparación con los bivalvos. Las elevadas tasas de filtración del fitoplancton junto con el consumo de zooplancton de menor tamaño, determinan que ambas especies de bivalvos presenten un gran potencial en las técnicas de biomanipulación.

SS2-Carbon processing in freshwaters: approaches and perspectives

SS2-O104 **Metabolism responses to flow regulation by dams in Mediterranean river ecosystems**

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Rivers are increasingly affected by human activities, especially in dry regions densely populated, like much of the Mediterranean area. Flow regulation by dams results in severe impacts of the hydrological regime, water quality, channel form and biological communities. These changes can in turn affect ecosystem processes such as river metabolism. We hypothesised that river regulation will affect benthic storage of dead organic matter, gross primary production (GPP) and ecosystem respiration (ER). These hypotheses were tested in 3 tributaries of the river Ebro: Siurana, Montsant and Cinca (NE Iberian Peninsula). An upstream control and a downstream impacted reach 250 to 2500 m in length, were selected for each river and sampled on summer, autumn and winter. We analysed diel cycles of dissolved oxygen and temperature at the upstream and downstream end of each reach, and calculated GPP and ER by means of the double-station open-channel method. Impacted reaches stored larger amounts of benthic organic matter and displayed larger diel variations in oxygen saturation. Seasonal changes were larger in the control than in the impacted reaches. Flow regulation resulted in more autotrophic metabolism in the reaches downstream the dams.

SS2-O105 **Proyecto RIOTEM: efectos de la temperatura en el funcionamiento de ríos de Cabecera de la Cornisa Cantábrica**

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El aumento de la temperatura en la Tierra en las últimas décadas ha hecho proliferar los estudios enmarcados en planteamientos sobre el cambio climático, ya que sus efectos sobre los ecosistemas, incluidos los ríos de cabecera, son todavía poco conocidos, particularmente cuando interactúan con otros factores a nivel local. La descomposición de la hojarasca es un proceso clave en arroyos de cabecera heterótrofos de gran interés por su repercusión en el ciclo global del carbono, ya que el calentamiento global puede acelerar las tasas de descomposición.

Además, otros factores como el substrato geológico y diferencias en las comunidades bentónicas podrían modular la respuesta del funcionamiento fluvial frente al cambio climático en un ámbito regional dado. El objetivo general de este proyecto es evaluar los efectos de la temperatura en la descomposición de hojarasca y otras variables asociadas como indicadores de cambios en el funcionamiento de los ríos de pequeño orden de la Cornisa Cantábrica, y discernir la trascendencia que ello pueda tener sobre los ecosistemas fluviales en los escenarios climáticos proyectados. Los resultados obtenidos durante el primer año del proyecto nos han permitido identificar los factores que determinan la variabilidad espacial de la temperatura del agua en estos arroyos y explicar su variabilidad temporal en función de la meteorología local. Las tasas de descomposición de aliso estimadas en 7 arroyos de geología silícea muestran una relación débil con la temperatura, sugiriendo que otros factores locales, físicos (caudal) y biológicos (fauna bentónica o microbiana) interaccionan con la temperatura o son más importantes para explicar la variabilidad espacial en las tasas de procesado.

SS2-O119 **Degradation of allochthonous and autochthonous material in river and salt marsh sediments: suitability and meaning**

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Experiments with salt marsh plants (*Sarcocornia perenni* (Mill.) A. J. Scott) and terrestrial plants (*Eucaliptus camaldulensis*. Denhn) were performed to analyse several marker variations in aerobic and anaerobic conditions during its degradation. The markers used were: C and N concentrations, discrimination rates of weight isotopes of carbon ^{13}C and Nitrogen ^{15}N as well as loss of biomass. The degradation of both types of plant materials was quite different during the incubation period: *S. perenni* was degraded well, while *E. camaldulensis* leaves were difficult to be degraded. The loss of biomass in salt marsh plants is greater in aerobic than in anaerobic conditions, and both are different than those calculated in the field. ^{13}C and ^{15}N did not change during the degradation time so they could be used as markers in an excellent way. C:N decreased because of the bacterial weight during degradation. Autochthonous materials follow different degradation paths. They are discussed in this study.

SS2-O120 **Quantitative estimation of the organic matter origin in the sediments using ^{13}C, ^{15}N and C/N**

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River and estuarine sediments are heterogeneous and have different source of organic matter (freshwater and marine plankton, terrestrial and salt marsh detritic plant material, and several anthropogenic activities (such as agriculture, industry and urban wastes). It is important to know the amount and origin of sedimentary organic matter because it reflects the ecological health of the area. There have been proposed some numerical models based on the use of two or three equations. The values of variables (C/N, N/C, $\delta^{13}C$, $\delta^{15}N$) in the considered sources have been used as characteristic in the mentioned sources. Some negative results were shown by this method. Moreover, the number of possible sources is reduced to two or three. In this study the proposed model is based on the vectorial distance between the sediment samples and the different sources (as many as required) in three dimensional space which represent the values of C/N $\delta^{13}C$ and $\delta^{15}N$. The method is easy in application and very clear in the results, no negative coefficients of participation are possible and it seems suitable for a general use. In the case of study in the Palmones river and estuary, riverine transition and estuarine samples were grouped by this affinity using the most appropriate markers among many.

SS2-O146 **The role of alkalinity on the relationship between lake metabolism and CO_2 saturation and its global relevance**

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Since the observation that surface waters from most lentic ecosystems are supersaturated in CO_2 researchers have focused on the factors explaining this high CO_2 concentrations. Among these, the aquatic metabolic balance and its relationship with allochthonous inputs of dissolved organic carbon are widely accepted as main drivers of CO_2 supersaturation. However, most efforts devoted to understanding CO_2 variability has been performed in lakes covering a small range of alkalinity. Therefore, it is not clear how high alkalinity systems will fit in the current paradigm, and the relevance of those systems at the global scale. In this work we evaluated CO_2 saturation in surface waters of 100 Spanish reservoirs using data collected during an extensive survey performed in the 1990' s. Each system was sampled during summer and autumn, and the survey covered a wide range of geological settings, land use typologies, and trophic states. Our results showed that most of the reservoirs had CO_2 concentrations above atmospheric equilibrium, but oxygen subsaturation was not as prevalent as CO_2 supersaturation, and a significant number of reservoirs were supersaturated in CO_2 despite having oxygen concentrations above equilibrium. Such discrepancy was observed in medium to high alkaline waters. From a theoretical approach based on the equations governing the inorganic carbon system, we show that the carbonate reactions can significantly contribute to CO_2 supersaturation, and also determine dramatic changes in the relationship between metabolism and CO_2 saturation. After an analysis of the representativeness of medium to high alkalinity waters in the world lakes budget, we consider that the paradigm linking CO_2 supersaturation to net heterotrophy should be revised on a global perspective.

SS2-O153 **Reactivity of allochthonous and autochthonous DOM sources in a Mediterranean coastal lagoon**

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Dissolved organic matter (DOM) reactivity is essentially dependent on DOM precursor material and on the processes regulating its bioavailability, especially radiation and microbial activity. In the present study, we investigate the reactivity of allochthonous and autochthonous DOM sources in a Mediterranean coastal lagoon. We used a set of mesocosm experiments to assess changes in DOM due to light-induced photoreactions and to microbial degradation. The Ultraviolet/

Visible (UV/vis) absorbance as well as the excitation emission matrix (EEM) fluorescence spectra were used to trace temporal changes in the DOM characteristics. To examine microbial degradation, we measured bacterial abundance and biomass production. Allochthonous DOM before irradiation presents a higher biodegradable dissolved organic matter (BDOM) fraction and is less colored and aromatic than the autochthonous DOM. Nonetheless, protein-like signal in the excitation-emission matrices (EEM) is stronger in autochthonous DOM from the lagoon waters, signaling an important microbial activity. During the incubation, the effect of photoreactions on DOM was more important than the microbial degradation for both types of DOM. The rate of change of spectroscopic descriptors showed a faster mineralization and a stronger effect of both microbial degradation and photoreactions on allochthonous DOM than on autochthonous. These results show that DOM from torrential waters is more reactive than the lagoon water DOM, and provide insight into the tracing of allochthonous DOM inputs in receiving waters.

SS2-O163 **Granulometría inorgánica y contenido en carbono orgánico y nitrógeno en sedimento de embalses de Cataluña**

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El sedimento de embalses es un componente importante en el ciclo del carbono dado su papel como fuente de gases de efecto invernadero, y a la vez por su capacidad de almacenamiento a largo plazo de carbono orgánico (OC). El presente estudio relaciona la distribución granulométrica del material inorgánico con el contenido en OC, nitrógeno (N) y el cociente OC/N del sedimento superficial de cinco embalses catalanes (España) con un rango de concentración de OC entre 3.5 y 10.5%. Nuestro principal objetivo era establecer las posibles relaciones entre el contenido en materia orgánica (C y N) y la estructura física (tamaño de partículas) del material inorgánico, así como su variabilidad intra e interembalse. El tamaño medio de las partículas inorgánicas presenta diferencias significativas entre los cinco embalses y a la vez entre los distintos tramos ($p<0.001$ en ambos casos), mostrando una tendencia decreciente desde la cola hacia la presa. El coeficiente de variación presenta diferencias interembalse ($p<0.001$) y una distribución espacial variable dependiendo del embalse. Globalmente, tanto para el tamaño medio de partícula como para la desviación estándar existe una correlación positiva con el contenido en OC y N del sedimento.

SS2-O182 **Estimates of whole-lake metabolism in stratified lakes: relevance of the metalimnetic zone**

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Estimates of whole-lake metabolism have been substantially improved through the application of the diel free-water method on high-resolution data sets of dissolved oxygen (DO) generated by the new generation of sondes. However, most of the studies only deploy sensors at a shallow depth of one central station within the lake, assuming that the sensor is representative of DO production and consumption on a whole-lake scale. Despite some studies have shown the importance of sonde location in estimating metabolism, the uncertainty of using solely epilimnetic DO concentrations in whole-lake metabolic estimates is yet to be determined. Here we present results from a newly developed method to determine depth-specific rates of gross primary production (GPP), respiration (R) and net ecosystem production (NEP) using frequent automated profiles of DO and temperature. Depth-specific metabolic rates were calculated for three Danish lakes during the stratification period using a methodology that integrates rates across the entire depth profile and includes DO exchange between depth layers. Our results show that metabolic processes occurring in the metalimnion are very important for overall carbon processing in lakes of different trophic status during summer stratification. Apart from the expected vertical distribution of NEP with depth (net autotrophy in the epilimnion and net heterotrophy in the hypolimnion), the metalimnion is shown as a highly dynamic and metabolically intense layer that should be considered when estimating lake metabolism at a whole-system scale. Estimating metabolism from vertically distributed DO measurements is also highly recommended in stratified lakes because it permits assessment of vertical exchange between epilimnetic and hypolimnetic waters.

SS2-O336 **Five-year CO_2 and O_2 variability in a subtropical coastal lake of the Atlantic Rainforest, Brazil**

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The present study aimed to quantify the concentrations of CO_2 and O_2 in the water and to point to the main regulators of gases' dynamics during a 5-year period in Peri Lake. Dissolved oxygen concentration was most often high (5.6-12.1 mg L^{-1} and 68.0-128.3% Sat) and pO_2 oscillated from 13,865.4 (July 2008) to 26,198.7 µatm (July 2007), reflecting a good oxygenation of the system. CO_2% saturation varied from 14.9 to 3,692.1%, with pCO_2 oscillating from 56.1 (November 2008) to 13,072.3 µatm (July 2011). The respiration index (RI) (pO_2/pCO_2 ratio) was on average 1.68, demonstrating that Peri Lake provides enough energy to maintain biological diversity. This great intra- and interanually variability in CO_2 concentration has been reported in other coastal lakes in Brazil. The overall (5-year) balance between CO_2 release and fixation in the lake is positive, meaning that the lake surface functions as a CO_2 source. This positive net balance between outgassing and fixation of CO_2 may be related to either allochthonus input of organic carbon from the surrounding Atlantic Forest or by microbial activity, or both. However, in several months the lake removes CO_2 from the atmosphere. Additionally, there was a significant negative relationship between pCO_2 and temperature, and a positive relationship between wind speed and pO_2 in Peri Lake. These findings differ from what has been observed across lakes, where temperature is shown to be positively related to pCO_2. Temperature and wind regulate the CO_2 and O_2 fluxes, respectively, in this subtropical lake. Extrapolating our finding to the global warming perspective, we need to test whether under increasing temperatures, subtropical lakes will maintain their major role as CO_2 source.

SS2-O337 **Bacterial community regulates carbon variability in a subtropical coastal lake, Brazil**

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In order to assess the bacterial community structure temporal variability in a subtropical lake and its relationship with the carbon dynamics, we carried out four 48h- experiments in the Peri Lake during one year. Community structure was characterized as density and biomass of heterotrophic and autotrophic bacteria, where the last were divided in cocoid and filamentous cyanobacteria. During all experiments, we measured wind speed, water temperature, dissolved organic carbon (DOC), and carbon dioxide (CO_2). DOC was higher in summer (6.44 mg L^{-1}; WT=27 ºC) and lower in winter (2.76 mg L^{-1}; WT=17 ºC), with no significant variability through the 48 hours. CO_2 concentrations presented the opposite pattern, minimum in warm waters (8.31 µM) and a 60-fold increment in cold waters (514.93 µM). Regarding the bacterial community, the density of heterotrophs predominated over autotrophs throughout the year, and autotrophs were responsible for 95-98% of total bacterial biomass. Heterotrophic bacteria were positively related with CO_2 and negatively with DOC. Maximum heterotrophic bacteria abundance and biomass occurred in winter ($7.22x10^6$ cells mL^{-1} and 20 µgC L^{-1}) and minimum in summer. Filamentous cyanobacteria, mainly *Cylindrospermopsis raciborskii* ($2.28x10^4$-$1.89x10^5$ cells mL^{-1}) produced up to 2.300 µgC L^{-1} in spring and summer, while coccoid cyanobacteria even in smaller number and size appeared to have a higher contribution in summer. Heterotrophic bacteria were related to DOC consumption and CO_2 production, while autotrophic cyanobacteria was negatively related with CO_2. Consequently, bacterial community structure appears to regulate the dissolved carbon dynamics in the lake.

SS2-O376 **Carbon sedimentation dominated over CO2 emission in two net heterotrophic Mediterranean reservoirs**

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Reservoirs and lakes are important components of the global carbon cycling as conduits of CO_2 to the atmosphere and as sinks of organic carbon. Yet, we have a relatively limited understanding of how all the biochemical processes interact in the balance between carbon burial and atmospheric exchange. Simultaneous estimates of organic carbon sedimentation rates and of CO_2 fluxes, based on continuous pCO_2 records, have not been reported in freshwaters. Here we performed a synchronous study of sedimentation and air-water CO_2 exchange in two Mediterranean reservoirs of different trophic status during the stratification period. pCO_2 continuous measurements were performed at hourly resolution while sedimentation rates of particulate organic carbon (POC) were measured biweekly. Both reservoirs were net heterotrophic and acted simultaneously as organic carbon sinks and as emitters of CO_2 to the atmosphere. High sedimentation rates were measured as a result of high POC concentration in the water column, mostly dominated by detritic carbon. A positive relationship between sedimentation rates and CO_2 evasion was observed. Our results suggest a decoupling between these two processes in a short scale period.

SS3-Challenges in assessing the ecological status of rivers and streams

SS3-O210 **Building macroinvertebrate biotic indices from trait descriptions, an example for organic pollution**

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We assumed that trait combinations within individual organisms would effectively represent synergistic, antagonistic and null interactions with respect to stress sensitivity. Applying this principle of positive and negative complementarity we constructed indicator scores for macroinvertebrate families for the complex stressor of organic pollution based on potentially relevant traits: respiration, habit, trophic class, flow preference, thermal preference, size and activity/mobility. We compared trait-derived sensitivity scores to empirically-derived scores from three versions of a biotic index: the BMWP, a statistically-based revision of the BMWP (s_BMWP) and the BMWP modified for the Iberian Peninsula (IBMWP). Trait-derived sensitivity scores were significantly correlated with empirical sensitivity scores: IBMWP > s_BMWP > BMWP. Despite the overall good correspondence, trait-derived scores tended to be consistently under or overestimated for particular taxa compared to BMWP scores. While revision of the composite trait algorithm could, in some cases, improve these disparities they also indicate the importance of evolution and phylogeny in determining organism sensitivity to river pollution. Despite the potentially contentious issues of trait selection and trait weighting, the concept of trait complementarity is arguably more scientifically justifiable than regarding traits as isolated entities. It may offer the most pragmatic means to elaborate biotic indices where empirical methods are problematic. The subsequent ability to deconstruct sensitivity scores to verify their appropriateness would greatly facilitate moves towards harmonized assessment.

SS3-O211 **Assessing stream macroinvertebrate responses to multiple pressures**

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Bio-indicator appraisal and identification is a vital step in ecological assessment processes. We assessed from a survey in 96 sites in North Portugal the benthic invertebrate responses to stressors by using local and regional variables. We also analyzed the influence of environmental parameters associated with landscape patterns at different scales on the final ecological state of running waters, a crucial issue in the characterization of the environmental descriptors and biological characterization. Random forest classification results indicated (i) the strong dependence of ecological state on landscape patterns at both catchment and local spatial levels (1 km radius around sampling sites) and that (ii) the ability to predict sites classified as "Good" was much greater than that to predict "Poor" sites; however, the inclusion of both

spatial levels increased the significance of successful prediction for each quality class. We identified key environmental factors contributing to macroinvertebrate community structure described via (i) family level relative abundance, (ii) AQEM metrics and (iii) traits by running three separate multiple non-parametric regressions, then Principal Component Analyses on selected environmental variables. The 1st axis of PCA indicated clear disturbance gradients. We used a concept of niche breadth to select boindicators associated with the extreme edge of each gradient, thereby reflecting a strong affinity to either pristine or strongly impacted sites. Candidate taxa were further validated using partial least square regressions. Traits were better able to quantify human impacts and a total of 23 indicators were obtained by this technique, increasing ability to integrate different sources of disturbance across distinct spatial scales.

SS3-O213 **Selection of reference sites in Mediterranean temporary streams**

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The selection of reference sites is a critical step when reference condition must be established, because reference sites should present the full range of conditions expected to occur naturally within a given stream type. The use of pressure or reference criteria has been widely applied in several regions across the world. Despite the predominance of temporary streams in many regions, including Mediterranean areas, all previously established pressure criteria defined in many studies were proposed regardless of the hydrological condition of streams, therefore the same criteria were proposed in permanent and temporary streams. A review of studies carried out in temporary streams seems to indicate that they are especially vulnerable to pressures related to agriculture, grazing, hunting and dumping. In this context, we believe that the development of specific reference criteria which reflect their particular condition and vulnerability to different types of human pressures is essential. The specific objectives of this study were to: i) propose pressure criteria to select reference sites in temporary sites, ii) select reference sites in temporary streams by the application of the proposed criteria, and iii) analyse the effect of human pressures on macroinvertebrate community of temporary streams. In this work, we propose a list of 34 criteria which are defined at two different scales: basin level (drainage area) and river segment scale (water body). We approach these aims studying 81 temporary streams (48 in Spain, 16 in Greece, 15 in Italy and 2 in Portugal). Study funded by the MIRAGE project (FP7-ENV-2007-1) and CGL2010-21458.

SS3-O233 **Securing water for the lower Ebro: environmental flows, invasive species and Water Framework Directive**

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Environmental flows refer to the quality, quantity, and regime of water flow necessary to maintain components, functions, processes, and resilience of aquatic ecosystems that provide goods and services to people. Thus, in order to be considered as "environmental", a flow regime must contribute to solve specific ecological problems. Fish fauna from the lower Ebro River (Northeast Iberian Peninsula) was assessed and non native species were found to be dominant both as number of species or abundance (approximately 60% and 90%, respectively). A significant relationship between water velocity and the proportion of fish abundance between native and introduced species was found. Moreover, a critical water velocity threshold was established from which native species become dominant (0.4 m/s). As water velocity directly depends on river flow, a relationship between mean annual flow scenarios and the proportion of native/introduced species was established, throughout habitat modeling. This methodology was used to perform biological validation of different proposals of mean annual flows for the lower Ebro River. The importance of environmental flows in achieving Water Framework Directive ecological status objectives is discussed.

SS3-O269 **The multimetric invertebrate index (I_2M_2): improving stream ecological assessment in multi-pressures context**

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Following the Water Framework Directive (WFD) requirements, the French Ministry of Environment had recently impulsed the development of a new method for the invertebrate-based ecological assessment of French wadeable streams: the MultiMetric Invertebrate Index (I_2M_2)(1). This index was designed to (i) fully encompass the WFD requirements, (ii) be applied at large spatial scale and (iii) be able to identify impaired reaches regarding a large set of anthropogenic pressures potentially leading to water quality alteration or habitat degradation. The I_2M_2 is composed of five individual metrics that have been mainly selected according to (i) their discrimination efficiency (DE) for a great number of different pressure categories (i.e. their ability to discriminate impaired from least impaired river reaches), (ii) their stability in near natural conditions and (iii) their complementarity. These five metrics encompass taxonomic structure (richness and Shannon's index), taxonomic sensitivity to contaminations (ASPT index) and biological traits (polyvoltinism and ovoviviparity frequency). The stream typology and comparison to near natural conditions were integrated in the I_2M_2 calculation through the transformation of the individuals metrics in Ecological Quality Ratio (EQR). The final I_2M_2 score was obtained by calculating the weighted (by their respective DE) average of the individual metrics EQR. The efficiency of the new I_2M_2 was tested and compared to those of the former French index (IBGN) and

of the European intercalibration index (ICM) in different multi-pressure conditions. Our results showed that the new I_2M_2 significantly improve the identification of impaired reaches and water bodies leading to a better stream ecological assessment.

Reference:
(1) Mondy C. P. *et al.* (2012) *Ecological Indicators* **18**:452-467.

SS3-O331 **Global assessment of stream integrity based on aquatic communities**

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Diatoms and macroinvertebrates provide complementary information on stream water quality. However, classification methods have been developed separately for the two biological elements. The aim of the present study is to evaluate if a predictive model based on the evaluation of biodiversity using taxa from both biological elements, produces a simpler and simultaneously more holistic and accurate assessment of stream health than individual methods, which classifications need to be combined later, usually based on "one-out all-out" approach. For that purpose, we built 3 predictive models for central Portugal: one for diatoms, another for macroinvertebrates, and the last one integrating diatom and invertebrate assemblages. Data from 105 minimally disturbed sites sampled simultaneously for diatoms and invertebrates in the Spring of 2004 and 2005 were used to calibrate and validate the models. For all the three predictive models, 19 impacted stream sites affected by organic contamination and industrial effluents were used as test sites. According to the assessment made by the diatom's model, the sites were classified as high and good, and only one site was evaluated as moderate classes, while, the invertebrate's model evaluated all sites as bad and poor. Finally, the combined model assessed the streams as poor and moderate quality. The responses to the environmental degradation of the three models were analysed through a Spearman correlation. The integrated model was sensitive to a greater number of pressure variables than each model individually. This finding suggests that merging the two assemblages in a single method can be useful, time saver and may establish a robust measure of water quality assessment.

SS3-O463 **Transitional and freshwater bioassessments: is the river continuum discontinued?**

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Although a consistent advance is evident for science (benthic macroinvertebrate communities) of marine, estuarine and freshwater areas, the existing data are not exactly the same for these aquatic zones. Even with similar scientific objectives, the research teams working on these different areas use different sampling strategies and so collect different data, which result also in different perceptions of macrobenthic communities. The lower part of big rivers and the upper part of transitional waters constitute the contact study zone between two important research areas (rivers and coastal areas). Due to the used protocols, differences found for macrobenthic communities inhabiting the contact zone may be considered as artefacts, and the apparent discontinuity observed in there by the different research teams should be considered with care. The knowledge provided by both scientific fields should be merged for a better understanding of structure and functions found in the contact area community. To clarify the uncertainty about these areas, macrobenthic samples were collected in the contact zone of the Mondego, following simultaneously the protocols used by river and coastal benthologists. The difference found on taxonomic composition (Ephemeroptera & Trichoptera, and Gastropoda contributed each with 22% for total diversity in river samples but were not collected by coastal water methods; Crustacea contributed more to total diversity in samples from coastal teams than for rivers) may be due to the habitats surveyed by each team and differences on identification procedures. These results are in line with recent concerns created by the WFD. Harmonization along aquatic systems should be ensured, namely for the same BQE (e.g. macroinvertebrates) in different water categories.

SS4- Diapause as invertebrate survival strategy in instable aquatic environments

SS4-O96 **Where do they come from? The role of pools and resting eggs in the recovery of zooplankton in a shallow lake**

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Small-sized pools next to coastal lakes may serve as refuge for organisms during unfavorable environmental conditions in the lakes, due to sporadic connections among all aquatic systems. Here, we assessed the importance of environmental variables, hydrological connectivity and the role of the resting egg bank for the structure and recolonization of zooplankton communities in one saline lake (Garça) and six adjacent pools in Rio de Janeiro, Brazil. Zooplankton and environmental variables were collected during one year (May 2010 – Feb 2011) and the resting egg bank was sampled in August 2010. NMS analyses showed that the pools were more similar between each other than between the lake in all seasons (dry or rainy). A RDA analysis showed that salinity and pH were the main structuring factors of communities in Garça system. The beta-diversity index demonstrated that the lake had a higher temporal turnover. The pools showed richer egg banks than the lagoon and 45% of the species recorded in the lake's active community were founded in the pools. Although the lake and pools were not more similar in the rainy season, the presence of freshwater species that were also found in the pools shows the importance of connectivity among these environments. This fact, in addition to lower beta diversity showed by pools suggests that dispersal is not limited. The high contribution of the active and dormant communities of the pools for Garça lake's active community shows the importance of these environments for the maintenance and recolonization of zooplankton communities in shallow lakes.

SS4-O183 **Past experiences and future research on diapause in Uruguay**

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La Limnología en Uruguay ha tenido un fuerte desarrollo en los últimos 20-25 años. Impulsado desde la Universidad de la Republica y tras el retorno al país de jóvenes investigadores formados en el exterior los estudios han evolucionado de aproximaciones enfocadas en determinadas comunidades a abordajes ecosistémicos. Incluyendo diversos ecosistemas, lagunas costeras, represas y embalses, lagos someros y más recientemente ríos, arroyos y charcos temporarios. No obstante, el estudio de las estructuras de resistencia no ha reflejado este nivel de avance. Solo en los últimos años se ha comenzado a impulsar esta línea de investigación con el afán de entender el funcionamiento de estos ecosistemas y las interacciones entre peces y zooplancton. Importantes interrogantes acerca del funcionamiento de lagos y charcos subtropicales podrán recibir respuesta solo a través del estudio y entendimiento de la composición y fenología de eclosión de las estructuras de resistencia desde el sedimento.De la escasa experiencia surge la necesidad del abordaje múltiple para entender los procesos. Estudios de campo, realización de exclusión de peces en mesocosmos o a través del uso de trampas de eclosión. Estudio directo de la composición y abundancias relativas de las estructuras de resistencia así como su eclosión en condiciones controladas nos permitirán echar luz sobre cuándo y con qué intensidad se da el reclutamiento del zooplancton desde los sedimentos e intentar dilucidar cuales son las señales que desencadenan los procesos de reclutamiento y formación de estructuras de resistencia. Se presentaran a modo de ejemplo algunos de los resultados más relevantes obtenidos así como las hipótesis sobre las que se está trabajando en la actualidad y las metodologías siendo empleadas.

SS4-O184 **Estratégias de sobrevivência do zooplâncton em ecossistemas instáveis**

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Os ecossistemas aquáticos sofrem alterações nos períodos chuvosos e secos. Isso é principalmente sentido em ecossistemas de ambientes semi-áridos, em que as baixas taxas de precipitação associadas a longos períodos secos, tornam as condições ambientais extremas. Dessa forma, é necessário que as espécies tenham adaptações para sobreviver em ecossistemas em que a qualidade da água muda com frequência. Os cladóceros produzem ovos efipiais e os rotíferos ovos de resistência, que suportam períodos de dormência. Esses ovos ficam nos sedimentos ou em macrófitas, eclodindo quando o ambiente na coluna de água apresenta condições adequadas à vida de cada espécie. Assim, uma maneira de analisar a biodiversidade desses grupos é coletando sedimento e analisando as espécies que eclodirem. Esse banco de espécies facilita estudos de biodiversidade, e seu período para eclosão dá-nos uma idéia da sequência sucessional no ambiente. Em estudos realizados no semi-árido da Paraíba, Brasil, a produção percentual de ovos efipiais numa população, depende do ambiente, sendo o maior percentual registado em lagoas, e o menor registado em ambientes de maior porte, como os reservatórios. Analisando diferentes estratos no sedimento, verificou-se que em camadas superficiais (0 a 5 cm) há maior diversidade de espécies que em camadas mais profundas (5 a 10 cm). Também se verificou, analisando estratos distintos, que espécies diferentes poderão ser observadas, podendo servir de indicadoras ambientais. Fatores ambientais que levam à produção de ovos de resistência, assim como os que induzem a quebra da diapausa, precisam ser melhor estudados. Em experimentos laboratoriais, verificou-se que alterações no pH induzem a produção antecipada de ovos efipiais em *Daphnia similis*.

SS4-O297 **About the seasonally homeless aquatic invertebrates in the Amazon**

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The aim of this study is to point out how knowledge derived in temperate zones simply exported to the tropics, without much thought, can in fact hinder the progress of determined areas of investigation. For example, early conjectures about and initial observations of tropical environments emphasized the high and constant, year round, air and water temperatures and the constant photoperiod. The onset of sexual reproduction and the production of resting eggs among the cyclical parthenogenetic aquatic organisms in the temperate regions could be correlated to, among other factors, changes in temperature and day length during the year. It was assumed then, that in the tropics, sexual reproduction and production of resting eggs probably did not occur much. This line of thought had and has still consequences and is reflected in the incipient studies of reproduction and diapause in aquatic invertebrates in the tropics in general and in the equatorial Amazon in particular. On the other hand it should be remembered that at the end of the XIX century and early in the XX century, in Norway, G.O. Sars described and illustrated a number of species of Cladocera, ostracods and Calanoida copepods raised from resting eggs found in dry sediments collected in Brazil, Argentina, South Africa and Australia. Our studies to date, particularly with the associated cladoceran (50 species) and rotifer (109 species) fauna found in *Utricularia foliosa* stands in a black water lake, suggest that in the aquatic environments of the Brazilian Amazon the production of resting eggs is one of the mechanisms that permits many invertebrate species to survive the predictable dry periods and the disappearance of macrophyte stands and pelagic and littoral habitats, every year.

SS7-Running without water: water scarcity implications for river functioning, conservation and management

SS7-O82 **Efecto de la detracción de agua en la acumulación y descomposición de materia orgánica particulada gruesa**

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Las detracciones de agua de los ríos aumentan constantemente para satisfacer la creciente demanda de energía y agua. La detracción podría tener un fuerte impacto sobre el funcionamiento de los ríos, aunque hay

poca información al respecto. En este trabajo se evalúa el efecto de la detracción de agua por minicentrales hidroeléctricas en la acumulación y descomposición de materia orgánica en 5 arroyos. En cada arroyo se estableció un tramo control aguas arriba del azud de detracción, y uno impactado aguas abajo. En todos los tramos se realizaron 3 experimentos de descomposición y se determinó la acumulación de materia orgánica bentónica. Para los experimentos de descomposición se introdujeron hojas de aliso recién caídas en bolsas de malla de 5 mm (5±0.05 g) que se incubaron en zonas de rápido. Se recogió el material regularmente (5 réplicas por tramo) y las hojas se secaron (70 °C, 72 h), y se quemaron (500 °C, 5 h), para calcular las tasas de descomposición de acuerdo al modelo exponencial negativo. Para determinar la acumulación de la materia orgánica, se recogieron 10 muestras Surber (30x30 cm, malla de 5 mm) aleatoriamente en cada tramo y se calculó su peso seco libre de cenizas. Asimismo, se midió la geometría del cauce, la velocidad de la corriente, y las características físico-químicas del agua. La detracción no alteró la calidad del agua, pero causó una reducción del perímetro mojado. No se detectaron cambios evidentes en la acumulación de la materia orgánica en gramos por metro cuadrado, pero debido a que el perímetro mojado disminuyó notablemente, bajo las presas se acumuló menos materia por metro lineal. La hojarasca se descompuso más lentamente bajo las presas. Los resultados mostraron que la detracción de agua altera el funcionamiento de los ecosistemas fluviales.

SS7-O94 **Does flow intermittency influence in-stream N processing rates in a Mediterranean stream?**

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Temporary streams are characterized by hydrological intermittence. The sediment drying may lead to changes in physico-chemical features and in microbial community structure and functions, which ultimately might affect N processing. Nonetheless, the rapid reactivation of microbial functions after drying has been reported in temporary streams. The duration and extent of flow intermittence is expected to raise globally across rivers and streams. Thus, there is an urgent need to investigate how flow intermittence affect the N processing to evaluate its implications for river functioning. Our aim was to examine the effect of flow intermittence on in-stream N processing in a Mediterranean temporary stream. For that, we analyzed dentirification and nitrification rates monthly along 1 year in 2 reaches of the same stream, differing in the hydrological regime: a perennial and an intermittent reach. The study period covered a wet phase, when reaches had surface water, and 2 dry periods, in which the intermittent reach was dry out. The acetylene-block and nitrapyrin inhibition method were used to measure denitrification and nitrification rates, respectively. Similar rates on N processes were found in both reaches during the study period. Even, during one of the dry period the intermittent reach displayed higher denitrification rates than the perennial reach. Our results suggest that flow intermittence does not affect N biogeochemical rates, at least under the studied temporal scale. Our findings support the idea that microorganism continuously react to microclimate changes with rapid and short-term physiological adjustments, especially those residing in streams affected by recurrent drying, as temporary streams. Study funded by CGL2010-21458 and FP7-ENV-2007-1.

SS7-O99 **Fungal diversity affects streams recovery after drought periods**

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Intermittency is a predictable event in watercourses in semi-arid and Mediterranean regions and it is expected to become more severe in many geographic areas due to global climate change. In this study we conducted a microcosm experiment to assess the effects of flow cessation on microbial mediated decomposition of leaf litter (oak, *Quercus robur*) and its resulting quality for a shredder (*Sericostoma vittatum*). Leaf discs were artificially inoculated with a mix of 3 or 8 species (poor vs. rich community, respectively) and subjected to flow interruption (4 weeks wet period (W1) - 4 weeks dryness (D) - 2 weeks rewetting (W2)). We measured leaf decomposition and associated microbial parameters and invertebrate feeding rates under the two microbial diversity scenarios. No differences were observed in mass loss between fungal treatments after W1. Spore production was higher on leaves with low diversity of fungal assemblages. After the drought event, decomposition rates were faster in the low diversity than in the high fungal diversity microcosms. Drying (W2) caused a reduction in fungal biomass in all treatments, while spore production was reduced (>94 %) in both treatments with a stronger significant effect on leaves previously conditioned with 8 species; shifts in individual species dominance were also observed in both cases. Shredders consumption was not affected by dryness; consumption was consistently higher on rich microbial conditioned leaves. We suggest that drought events have the potential to cause shifts in microbial assemblages. Unlike our expectation, high fungal diversity did not buffer decomposition process against drought. However, the outcome of the drought effect may depend more on the identity of the dominant fungal *taxa* than on the diversity.

SS7-O117 **Linking in-stream nutrient flux and removal to land use and climate variability in an impaired basin**

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Mediterranean streams and rivers can be particularly vulnerable to water pollution due to the presence of additional pressures such as damming, water extraction and urbanization. The relative importance of the nutrient sources at the basin scale is better expressed in terms of in-stream processes, which should be evaluated from the perspective of river networks. Modeling tools become useful in determining the sources and the processes by which pollutants are transported at the basin scale. A hybrid process-based and statistical model (SPARROW, SPAtially Referenced Regression On Watershed attributes) was applied to the Llobregat river basin, a highly impacted watershed in NE Spain, to estimate the annual nitrate and phosphate loads that reach the drainage network. The SPARROW in-stream decay specifications, which were mainly hydrology-dependent, were modified to better capture the processes related to biological nutrient removal. Model calibration results provided a reasonable fit between measured and predicted loads of nitrates and phosphates. In both models, the stream decay coefficients were statistically significant, indicating the potential role of in-stream processing in limiting the nutrient export to downstream water bodies.

Nitrate removal capacity slightly increased with the transition from a year characterized by wet conditions (i.e. higher mean runoff and discharge) to a dry year. Regarding the main nutrient sources in the basin, diffuse sources accounted for the most part of nitrates exported from the sub-watersheds considered in the model. In the case of phosphates, loads associated to urban and industrial spills (i.e. point sources) were predominant and exhibited a distinct spatial heterogeneity.

SS7-O139 **Effects of flow scarcity on leaf-litter breakdown in streams from northern Spain**

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The hydrological regime is one of the main drivers of the aquatic ecosystem functioning. Researchers have usually assessed the effects of flow fluctuations on running water ecosystems by means of physical and structural indicators, being the functional indicators rarely examined. Litter breakdown, an ecosystem critical process could add valuable information as it integrates the activity of different organisms (e.g. microbial decomposers, macroinvertebrates) and a complex set of relationships with several abiotic factors (e.g. temperature, water chemistry). The aim of this study was to analyze the effect of flow variability on leaf-litter processing in streams. Alder leaf-litter (*Alnus glutinosa* (L.) Gaertn.) was enclosed in fine (0.5 mm) and coarse (5 mm) mesh bags and immersed from November 2011 to March 2012 in four calcareous streams with different flow stability. The discharge regime of each stream was defined after regressing discrete flow measures with data from a downstream flow monitoring gauge station. Continuous measures of temperature and discrete samples of water for nutrient analyses were taken during the experimental period. Leaf-litter breakdown and its elemental components (C, N and P) were followed along the process (4 sampling dates). Additionally, macroinvertebrates associated with the processing and benthic fauna of streams were studied. Breakdown rates in coarse mesh bags clearly responded to the flow fluctuations, being the microbial processing less affected. The leaf-litter breakdown was slowed down in the less flow-stable stream, coinciding with a low density of invertebrates, especially shredders.

SS7-O160 **Effects of flow regime alteration on fluvial and riparian habitats in a semiarid Mediterranean basin**

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The Segura River Basin, one of the most arid zones of the Mediterranean region and the most regulated in Europe, includes four main hydrological river types: 1) mainstream rivers, 2) perennial stable streams (headwaters), 3) perennial seasonal streams and 4) temporary streams (intermittent or ephemeral). The relationship between flow regimes and physical habitat features was studied at reference and hydrologically altered river reaches in the four hydrological types. River habitats were characterized using the River Habitat Survey (RHS), while riparian condition was assessed using the Riparian Quality Index (RQI). In reference conditions, the number of rapids, the proportion of coarse substrates and macrophytes, and the banktop vegetation complexity increased with flow stability. Maximum flows in the basin were positively related to features such as channel dimensions, the presence of submerged vegetation and woody debris, and negatively to other features such as cliffs, bars or exposed rocks. Minimum flows were positively associated with the diversity of mesohabitats and smooth flow types, and negatively with channel dimensions and the complexity of the banktop vegetation. Altered reaches in mainstream rivers, the most altered ones, presented mainly greater channel dimensions and lower diversity of mesohabitats, presence of submerged vegetation and riparian condition. In seasonal streams, those with a highest number of habitat features showing statistically significant changes, hydrological alteration was associated with a lower riparian quality, complexity and richness, and also with a lower diversity of mesohabitats. Classes 2, the least impacted in the basin, and 4, which also suffers a strong hydrologic stress in reference conditions, showed softer changes.

SS7-O164 **Effects of extreme drought on macroinvertebrates communities in typically perennial Atlantic humid streams**

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A severe drought period is taken place in our national territory. February 2012 was the driest in the last 80 years and the total monthly precipitation in the period October 2011 – February 2012 was 15 times lower than in the previous year (1-50 mm). In this climatic extreme scenario, some perennial steams have been dried out completely. This study is part of a collaborative investigation on the effect of extreme drought in macroinvertebrate and diatom communities and patterns of recovery. Six littoral streams with Atlantic humid climate, but with diverse geological and local conditions, were sampled in spring 2011 (d1) and are being followed until spring 2012 (d8). In October 2011, the six streams dried out completely (d2) and just four of them have recovered the flow until Feburary 2012, even though with lower water levels for winter. The macroinvertebrate communities of those 4 sites were sampled with a 2-week periodicity (d3-d7). Multivariate analyses showed similar patterns in communities' dissimilarities between sampling dates. For all sites, d3 sample is the most different from d1 in terms of community structure. Samples from d3 showed a lower number of taxa and individuals, lower EQR values and a significant loss of EPT taxa. All those values become similar to d1 in d4 or d5, which indicates that the recovery of streams after drought may be complete after 8 to 10 weeks. Sites with better environmental conditions showed the fastest recovery. The samples from spring 2012 will be used to confirm these results and exclude the differences that may be due to insects' life cycles and to determine at the structural level which are the effects of the prolonged extreme drought in the macroinvertebrate communities and their reflex in quality classifications.

SS7-O166 **Do extreme drought events influence diatom assemblages?**

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Portugal is suffering a severe drought, with values of total monthly precipitation as low as 1-10 mm in October 2011-February 2012. February 2012 was the driest since 1931. Thus, 6 perennial streams in central Portugal have dried up in the late summer 2011. We have been following these streams to understand the patterns of post-drought recovery and the effect of long-lasting low water flow in diatoms. Two streams have not re-wetted. In the other 4 streams, where water runs with a low level, samples were collected in 5 occasions until now: spring 2011 (d1); after re-wetting (d3); and periodically with 2 weeks intervals (d4, d5, d6). Multivariate analyses reveal that these streams, all in Littoral type, have different assemblages and each community shows a particular response to extreme drought and recovery patterns. Nevertheless, for 3 streams there was a common trend for the diatom communities, which become more similar to d1 with time. Immediately after dryness (d3) the communities were less diverse and *Achnanthidium minutissimum* (ADMI), the dominant species at all sites, had lower abundances than d1. Then, the community turns to the highest evenness (around d4) but later ADMI recovers to its usual high abundance. Other co-dominant species (*Planothidium frequentissimum*, *Karayevia oblongella*, *Gomphonema rhombicum*) varied from site to site in their recovery patterns. Diatoms recovered in about 6 weeks after the drought event, approaching d1 values for richness, EQR and evenness, which is much longer than other studies using artificial substrate colonization (2 to 4 weeks). The samples from spring 2012 will help clarify the effect of long-lasting drought on diatoms, which taxa are better adapted to that condition and the reflection of those changes in quality assessment.

SS7-O174 **Can the river shrimp *Athyaephyra desmarestii* fly to escape to drought?**

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The river shrimp *Athyaephyra desmarestii* is a Mediterranean species which occurs in ephemeral rivers in the South of Portugal. In this study we propose to investigate the possibility of passive external dispersal of the river shrimp *A. desmarestii* by waterfowl. We performed experiments testing shrimp desiccation survival, probability of attachment to waterfowl and probability of successful transport. We found that in the laboratory 10% of the river shrimps can survive out of water for up to 90.1 minutes, but this period was reduced to 18.5 minutes under simulated bird flight conditions. Two different outdoor experiments simulating bird flight conditions indicated a 50% probability of successful transport on flight distances over 15 km. Our results using dead ducks show evidence that small, large or ovigerous river shrimps can attach to and be transported by ducks and that this capacity is affected by water depth. This study suggests that waterbird-mediated passive dispersal of river shrimps can occur and may be important for genetic flows between populations and for the re-colonization after drought events.

SS7-O225 **Effects of salinity on wood breakdown and microbial activity in semiarid Mediterranean streams**

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In the Mediterranean basin, natural saline streams are considered especially singular by its physico-chemical and biotic environment. Although saline ecosystems are rare in a European context they are widely distributed through arid lands. Besides, whether arid conditions will predominate in the future, it might be expected that saline streams are distributed in a broader range of areas. Whereas some structural aspects of saline streams have been studied, the knowledge about functional processes is still very scarce. Wood is an important component of many streams, being an important resource in streams with altered riparian vegetation that do not receive large annual supplies of leaves and saline streams where riparian vegetation is very scarce or even absent. We examined wood breakdown and microbial activity on wood substrata in 14 streams from the Murcia Region. These streams were selected to exhibit a gradient in water salinity from 0.6 mS cm^{-1} to 93 mS cm^{-1} in terms of electrical conductivity (EC). We analyzed hydrolysis of fluorescein diacetate (FDA) and ergosterol accumulation on wood substrata, as indicators of microbial activity and fungal biomass respectively, along the salinity gradient. We also analyzed water temperature, sediment organic matter content, nitrogen, phosphorus and dissolved organic carbon concentrations. First results seem to indicate that breakdown rates are influenced by the chemical composition of stream waters. In this sense, it is important to highlight not only the potential effect of increasing salinity on stream breakdown rates, but also the effect of decreasing salinity in natural saline streams as result of dilution disturbances. Study funded by CGL2010-21458.

SS7-O235 **Temporary streams in Spain: exploring flow regime typology and tendencies under water scarcity**

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Temporary streams are very common in Spain, and frequently contain specialized aquatic communities with many endemic species. However, they are not specifically covered by the Spanish River typology defined to application of the WFD. We selected 107 streams containing gauging stations and distributed throughout Spain. The fact of having a gauging station indicates certainty that the selected streams had water resources and were not ephemeral. Daily flow records included at least 15 years, between 1930 and 2008. A stream flow regime was considered temporary when meeting the criteria of 10 days with zero-flow per year, at least during two years. Flow regimes were analyzed using the 32 hydrological parameters with ecological meaning proposed by Richter (1996). The studied streams were classified along the gradient of 'temporality' (i.e., probability of channel drought and number of zero-flow days per year) and along a gradient of flashiness (i.e., ratio annual maximum/mean annual flows, and frequency and seasonality of high pulses). Although Mediterranean rivers have a long history of man's interaction with the natural environment, it is clear that their major alterations have been during the recent years (from the 70' s). On

those streams (24) with flow records longer than 40 years we studied the tendencies of the regimes along recent times. Our results showed a clear reduction in flow magnitudes (average and maximum values). However, channel temporal drought showed different tendencies. In some streams, we found longer summer droughts, but in many others we found the opposite trend, even to the extreme case in which rivers became permanent. The ecological and biological consequences of these tendencies were reviewed in a climate change context.

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(1) Richter BD *et al.* (1996) *Conservation Biology* **10 (4)**:1163-1174.

SS7-O247 **The role of chemical inputs in Mediterranean rivers biofilms**

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Mediterranean rivers undergo several anthropogenic impacts and water scarcity. Waste water treatment plant effluents and non point pollution inputs deteriorate water quality. The relevance of environmental factors or chemical stressors in the structure and functioning of epilithic biofilms in four Mediterranean river basins (Llobregat, Ebro, Júcar & Guadalquivir) was analyzed during autumn 2010. Five sites were selected in the main course of each river along a chemical pollution gradient. The chemical gradient was defined from the concentrations of emerging and priority compounds in the water. The algal component of the biofilm was assessed by determining community composition, algal biomass and photosynthetic efficiency. The heterotrophic component of the biofilm was analyzed by determining bacterial density and extracellular enzymatic activities. The relative contribution of environmental factors and pollutants to the variability of biofilms was determined by Variance Partition Analysis. Environmental stressors, such as discharge and conductivity, determined a natural gradient of nutrients and light in the river from headwaters to downstream, and explained the major changes in biofilm structure and functioning. Biomass increased along the river, while functional parameters like photosynthetic efficiency decreased. The chemical inputs affected specifically the biofilms of different river basins; photochemical processes were affected in polluted sites. The gradient of water quality decreased from the Ebro, Júcar, and Guadalquivir to the Llobregat River, and it corresponded to lower community diversity.

SS7-O248 **Microbial community composition during desiccation of the streambed in an intermittent stream**

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Microbial communities dwelling in Mediterranean streams face an ensemble of factors that vary spatially and temporally being stream flow the main driver of change. Continuous flow in Mediterranean streams is usually interrupted due to long summer droughts that cause a complete streambed desiccation. Changes in the microbial community composition of three different stream compartments (epilithic, epipsammic and hyporheic) in a Mediterranean stream were studied during an hydrological cycle which included the drought period, in order to investigate the differential response of these compartments to desiccation. A molecular approach combining bacterial 16S rRNA gene PCR amplification and DGGE fingerprinting was applied to examine changes in the composition of microbial communities in the different compartments along seasons. Results revealed that during streambed desiccation the major changes occurred in the epilithic compartment probably due to its higher exposure to humidity loss in comparison to sandy compartments (epipsammic and hyporheic). The epipsammic compartment also showed considerable changes, whereas the hyporheic compartments maintained a stable microbial community through the whole hydrological cycle. This was specially the case during the desiccation phase of the streambed. The observed variations between compartments may be related to their specific abilities to retain humidity, which greatly influence the response of their indigenous microbial communities to intermittency.

SS7-O253 **Effects of long time drought on leaf litter decomposition in a Mediterranean stream**

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Low order streams in Mediterranean regions use to have an intensive summer drought. During this period the flow is interrupted and fallen leaves are directly exposed to high solar radiation and high temperature. Climate change predictions expect longer drought periods which could implicate important functional changes in Mediterranean streams. The effect of leaf exposure to drought on the decomposition process has been mainly investigated in terrestrial ecosystems while less is known for stream ecosystems. For this purpose, *Populus nigra* and *Alnus glutinosa* leaves were exposed for three months under drought summer conditions. After this period, the treated leaves were immersed in the stream in bags together with early fallen leaves (control). During the whole experiment (drought and wet periods) leaf quality, microbial activity and biomass, and macroinvertebrate community were measured. Our results showed that the drought treatment was affecting the leaf quality (decrease in C/N and in P content), but this was not expressed in significant changes in the decomposition rates. The enzymatic activity related with cellulose degradation was higher in the treated than in the control leaves which might be related to the leaves quality changes. The microbial biomass and macroinvertebrate community was not affected by the drought exposition. However, all community descriptors showed lower variability among replicates in treated leaves, suggesting a homogenization of the quality of available organic matter source. Our results evidenced that even though differences in the decomposition rate were not significant, the drought determined changes in leaves quality affecting microbial activity and the structure of the heterotrophic communities involved in leaf decomposition.

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(2) Dieter D *et al.* (2011) *Aquat Sci* **73**:599-609.

SS7-O300 **Regional extinction risk of freshwater biota in mediterranean and temperate climate regions**

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Freshwater species worldwide are experiencing dramatic declines partly attributable to habitat loss driven by global change. In particular, mediterranean regions presumably will suffer increased extinction rates because these regions host many endemic freshwater species, which are locally less abundant, and are subjected to higher level of human impacts than temperate regions. We tested this hypothesis by simulating the rate of species extinction expected as local stream habitats are randomly and sequentially lost from two regions: one mediterranean and one temperate. For the simulations, we used macroinvertebrate presence/absence data from 265 stream reaches in the Mediterranean Basin and 265 in temperate Europe. Our results showed that rates of genera loss significantly differed between climate regions in the sense predicted, with mediterranean regions showing significantly greater rates than temperate ones. Considering the neutral characteristics of these extinction models, we further investigated how different biological traits can increase or decrease the extinction risk. Despite the higher extinction risk in mediterranean regions, the particular biological traits of mediterranean species could diminish the extinction risk in these regions.

SS7-O328 **Inter-annual hydrological variability: structural and functional responses of invertebrates**

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Mediterranean streams are really fluctuating ecosystems with large intra and inter-annual variability in flow, mainly related to drought intensity in summer. Drought severity determines hydrological connectivity, which interferes with the availability of dissolved and particulate organic matter and thus, determines the structural and functional parameters of heterotrophic and autotrophic organisms. Fuirosos (NE Spain) is an intermittent third-order Mediterranean forested stream which has been monitored for the last 2 decades and large inter-annual variability in hydrology has been observed. The aim of this study is to compare meiofaunal and macrofaunal attributes between wet (without flow cessation) and dry years. Meiofaunal density and biomass were higher in dry years than in wet ones. Drying also caused an increase in macroinvertebrate density and biomass that peaked in isolated pools soon after flow ceased. Heterogeneity in biotic community composition was more pronounced in drier years. Changes in macroinvertebrate density were translated to the food web structure. In dry spring-summer periods, the number of taxa and the number of connections were higher and food chain was also longer. However, connectance was similar between years. Annual secondary production of cyclopoids was 3x higher in wet than in dry years and 10x for ostracods. Invertebrates show high plasticity to respond to hydrological variability. Although drought intensity accentuates inter-annual differences, structural reorganization of aquatic community occurs rapidly over a period of months. Wetter conditions would favor higher productivity, at least for some groups. These results can complement predictions of effects on permanent and intermittent rivers under future scenarios of water scarcity.

SS7-O466 **The challenge of restoring bi-national rivers: the Rio Grande/Rio Bravo and the Colorado River/Rio Colorado**

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The United States and Mexico share two great rivers – the Rio Grande and the Colorado River. In Mexico, these rivers are called the Rio Bravo and the Rio Colorado, respectively. These rivers are extensively dammed and diverted. The Colorado River has the largest ratio of reservoir storage to mean annual flow (3.34) in North America and the smallest proportion of natural runoff (8%) that reaches the sea. The Rio Grande has the second largest ratio of reservoir storage to mean annual flow (1.75) and the second smallest proportion of natural runoff (41%) that reaches the sea. Today, these rivers are subject to conflicting river management objectives. Intensive efforts are underway to increase the efficiency of water use so that water availability is increased to meet societal demands. On the other hand, large river rehabilitation programs have been created whose goals are to recover threatened or endangered species and their habitats. Full restoration of these river ecosystems is impossible, because such restoration would require dismantling the infrastructure that sustains the urban areas and irrigated agriculture of the region. However, partial ecosystem rehabilitation is possible on some river segments. Such efforts necessitate careful consideration of the trade-offs between the economic cost of changing the infrastructure or the operations of that infrastructure in relation to the ecological benefits of rehabilitation. In the case of the bi-national segments of these rivers, rehabilitation planning also involves international treaties.

T1-Aquatic ecotoxicology and environmental risk assessment

T1-O73 **Effects of zinc pollution on functional stream attributes at two different scales**

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This study aimed to investigate the effect of a chronic exposure to zinc on the functioning of a stream ecosystem. We used field and microcosms approaches to examine the effects at both the reach scale as well as at the scale of epilithic microbial communities. The study was conducted in the Osor River (North-Est Catalonia, Spain) which has zinc contamination derived from a mining run-off. Along the Osor river we selected three reaches: one located upstream of the mining effluent input, and two reaches downstream of it. The results showed that the chronic metal exposure did not affect the biomass of the epilithic communities, but induced a shift in their composition consisting in a decrease in diatoms and cyanobacteria and an increase in green algae. The photosynthetic efficiency of the epilithic communities was reduced in sites exposed to metal pollution. At reach scale, we observed a shift in metabolism from being autotrophic-dominated upstream of the effluent input to heterotrophic-dominated downstream of it. Whole-reach phosphate and ammonium uptake was not affected by the metal pollution conditions.

Similar to what we observed at reach scale, at epilithic community scale, phosphate and ammonium uptake did not differed among study sites. However, the relative contribution of nitrification to total ammonium uptake significantly decreased in communities exposed to metal pollution. These results indicate that the chronic metal exposure can induce structural and functional changes in the epilithic communities which can then be reflected at whole-reach scale.

T1-O364 **Detection of potential microcystin-producing cyanobacteria in São Miguel lakes using PCR methods**

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In recent years, the eutrophication of several lakes in the Azorean island of São Miguel, Portugal, as lead to an increase in the frequency and abundance of planktonic cyanobacteria, the majority of them belonging to potentially toxin-producing genera (e.g. *Microcystis*, *Anabaena*, *Aphanizomenon* and *Woronichinia*). The sub-tropical climate conditions in these Atlantic islands favour the maintenance of high cyanobacterial cell density ($1x10^6$ to $1x10^9$ cells L^{-1}) throughout the year. Microcystin detection by HPLC had positive results in all seasons. Also microcystin detection by HPLC at several Azorean lakes is part of the regular monitoring programme. PCR techniques can provide early warning for potential toxin production. So, the aim of this study is to test the detection of microcystin-producing cyanobacteria in the lakes of São Miguel Island by PCR techniques. For that we analysed environmental samples from 19 lakes by PCR amplification with genomic DNA obtained from an extraction process and whole-cells (whole-cell PCR). In order to distinguish the potentially producing from non-producing samples, six segments of the microcystin synthetase (*mcy*) gene cluster (genes *mcyA*, *mcyB*, *mcyC*, *mcyD*, *mcyE* and *mcyG*) were amplified. The results showed that: (i) samples from more eutrophic lakes with high cyanobacterial cell density were positive for almost all *mcy* genes analysed; (ii) PCR amplification with both whole-cell and genomic DNA are feasible for the detection of microcystin genes. The PCR method proved to be effective in the detection of microcystin-producing genotypes in São Miguel lakes making it a useful, rapid and easy method for toxin monitoring.

T1-O410 **Overwintering strategies of *Anabaena*, *Aphanizomenon* and *Microcystis* in Spanish freshwater reservoirs**

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Overwintering cyanobacterial populations of Nostocales and *Microcystis* were investigated in 6 freshwater reservoirs of Northwestern Spain during two consecutive winters (2006/07 and 2007/08). Surface sediments (0-5 cm) hosted maximums of 1900-186900 Nostocales akinetes mL^{-1} and 270-28000 *Microcystis* colonies mL^{-1}, which in Prada (186900 aks mL^{-1}) and Las Conchas ($14.3x10^6$ Microcystis cells mL^{-1}) reservoirs might represent circa 1% of the organic matter content of sediments. *Anabaena* spp. akynetes dominated the sediment pool in all the reservoirs, with minor amounts of akinetes of *Aphanizomenon* and of benthic Nostocales. A dual benthic-pelagic overwintering was confirmed in *A. flos-aquae*, *Ap. gracile* and *M. aeruginosa*, which appeared in the pelagial of Trasona (28000 *A. flos-aquae* cells mL^{-1} in February 2008 at a water temperature of 9.8 ºC), Cachamuiñas (12000 *A. gracile* cells mL^{-1} at 7.5 ºC in January 2008) and Las Conchas (1290 Microcystis cells mL^{-1} at 9.2 ºC in February 2008), respectively. Our preliminary data on sediment abundance and estimated resuspension suggested that (1) most of the sediment pool of akinetes will progressively decay along winter, in contrast with a lower degradation of benthic *Microcystis* during the same period; (2) only a small fraction (< 1%) of the sediment pool of akinetes and *Microcystis* was resupended to hypolimnetic water; and (3) the apparently small initial inocula, combined with overwintering pelagic populations, seemed sufficient to build up the summer maxima observed in the reservoirs under estimated *in situ* growth rates. This study provides novel data on the sediment pool of akinetes and *Microcystis* in Spanish freshwater reservoirs and the overwintering of *Ap. gracile* and *A. circinalis* in European freshwaters.

T1-O467 **Humic acids and nanoparticle size change the toxicity of nano CuO to freshwater microbes and invertebrates**

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Enhanced commercial use of metal oxide nanoparticles increases the chance of their release into freshwaters, constituting a potential threat to biota and associated ecological processes. However, possible impacts may change with nanoparticle size and due to interactions with natural organic matter, such as humic substances. In streams, microbes and invertebrate shredders play a crucial role in detritus foodwebs by transferring energy from plant-litter to higher trophic levels. We investigated the effects of nano CuO concentration (up to 400 ppm; 5 levels) and size (12, 50 and 80 nm powder) on stream-dwelling microbial decomposers and on the shredder *Allogamus ligonifer*, and further examined the influence of humic acid (HA ≤100 ppm; 3 levels) on nano CuO toxicity. In the absence of HA, exposure of microbially-colonised leaves to different sizes of nano CuO reduced leaf decomposition. The effects became more severe as nano CuO concentration increased and nanoparticle size decreased. The exposure of shredders to sublethal concentrations of nano CuO decreased leaf consumption rate and the effects were stronger for nanoparticles with lower size. Exposure to higher concentrations of HA alone reduced leaf decomposition by microbes and leaf consumption by the invertebrate. Conversely, exposure to HA led to a decrease in nano CuO toxicity, particularly at lower nanoparticle sizes. FEDER-POFC-COMPETE and FCT supported this study (PEst-C/BIA/UI4050/2011 and PTDC/AAC-AMB/121650/2010), AP (SFRH/BD/45614/2008) and PG (SFRH/BD/75516/2010).

T1-O468 **Responses of freshwater microbial decomposers to copper oxide nanoparticles**

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Intensive use of nano metals increases the chance of their release into natural watercourses and may pose at risk aquatic biota and their ecological functions. In streams, microbial decomposers, predominantly aquatic fungi, play a crucial role in organic matter turnover. We investigated the impact of nano CuO on stream-dwelling microbial decomposers of leaf litter by examining i) structure and functions of fungal and bacterial communities retrieved from a non-polluted stream, and ii) the physiological and cellular responses of fungal populations isolated from metal-polluted and non-polluted streams. Results were compared to those obtained after exposure to Cu^{2+}. The exposure to nano CuO (≤500 ppm, 4 levels) and Cu^{2+} (≤30 ppm, 4 levels) significantly reduced leaf decomposition, bacterial and fungal biomass, fungal reproduction and diversity. Cluster analysis of DGGE based on DNA fingerprints showed that both forms of copper induced shifts in community structure. However, impacts were stronger for bacteria than fungi. At the cellular level, increased nano CuO concentrations (≤200 ppm, 5 levels) induced activity of laccase by single fungal populations. Fungal populations from non-polluted streams were more affected by nano CuO than those from polluted streams, as shown by stronger inhibition of biomass production, accumulation of reactive oxygen species (ROS), plasma membrane disruption and DNA strand breaks. Results showed that nano forms are less toxic than ionic forms, and further suggest that the toxicity of nano CuO to freshwater microbial decomposers may occur due to induction of oxidative stress. FEDER-POFC-COMPETE and FCT supported this study (PEst-C/BIA/UI4050/2011, PTDC/AAC-AMB/121650/2010 and FCT-DAAD: 2010-2011) and AP (SFRH/BD/45614/2008).

T2-Biodiversity and biogeography

T2-O30 **Zoobentos de Arroyos en condiciones extremas en la Puna Altoandina argentina**

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Los humedales de alta montaña constituyen ambientes interesantes por su insularidad y la variabilidad de factores que interactúan determinando características peculiares, con una biota poco común. La fragilidad de estos ecosistemas está asociada a causas naturales como sequías extremas, alta irradiación, fuertes vientos, evaporación, aumento de la salinidad y grandes amplitudes térmicas. La preservación de estos hábitats resulta entonces de mucha importancia por presentar un alto valor biológico debido a sus endemismos y diversidad. Muestreos realizados en arroyos entre 2009 y 2010 en la Puna Altoandina argentina (> 4000 msnm), permitieron observar aguas ligeramente alcalinas con elevado grado de mineralización, concentración de oxígeno disuelto (OD) de 2 a 14 mg L^{-1}; conductividades entre 1500 y 12000 µS cm^{-1} y el pH entre 7.1 y 9. La diversidad zoobentónica fue relativamente pobre en sitios con mayor % de materia orgánica (MO) y mayor densidad de invertebrados tolerantes como oligoquetos, nematodos y quironómidos. Fueron interesantes los registros de dípteros efídridos y sírfidos de tolerancia a condiciones de bajo tenor de OD y abundante MO. La mayor riqueza de especies, la diversidad y la equitabilidad se reflejaron en correspondencia con un aumento de las hidrofitia en estos ambientes conformada principalmente por *Potamogeton* cf. *pusillus* que favorece la formación de refugios habitables, en forma de parches y mejor estructurados.

T2-O45 **Environmental drivers - spatial and temporal variation of macroinvertebrate communities in island streams**

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Freshwater systems in volcanic oceanic islands differ strongly from mainland systems as a result of their geological origins, relatively small size, distance from colonization areas and catchment morphology. A characterization of macroinvertebrate spatial and temporal distributions was made over two seasons at 24 sites in 14 streams of the Azores Archipelago. ANOSIM results identified significant differences in macroinvertebrate assemblages between islands, along the longitudinal gradient of streams and over time. Links between environmental factors and macroinvertebrate assemblages were assessed using DISTLM, a linear model for distance-based multivariate analysis. Temperature, latitude, altitude, nitrite, scrub area and nitrate were the best predictors of community assemblages. Latitude and island age complex were the principal factors explaining macroinvertebrate composition between islands, while land use, temperature, conductivity and nutrient levels contributed to the distribution patterns along the lotic longitudinal gradient. Flow variation was the principal factor responsible for temporal patterns observed in community. Species responses to previously identified key environmental variables were determined, and optima and tolerances were established by weighted average regression. These results clearly show that the information gained from this study will help to provide a strong overview to support current and future research of Azorean stream ecosystems and will provide information for freshwater management in the Azorean archipelago.

T2-O286 **Taxonomic characterization of Fragilariaceae (Bacillariophyceae) from benthic communities of Azorean lakes**

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Benthic diatoms are key elements for environmental quality assessment, and have been used in monitoring programs in the Azores. Routine diatom analyses in these programes use light microscopy (LM) for diatom identification and counting. In LM, some Fragilariaceae species usualy frequent, sometimes dominant, in benthic communities of azorean lakes are difficult to distinguish due to the high variability in terms of size,

shape and frustule microstruture present in this family. With the aim of contributing to clarify the taxonomic identity and species distribution of Fragilariaceae diatoms in benthic communities of azorean lakes, a detailed Light microscopy (LM) and Scanning electron microscopy (SEM) analysis was done. Fragilariaceae taxa of uncertain identity were also isolated by micropippeting technique and cultiveted in Diatom Medium for further genetic analysis. The taxonomic characterization of benthic Fragilariaceae allowed us to distinguish ten species belonging to the genera *Pseudostaurosira*, *Pseudostaurosiropsis*, *Stauroforma*, *Staurosira* and *Staurosirella*. Four of these taxa could not be assigned to a specific taxon, sugesting the need of more morphological research and genetic analysis. The cultures established for some taxa of Fragilariaceae provided the necessary material for these studies, in particular the genetic analysis. This study contributed to the increase of knowledge on litoral benthic diatoms communities of azorean lakes, particulary on the taxonomy of Fragilariaceae and to better understand species distribution and ecological preferences in this family. This knowledge is important for a better ecological status assessment using diatom indices.

T2-O351 **Diversidade funcional de algas planctônicas e perifíticas em lago de planície de inundação tropical**

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Este estudo objetivou responder quais são as estratégias adaptativas das algas planctônicas e perifíticas em um lago isolado sob e sem efeito do pulso na Planície de Inundação do Alto Rio Paraná, e em que período hidrológico a diversidade funcional é maior. A dinâmica das estratégias foi analisada quanto à riqueza e densidade das algas em dois períodos amostrais, águas altas (AA) e baixas (AB). As estratégias avaliadas para as duas comunidades foram classe de tamanho, forma de vida e grupos funcionais. Para o fitoplâncton avaliou-se também as adaptações quanto à flutuação na água, e para o perifíton a intensidade e a forma de aderência aos substratos. A diversidade funcional foi calculada a partir de dendogramas funcionais das espécies. Em AA o lago apresentou pico de nível hidrométrico de 6,3 m e zona de mistura 3,5 m, e em AB o pico foi 2,2 m e a relação profundidade máxima e zona de mistura igual a 1. O período de AA apresentou maior riqueza, densidade de espécies e diversidade funcional para as duas comunidades, sendo dominantes no fitoplâncton o grupo funcional morfológico V e espécies C estrategistas, e no ficoperifíton as espécies C-S estrategistas. Em AA *Cryptomonas marsonii* Skuja foi dominante no plâncton e *Pseudoanabaena skujae* Claus no perifíton, enquanto em AB *Merismopedia tenuissima* Lemm. no plâncton e *Fragilaria capucina* Desm. no perifíton. Os resultados demonstram a influência do pulso de inundação, que proporcionou a dominância em AA de espécies livre nadantes no plâncton, e no perifíton de espécies metafíticas. Em AB, a maior mistura da coluna d'água e menor profundidade propiciaram o domínio de espécies com maior superfície/volume no plâncton, e fortemente aderidas no perifíton.

T2-O480 **Biogeography of aquatic fungi: preliminary conclusions**

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Aquatic hyphomycetes occur worldwide on a wide range of plant substrates decomposing in freshwaters, and are known to play a key role in organic matter turnover. However, the presumed worldwide distribution of many species is based on morphology-based taxonomy and identification, which may overlook cryptic species, and therefore hide global-scale biogeographical patterns. This might be circumvented by using DNA sequence data. The internal transcribed spacer (ITS) region from rDNA has been claimed to be the most suitable barcode for fungal identification (1, 2). We used this approach to elucidate biogeographical patterns of aquatic hyphomycetes. We generated ITS barcodes of 130 isolates belonging to 6 common aquatic hyphomycete species (*Anguillospora filiformis*, *Flagellospora penicillioides*, *Geniculospora grandis*, *Lunulospora curvula*, *Tetrachaetum elegans* and *Tricladium chaetocladium*), collected from streams of Southwest Europe (86 isolates) and East Australia (44 isolates). European and Australian populations of 4 species (*A. filiformis*, *F. penicillioides*, *G. grandis* and *T. elegans*) grouped into different phylogenetic clades, and molecular diversity indices supported significant differentiation between those populations. Continents did not share haplotypes except for *T. chaetocladium*. Overall our study indicates considerable population diversity for all tested species and suggests that the biogeography of aquatic hyphomycetes may be species-specific. FEDER-POFC-COMPETE and FCT supported this study (PEst-C/BIA/UI4050/2011 and PTDC/AAC-AMB/113746/2009) and SD (SFRH/BPD/47574/2008).

T3-Climate Change

T3-O39 **Warming stimulates macroinvertebrate- more than microbial-mediated litter decomposition in a temperate stream**

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In woodland headwaters, the decomposition of organic material is the basic ecosystem process and it might be affected by the increase in temperature predicted for this century. Here we addressed the effect of increases in water temperature on litter decomposition by incubating oak litter, exposed and protected from invertebrates, monthly over two years in both sides of a small woodland mountain stream that was divided longitudinally. During the first year water was at ambient temperature on both stream sides, while during the second year water in one side was experimentally warmed ~ 3 ºC above the ambient temperature observed in the other side. Experimental temperature increase did not have strong effects on litter decomposition. However, 30-days litter decomposition was stimulated over the seasonal gradient (6–16 ºC): 4.3% mass loss $ºC^{-1}$ for overall litter decomposition, 1.5% $ºC^{-1}$ for microbial-induced litter decomposition, and 2.8% $ºC^{-1}$ for macroinvertebrate-induced litter decomposition. This might indicate that an increase in

water temperature by more than 3 ºC might be necessary to stimulate litter processing in oligotrophic streams. However, if riparian removal co-occurs with warming, water temperature increase might well exceed 3 ºC. Macroinvertebrate-induced litter decomposition was more responsive to warming than microbial-induced litter decomposition suggesting that a larger fraction of litter carbon will be converted into secondary production and stored in the system for longer time in the future. Globally results suggest that larger amounts of carbon dioxide will be released from freshwaters into the atmosphere in the future. Such effect might lead to a mismatch between consumers and their resources.

T3-O108 **Competitive outcome of *Daphnia-Simocephalus* experimental microcosms: salinity versus priority effects**

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Competition is a major driving force in freshwaters, especially given the cyclic nature and dynamics of pelagic food webs. Competition is especially important in the initial species assortment during colonization and re-colonization events, which depends strongly on the environmental context. Subtle changes, such as saline intrusion, may disrupt competitive relationships and, thus, influence community composition. Bearing this in mind, our objective was to assess whether low salinity levels (using NaCl as a proxy) alter the competitive outcome of *Daphnia-Simocephalus* experimental microcosms, taking into account interactions with priority effects (sequential species arrival order). With this approach, we aimed to experimentally demonstrate a putative mechanism of differential species sorting in brackish environments or in freshwaters facing secondary salinization. Experiments considered three NaCl concentrations (0, 0.75 and 1.50 g L^{-1}) crossed with three competition scenarios (no priority, priority of *Daphnia* over *Simocephalus*, and vice-versa). At 0 and 0.75 g L^{-1}, *Daphnia* was a significantly superior competitor, irrespective of the species inoculation order. However, salinity caused a decrease in *Daphnia* population growth, thus alleviating the competitive pressure on *Simocephalus*, causing an inversion of the competitive outcome in favour of *Simocephalus* at 1.50 g L^{-1}. The intensity of this inversion depended on the competition scenario. This salinity-mediated disruption of the competitive outcome demonstrates that subtle environmental changes produce indirect effects in key ecological mechanisms (species assortment) that can alter community composition, which may lead to serious implications for ecosystem functioning (e.g. lake regime shifts due to reduced grazing).

T3-O170 **Warming effects on stream biofilm function**

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The understanding of ecosystem and organism responses to changing environmental conditions is becoming increasingly relevant in the context of climate warming. Microbial biofilm communities can respond quickly to shifting temperatures due to their short generation time and sensitiveness to fluctuating conditions. In this study we determined the effect of the 3 ºC increase in the water temperature on the biofilm function and structure in the context of global warming. Experiments were performed in a stream (Candal, Portugal) longitudinally divided in two reaches: an ambient water temperature reach (A) and an elevated temperature reach (E) where water temperature was permanently 3 ºC above the basal stream water. Biofilm colonization was monitored during 40 days in the two stream reaches. Changes on the biofilm structure (algal and bacterial biomass) and function (enzyme activities and biofilm multifunctionality measured by Biolog Ecoplates) were analysed. High algal and bacterial densities were obtained in the E reach. All enzyme activities (leucine-aminopeptidase, β-glucosidase, phenol-oxidase, β-xylosidase, cellobiohydrolase, and phosphatase) were higher at the E stream reach except in the case of lipase which was similar in both reaches. The results from the Biolog Ecoplates showed an increase in the functional diversity of the biofilms developed in the E reach as well as changes in use of the different substrates. These results suggest that warming affected the heterotrophic capabilities and the diversity of the microbial communities which might have prompt effects on ecosystem functioning. The present study evidences that stream temperature interfere with the structure and function of the biofilm, changing the patterns of organic matter use and decomposition.

T3-O185 **Effects of global warming in leaf litter quality and detritivore performance: a stream manipulative experiment**

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An increase in stream water temperature is expected due to global warming, which may affect both biota inhabiting these systems and their main resource's quality, leaf litter. In this study we aimed to test (i) whether an increase in stream water temperature caused differences in leaf litter conditioning and (ii) whether temperature changes were reflected in differences in consumers' fitness and performance.A field manipulation was conducted in a longitudinally divided stream reach (~22 m). Water in one half was heated 3 ºC (*Elevated; E*) above the temperature of the water running on the other half (*Ambient; A*). Oak leaves conditioned for 3 weeks in both sides were offered to groups (n=4) of 12 shredders (*Sericostoma vittatum*) kept in cages in both sides of the stream (*A* leaves/ *A* invertebrates; *E* leaves/ *E* invertebrates). Food was renewed weekly, for 5 weeks, and differences in consumers' performance and development recorded. *E* leaves had significantly lower toughness, phenols and lipid concentrations and a higher nitrogen percentage. However, no difference in consumers' stoichiometry was detected, which resulted in higher C:N imbalances in *A* detritivores. *E* consumers had higher lipid content. No differences in relative growth rates or feeding preferences were detected. Nonetheless, both consumption and pupation rates were higher for *E* individuals. Our results show that warming may affect detritivores through changes in the quality of the available detritus and/or through effects on their feeding behavior and fitness. If generalized, such pattern may have profound effects on nutrient cycling and energy transfer to riparian ecosystems.

T3-O202 **Effect of an experimentally induced drought in a permanent stream ecosystem on the macroinvertebrate community**

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The assessment of the effects of climate change on stream ecosystems and their potential adaptation and mitigation strategies are the central goals of the REFRESH project. One scenario considered is the change in hydrologic regimes, with severe droughts that can transform the ecosystems from permanent to temporary streams. To test the effects of this change on the macroinvertebrate community, a removable dam was placed in a lowland area of the Riera d'Arbúcies river Basin (NE-Spain) in the beginning of September 2011. The dam was connected with a derivation channel that transported stream water 100 m downstream of the dam, leaving the stream channel with stagnant water near the dam and completely dry over the last 50 m. We selected a 100 m reach upstream of the dam, which served as a control and compared it with the two sections (stagnant and dry) of the reach downstream. To study the effects of the drought on the macroinvertebrate community we conducted 5 weekly samplings before and after the dam placement at the two selected reaches. Together with these samplings, we also measured hydraulic parameters and water chemistry. The macroinvertebrate community changed from a similar structure and composition in the three zones before the placement of the dam, to an initial four times increase of individual density at the stagnant and dry zones after the placement of the dam. A similar pattern was observed for the richness at the dry zone, with 14 more taxa than in upper zones, especially for beetle species. The reophylus species of mayflies, caddisflies and dipteran disappeared from the two downstream zones two weeks after the placement of the dam. The stagnant zone changed with time and the community structure became more similar to the initially found at the dry zone.

T3-O214 **Assessing the effects of global warming: a stream manipulative experiment**

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A rise in mean water temperature in temperate regions is expected to occur, in the near future. Laboratorial and field correlative studies suggest that important impacts on streams ecological integrity may occur in this scenario. However, no realistic ecosystem-level approaches have been made in small detritus-based streams, hotspots of diversity of the fluvial net. Here we describe a heating system to simulate an increase in water temperature on a stream ecosystem. We chosed a natural 2nd order stream reach that we divided longitudinally in half (~22 m long; ~1.5 m width). A realistic increase in water temperature was promoted by the system located just upstream the reach and operating with a continuous supply of energy (41.4 KW). The system was composed of two stainless steel tanks (260 L), provided with thermostatic and electrical protections, that received water, by gravity, from the main channel. One tank was equipped with resistances (n=30; 2000 W). In and out flow was controlled by valves. One half of the stream reach received the water from the heating tank, 3 ºC above the ambient temperature, while the other half received water from the tank with no heating power. The system allowed natural diurnal and seasonal patterns of variation of the abiotic factors (with 2 levels of temperature) and the prosecution of integrative short or long time experiments in a real stream environment. So far, this original system was used to evaluate the effects of warming on stream functioning at several levels of biological resolution Litter decomposition studies were performed in both sides of the stream for 2 years; in the first year both sides were at the same temperature while in the second one half was 3 ºC above the other (BACI design).

T3-O217 **The response of macroinvertebrate communities structure and trait composition to wildfire in upland Portuguese**

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In recent decades large areas of forest are affected by wildfire in Portugal but its effects on aquatic systems remain poorly known. The assessment of fire-impact is of a great importance, as fire risk is expected to intensify with climate change. Evidence from previous study revealed that macroinvertebrates in upland streams recovered rapidly following wildfire disturbance. Here, we present data from an intensive, short-term study. In summer 2009, 20 upland streams representing a gradient of wildfire impacts (50 - 100% catchment burned) were surveyed by kick-sampling in riffles, pools and plant/woody surfaces within the water column. A sub-set of 10 sites and 6 reference sites (with no wildfires in the last 20 years), were surveyed in November 2009, March and May 2010. One year after the fire (summer 2010) all 20 sites were re-sampled. Macroinvertebrates were identified to genus/species and biological/ecological trait composition on each sample was assigned, according to Tachet *et al.* (2000) database. Taxa richness and abundance were significantly lower in burned sites compared to reference sites. However, no significant differences were recorded for functional diversity (RAO's diversity index). When trait frequencies were analyzed, some differences were found between burnt and reference sites, although patterns were generally inconsistent over time and within and across habitats. However, changes in food and feeding group appeared to be robust with an increase in predators and decrease in shredders in burnt sites. Despite the major changes in species abundance and taxonomic composition, functional diversity remained intriguingly stable, suggesting that this approach should be used with caution to assess the impact of wildfire in Mediterranean region.

T3-O270 **Using a community-level method for forecasting climate change impacts in freshwater fish**

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Possible impacts of climate change operate and have already been observed at individual, population, species, community, and ecosystem scales. Up to now, most forecasts built for climate change biodiversity impacts are based on species-level approaches accounting for habitat suitability for species rather than considering the whole community.

However, habitat suitability might not be enough to ensure viability of natural populations if interactions among species impede co-occurrence. Here we aim to develop RIVPACS-type models to forecast freshwater fish communities in the Ebro Basin under climate change. Data used covered fish samplings from 2005 to 2009 and environmental predictors of local habitat (e.g. riverbed, mineralization, alkalinity) and landscape features (e.g. stream topography, climate). The best models built (all subsets approach) with the AQUAWEB tool provided ~60-70% of correct classifications of community assemblage with linear regression of observed/expected (O/E) richness achieving $r^2>0.6$. The O/E standard deviation (SDs) for the best models (<0.3) were within the minimum and maximum precision given by the null model and replicate sampling SDs. This community-level appproach provides advancements for the development of realistic forecasts of freshwater biodiversity under future scenarios, thus giving better prospects for conservation and management than models built for individual species.

T3-O298 **Regulación de la temperatura en ríos de montaña del centro de la Península Ibérica**

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En este trabajo estudiamos el efecto de la temperatura del aire sobre la temperatura del agua en varios ríos del centro de la Península Ibérica y aquellos factores que explican las desviaciones de las temperaturas modelizadas respecto de las observadas. Para ello nos servimos de dos enfoques: (1) introducimos el efecto de la temperatura del agua del día anterior en el modelo Mohseni et al. (1998); (2) estudiamos la relación entre las tasas de cambio de la temperatura del aire y la temperatura del agua por medio de un modelo lineal, y explicamos los residuos del modelo mediante la tasa de variación del caudal la geología de la cuenca. El conocimiento de la relación entre la temperatura del agua y del aire, mejorado con nuestros resultados, afinará las predicciones del efecto del cambio climático en los ríos.

Reference:
(1) Mohseni O. *et al.* (1998) *Water Resources Research* **34**:2685-2692.

T3-O363 **Haematozoan prevalence in a water bird specialist (*Cinclus cinclus*) under climate change constraints**

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Birds that live in aquatic habitats are at higher risk of being infected with malaria parasites (mainly hematozoan genus *Plasmodium*, *Haemoproteus* and *Leucocytozoon*) because in those habitats vector'abundance (mostly Diptera, Culicidae and Simuliidae) is greatest. One of these birds is the White-throated Dipper *Cinclus cinclus*, a riverine habitat specialist restricted in Iberian Peninsula to mountain swiftly running rivers and streams or the reservoirs into which these fall. Parasite prevalence levels, by potentially impairing bird fitness can affect reproduction, feeding habits and dispersion, thus leading to changes in dipper´s distribution and life history strategies. The aim of our study was to examine the occurrence of blood parasites in dippers from Iberian Peninsula and to investigate the relationship between those prevalence levels and a set of abiotic factors (climatic, hydrological and topographic) describing sample areas. About half (51.3%) of the observed 152 dippers from five mountains in the centre of Iberia showed some kind of infection, with *Haemoproteus* being the most frequent parasite (42%), specially in Serra-da-Estrela. The relationships between prevalence levels and abiotic factors differed significantly between sampling areas. Altitudinal range was positively associated with absence of infection, whereas prevalence of *Haemoproteus* and *Leucocytozoon* were related with annual rainfall and mean annual temperature, respectively. In a climate warming scenario an extra pressure is foreseen in rivers from Southern Europe already heavily affected by anthropogenic activities. Thus in view of our results, the implications of an increase in temperature and decrease in rainfall (among other constraints) to the dipper's fitness and conservation will be discussed.

T3-O479 **Plant-litter decomposition by microbes increases with temperature and nutrient load in streams**

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We examined the interactive effects of temperature and inorganic nutrients on leaf decomposition and activity of the associated microbes in streams. Leaves of alder and oak were immersed for 10 days in a stream (NW Portugal) to allow microbial colonization, and then were exposed in microcosms to N-NO_3 (90-5000 µg L^{-1}; 6 levels) and P-PO_4 (3-300 µg L^{-1}; 3 levels), alone or in all possible combinations. One set of microcosms was kept at 12 ºC, a temperature typically found in autumn, and the other set at 18 ºC to simulate a warming scenario. Leaf mass loss was higher for alder compared to oak, but fungal biomass was higher on oak leaves. This may be due to the transfer of fungal carbon from biomass into reproduction, because maximum fungal sporulation on alder leaves was one order of magnitude higher than on oak leaves. N immobilization in alder leaves was higher than in oak leaves and increased with N concentration and temperature in the stream water for both leaf types. Leaf mass loss and fungal biomass increased asymptotically with N concentration in the stream water (Michaelis-Menten kinetics), but P had no significant effect. For both leaf types, leaf decomposition and fungal biomass were higher at 18 ºC. The increase in temperature led to a decrease of the N concentration needed to achieve half of maximum fungal biomass and sporulation (km) on both leaf types, and km values were higher for oak than for alder leaves. This suggests that, under the predicted warming scenario, maximum fungal biomass and reproduction may be attained at lower nutrient concentrations, which may result in faster leaf decomposition in streams with lower nutrient levels. FEDER-POFC-COMPETE and FCT supported this study (PEst-C/BIA/UI4050/2011 and PTDC/CLI/67180/2006) and IF (SFRH/BD/42215/2007).

T4-Ecohydraulics

T4-O24 Biotic contribution to the estimation of environmental flow downstream hydropower reservoirs

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The environmental flows consider the necessities for freshwater sustainability, guaranteeing the conservation of river biota and multiple uses downstream hydropower plants. The main goal of this study was to assess the effects of discharge manipulations on the benthic macroinvertebrates and benthic drift, and on the fishes, as bioindicators of environment quality, maintaining the electrical power generation. Adaptative management experiments were conducted to assess biological responses to (i) different discharges on wet and dry periods and (ii) daily flow fluctuations. The results showed that there were no significant changes in physical and chemical water quality parameters between the wet and dry seasons; benthic communities were significantly more influenced by seasonal changes on discharge than by daily discharge changes; significant differences on macroinvertebrates drift were observed on the wet season; discharge fluctuations influenced changes on fish number and biomass. We will discuss environmental and operation management to energy demands, dealing with human interests and the necessity of freshwater wildlife conservation.

T4-O32 Performance of two cyprinid species upon distinct flow regimes in a pool-type fishway

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River's longitudinal connectivity is disrupted by the construction of dams and weirs, promoting species isolation and affecting fish movements for reproduction, feeding and habitat colonization which leads to genetic impoverishment and loss of populations. The most widely used method to circumvent a barrier and moderate its impacts is the implementation of a fishway. These structures are often non effective or effective for a single species group. There is thus, the need to determine dimensioning and hydraulic parameters that facilitate fishway negotiation by fish species with different morphological and ecological characteristics. The aim of this work is to study the behaviour and performance of two cyprinid species with different ecological characteristics (*Luciobarbus bocagei* – bottom oriented, and *Squalius pyrenaicus* – surface oriented) in a full-scale experimental pool-type fishway prepared to accommodate two different flow regimes (plunging and streaming). Hydraulic characterization of the fishway was done by means of a Vectrino 3D acoustic doppler velocimeter. Results show that in the plunging flow the bottom orifice is widely used by both species and the surface notch is almost not used. In the streaming flow regime the orifice usage of both species diverged: *L. bocagei* used indistinctively both orifices and *S. pyrenaicus* used preferentially the surface notch to progress upwards. Streaming flow significantly enhanced upstream movement of both species, by facilitating the movement of the surface oriented species and increasing the options of the bottom oriented species. Streaming flow regime is thus the most suitable for fishways implanted in systems with a plethora of ecomorphologically different fish species.

T4-O90 Predicting the hydrologic character of river networks; comparison of approaches

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Hydrology is linked to a variety of processes that determine river ecology and water resource availability. The character of the natural flow regime is essential to understand spatio-temporal patterns of physicochemical characteristics, habitat configuration and biological communities and for a sustainable management of water resources. The definition of the flow regime in ungauged rivers is usually carried out through the use rainfall-runoff modelling. Nevertheless these tools require a great amount of resources which many times contrast with the accuracy of the results, especially when they are applied over large areas. In the present study, we proposed a novel approach to model hydrologic indices which account with ecologically relevant aspects of the regime including magnitude of mean flows and magnitude, duration and frequency of extreme flow events. We calculated hydrologic indices based on flow series recorded on 178 unmodified gauges from Spanish Mediterranean and Atlantic basins. Values of the hydrologic indices were predicted for the whole river network by means of topographic, climate, land-use and geology variables. We compared the prediction ability using two different approaches. On one hand, models were derived using all the gauges and predictions were carried out to the whole network; on the other, we first developed a natural flow regime classification and performed different models taking into account the gauges and segments belonging to the same hydrological class. Moreover, we compared the results of using different statistical techniques including linear, random forest and fuzzy logic models. Our results highlighted the increase in prediction ability in some river classes and that the best fitted statistical model depends on the index being modelled.

T4-O245 Transporte neto de substancias y tiempos de renovación en estuarios convergentes con forzamiento mareal

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La dinámica del transporte neto de sólidos en suspensión y los tiempos de renovación en estuarios con forzamiento mareal, y en ausencia de aportes fluviales significativos, está dominada por la distribución espacial de las corrientes de deriva y del prisma de marea a lo largo del estuario. En el caso de estuarios de sección convergente, las corrientes de deriva y el prisma de marea responden a la dinámica mareal generada por el balance de fuerzas de fricción e inerciales (estas últimas asociadas al cambio de sección). Fuerzas que tienen, típicamente, carácter no lineal [Souza and Hill, 2006]. En este artículo se presenta un modelo unidimensional de dinámica mareal en estuarios convergentes, no publicado anteriormente, y que permite obtener, con un número mínimo de parámetros de entrada, la distribución espacial del prisma

de marea y las corrientes de deriva incluyendo los efectos no lineales asociados tanto a la forma convergente del estuario como a los términos de fricción. Este modelo se ha aplicado al análisis de la influencia de los efectos no lineales en la distribución de sólidos en suspensión y en los tiempos de renovación de los estuarios de Delaware (EE.UU), [Parker, 1984], Thames (U.K.), [Prandle, 1974] y Guadalquivir, (España), [Álvarez et al., 2001], en respuesta a distintos forzamientos mareales. Durante la presentación del trabajo, se mostraran los resultados obtenidos con el modelo y se compararan con datos de campo existentes en cada una de las zonas de estudio. Los resultados evidencian la importancia de los efectos no lineales en la dinámica de marea y en la distribución de sólidos en suspensión y de los tiempos de renovación en estuarios de secciones convergentes.

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T4-O285 **Factors influencing physical functions of instream wood following wildfires in central Portugal**

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Wildfire is an increasingly common disturbance influencing wood recruitment to streams, and thereby affecting their physical and biological condition. We examined 27 1st- through 3rd-order Portuguese streams from forests of cork oak, eucalyptus and maritime pine, which recently experienced extensive wildfires. Many of the streams were intermittent, with stretches remaining dry for several months. We evaluated the physical structure of 1483 wood pieces intercepting stream bankfull (1), and modeled the effects of wood characteristics (burned status, diameter, presence of rootwads) and its instream emplacement (position, location along the stream, wood length/channel width ratio, number of anchoring ends) on the probability of performing a physical function (e.g. creating pools and/or riffles). Probability of function increases on wood of greater diameter, and decreases on pieces longer than ~3 times the channel width. Probability of function was higher in the second half of streams, reaching a peak at ~3/4 of their lengths. Wood pieces with more anchoring ends in either the bank or the stream have a higher probability of having a function, and the same trend can be found for pieces with rootwads. Concerning position, loose on the streambed have a higher probability of having a physical function, followed by pieces ramping on one bank only, and, finally, pieces spanning the channel (bridges) have the lowest probability of performing a function. A Bayesian structural equation model revealed that wood fire status indirectly positively affected function through an effect on diameter. Climate models predict more droughts in the Euro-Mediterranean region in the future, where pools formed by instream wood may provide a major refuge for biota during low flows.

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T4-O349 **Estimativa da profundidade de mistura gerada por ventos severos no reservatório de Itaipu**

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Existe no Brasil mais de 23 mil espelhos d'água, entre naturais e artificiais com mais de 20 hectares. Estudos limnológicos nestes ambientes frequentemente demandam informações relacionadas à dinâmica da massa hídrica. Este artigo apresenta uma ferramenta computacional que determina a distribuição da profundidade da massa líquida afetada pela propagação de ondas geradas pela ação do vento. O estudo de caso apresenta a distribuição espacial da profundidade de mistura pela ação de ventos severos sobre o reservatório de Itaipu. Os ventos severos foram estimados através da análise de frequência regional para várias estações anemométricas na região oeste do Estado do Paraná. A profundidade de mistura foi simulada pelo método paramétrico SMB, que usa como dados de entrada o fetch e a velocidade do vento. A análise de frequência regional do vento considerou os registros horários das rajadas medidas nas estações do SIMEPAR para o período de 1998 a 2005. Os testes estatísticos indicaram que a distribuição de Wakeby foi a mais robusta para as séries curtas de ventos horários máximos anuais, produzindo estimativas de ventos severos que variaram entre 22,8 m s^{-1} (tempo de retorno de Tr=10 anos) a 47,8 m s^{-1} (Tr=100 anos). O contorno georeferenciado das margens, imprescindível para a determinação do fetch, foi derivado a partir de imagens de satélite. A determinação automatizada dos mapas temáticos foi obtida pela aplicação do modelo ONDACAD e os resultados serão atualizados de forma automatizada pelo modelo HIDRONDA disponível em https://sites.google.com/site/hidronda/.

T4-O367 **Comparación del hábitat para la especie *Ictalurus punctatus*, en un tramo de río, respecto al tramo modificado**

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Comparación del hábitat para la especie *Ictalurus punctatus*, en un tramo de río, respecto al tramo modificado para crear un parque lineal. En el presente trabajo se presenta la comparación del hábitat físico disponible, estimado para la especie *I. punctatus*, en un tramo de río de 12000 metros de longitud, respecto al hábitat físico estimado para el tramo de río modificado con la finalidad de crear un parque lineal. El tramo de río en estudio forma parte del río Lerma. La cuenca río Lerma se localiza en la zona centro occidente de los Estados Unidos Mexicanos y representa el 3% (i.e. 53 591 km^2) del área del territorio nacional. El río Lerma nace en la Laguna de Almoloya, localizada al oeste de la ciudad de México, y descarga sus aguas al lago de Chapala, después de discurrir por cinco estados de la República Mexicana, mediante su longitud de 708000 metros. El tramo de río en estudio forma un meandro con una longitud de 12000 metros, tiene un ancho medio de 50 metros y la mayor parte del año permanece aislado de la dinámica del río Lerma, con la presencia de caudales cercanos a cero. En primera instancia se estimó el hábitat disponible para la especie Ictalurus punctatus mediante

la simulación del hábitat físico, utilizando información topográfica, hidráulica y de hábitat obtenida del tramo de río en estudio en su estado actual. En Segundo término se obtuvo el hábitat disponible para la misma especie, basándose en la simulación del hábitat físico, realizada utilizando la información topográfica y de hábitat obtenida del tramo de río con la modificación propuesta para crear un parque lineal. En tercer término se presenta la comparación de ambos escenarios en función del hábitat disponible estimado para especie *I. punctatus*.

T5-Ecosystem processes

T5-O13 **FPOM is abundant in mountain low order streams in Central Portugal, but it has lower quality than leaf litter**

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Streams are known to be subsidized with energy and nutrients from terrestrial systems. Leaves produced in the riparian area are subject to enzymatic breakdown by aquatic organisms, consumed by detritivores and fragmented by the current. The result is the transformation of coarse particulate organic matter (CPOM) to fine particulate organic matter (FPOM). FPOM includes leaf fragments, fecal pellets and microorganisms. This material tends to be transported downstream and accumulated among the mineral substrate particles. The distributional abundance of functional feeding groups suggests that FPOM is an important energy source for low order streams. We determined that the FPOM standing stock in several mountain low order streams in Central Portugal ranged from ~0.1 to ~11 mg ash free dry mass (AFDM) m^{-2}, being more abundant in spring/summer than in autumn/winter. Nitrogen content ranged from 0.5 to 1.1%, which is lower than the typical values for senescent leaves. The lignin content, on the other hand was higher (45-65%) than the observed in decomposing leaves. Under laboratory conditions, specimens of *Chironomus riparius* were able to grow and survive in FPOM (collected in streams) and their performance was reduced when the FPOM was sterilized. We conclude that FPOM is a low quality resource in low order streams, but its presence along the year ensures a constant energy supply for stream invertebrates.

T5-O16 **Effects of the fungicide pyrimethanil on biofilm and organic matter processing in outdoor aquatic mesocosms**

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The effect of the fungicide pyrimethanil (0.8 mg L^{-1}) on biofilm development (biomass, chlorophyll and ergosterol) and organic matter processing (alder leaf mass loss, ergosterol and macroinvertebrate colonization) in aquatic ecosystems was tested in six outdoor lenthic mesocosms after an incubation period of two months. Leaf mass remaining, ergosterol concentrations and animal abundance associated with decomposing leaves were similar in both treatments. Invertebrate richness and diversity were, on average, higher in control than in treatment mesocosms, but the differences were not significant. On average, biofilm biomass and chlorophyll were higher in treatment than in control mesocosms, while ergosterol concetration was similar in both treatments, but there was no significant effect of treatment on any of the biofilm response variables. The lack of statistically significant effects was due to the high variability shown by the individual mesocosms, probably as a consequence of the natural course of colonization and development associated with the natural outdoor environment. This small-scale experiment illustrates the influence of natural variability in the responses of aquatic ecosystems to disturbance. However, the lack of statistically significant effects does not imply the lack of effect. The analysis of the individual mesocosms and the comparison of ergosterol (an indicator of algal and fungal biomass) with chlorophyll (an indicator of algal biomass) shows that the fungicide pyrimethanil altered, at least, the relative abundance of algae and fungi on biofilm developing in control and treatment mesocosms.

T5-O44 **The effect of sewage effluents on benthic communities and metabolism of three Atlantic rivers**

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Sewage inputs on fluvial ecosystems alter trophic networks and affect benthic communities resulting in changes on river functioning. Functional indicators (e.g. river metabolism) have been proposed as a valuable tool to evaluate ecosystem impairment. In the present study, we monitored river metabolism in spring and summer using the single-station method over a 24 hour period up and downstream waste water treatment plant (WTP) effluents on three Atlantic river reaches. These river reaches were located on the middle part of the Saja and Miera river catchments (445 and 125 km^2, respectively) and on the upper part of the Escudo river catchment (20 km^2). Concurrently with river metabolism we characterised benthic macroinvertebrate communities, algae and epilithic biomass and water pH, temperature, conductivity and phosphate and nitrate concentration. Upstream of the studied effluents, gross primary productivity (GPP) was larger on summer in Saja and Escudo rivers and on spring in the Miera river. River metabolism was only heterotrophic in the Escudo River in summer due to larger ecosystem respiration (ER). Downstream WTPs, GPP and ER patterns changed substantially and net metabolism was lower in all cases mainly due to lower GPP. Chlorophyll a concentration was more than 4 times larger in spring than in summer in all river reaches, while epilithic carbon followed a similar but less obvious pattern. Increase of invertebrate scraper densities (an order of magnitude higher) seems to be a plausible explanation for the algae biomass temporal patterns in all sites (higher in spring than in summer), however explaining GPP and ER patterns through algae biomass, epilithic C and invertebrate density variations are not global and reflect the importance of local scale controls.

T5-O93 **Impacto de los eucaliptales en las comunidades de macroinvertebrados de arroyos de la cuenca del río Lérez**

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Los usos del suelo de una cuenca hidrológica ejercen un efecto importante sobre la estructura y funcionamiento de sus ecosistemas fluviales. Cambios en la composición de las especies vegetales provocan modificaciones en las entradas de materia y energía a los ríos, afectando a sus comunidades de invertebrados. El principal objetivo de este estudio es analizar los efectos de los usos del suelo de las cuencas de una serie de arroyos, y en particular las plantaciones de eucalipto, en sus comunidades de macroinvertebrados. Se estudiaron 16 arroyos afluentes del río Lérez (Galicia, España), recogiendo muestras de macroinvertebrados en marzo-abril y mayo de 2011. Los usos del suelo se clasificaron en 5 categorías: bosque autóctono, eucaliptal, zona agrícola, matorral y zona urbana. La diversidad de macroinvertebrados aumentó con el tamaño de la cuenca y con el porcentaje de bosque autóctono, el cual resultó estar inversamente correlacionado con la cobertura de eucaliptales. La diversidad y riqueza de macroinvertebrados disminuyeron a medida que aumentó el suelo ocupado por eucaliptal. Además, los arroyos con un mayor porcentaje de eucaliptos en sus cuencas presentaron un mayor estiaje. Bajo la perspectiva del cambio climático, el reemplazo de bosques autóctonos por eucaliptales parece afectar al mantenimiento de los recursos hídricos. Se sugiere el mantenimiento y/o creación de zonas ripícolas de bosque autóctono como forma de minimizar los impactos antropogénicos provocados por el monocultivo intensivo de eucaliptos, ya que los efectos de estas plantaciones pueden ser fuertemente atenuados si se mantienen las franjas de protección de la vegetación ripícola nativa.

T5-O106 **Nitrogen uptake kinetics of stream biofilms in response to increased availability of ammonium and nitrate**

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Human activity has significantly increased dissolved inorganic nitrogen (N) availability and has modified the relative proportion of ammonium and nitrate forms in stream ecosystems. Nonetheless, the relationship between N uptake and N concentration remains unclear due to the complex interactions among factors governing N uptake. We aimed to evaluate the N uptake response of biofilms from two streams differing in ambient N concentrations to increases in N availability. We measured biofilm N uptake in artificial flumes located in each stream using separated ^{15}N-ammonium and ^{15}N-nitrate additions at increasing N concentrations. We predicted that biofilm N uptake kinetics would vary between the two streams due to differences in ambient N concentration and will also vary depending on the considered N form. N uptake by biofilms from the two streams showed a Michaelis-Menten response to increases in ammonium concentration, indicating no saturation under ambient concentrations. However, the affinity (K_s) and maximum N uptake for ammonium (V_{max}) was higher and lower, respectively, for the stream with the lowest ammonium concentration. In contrast, biofilm N uptake did not vary with increases in nitrate concentration, suggesting biofilm N saturation for this N form in the two streams. Our results indicate differential biofilm N uptake responses between N forms, being more reactive in front of variations in ammonium than in nitrate concentrations. They also indicate that biofilm N kinetics, especially for ammonium, are susceptible to ambient N concentrations. Results from this study provide important insights to better understand the role of benthic biofilms in stream N uptake under chronic or episodic changes in N availability.

T5-O122 **The light and the dark side of the force: relevance of different metabolisms on inorganic carbon assimilation**

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A central issue in limnological studies is the characterization of the autotrophic fixation of inorganic carbon. These studies are relevant in the context of basic research, but also from an applied point of view in managing aquatic ecosystems. From the earliest historical studies, the autotrophic fixation of inorganic carbon in pelagic ecosystems has undergone significant changes in their paradigm. Inorganic carbon fixation by RuBisCo remains the most studied and important pathway; however, some alternative metabolic pathways are currently known that microorganisms may use under certain conditions. The Iberian Peninsula has a high diversity of aquatic ecosystems which show quite diverse features. Early studies on carbon assimilation in the Iberian Peninsula date back from 60's and a wide variety of aquatic systems have been characterized thenceforth. Most relevant are the studies in stratified systems, like deep lakes or microbial mats, where strong physical and chemical gradients allowing the spatial coincidence or segregation of different metabolisms, which include alternatives to oxygenic photosynthesis. In this sense, important contributions have been made to both the study of anoxygenic photosynthesis and dark fixation; attention has been payed to the characterization of microorganisms responsible for these activities and further evaluating their contribution to the whole primary production system. Because the uniqueness of some types of aquatic ecosystems in the Iberian Peninsula, further studies on the different pathways of autotrophic carbon assimilation are needed, including the analysis of genetic diversity of the involved biota, which will enhance the knowledge on the functioning of their microbial food webs.

T5-O140 **Efectos de la temperatura sobre la decomposición de hojarasca de diferente calidad en rios de cabecera**

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La descomposición de la hojarasca que ingresa en los ríos forestados de cabecera es un proceso clave en el funcionamiento de estos sistemas. Las tasas de descomposición dependen de la calidad de los materiales pero se sabe menos de cómo afecta la temperatura al procesado de hojarascas de diferente calidad. El presente estudio se enmarca dentro del proyecto RIOTEM, el cual pretende evaluar los efectos de la temperatura sobre el funcionamiento de ríos de pequeño orden de la Cornisa Cantábrica.

Este trabajo se centra en la comparación del procesado de 3 especies de hojarasca: aliso (*Alnus glutinosa*), roble (*Quercus robur*) y haya (*Fagus sylvatica*) en 3 ríos forestados de cabecera en un gradiente de temperatura. Las hojarascas fueron incubadas en bolsas de malla de 0.5 y 5 mm de poro a fin de discernir la actividad de los invertebrados. Se ha estudiado la dinámica de descomposición de las diferentes hojarascas, así como la de algunos de sus componentes (C, N and P). Adicionalmente se midieron las tasas de respiración en las bolsas de malla fina de los muestreos iniciales, determinándose los macroinvertebrados de las bolsas de malla gruesa y del bentos en fases más tardías. La temperatura se registró en continuo durante todo el experimento y se caracterizó la físico-química de los ríos. Las tasas de descomposición en malla fina (actividad microbiana) de todas las hojarascas mostraban una tendencia positiva con la temperatura, mientras que en malla gruesa (actividad microbiana + detritívora) sólo se observaba esta tendencia para la hojarasca de mejor calidad. Nuestros resultados sugieren que el tipo de vegetación riparia podría condicionar la eficiencia con la que los ríos aprovechan la materia orgánica alóctona con el aumento de temperatura pronosticado por el cambio climático.

T5-O222 **Avaliação da integridade ecológica de riachos através dos invertebrados aquáticos e da decomposição foliar**

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Este estudo teve como objetivo avaliar a estrutura ecológica de riachos, utilizando a comunidade de invertebrados aquáticos como medida de integridade estrutural e o processo de decomposição do detrito foliar como medida de integridade funcional. Para isso foram selecionados dois riachos subtropicais com complexidades vegetais distintas. Em cada riacho foram realizadas coletas mensais de material bêntico com o uso de um amostrador Surber (30x30 cm; 250 µm). Para a avaliação do processo de decomposição, quinze litterbags foram incubados mensalmente nos dois riachos e retirados após 30 dias de incubação para determinação da porcentagem de massa seca remanescente. In situ, foram mensuradas as variáveis abióticas da água e, em laboratório determinadas as concentrações de nitrito, nitrato, amônia, orto-fosfato e alcalinidade total. Os resultados demonstraram alta divergência na composição da comunidade de invertebrados aquáticos entre os riachos (F=52,73; p=0,0002) e entre os meses do ano (F=4,53; p=0,0002). Diferenças nas variáveis espaciais (concentrações de fosfato, amônia, nitrato, alcalinidade e oxigênio dissolvido) entre os riachos, e nas variáveis temporais (temperatura da água e pluviosidade) foram os fatores que mais influenciaram o processo de estruturação da comunidade nos riachos selecionados. Da mesma forma, a porcentagem de massa remanescente diferiu entre os riachos (F=5,44; p= 0,021) e os meses do ano (F=8.29; p=0,0001) destacando a formação de dois blocos temporalmente distintos. O uso da comunidade de invertebrados aquáticos e dados de perda de massa remanescente mostraram-se eficientes para a avaliação da integridade ecológica de riachos, uma vez que os riachos selecionados foram separados de acordo com o grau de conservação dos mesmos.

T5-O294 **Complexity of aquatic macrophytes on ostracods (Crustacea) community in a lake of neotropical floodplain**

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Aquatic macrophytes provide heterogeneity to the environment and are important micro-habitats for aquatic communities. Several studies have shown the importance of architecture and/or structural complexity of aquatic macrophytes on the richness, distribution and abundance of invertebrates, but so far they did not quantify the fractal complexity of aquatic macrophytes. Here, we analyse the ostracod community associated with *Eichhornia crassipes* and *Salvinia minima*, with different structural complexities, measured by fractal dimension. We test the hypothesis that more complex plants are inhabited by higher diversity and abundance of ostracods. In addition, we analyze abiotic factors involved in the structure of this community. Sampling was performed monthly from November 2010 to October 2011, in a lentic environment in the upper Paraná River floodplain. *S. minima* was more complex than *E. crassipes*, with higher density of individuals, confirming one of our hypotheses. On the other hand, richness and diversity were higher in *E. crassipes*, thus not confirming the second hypothesis. The difference in the community structure of different aquatic macrophytes may also occur owing to abiotic factors such as plant identity, interaction with plants, interspecific competition, etc., which could interact with the effects of structural complexity. In the present study, the higher structural complexity seems to be correlated to ostracods density, but as correlation does not necessarily equal causality, there is so far no evidence that structural complexity offers higher availability of niches in this environment.

T5-O325 **Spatial patterns of N_2O and CO_2 emissions during the growing season in a Mediterranean riparian zone**

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The aim of this study was to investigate the spatial patterns of nitrous oxide (N_2O) and carbon dioxide (CO_2) fluxes in a Mediterranean riparian zone during the growing season and which factors drive their variation. This study is part of an European project (REFRESH) which focuses on the effects of climate change on freshwater ecosystems and the potential strategies to adapt or mitigate these effects. The study was done in la riera d'Arbúcies (NE Spain) from May to September 2011. Two weeks before the study started, a 50-year recurrence flood completely inundated the riparian zone in the study area, and discharge gradually decreased afterwards. We defined 4 zones across the stream-riparian gradient based on differences in soil texture and dominant vegetation types. The gas emissions were measured in situ every 2 weeks using close chambers distributed at 18 sampling plots (40x40 cm) across the stream-riparian gradient. At each plot, we also measured soil moisture, temperature, redox potential, pH, soil nitrate, total C and N, organic matter debris, and % of grass coverage. The rate of N_2O fluxes ranged from 0.5 to 8 µg N m^{-2} h^{-1} during the study period. The highest rates were measured near the stream edge, whereas the lowest rates were measured uphill of the riparian zone. A contrasting pattern was observed for rates of CO_2

fluxes, which ranged from 0.2 to 20 g CO_2 m^{-2} h^{-1}. The lowest rates were measured near the stream edge in semi-inundated plots. We found that rates of N_2O fluxes were significantly correlated with soil redox potential close to the stream edge and with soil nitrate content in the middle parts of the riparian gradient. In contrast, rates of CO_2 fluxes were related to soil moisture and carbon content and were highly influenced by the percentage of grass coverage.

T5-O341 **An alternative model for multiple stable states in shallow lakes of Argentina**

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Twenty years ago, Scheffer [1] proposed a very successful model to explain the existence of two alternative stable states in shallow lakes: a clear state, and a turbid state. That model considers some simple relationships between variables. A few nonlinear responses produce the existence of two stable states. The turbid state is reached when nutrients are high and piscivorous fish abundance is low because of the phytoplankton uses nutrients to grow and there is a low abundance of zooplankton eating algae. On the contrary, when nutrients are low, macrophytes dominate the water column and reduce the solid resuspension; moreover, submersed plants give refuge for zooplankton that grazes on algae controlling them. Despite the success of this model, some authors point that it is not easily applicable to the shallow lakes in the Buenos Aires province (Argentina) or "pampean lagoons". These lagoons have no two alternative states but three: clear, green and brown. The clear and green states correspond to the Scheffer's model ones. The brown state is characterized by the existence of a great concentration of inorganic suspended matter (ISM) and humic and fulvic acids. This is given mainly by the effect of the winds that mix the water and resuspends the sediment of the bottom. We add two more variables to the Sheffers's model: 1) ISM and 2) The ratio [wind energy / lagoon depth] (V/Z). Our model has three axes: AXIS 1: the V/Z ratio, AXIS 2: the nutrients concentration, and AXIS 3: the piscivorous density. Combining high values in one axis with low values in the other two, we obtained each one of the three alternative stable states: clear when AXIS 3 predominates, brown when AXIS 1 predominates, and green when AXIS 2 predominates.

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T5-O371 **Ciclagem de nutrientes via bioturbação e excreção de *Laeonereis culveri* em um gradiente trófico do sedimento**

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O objetivo do trabalho foi verificar como a reciclagem de fósforo e nitrogênio via bioturbação e excreção realizado por *Laeonereis culveri* (Polychaeta: Nereididae) varia com o estado trófico do sedimento. Fluxos de nutrientes foram medidos em microcosmos contendo sedimento com sete diferentes níveis de concentração de matéria orgânica (MO), colonizados ou não. Após 48 horas de incubação, os indivíduos de cada microcosmo foram retirados e acondicionados por 1.5 horas em microcosmos com água e areia esterilizada para estimar as taxas de excreção. O fluxo de Fósforo Total Dissolvido (FTD) nos microcosmos contendo o gradiente de MO diminuiu significativamente com a redução do estado trófico (r^2=0.60, p=0.01), mas o mesmo não foi notado para o fluxo de Nitrogênio Total Dissolvido (NTD) (r^2=0.04, p=0.33). Consequentemente, observamos um significativo aumento da razão estequiométrica entre os fluxos de NTD e FTD (r^2=0.66, p=0.001). Não foram observadas mudanças significativas nos fluxos de NTD (r^2=0.19, p=0.06) e FTD (R2=0.01, p=0.55) mediados unicamente pela excreção ao longo do gradiente trófico. Embora as comparações devam ser feitas com cautela devido a diferença no tempo de incubação, os fluxos pela excreção foram superiores aos microcosmos contendo o gradiente de MO, sugerindo que parte dos nutrientes excretados são imobilizados no sedimento. Nossos resultados indicam que diferentes vias de reciclagem de nutrientes mediadas por *L. culveri* respondem de forma distinta a variações do estado trófico do sedimento e ao tipo de nutriente. Por fim, indicam que a reciclagem de nutrientes oriunda de interações biogeoquímicas no sedimento mediadas pelas atividades não tróficas (bioturbação), são mais susceptíveis às variações do estado trófico do sedimento de ecossistemas aquáticos.

T5-O420 **Leaf litter decomposition in a Mediterranean stream: dynamics from basal resource to consumers**

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The importance of allochtonous organic matter, particularly leaf litter, as an energy source in low order forested streams has been highlighted in many studies from different climatic areas. However, there is still a lot to learn about nutritional quality of this resource and trophic structure of colonizing communities. A decomposition experiment was conducted in a third order Mediterranean stream to understand how changes in food resource (leaf litter) quality affected litter-associated bacteria, fungi and macroinvertebrates. *Populus nigra* litter bags were immersed in the stream for 96 days in winter. Invertebrates associated with leaf litter were identified, assigned to functional feeding groups, characterized using a trait-based approach, and stoichiometrically analyzed. Breakdown rates were calculated using an exponential decay model, and litter content (CNP, lipids, and soluble carbohydrates), microbial biomass and enzymatic activities (ß-glucosidase, ß-xylosidase, cellobiohydrolase, phenoloxidase) were also analyzed. Litter composition changed over time, increasing its nutritional quality. Enzymatic activities increased gradually. Invertebrate richness and, especially, biomass were also enhanced with time. However, CN and CP ratios differed by at least one order of magnitude between consumers and resources during the process, suggesting a strong nutrient limitation. The results provide evidence that decomposition is a complex process which involves both bottom-up and top-down controls. Initially, the dynamics of the invertebrate community seemed to be related to the quantity and quality of the resource (bottom-up control). However, the presence of large individuals, mainly predators, exerted a top-down control on the community at the end of the experiment.

T5-O443 **Effects of pollution on leaf-litter breakdown in low-order streams**

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The effect of pollution on alder (*Alnus glutinosa*) leaf litter breakdown was studied at 3 reference (Moreira, Pinhão and Olo) and 3 polluted (Este, Febres and Vizela) streams, located in North Portugal. Stream sites differed in dissolved oxygen, conductivity, nitrate, ammonium, phosphate, total-N, total-P concentrations and contents of chemical and biochemical oxygen demand. During coarse litter bags immersion, variation in litter mass loss, invertebrate colonization (abundance, density, diversity, community composition and functional feeding groups) were assessed. Litter breakdown rates varied greatly ($0.0078\ d^{-1} < -k < 0.064\ d^{-1}$), and achieved the highest values at Moreira and Pinhão, followed by Febres. The lowest k values were found at Vizela (polluted) and Olo (reference) sites. The reference sites with high breakdown rates exhibited the highest values for invertebrate density and diversity. Also shredders reached higher values at these two sites, and were almost absent at polluted streams. Multidimensional scaling (MDS) revealed differences in invertebrate communities between reference and polluted streams. Invertebrate community associated with leaf-bags at Olo stream were more similar to the communities found at polluted sites (50% similarity) than to the ones of other reference sites (~ 20% similarity). These results suggest that litter breakdown is strongly influenced by stream characteristics, pollution level and pollution type.

T5-O481 **Effects of riparian plant diversity on leaf-litter decomposition along an eutrophication gradient**

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This study addressed the effects of riparian plant diversity (identity and number of species) and stream eutrophication on leaf-litter decomposition and the associated decomposer communities. For that, leaves of alder, chestnut, eucalyptus, plane tree and oak, alone or in mixtures with 2, 3 and 5 species, were placed in coarse-mesh bags and immersed in six low-order streams along an eutrophication gradient. Leaf species identity affected leaf mass loss, and fungal and invertebrate biomasses on leaves. Invertebrate biomass was not affected by leaf species number, but fungal biomass was higher in mixtures with 5 leaf species, suggesting that fungi depend on riparian plant diversity more than invertebrates. Leaf mass loss was higher in leaf mixtures than in single leaf species. Higher N immobilization occurred in moderately and highly eutrophic streams comparing to the most oligotrophic one. Also, N immobilization was higher for leaves with lowest initial N concentration (plane tree). Apart from the most eutrophic stream, a positive linear relationship between initial N concentration in leaves and leaf mass loss was found, and the slopes increased with increasing eutrophication. This suggests that the positive effects of leaf quality on litter decomposition can be enhanced by moderate eutrophication. Leaf-litter decomposition in mixtures was higher than that expected based on the sum of decomposition of individual leaf species, but these effects were not evident in the most eutrophic streams. Overall results suggest that moderate eutrophication may enhance leaf quality effects and attenuate leaf diversity effects on leaf decomposition. FEDER-POFC-COMPETE and FCT supported this study (PEst-C/BIA/UI4050/2011 and PTDC/AAC-AMB/117068/2010) and IF (SFRH/BD/42215/2007).

T6-Environmental management and water quality

T6-O26 **Effect of temperature and vegetation on *E. coli* removal in non-conventional wastewater treatments technologies**

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One maturation pond and six constructed wetlands for wastewater treatment have been compared regarding their efficiencies on *Escherichia coli* removal, analyzing both the effect of temperature and presence-absence of vegetation as well as other parameters as COD, BOD_5 and TSS. The monitored maturation pond is the final pond of a lagooning system composed by one anaerobic pond, one facultative pond and two maturation ponds. Constructed wetlands are: two vertical flow, three horizontal flow and one free flow, which in turn have different substrates and plants densities and which have been working by different combinations. Fortnightly sampling of raw wastewater and outlet of treatment systems were carried out during two years. Mean removal efficiencies of *E. coli* (in log unit) was between 1.5 and 4.6 and results showed that higher reductions were obtained in maturation pond and constructed wetland combinations. The results of other monitoring parameters reveal that the studied technologies met a BOD_5, COD and TSS reduction values in accordance with those established in the European Wastewater Directive. There are significant correlations between those variable and *E. coli* concentration in most of systems and the higher removal efficiency of BOD_5, COD and TSS has been obtained in the combination between constructed wetlands. Analyzing temperature we can conclude that both in maturation pond and horizontal constructed wetlands there are significant correlations between this parameter and *E. coli*, but in the case of vertical flow constructed wetlands no significant correlations have been obtained. Regarding the effect of presence-absence of vegetation, have been detected a direct relation between this and the *E. coli* concentration.

T6-O43 **Predicting water quality characteristics to entire river networks**

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Understanding the patterns of water physico-chemical characteristics, and its relationships with natural environmental factors and human activities, is extremely important to comply with Water Environmental legislation and also to advance in the knowledge of applied fluvial ecology and the conservation and restoration of river ecosystems. In this study we analysed and predicted the spatial and temporal patterns of several physico-chemical parameters at reach scale (500 m reaches) for fluvial catchments in the northern third of Spain, using data from more

than 1,000 sampling points belonging to the Confederación Hidrográfica del Cantábrico (CHC), the Confederación Hidrográfica del Ebro (CHE) and the Agencia Vasca del Agua (URA). We concentrated on looking for the most important environmental factors (geologic, climatic, hydrological, topographic) explaining variation among river reaches located in different parts of the studied river network. We also analysed the importance of these factors under different seasonal scenarios. Moreover, we were also interested in modelling how the anthropic pressures produce changes on water characteristics. We used Random Forest models to predict water characteristics to all the segments of our study area (650.000 segments). Our results provide strong evidence for the importance of diffuse sources of contamination on the increase of several variables (nitrates, suspension solids and conductivity) and of urban settlements on phosphates. On the other hand, the temperature was mainly determined by non-human factors such as topographic factors. These results indicate that we are able to predict a great part of the site-specific physico-chemical variation using catchment averages of environmental variables and land-use.

T6-O80 **Mathematical modeling of P mobility in lake sediments: the effect of mineral composition in P retention**

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Water body quality state is largely influenced by complex biological and geochemical relationships in the diagenetic system. Particularly for the eutrophication problem, understanding the mobility of phosphorus (P) in sediments is of great concern (1). However, tracing changes in the several P type concentrations (e.g. organic forms, adsorbed to metallic minerals or precipitated as salt), is extremely difficult to perform in situ. Thus, mathematical modeling (applying the AQUASIM platform) was used to understand the P mobility in relation with oxygen concentration changes in the sediment-water interface (SWI). The importance of the AlOOH:FeOOH ratio in P retention (2) was also evaluated through the model. Processes of organic matter (OM) mineralization, acid-base equilibrium, precipitation and adsorption where included in the model. For calibration, microsensors where used to determine oxygen depletion within the sediments. Additionally, P sequential extraction and determination of total Fe and total Al concentration were performed in natural sediments from the Azorean Lake Furnas – Portugal (3). The model results showed that the P released during oxygen depletion was lower than the one released during the aerobic period. Although P adsorbed to FeOOH mineral was released when sediment were anoxic, this quantity was largely exceeded by OM mineralization in the oxic period, as P adsorption only occurs in 1.5 % of the Fe in FeOOH. In addition, dissolved P can be removed from the pore water precipitating as vivianite if Fe(II) is available; a condition that is largely dependent on the concentration of hydrogen sulfide. Thus, the P retention capacity potential should be assessed through AlOOH:FeOOH:FeS ratio.

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T6-O123 **Effects of land use intensification on fish assemblages in Mediterranean climate streams**

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The South of Portugal is experiencing a rather accelerated change in land use towards intensive farming systems, namely olive production. These systems have strong negative environmental impacts and can affect the ecological integrity of aquatic ecosystems. This study aimed to identify the main environmental disturbances related to olive grove intensification on Mediterranean climate streams in Southern Portugal and to evaluate their effects on fish assemblages' structure and integrity. Twenty six streams were sampled within the direct influence of traditional, intensive and hyper-intensive olive groves. Integrity of fish assemblages was evaluated through deviation from an independent set of undisturbed/least disturbed sites (reference) considering metrics and guilds, based on multivariate analyses. Disturbance variables showed an overall increase along the gradient of olive grove intensification, mostly organic/nutrient enrichment, sediment load and riparian degradation. Animal load showed an opposite pattern, due to high livestock production nearby traditional olive groves. Olive grove sites were dominated by non-native and tolerant fish species while reference sites presented higher fish richness, density and were mainly composed by native and intolerant species. Olive production led to multiple in-stream disturbances, whose cumulative effects promoted the loss of biota integrity, even in traditional olive groves. The impact of these low intensive practices on aquatic ecosystems can be dramatically different when they are coupled with livestock production. Although preliminary, this study may contribute to guide policy decision-makers in agriculture and water management.

T6-O129 **Evaluación del riesgo de incumplir los objetivos de la DMA en aguas superficiales de la cuenca del Ebro**

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La Directiva Marco del Agua (DMA, 2000/60/CE) establece en su artículo 5 que cada demarcación hidrográfica debe efectuar un estudio de las repercusiones de la actividad humana en el estado de las aguas superficiales. Con este fin, se realiza la evaluación de impactos y presiones, metodología conocida como IMPRESS, en la que se estudian las presiones que ejerce la actividad humana sobre las masas de agua y el impacto que éstas ocasionan sobre el medio. A partir de los resultados obtenidos, se debe evaluar el riesgo de incumplimiento de los objetivos medioambientales que recoge dicha Directiva en su artículo 4. Con el propósito de implantar dichos requerimientos en la cuenca del Ebro y fruto de la evolución y experiencia adquirida a lo largo de los años en la realización de este trabajo, se ha desarrollado una metodología que permite evaluar de forma cuantitativa el riesgo de incumplimiento de los objetivos medioambientales a partir de la combinación del resultado numérico de presión e impacto para cada masa de agua. Para ello ha sido necesario obtener numéricamente un valor de presión global a partir de los resultados de cada uno de los tipos de presión y asignar un

valor numérico al impacto a partir de datos de estado ecológico, estado químico y cumplimiento de zonas protegidas. Con la metodología IMPRESS se ha conseguido que el resultado de riesgo sea un fiel reflejo del estado en el que se encuentra cada una de las masas de agua de acuerdo a sus presiones e impactos. El resultado de riesgo obtenido ha permitido ajustar las redes de control en la cuenca del Ebro y clasificar y ordenar las masas de agua en función de su mayor riesgo con el fin de priorizar las medidas correctoras a tomar en ellas.

T6-O141 **A new quantitative fish index to the classification of ecological potential in Spanish reservoirs**

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During the last five years, a noticeable number of fish surveys have been conducted in Northern Spanish reservoirs, upon a common methodological approach. Moreover, all the hydroacoustic studies have been done by the same technical team. An acoustical based sampling protocol has been applied, by means of combined split beam vertical/horizontal echosounding and habitat stratified direct sampling. Fish density and biomass estimations comprise a range that roughly spans from 0.05 to 50 ind dam^{-3} and from 0,02 to 45 g m^{-2}, respectively. A set of 24 biotic metrics have been tested against a Global Pressure Index (GPI), defined as the main ordination axis of a number of natural and anthropogenic traits, both at basin and reservoir level. The different biotic metrics, related with fish guilds and autochthonous vs. exotic species, are all derived from quantitative echosounding data and species composition obtained from direct sampling gears. A stepwise multiple lineal regression model among GPI and fish metrics has lead to the QFBI (Quantitative Fish Biotic Index), which is composed of a reduced number of metrics and shows high correlation with the individual pressures. Using this first version of the index, it has been possible to obtain a classification of the ecological potential of the reservoirs, in compliance with the WFD. Results also reinforce the feasibility of using quantitative fish community indicators in this kind of water bodies, in order to establish a normalized protocol for the evaluation of the ecological status (lakes, rivers, estuaries) or ecological potential (reservoirs) as the WFD prescribes. At the same time, density and biomass of species and guilds provide basic information for fisheries management and programs of measures.

T6-O145 **Assessment of the ecological status of the Ferreira River (North of Portugal)**

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The demographic and industrial growth has been increasing in the Ferreira River's hydrographic basin (North of Portugal). The area includes the site PTCON0002, which is part of the Natura 2000 network. Our aim was to evaluate the ecological status of the Ferreira River in Valongo and Gondomar municipalities through the analysis of biological (benthic macroinvertebrates and aquatic macrophytes), physicochemical and hydromorphological parameters. The study was performed for 10 months (Nov. 2009 to Aug. 2010), in four sampling sites: one site is in the Simão River (tributary of the Ferreira River), and the other three sites are distributed along the Ferreira River's ending zone. In general, the integrated analysis of the physicochemical parameters and biotic communities, suggests that the Ferreira and Simão rivers are highly degraded, particularly near the confluence of the Ferreira River with the Sousa River. The physical habitat at the study sites is higly transformed, with riparian zone unable to buffer some anthropogenic impacts. It becomes necessary to elaborate a global management plan that seeks to decrease scattered and punctual pollution in the entire hydrographic basin of the Ferreira River, along with the rehabilitation of the riparian zones and the creation of proper conditions for nutrient retention, so that a "good" ecological status, commended by the Water Framework Directive, can be achieved.

T6-O156 **Managing macroinvertebrate communities seasonality in a national predictive model for Portugal**

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The present study aimed to investigate the influence of seasonal patterns in the structure of macroinvertebrate communities over models predictions of expected taxa and, consequently, in the variation of Observed/Expected (O/E) ratios and the attributed quality classes. Additionally, we intended to manage possible seasonal differences in an attempt to use such model in bioassessment all over the year instead of its application being restricted the reference season, Spring. For that, we developed a RIVPACS-type predictive model using the online AQUAWEB platform (http://aquaweb.uc.pt/) based on macroinvertebrate communities and using a total of 149 reference sites collected in Spring from 1993 to 2011. The approach implemented in AQUAWEB enabled the retention of the 5 best models among all possible combinations of potential discriminant variables, up to a maximum of 11 variables. The elected model was given by the regression $y = 0.99x - 0.06$, $r^2=0.70$ and had a Discriminant Function Analysis classification accuracy of 69% based on re-substitution and of 60.4% in cross-validation method. This model was then used to test ≈ 50 sites that were sampled in Spring, Autumn and Winter and differences in O/E values and quality classes were found for both reference and non-reference sites.

T6-O167 **The algal group indexes (IGA, IGA2) for assessing ecological status of lakes and reservoirs within WFD**

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The algal group index (IGA) is a phytoplankton index currently in use in several Mediterranean countries. Here we provide the scientific rationale behind the index, which takes into account the different nutrient optima among main algal groups, and distinguishes between colony-forming and single-cell species within them. Further, we determine its sources of uncertainty in its application and its potential shortcomings. Based on these latter analyses we introduce a new index (IGA2) that considers a broader set of algal groups, improves the relative weighting of the groups and includes a way to prioritise the groups according to their optimum reliability. The value of this new index is discussed comparing its distribution across total phosphorus gradients using a large dataset from European water bodies and highlighting its differential attributes respect to other phytoplankton metrics.

T6-O171 **Best available conditions within common Mediterranean stream types from 7 countries**

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The Mediterranean Rivers Geographic Intercalibration Group developed a 3-step approach that allowed the characterization of the best available condition of four Mediterranean common stream types, regarding organic contamination and nutrients, hydrological and morphological alterations and land use. For this purpose, a common database composed of 7 member states national reference sites sampled for invertebrates, diatoms and macrophytes was used, with an initial number of 929 sample records gathered in different seasons, but mainly in spring. After a first step, the analyses of reference sites, classified with no-impact for hydromorphological changes, revealed that medium-size streams (100-1000 km²) with highly seasonal hydrological regime are the most affected by extensive agriculture in the catchment, while non-siliceous rivers (e.g., calcareous river bed) are the most affected by intensive agriculture. Small rivers (<100 km²) are those with a higher % of semi-natural areas. Based on the previous sites selection, the 90th percentile (or/and the 10th percentile in case of inverse variables) was used to calculate threshold values for pressure variables by type. The results indicated a lower threshold value for DO (60%) in RM5 streams compared with the other stream types, which can be attributed to temporary streams' natural characteristics, and was therefore retained for this stream type. For the remaining parameters (ammonium, nitrate, phosphate, total P, % of artificial areas, % of intensive and extensive agriculture, % of semi-natural areas) the differences between types were minimal and common limits were established. These values were further used to select the list of reference sites to be used in the Intercalibration Exercise within the Mediterranean areas.

T6-O186 **Limnological features and plankton communities of seven reservoirs in the Southeastern Brazil**

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Brazil has one of the most developed systems of hydroelectric generating facilities that currently accounts for 72% of the electricity produced in the country. This study aimed at gain knowledge on the plankton communities and water quality of seven hydroeletric reservoirs in an integrated system, which also supplies water for around 12 million people. The reservoirs differ in surface area (Santa Branca 30 km², Lajes 40 km², Santana 6 km², Vigário 4 km², Ilha dos Pombos 3.8 km², Ponte Coberta 1.2 km² and Tocos 0.4 km²), hydraulic features and trophic conditions. Samples were taken in two seasons (winter and summer) of 2011 and the results showed a trend of water column mixing during winter and a summer stratification in the deeper reservoirs and also constant mixing in the shallow systems. According to nutrient analysis the reservoirs ranged from oligotrophic to eutrophic. The phytoplankton of all reservoirs showed a higher richness of green algae, a numerical predominance of small-sized cyanobacteria and a low diversity in the communities. *Cyanogranis ferruginea* and *Aphanocapsa delicatissima* were the most abundant species in most reservoirs. However, as the dominant species were of small size, the low biomass in most phytoplankton communities was consistent with those recorded in oligotrophic systems. Zooplankton in all reservoirs presented a high number of rotifer species. Reservoirs with longer retention time showed higher biomass of microcrustaceans. Nauplius forms predominated among copepods, *Bosmina longirostris* and *Daphnia gessneri* were the cladoceran species mostly found. The greatest diversity in the zooplankton community was found in the reservoir Ponte Coberta, downstream of two other reservoirs (Lajes and Vigário reservoirs).

T6-O201 **The MIRAGE "Tool-Box": linking hydrology and ecology to measure the Ecological Status of temporary streams**

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The assessment of the Ecological Status in temporary streams is dependent on the knowledge of the present and past hydrological conditions of a stream. Sampling strategies for biological or chemical determinations developed for permanent water bodies may not be applicable to temporary streams. The Collaborative MIRAGE EU-funded project (grant FP7 nº 211732) addressed the difficulties of establishing the Ecological Status of temporary streams using the so-called 'MIRAGE tool-box'. This box consists of a series of tools allowing the user to: 1) determine if a stream is permanent, temporary or ephemeral; 2) determine the deviation of river from its reference conditions; 3) compare the actual with the past hydrological conditions and establish the Hydrological Status; 4) determine the Aquatic Status (AS) of the river, a previous condition necessary to establish the Ecological Status; 5) apply the adequate protocol to sample and establish the biological quality of water using macroinvertebrates according of the AS of the stream; 6) compare values of chemical parameters with the threshold of reference conditions to establish the Chemical Status; 7) establish the final Status of the stream. The Mirage tool-box and protocols may be a valuable tool for managers of temporary Mediterranean streams. The tool-box has been used in six basins across the Mediterranean region (Portugal, Spain, France, Italy and Greece). NOTE: This abstract is also undersigned by the MIRAGE-team, a group formed by more than 50 researchers from 17 Institutions from Europe and North Africa.

T6-O218 **About the influence of litoral barriers on the water quality of coastal lagoons: two study cases**

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Las barreras costeras son el principal elemento geomorfológico que separa las lagunas costeras del mar abierto. Tradicionalmente, han sido consideradas como elementos impermeables desde el punto de vista de los flujos y el transporte de sustancias, sin ninguna funcionalidad ambiental. En este trabajo se revisa la visión tradicional de la funcionalidad ambiental de las barreras costeras, y se analiza su impacto en la calidad de las aguas en dos de las principales lagunas costeras mediterráneas, las lagunas del Mar Menor (España) y de Nador (Marruecos), en respuesta a la variabilidad climática. A través de un modelo no estacionario de flujo y transporte basado en la ecuación de Boussinesq (1), se demuestra la posible existencia de flujo a través de los cordones litorales durante el paso de temporales para determinadas configuraciones goemorfológicas. La aplicación del modelo a las lagunas del Mar Menor y de Nador, evidencia la posible existencia de transferencia de flujo y calor en distintos tramos del cordón litoral entre estas lagunas y el mar durante el periodo invernal. Durante la presentación del trabajo, se identificarán los tramos de las barreras litorales de estas dos lagunas que deberían considerarse como elementos permeables desde el punto de vista de transferencia de calor y flujo. Además, se caracterizarán las condiciones climáticas en las que se produce dicha transferencia. Los resultados del modelo sugieren que aproximadamente el 60% del cordón litoral del Mar Menor y el 45% del cordón litoral de Nador presentan secciones potencialmente permeables. Finalmente, se analizarán las implicaciones de los mismos en la calidad de las aguas y los ecosistemas de las dos lagunas (2) que, hasta donde tenemos conocimiento, hasta la fecha no han sido tenidas en cuenta.

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T6-O282 **Estudio de la comunidad fitoplanctonica en embalses gallegos a las puertas del invierno**

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Los embalses gallegos incluidos dentro de los programas de control de la DMA en las cuencas del Miño-Sil y Aguas de Galicia, han sido muestreados durante el otoño del 2010 (27 embalses). La riqueza taxonómica fue de 162 taxones. El embalse con menor densidad algal fue Belesar, superando 100 células mL^{-1}, mientras que el embalse con mayor densidad fue Rosadoiro superando $1{,}3x10^6$ células mL^{-1}. Vilasouto con dominancia de *Planktothrix rubescens*, obtuvo el menor índice de Shannon (H=0,149). *Fragilaria crotonensis* fue la responsable del máximo biovolumen en el embalse de Touro (142,18 mm^3 L^{-1}). Se ha realizado una ordenación en MDS de 29 puntos de muestreo en base a la comunidad fitoplanctónica. Dicha ordenación, testada mediante un análisis SIMPER, muestra como especies *Woronichinia naegeliana*, *Fragilaria crotonensis*, *Planktothrix rubescens*, *Cryptomonas ovata*, *Rhodomonas mituta* y *Crucigenia tetrapedia* separan a este conjunto de embalses en tres grupos diferentes (ANOSIM R=0,74, p=0,1%). Las concentraciones de hierro, magnesio, manganeso y fósforo total son las variables químicas que mejor determinaron la comunidad fitoplanctónica durante el otoño de 2010 (BIOENV; Rho=0,613). La concentración de fosfatos es la variable que se correlaciona de forma significativa con la densidad algal y la concentración de clorofila *a* (r=0,73 y r=0,99; p=0,001). Las comunidades fitoplanctónicas muestran que la agrupación de los embalses está claramente relacionada con las variables fitoplanctónicas utilizadas para el cálculo del potencial ecológico.

T6-O310 **Predicting changes in water quality before the construction of a dam in the River Alva (Portugal)**

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The European Water Framework Directive sets actions with the objective of reaching a good ecological status of surface waters until 2015. Thus, the environmental impact of the construction of artificial reservoirs, specifically on water quality, should be assessed. The objective of the present study is to predict changes in water quality of the Alva River by means of mathematical modeling. Before the construction of a dam, we used CE-QUAL-W2 model to understand the effect of water retention and surface water elevation in future reservoir eutrophication process. The results showed that the dam construction may favour oxygen stratification and algae blooms during the summer, when the water inflow is approximately twenty times lower than in winter. However, in a four year horizon, the water quality will remain roughly the same as before the dam construction, except in summer. Thus, we were able to determine the most critical periods where destratification measures should be applied or alternatively no water retention should be made to maintain the present good ecological status of the Alva River. In conclusion, models can help determining the most sensible period for water quality degradation and should be used in every environmental impact studies, as they represent a useful tool in support of decision making.

T6-O316 **Inference models of environmental changes based on diatoms (Bacillariophyta) from sediments of Azorean lakes**

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Both local and global environmental changes can affect ecological quality of lakes. In the absence of historical data the detection and quantification of these changes can be reveled by paleolimnological approches. Lake sediments have been used increasingly in recent years to infer past fluctuations in environmental conditions and several studies covering several local and temporal scales, have shown the importance of lakes as paleoclimate and ecological archives. Of the range of biological remains preserved in lake sediments, diatoms are useful

paleoecological indicators mostly because their wide distribution, well preserved silicate frustules, high indicator values and species diversity. In order to develop inference models for environmental variables from diatom assemblages in sediments, 40 lakes distributed throughout Azorean islands were sampled using a gravimetric corer and several environmental variables were measured. Multivariate analyses were used in order to relate the diatom assemblages in sediments with the ecological and environmental conditions. Those with the highest correlation with diatoms assemblages were used to develop transfer functions based in Weighted Averaging and Weighted Averaging Partial Least Square regression and calibration models. Transfer functions allow to reconstruct quantitatively past environmental conditions, provide tools for characterizing lake types, define the ecological and chemical reference conditions and allow to evaluate the deviation from the reference state. The recognition of the impact that past environmental changes exerted on the ecosystem can contribute significantly to the prediction of future changes resulting from local and global environmental changes.

T6-O350 **Abordagem multimétrica com macroinvertebrados em uma bacia hidrográfica no sudeste Brasileiro**

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O presente estudo visa avaliar a integridade ecológica da água dos rios de fundo rochoso pertencentes à bacia hidrográfica do rio Macaé, por meio de medidas biológicas das assembléias de macroinvertebrados. As coletas se deram no período seco, com amostrador *kick net* de malha de 500 µm. Utilizou-se o método de amostragem multi-habitat. As amostras obtidas foram subamostradas no equipamento ESAM e foram identificadas nos níveis taxonômicos família e gênero. Foi amostrado um total de 25 trechos de rios que representam um gradiente de influência antrópica, segundo critérios definidos *a priori* . Os trechos de rios foram classificados como referência (8 trechos), intermediários (11) ou pobres (6). Destes, 6 trechos de referência e 6 trechos pobres foram utilizados para a construção do índice e os demais 13 foram utilizados para testar o índice. A matriz biológica foi utilizada para realizar o cálculo de 44 métricas. Dentre essas, 21 foram capazes de diferenciar as áreas de referência de áreas impactadas, pelo método gráfico de Box-Plot e foram confirmadas pelo teste U de Mann-Whitney ($p<0.05$). Um teste de redundância foi realizado (correlação de Pearson) e os pares de métricas com valores de $r \geq 0.8$ e $p<0.05$ foram considerados redundantes. Foram selecionadas 6 métricas dentre os pares redundantes: %Plecoptera, %MOLD, %EPT, BMWP-CETEC, Diversidade de Shannon_H e Riqueza de táxons. Estas foram padronizadas pelo método contínuo. O Índice Multimétrico de Macaé – IMM variou de 0 a 100, em cinco classes de qualidade (muito pobre; pobre; regular; bom; muito bom) para a região. Dos 13 trechos utilizados para testar o índice, 4 foram classificados como bom, 6 como regular e 3 como pobre.

T6-O352 **Assessing the use of plant litter for uranium removal from contaminated streams**

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The primary goal of this research was to determine whether plant material from forests and streams is suitable for uranium removal from streams polluted by mine drainage. We collected leaf branches of *Cytisus scoparius* (Portuguese broom) and *Erica arborea* (tree heath), senescent leaves of *Quercus robur* (oak) and plant material of *Callitriche stagnalis* (water starwort). Uranium accumulation rates were determined in laboratorial microcosms with 200 200 µg L^{-1} of uranium, the average concentration found in a local polluted stream, Ribeira da Pantanha (Nelas, Viseu). The four species were able to passively accumulate uranium, reaching maximum average values of 632.06 mg kg^{-1} (DW) for *Callitriche stagnalis*, 182.04 mg kg^{-1} (DW) for *Quercus robur* and 145.31 mg kg^{-1} (DW) for *Cytisus scoparius* at 37 days of laboratorial experience. *Erica arborea* showed the lowest accumulation rates, with a maximum average accumulation value of 97.01 mg kg^{-1} (DW). An *in situ* experiment is being conducted to determine whether the same results are achieved in real conditions. We conclude that the plant material may accumulate large amounts of uranium. The applicability of such properties requires further measurements in polluted streams.

T6-O365 **Implantação de uma estação de monitoramento remoto em tempo real da qualidade da água no reservatório Billings**

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O monitoramento remoto em tempo real é uma excelente ferramenta para a prevenção da degradação dos recursos hídricos, pois além de possibilitar uma avaliação permanente das condições físicas e químicas por consequência do aumento da frequência de coleta de dados, pode permitir, por exemplo, o desenvolvimento de modelos matemáticos que possibilitem o entendimento do processo de florações de algas e dessa forma definir estratégias para a prevenção de novas florações. Deste modo, uma revisão bibliográfica foi realizada para levantar informações existentes no no Brasil e no mundo sobre este tipo de monitoramento, a fim de correlacioná-las com as ocorrências de florações de algas e com o projeto que será realizado na represa Billings por pesquisadores do Brasil, na Universidade Federal de São Paulo, campus Diadema. Todos os projetos encontrados na literatura utilizaram sondas multi-parâmetros na coleta de dados, as quais possuem como principais vantagens o alto nível de informação disponível e facilidade na limpeza e instalação. Posteriormente, foi feita uma comparação entre todos os projetos estudados e algumas sugestões foram dadas para o projeto da Billings, como a construção de modelos preditivos, a disponibilização de dados com auxílio da internet para o público, a realização de um estudo para determinar o melhor intervalo de calibração, a aplicação de métodos para prevenir incrustações, a inserção de um alarme de floração de algas e de um sensor de velocidade dos ventos. Dessa forma, a boia de monitoramento do reservatório Billings está em fase final de desenvolvimento e será instalada para o estudo desse manancial de água, altamente degradado e vital para o abastecimento da região metropolitana de São Paulo.

T6-O393 **Automatic dammed water quality monitoring in Mediterranean reservoirs for management decision support**

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Automatic Dammed Water Quality Monitoring Systems were installed and commissioned in some reservoirs from the framework of the Confederación Hidrográfica del Júcar (CHJ). These systems perform four daily vertical water profiles, measuring temperature, pH, pressure, conductivity, dissolved oxygen, turbidity, redox, chlorophyll a and light extinction, these data are sent in real time to a control center. With the support of the Limnology Unit of the University of Valencia, ADASA SISTEMAS, commissioned by the CHJ, has been studying these reservoirs using both limnological monitoring and continuous measurements with the on line monitoring systems, since 2010. Using these direct measurements in terms of continuous water quality monitoring, it is possible to know at any moment the state of the reservoir, such the patterns of stratification, seasonally oxygen depletion, formation of deep chlorophyll maxima (DCM) and so different water quality features that allows to know the water quality near the dam's dock. The availability of this real-time on-line information provides the reservoir responsible authority with a very valuable support for the short-term decision-making, regarding the reservoir management and exploitation. This technology makes it also possible to detect different threats to the human water consumption like the potential presence of toxic algae in the reservoir. Early detection of these events has a dramatic importance due to the potential consequences of such events. We will show our experience with this monitoring system and the correlations and interpretation of the data with the limnological studies. Also, we will show some of the first data using the phycocyanin probe installed in a reservoir to follow potentially harmful cyanobacterial populations.

T6-O459 **Instrumental methods and remote sensing imagery as tools to establish the Ebro reservoirs ecological quality**

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During summer 2011, in 32 reservoirs of the Ebro watershed, it was conducted instrumental vertical profiles, water column samplings and laboratory techniques to perform analytical data to establish the ecological quality in the operational monitoring network of reservoirs. The use in the field of chlorophyll fluorometers, turbidity probes, as well as Phycocyanin and Phycoerythrin fluorometers can help to locate metalimnetic and deep algal or cyanobacteria maximums. CDOM fluorometry probe indicates the amount and main type of dissolved organic matter in the water. Spectroradiometric water profiles of sun light penetration combined with the spectroradiometry of the water body reflected light are important data mainly to determine the amount and type of biological or minerals pigments in the water and will also be useful tools to the correct interpretation of remote sensing imagery. These techniques, combined with laboratory instrumental analyses as HPLC of pigment extracts, dissolved organic carbon, flow fluorocytometry and spectrofluorometry, will be useful tools to go ahead in the methodology for a better assessment of the water body ecological quality. Finally, remote sensing imagery from high resolution sensors (CHRIS – PROBA) combined with MERIS – ENVISAT scenes will be very important to establish the quantitative spatial distribution of chlorophyll concentration, turbidity and other water properties in the whole surface of the reservoir including not sampled areas.

T6-O478 **Structural and functional measures of invertebrate and fungal communities as predictors of eutrophication**

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To assess how eutrophication affects leaf-litter decomposition and the associated biota in streams, we examined i) the structure of invertebrate and fungal communities and ii) leaf mass loss of different plant species. Leaves of alder, chestnut, eucalyptus, plane tree and oak were placed in coarse-mesh bags and immersed in 6 low-order streams along an eutrophication gradient during 38 days. Additional benthic invertebrate samples were collected with a hand-net. The values of the IBMWP biotic index applied to benthic invertebrates increased from low to intermediate levels of eutrophication and then dropped sharply at high and very high levels of eutrophication. Cluster analysis applied to leaf-associated invertebrate and fungal communities separated the streams according to the eutrophication level. The % of shredders on leaves decreased, whereas the % of oligochaetes increased along the eutrophication gradient. Invertebrate biomass and density, as well as fungal biomass and reproduction increased along the eutrophication gradient, but decreased in the most eutrophic stream. Alder leaves decomposed faster than other leaf species. A hump-shaped relationship was established between leaf mass loss and the eutrophication gradient for all leaf species, suggesting that leaf decomposition is a valuable tool to assess changes in stream water quality. Results suggested that both structural and functional measures of invertebrate and fungal communities are good predictors of eutrophication level when assessing the ecological integrity of streams. FEDER-POFC-COMPETE and FCT supported this study (PEst-C/BIA/UI4050/2011 and PTDC/AAC-AMB/117068/2010) and IF (SFRH/BD/42215/2007).

T6-O487 **Standardization of taxonomy used to classify ecological status in Spanish water bodies. TAXAGUA and ID-TAX**

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The classification of the ecological status of surface water bodies is one of the main tools created by Water Frame Work Directive to determine whether a water body achieves the good status, the main objective of the Directive.

In Spain, River Basin District authorities designed first systematic biological monitoring (phytoplankton, benthic invertebrate fauna, macrophytes, diatoms and fish fauna) networks in 2004. Since then a great amount of data related with taxa occurrence and abundance has been produced. In order to guarantee good quality and comparability of the information generated, the Water Directorate of the Ministry of Agriculture, Food and Environment has developed and is already implementing a Quality Assurance / Control Program on the several steps involved in the information cycle, such as the design of monitoring programmes, the definition of sampling and sorting protocols or the establishment of a common database and storage system including standardised taxa lists, calculation / aggregation methods, and reporting and publication tools. TAXAGUA and ID-TAX are two more steps in this program in order to establish a common taxa list and identification keys to be used by River Basin Districts in the biological monitoring networks to classify ecological status of surface water bodies. With these tools it is now possible to advance on the future Water Status Information System for Spain, where raw data related to taxa will be available for public consultation.

T7-Estuarine ecology

T7-O107 **The carbon fluxes in a coastal area of northern Portugal**

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Estuaries have been the subject of several studies regarding the carbon biogeochemical cycle. Despite their reduced area, compared to other coastal regions, estuaries may play a significant role in the biogeochemical cycle of carbon due to their intense biogeochemical activity, partially as a result of river and anthropogenic inputs of organic and inorganic matter. Most of these studies suggest that estuaries emit carbon to the atmosphere. This work describes a study conducted in the Ave estuary (northern Portugal) in summer 2011 and winter 2012, where water-air CO_2 fluxes were quantified. Surface waters were always oversaturated in CO_2 with respect to the atmosphere. CO_2 partial pressure ranged from ≈689 to ≈1111 µatm in summer, during the flood and the ebb, respectively, whereas winter values ranged from ≈767 to ≈1021 µatm, during the ebb and the flood, respectively. These results suggest that the Ave estuary emits CO_2 to the atmosphere with an average rate of 14.9 mmol C $m^{-2} d^{-1}$ in summer and 25.6 mmol C $m^{-2} d^{-1}$ in winter. These values are lower than other Portuguese estuaries such as Tagus, Douro or Sado. For example, Tagus estuary emits 86.9 mmol C $m^{-2} d^{-1}$ in summer and 109.9 mmol C $m^{-2} d^{-1}$ in winter. The CO_2 flow rates of inner estuaries studied so far are about 84.1 mmol C $m^{-2} d^{-1}$.

T7-O411 **Distribuição e Composição de Macroinvertebrados Bentônicos em Lagoas Costeiras de Restinga (RJ, Brasil)**

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O objetivo deste trabalho foi avaliar a distribuição espacial e a composição de macroinvertebrados bentônicos e seus principais fatores reguladores em 16 lagoas costeiras de restinga no Estado do Rio de Janeiro, Brasil. As amostragens ocorreram em Julho e Agosto de 2010. Foram calculados índices de dominância, equitabilidade e diversidade. Foram realizadas análises de correlação de Pearson entre estes índices, a densidade, riqueza e as variáveis abióticas (profundidade, temperatura, salinidade, oxigênio dissolvido, pH, matéria orgânica e granulometria). As lagoas costeiras, apesar de próximas, apresentaram diferentes características que contribuíram na distribuição da comunidade de macroinvertebrados bentônicos. A salinidade foi a principal variável na determinação da distribuição da macrofauna bentônica. Pôde-se observar uma relação entre o aumento da salinidade e o aumento da densidade no teste de correlação de Pearson ($p<0,05$) e riqueza ($p<0,05$) destes organismos. Esta relação pôde ser corroborada através da analise de agrupamentos, baseadas na densidade, que mostrou proximidade entre lagoas com salinidades semelhantes. Dentre os índices calculados, a dominância se apresentou diretamente proporcional ao pH. *Heleobia australis* (Gastropoda), exibiu maior densidade e maior abrangência em uma amplitude de salinidade, ocorrendo em 12 lagoas amostradas e sendo o grupo dominante em 6 destas. As lagoas de água doce amostradas foram caracterizadas pela maior presença de insetos aquáticos, menor densidade e riqueza. Os ecossistemas de água salobra a salina caracterizaram-se pela presença de fauna estuarina e marinha apresentando maiores valores de densidade, destacando-se *Laeonereis culveri* e *Heteromastus similis* (ambos Polychaeta) e riqueza taxonômica.

T9-Food webs

T9-O27 **Food web ecology of a small lake in Central Spain using stable isotopes**

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Species-based food web descriptors are usually used as metric indicators of ecosystem food web structure. Since these descriptors are qualitative, much information on the trophic structure is lost. Natural isotopic abundances of $\delta^{13}C$ and $\delta^{15}N$ have been used successfully to assess food web structure and trophic pathways in aquatic ecosystems. In this study, natural isotopic abundances of $\delta^{13}C$ and $\delta^{15}N$ were measured in sediments, fine particulate organic matter (FPOM), zooplankton, epiphyton, aquatic plants, crustacean and fish in a small lake in Central Spain (Laguna Cueva Morenilla, Lagunas de Ruidera) during summer 2010. Using stable isotopes food web structure was assessed through

quantitative metrics ($\delta^{13}C$ range and $\delta^{15}N$ range, total area, mean distance to centroid, mean nearest neighbor distance, and standard deviation of the nearest neighbor distance) in order to assess the vertical structure of the food web, the basal resources for niche diversification at the base of the food web, the total amount of niche space occupied (and therefore the available niche space for trophic diversification), the degree of trophic diversity, the resource or niche partitioning and the evenness distribution of trophic niches. This quantitative metrics based on stable isotope data are most appropriate for community-wide analyses and provide deeper insights into the food web structure of an aquatic ecosystem.

T9-O83 **DNA-based detection of toxic cyanobacteria *Planktothrix rubescens* in *Daphnia* diet**

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Cladocerans play a central role in lacustrine food webs as grazers of plankton and as prey for planktivorous predators in deep perialpine lakes which are characterized by the recurrent presence of toxic cyanobacteria *Planktothrix rubescens*. Consequently, these cladocerans represent a potential way of cyanotoxins transfer to the planktivorous fish. Thus, the understanding of their trophic interactions is critical. In this respect, a promising strategy for assessment of feeding of metazooplankton is the use of prey specific nucleic acid molecules as biomarkers of trophic transfer (Nejstgaard et al 2008). In this study, we focused on the DNA-based detection of toxic *P. rubescens* in *Daphnia* diet by qPCR. To develop the assay, we conducted laboratory feeding experiments using *D. hyalina* fed either with *P. rubescens* alone or with an equal mix of *Scenedesmus* and *P. rubescens*, as model systems. Several methodological questions were addressed to evaluate the DNA extraction methods from *Daphnia*, to determine digestion time of *P. rubescens* and the minimum number of *Daphnia* sufficient for this molecular tracking. In parallel, we tested potential inhibition for *Planktothrix* quantification by qPCR. We also performed in situ sampling to compare the intake of toxic *P. rubescens* for different metazooplankton organisms including *Daphnia*, *Bosmina* and *Chaoborus*, isolated from lake Hallwilersee (Switzerland) characterized by blooms of *P. rubescens*. DNA originated from *P. rubescens* was unambiguously detected in DNA extracts from cladocerans in Lake Hallwilersee samples. The experimental results suggest that the quantification of prey items by qPCR is likely to be used to estimate the feeding rates and potential for cyanotoxins transfer.

Reference:
(1) Nejstgaard J *et al.* (2008) *Marine Biology* **153**:565-577.

T9-O98 **Estequiometría ecológica y homeostasis en la red trófica de un río Pampeano rico en nutrientes**

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The theory of ecological stoichiometry generally accept that heterotrophs display a higher degree of stoichiometric homeostasis than autotrophs, which tend to closely follow the variation of dissolved nutrient concentration. In this study, we analysed the elemental content [carbon (C), nitrogen (N), and phosphorus (P)] and the stoichiometric ratios (C:N, C:P and N:P) of organisms from different trophic levels (producers, macroinvertebrates, and fishes) of an enriched Pampean stream during 22 months. We investigated whether P and N contents of the biota were consistently higher than in other systems with lower nutrient conditions. The effects of additional enrichment on the stoichiometry of the biota was analysed by a fertilization experiment. The degree of homeostasis was determined in pairs of organism-resource, which were established by stable isotopic signatures, analysis of gut content in macroinvertebrates, and field and bibliographic information. The organisms were generally more enriched in P than in C and N when compared with other stream biota. Epipelon and epiphyton were the only primary producers that responded to the enrichment through an increase in their P content and a decline of the stoichiometric ratios. Increases in P content were also observed in macroinvertebrate scrapers, filterers and predators but they were not reflected in concomitant changes in the stoichiometric ratios. We can conclude that the biota of the Pampean stream generally showed a high P content and a substantial degree of stoichiometric homeostasis in all trophic levels. Both features explain the lack of response to the moderate P addition in most producers and consumers.

T9-O203 **What's for lunch? Density-dependant diet or high selectivity food choice of *Barbus meridionalis*?**

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The Optimal Foraging Theory (OFT) propose that organisms forage to maximize their net energy intake per unit time, looking for the equilibrium among costs (e.g. handling time) and benefits (e.g. prey energy content). Last studies emphasize the importance of body size as key trait in the OFT, as size is a component of both the costs and benefits of foraging. We examined a case study, food choice of *Barbus meridionalis* by a field mesocosms experiment in an intermittent Mediterranean stream (Vall d'Horta, NE Spain), before the total pool disconnection. We analized barbel gut contents, and we compared it with benthic composition using Jacob's index of electivity. Our results showed deep differences between macroinvertebrate community and gut content composition. *Cricotopus* sp. was barbel main prey (>50%), followed by *Habrophlebia* sp., and *Zavrelimyia* sp. Mean electivity for benthic macroinvertebrates was significantly negative, although the electivity of *Cricotopus* sp., *Habrophlebia* sp. and *Stictonectes* sp. was positive. We also explored macroinvertebrate biological traits. Significant selectivity of body size was detected. Barbel diet was dominated by crawlers, but their electivity was negative, probably due to the high cost of hunting more mobile taxa. On the other hand, attached organisms and burrowers were positively selected. In conclusion, our results indicate that size could act as bottleneck in diet choice, but others traits such as mobility and microhabitat could be similar in importance, due to their influence in pursuit and subduing time. Scientific knowledge about invertebrate ecology is necessary to understand the effects of barbel presence in the structure and functioning of stream ecosystems.

T9-O413 **Allochthonous carbon increase the effects of filter feeding fishes on plankton communities**

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Allochthonous inputs of detritus and multichannel omnivory are ubiquitous features of inland water ecosystems but it is still unclear how they interact to affect food web structure and dynamics. The aim of this study was to test their effects on community regulation with a mesocosm experiment where inputs of allochthonous detritus were manipulated in the presence and absence of an omnivorous filter-feeding fish (Nile tilapia) and the response of an aquatic community was monitored. The input of detritus increased algal and zooplankton biomass through nutrient enrichment while omnivorous fish reduced zooplankton biomass but did not affect algal biomass. This negative effect of fish on zooplankton biomass was stronger when allochthonous detritus were added to the mesocosms. This suggests that allochthonous detritus enhances the top-down control of fish on zooplankton as predicted, but does not produce stronger trophic cascades if increased algal production is also consumed by fish.

T10- Invasive species

T10-O15 **Remote sensing approaches to detect *Arundo donax* invasions in riparian habitats**

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The giant reed (*Arundo donax* L.) is amongst the one hundred worst invasive alien species of the world (Lowe *et al.*, 2000). In Portugal the giant reed is mainly widespread in southern and western coastal rivers where it frequently forms monotypic stands responsible for biodiversity loss and failure of many riparian ecosystem functions. Usually, giant reed invasions have been identified through field surveys. However, remote sensing techniques are less costly and time consuming with the advantage of covering large and inaccessible areas. In this work, we explored the use of remote sensing approaches for the detection of giant reed invasions, through the characterization of the spatial structure of invaded areas together with the spectral signature of this species. High Resolution Airborne Images (pixel 50 cm) were used to describe the spatial structure of giant reed, through the calculation and analyses of landscape metrics. Spectral samples were collected using a field spectrometer to assess the spectral separability between the giant reed and the surrounding vegetation. The results showed that riparian areas invaded by giant reed are composed by simple, elongated and highly-connected patches whereas the native woody riparian vegetation display large, detached and complex shapes. In addition, the giant reed was spectrally detachable from the surrounding woody and herbaceous vegetation, both in the vegetative and in the senescence period. Giant reed stands regenerated after mechanical harvesting were more spectrally separable from the surrounding vegetation than the stands that were not subjected to control measures. The combination of spatial and spectral information derived from remote sensing can be used for detecting, mapping and monitoring giant reed invasions.

References:
(1) Lowe S *et al.* (2000) *100 of the World's Worst Invasive Alien Species. A selection from the Global Invasive Species Database. Published by The Invasive Species Specialist Group (ISSG) a specialist group of the Species Survival Commission (SSC) of the World Conservation*:1-12.

T10-O169 **Waterfowl as potential vector enhancing spread of non-native amphipod *Crangonyx pseudogracilis***

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A set of experiments was performed in order to investigate if passive dispersal by animal vectors may play a valid role in the colonization process by *Crangonyx pseudogracilis*, an invasive amphipod of North-American origin. The mallard (*Anas platyrhynchos*) was used as model organism which can facilitate the spread of aquatic invaders. A dead mallard was dragged and immersed under different conditions in water containing amphipods with a density of 400 ind. m^{-2}. The goal was to test if *C. pseudogracilis* is able to adhere to duck's feathers and to its paws. Thus, mallard legs were immersed under different time intervals into plastic containers with amphipods. The aim of another experiment was, while simulating the swimming behaviour of a duck, to check if some *C. pseudogracilis* would adhere to mallard's feathers. A third experiment was performed to check if *C. pseudogracilis* can survive adhered to the duck during the flight. Finally, desiccation resistance of this species was analysed under fixed temperature conditions. We obtained probabilities of amphipods adhering to duck's paw of 0.2%, 2% and 2.4% for immersion periods of 1, 5 and 10 seconds respectively. In the experiment where a duck was placed without any movement into containers with amphipods, no ectozoochory was detected. Nevertheless, for experiment in which swimming activity was simulated we obtained a transport probability of 1.84%. A probit analysis provided that *C. pseudogracilis* may survive and stay attached to a flying duck for a distance of 6.8 km with LT_{90} of 5.4 minutes. Additionally, the same statistical test unveiled that our tested species can undergo exposure to air and stay alive with LT_{90} of 88.6 minutes. In light of these results, we conclude that waterfowl may enhance the spread of *C. pseudogracilis*.

T10-O205 **Consequences of the presence of the red swamp crayfish (*Procambarus clarkii*) on ecosystem functioning: a mesocosm study**

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The red swamp crayfish is an exotic species present in Europe since 1973 and nowadays is established, with permanent populations, in nine European countries. It has been identified to be responsible for strong modifications in the invaded ecosystems and thus causing many conservation concerns. Much of the impacts caused by this crayfish species deal with trophic interactions but it has also an effect on physical conditions of the habitat. Our aim was to assess how an invasive species can stress biodiversity and ecosystem functioning in wetlands. We did an outdoor experiment with 30 mesocosms (300 L) with two experimental crayfish densities (1 ind m^{-2} and 3 ind m^{-2}) plus controls, 10 replicates each. They were flooded in late autumn, following the normal hydrological cycle of a temporary pond in the

Mediterranean region. They were kept untouched and opened to allow the development of macrophytes and microinvertebrates communities and the their colonization by macroinvertebrates and amphibians, until the introduction of crayfishes in spring. Afterwards we sampled macrophyte community composition and biomass, and turbidity and chlorophyll a concentration fortnightly, and macroinvertebrates, tadpoles and microinvertebrates monthly during twelve weeks. In this presentation we are going to discus the significant shifts found on macrophytes biomass, turbidity, taxonomic richness, and diversity to show some insights of the consequences of diversity modification by an exotic species on the whole ecosystem functioning.

T10-O250 **Macro-scale drivers of crayfish invasions in Europe: the problematic Signal crayfish and Red swamp crayfish**

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A major goal of invasion ecology is to identify which factors enable non-native species to establish viable populations. Here we test the relative importance of human, biological and environmental factors in shaping the current distribution of two of the most widespread freshwater invaders of Europe, the Signal crayfish and the Red swamp crayfish. We collected a set of spatially explicit variables specifically related to four well known invasion hypotheses: propagule pressure, climate matching, human disturbance and the biotic resistance hypotheses. Using boosted regression trees we built predictive models relating these variables with the current macro-scale pattern of distribution of each invader in Europe. Model predictions attained a high accuracy for the two invaders (mean ROC-AUC≥0.91). Propagule pressure and climatic suitability were identified as the primary drivers of invasion, but the former had a much higher relative influence for the Red swamp crayfish. Climate matching was shown to have limited predictive success, since climatic suitability models based on occurrences from other invaded areas attained a consistently higher relative explanatory power. Biotic resistance and human disturbance were also shown to be of reduced importance in shaping the distribution pattern of these invaders. Obtained results are important for advancing on the general knowledge of the factors that enable certain species to become notable invaders. Being primarily driven by propagule pressure and climatic suitability, we expect that, given a continued dispersal, the future distribution of these problematic decapods in Europe will increasingly become a spatial representation of their fundamental climatic niche.

T11-Lentic ecosystems

T11-O124 **Propuesta de mejora para el control del estado ecológico de los lagos de la cuenca del Ebro**

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La Directiva Marco del Agua establece la necesidad de poner en marcha programas de control que permitan el seguimiento del estado ecológico de los lagos. Durante el periodo comprendido entre los años 2007 a 2010 se ha efectuado el seguimiento de 60 lagos en la cuenca del Ebro. De ahí se han seleccionado, mediante criterio experto, 20 masas de agua de referencia de las 15 tipologías que se muestrean. Durante estos cuatro años se ha ido evaluando la mejor tecnología disponible. Para determinar el estado ecológico de una masa de agua de la categoría lago se deben valorar las condiciones biológicas, físico-químicas e hidromorfológicas, a través de los elementos de calidad correspondientes, y después comparar las condiciones actuales con las condiciones de referencia. Al mismo tiempo de la realización de este estudio, durante los años 2009 y 2010, el CEDEX ha publicado diversas propuestas de establecimiento de condiciones de referencia y valores frontera en lagos para elementos de calidad biológicos, físico-químicos e hidromorfológicos. Este estudio ha aplicado las propuestas del CEDEX, las del Ministerio de Agricultura, Alimentación y Medio Ambiente, así como el criterio experto. La mayoría de los lagos muestreados entre 2007 y 2010, 37 de los 60 lagos (62%) se han mantenido siempre en un estado ecológico final bueno o muy bueno. Fruto de este estudio se considera necesario revisar para algunos lagos las tipologías establecidas por el CEDEX en el 2008, así como los valores frontera o la tipología para los elementos de calidad físico-químicos y, dentro de los elementos biológicos, para la riqueza de especies de macrófitos.

T11-O237 **The additive partitioning of macroinvertebrate diversity in tropical reservoirs**

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Knowledge of the ways that diversity changes across spatial scales is important for the conservation of biodiversity. The objective of this study is to characterize the diversity of aquatic macroinvertebrates in three Brazilian tropical reservoirs and to verify how the organisms are distributed over different spatial scales. We compared the diversity partition with the null hypothesis that the macroinvertebrate community is uniform over all the spatial scales investigated. We expect that environmental variability between the reservoirs and the limitation of the dispersal of organisms would reflect higher biological variability (beta diversity). The results of the spatial partitioning analysis of species richness in the reservoirs showed that each Ekman-Birge dredge sampling unit (α), on average, retains lower diversity than expected from the null hypothesis (Propexp>obs = 0.999). The diversities β1 (among Ekman-Birge dredge sampling units) were significantly higher (Propexp>obs < 0.001) but were lower than the value expected under the

null model of randomization of sampling units. The partitioning of the overall spatial diversity indicates that this effect is more pronounced at the lower hierarchical levels analyzed for the reservoirs.

T11-O358 **Dynamic of the phytoplankton functional groups during annual cyanobacterial dominance in a tropical reservoir**

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Harmful cyanobacterial blooms are a troubling indicator of advanced eutrophication. In arid and semi-arid regions, it assumes serious proportion as the rainfall is dwindling, infrequent, unpredictable and disproportionally distributed. The situation forces an extreme scarcity of water resource for northeast Brazil, and the freshwater resource is now facing a threat from cultural eutrophication and frequent bloom formation of potentially toxic cyanobacteria. Cruzeta reservoir (z_{max}=10 m) is an eutrophic tropical reservoir, located in the semiarid region (Northeast, Brazil). The aim of this study was to analyse the variation of the phytoplankton functional groups during an entire year with cyanobacteria dominance (average 94% of the total biomass), and to verify the related driving forces. A shift of nitrogen-fixing cyanobacteria (codon SN) and non nitrogen-fixing (M) was observed. Redundancy analysis indicated that physical factors such as temperature, dissolved oxygen, chlorophyll a and soluble reactive phosphorus were the main driving factors of the seasonal succession. The dominant functional group SN and S1, represented, respectively, by *Cylindrospermopsis raciborskii* and *Planktothrix* sp. + *Gleiterinema* sp., dominated in the rainy period, with higher values of dissolved oxygen and chlorophyll a. The codon M, represented by *Microcystis panniformis* and *Sphaerocavum brasiliensis*, bloomed in warm stable waters during the dry season, with higher temperatures and high nutrient availability. Despite all the long-standing dominance period of cyanobacteria showed high input of nutrients, other factors driven by the temporal change might be a more plausible explanation to promote changes in phytoplankton composition, especially physical variables.

T11-O397 **Identificação de zonas de transição em um reservatório no sul do Brasil**

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As zonas de transição entre rio e reservatório apresentam locais de importante variação das características da água. Este trabalho identificou as principais zonas de transição no reservatório Passo Real no Estado do Rio Grande do Sul – Brasil. Para o seu desenvolvimento foram utilizados trabalhos de campo, com identificação das características da água, e imagens dos satélites Landsat e MODIS (Moderate Resolution Imaging Spectroradiometer). A amostragem do reservatório consistiu na coleta de dados em 31 estações amostrais nas quais foram medidos os valores de pH, condutividade elétrica, transparência da água, totais de sólidos em suspensão e clorofila a. A partir dos dados das variáveis limnológicas foram identificadas a sua distribuição espacial a registradas em mapas do reservatório com interpolação dos dados em um programa de geoprocessamento. As imagens de satélite foram utilizadas para identificar a abrangência dos diferentes tipos de água. Os dados de campo permitiram identificar que a zona de transição sofre modificação de sua localização em função da precipitação pluviométrica e do contexto hidrodinâmico do compartimento aquático. Houve boa relação entre as imagens de satélite e dados de campo. Neste sentido, as imagens de satélite permitiram identificar a localização e gênese das zonas de transição do rio para reservatório. Em relação à clorofila a foi possível observar que a sua ocorrência e distribuição espacial foram associadas às zonas de transição e às condições climáticas.

T11-O437 **Limnological features of a tropical Amazonian reservoir (UHE Santo Antônio do rio Madeira) in its filling phase**

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The Madeira River is the main tributary of the Amazon River. In terms of water flow, the Madeira River is the fourth greatest river in water volume in the world, with flows over 40,000 m^3s^{-1}, making it very attractive for hydropower generation. Currently, there is a hydropower plant (Usina Hidrelétrica de Santo Antônio no rio Madeira) being implemented in the vicinity of Porto Velho (Rondônia, Brazil), with a power generation capacity of 3,150 MW. The reservoir that supports the plant occupies an area of 271 km^2, of which 164 km^2 ecompasses the Madeira River's natural riverbed. Prior to the impounding, which started in early September 2011 and was completed in late January 2012, around 80% of the vegetation present on the flooded area was removed. The remaining 20% went under water when the reservoir reached full capacity in September 2011. Between October 2011 and March 2012 vertical profiles of water temperature, dissolved oxygen, pH, electrical conductivity and turbidity were measured daily at every 10 cm in the Madeira River water column and inthree of its tributaries upstream the dam. The measurements were performed with a multiparameter probe (Yellow Springs YSI 6920 v2-2). With the flooding of the remaining vegetation, the metabolic processes and stratification dynamics were monitored and compared with data previously recorded, before the impounding. The high flows and the low residence time of the water caused hypoxia patterns different from those usually found during the filling of tropical reservoirs. Moreover, the hydraulic barrier and density differences between the water of the Madeira River and the tributaries' produced atypical limnological features, such as the occurrence of a hypoxic epilimnion and a well-oxygenated hypolimnion.

T12-Microbial ecology

T12-O131 Dinámica estacional de Epsilonproteobacteria y Bacterias Verdes del Azufre en un lago cárstico meromíctico

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Los lagos cársticos con interfases óxico-anóxicas ofrecen un nicho óptimo para el crecimiento de microorganismos implicados en transformaciones del azufre y donde las diferentes poblaciones pueden interactuar y competir directamente por los recursos. En este trabajo hemos estudiado la dinámica estacional de Epsilonproteobacteria (EPS) y Bacterias Verdes del Azufre (GSB) en una cubeta meromíctica del lago de Banyoles mediante CARD-FISH y sondas específicas para ambos grupos. Los resultados han mostrado una clara estacionalidad en la abundancia de EPS, con un valor máximo en invierno (~50% del recuento total con DAPI) y valores mínimos en verano (~6% del total). Por su parte, las poblaciones de GSB mostraron una tendencia inversa, llegando a concentraciones máximas en primavera (67% del total), disminuyendo en otoño (20% del total) y principalmente en inverno (~5%). El análisis en paralelo de bibliotecas de clones para el gen del 16S rRNA no solo corroboró el patrón estacional observado sino que permitió identificar los filotipos predominantes de ambas poblaciones (*Arcobacter* spp. y *Chlorobium phaeobacteroides* para EPS y GSB, respectivamente). Estos datos sugieren una dinámica estacional gobernada por una competencia por los recursos, en este caso sulfhídrico. Así, las poblaciones de GSB dominarían en verano debido a un mayor rendimiento de su metabolismo fotosintético en los meses de mayor insolación. En invierno, la drástica reducción en la intensidad lumínica limitaría la fotosíntesis anoxigénica, favoreciendo la actividad de las bacterias quimiolitotróficas del azufre (EPS). Desde el punto de vista ecológico, es interesante destacar que la redundancia funcional del sistema permite mantener la actividad oxidadora de H_2S a pesar de la alternancia de los agentes microbianos implicados.

T12-O133 Experimental approach to assess microbial food web interactions in the pelagic environment of stratified lakes

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Microbial food webs in pelagic environments show a complex set of dynamic interactions between organisms (e.g., predation, symbiosis) and abiotic factors (mostly light and nutrients). Meromictic lake La Cruz (Spain) has become a useful "model system" for the study of some of these microbial interactions. During summer, this lake presents a strong stratification which generates sharp physicochemical gradients (light, oxygen, nutrients, redox potential), thus allowing the coexistence of many different microbial metabolisms and complex interactions among microbes. In this work, we characterized the microbial food web structure and we assessed primary and secondary production in the water column. Moreover, we have performed an experimental approach to assess some functional aspects of this microbial food web. The first set of experiments was made to elucidate the phosphorus dynamics in the lake, which markedly showed unusual and luxurious high short-term uptake rates for this nutrient by microorganisms. Other in situ experimental setting consisted in a fully factorial design in which different levels of inorganic nutrients, grazing pressure and light availability were crossed. Finally, we estimated the potential grazing pressure exerted by nanoflagellates and ciliates over the most abundant picoplankters (bacteria and picocyanobacteria) by using flow cytometry and fluorescently labeled bacteria. In summary, our results prove the occurrence of a complex set of interactions between organisms, as a result of an unequal availability of light and nutrients throughout the vertical profile. These studies will likely allow us to draw more accurate models to better understand the functioning of complex microbial food webs.

T12-O178 Structure and function of bi-layered microbial mats from Byers Peninsula (Antarctica)

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Byers Peninsula is one of the largest ice-free areas in the Antarctic Peninsula. The environmental conditions in the site are suitable for the extensive growth of mat-building microorganisms. We provide a general description on the structure and functioning of the microbial mats dominating the site. The examination of samples revealed the occurrence of several cyanobacterial morphotypes and diatoms. Structural analysis indicated that these mats face stressors, such as UV radiation, lack of moisture or nutrients deficiency. They usually form cohesive and laminated structures. This archetypal structure involves a thicker, unstructured and inactive surface layer, largely composed of empty sheaths and shells, and a subsurface stratum assembled by a competent photosynthetic biomass with a more equilibrated stoichiometric composition. The carbon uptake in mats ranged from 2.7 to 4.2 μg C cm^{-2} h^{-1}. The oxygen profiles showed a shape with surface concentrations which were at equilibrium with the overlying water and increscent with depth until supersaturation in the first millimetres. Nitrogen metabolism varied among mats, with N2 fixation and the assimilation of combined forms being respectively higher and lower in different communities. An experiment performed in one of the mats indicated that assimilative and loss processes were closely balanced, translating into no mat build-up despite nutrient enrichment, still, it caused functional and structural alterations. For instance, the phototrophic activity was improved when nutrient availability was balanced. We underscore the ecological importance of these communities in the site as they may represent a significant input of allochthonous organic carbon for the unproductive pelagic food webs of nearby lakes.

T12-O244 **Spatial variability of sediment microbial functioning in a Mediterranean river**

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Heterotrophic microorganisms, especially bacteria, play an important role in degradation, uptake and mineralization of organic matter in river sediments. The functioning of sediment biofilm was characterized in a Mediterranean river located in North East of Spain (Tordera River). Twenty-one sites were selected in order to define spatial variability along the river. The main objective was to determine the fluctuations in sediment microbial functioning as a response to changes in water inputs of organic and inorganic matter. We estimated the bacterial density and viability, extracellular enzyme activities involved in the degradation of recalcitrant and labile compounds, respiration activity, and functional diversity by using Biolog Ecoplates technique. There was a significant spatial variation in sediment biofilm parameters separating the headwaters, the middle and lower parts of the Tordera River. The headwater was characterized by higher β-glucosidase and β-xylosidase involved in the degradation of cellulose and hemicellulose, probably linked to a greater input of allochthonous material. At lower reaches, the use of peptides and lignin compounds increased, together with respiratory activity. Enzymatic activity standardized per sediment organic matter showed a decrease in the middle part, while the functional bacterial diversity increased suggesting ability for degrading broader groups of carbon sources. However, specific highly-impacted sites showed lower functional bacterial diversity and percentage of live bacteria, but bacterial community had higher capacity to degrade recalcitrant compounds (polymers). These results show that it is necessary to use complementary functional parameters to define different impacted river sites.

T12-O398 **Segregación de comunidades de archaea y diseño de herramientas moleculares específicas de linajes nocultivados**

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La interpretación filogenética de los datos moleculares obtenidos de comunidades biológicas es cada vez más útil para describir procesos e interacciones desde un punto de vista ecológico. Esto es de especial interés en ecología microbiana y, particularmente, para estudiar la biogeografía y patrones de segregación de las Archaea, un grupo de microorganismos compuesto por diversos linajes la mayoría de los cuales carecen de representantes cultivados. Aunque en los últimos años se ha progresado enormemente en el conocimiento de algunos linajes especialmente activos y ubicuos tanto en ecosistemas acuáticos como terrestres (ej: Thaumarchaeota), otros grupos que predominan en ambientes lacustres y sedimentos—como las Crenarchaeota del linaje Miscellaneous Crenarchaeotic Group (MCG)—constituyen un enigma desde diferentes puntos de vista (metabólico, fisiológico, genético y ecológico). El análisis filogenético y de patrones de distribución de las comunidades de Archaea en el sistema cárstico de Banyoles muestran una clara segregación de las comunidades. En concreto, las MCG llegan a representar entre un 55% y un 85% de la comunidad de archaea en el hipolimnion anóxico y los sedimentos de lagos cársticos, respectivamente. A partir de este análisis filogenético y gracias al elevado número de secuencias del gen del 16S rRNA pertenecientes a MCG hemos diseñado cebadores de PCR específicos para este linaje que se han aplicado para la detección y cuantificación selectiva de este grupo de archaea en diferentes muestras ambientales. La interpretación de esta información molecular en combinación con los datos ambientales nos ha permitido identificar sus patrones de distribución y esclarecer cual es su papel dentro del ecosistema.

T12-O460 **Exploring in *Aphanizomenon* the relationship between cylindrospermopsin content and expression of *aoa* genes**

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Several bloom-forming cyanobacteria produce the toxin cylindrospermopsin (CYN), an alkaloid with diverse cytotoxic effects. The most representative CYN-producing species in the Mediterranean region, that appears to be spreading out, is *Aphanizomenon ovalisporum*. Although the CYN synthesis mechanism is not yet elucidated, there are sound experimental data indicating that similar clustered genes are involved in the species so far studied. In *A. ovalisporum*, these genes are named *aoa*. We were interested to know if CYN production is governed by gene expression in *A. ovalisporum*. For that, experiments were conducted with batch cultures of a strain isolated in our laboratory, grown in BG11 medium at 28 ºC and 60 µmol photons. m^{-2} s^{-1}. During 9 days it was daily analysed: 1) the CYN content, total as well intracellular and external, by HPLC; and 2) the expression of 3 *aoa* genes, *aoa*A-C, by quantitative RT-PCR. The results clearly showed that: i) total CYN per biomass hardly varied between the second and fifth day, while steadily increased between the fifth and the ninth, when the culture was still at mid exponential phase. This CYN increment seemed to be due to the external CYN; ii) the expression of each of the 3 *aoa* genes analysed followed a different pattern along the culture growth. Curiously, at the ninth day a conspicuous gene transcription rise of the 3 genes took place. Taking together, the most interesting result is that no correlation was observed between the expression of the three *aoa* genes analysed and the CYN content.

T13-Multiple stressors

T13-O81 **Respuestas de los macrófitos a cambios en el nivel de eutrofización y de la radiación ultravioleta-B**

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En ecosistemas de aguas someras, la eutrofización y la radiación son dos de los factores más influyentes en el desarrollo de las poblaciones de macrófitos. El objetivo de este trabajo ha sido comprobar si existe un efecto negativo del aumento de productores primarios planctónicos (competencia por luz y nutrientes) y qué efectos tiene el incremento de la proporción UV-B/PAR en el desarrollo de macrófitos, así como la interacción entre ambos factores. En el laboratorio se han llevado a cabo varias experiencias con diferentes especies de macrófitos (los carófitos *Chara hispida* var. *baltica*, *C. hispida* var. *hispida*, *C. vulgaris y Nitella hyalina* y la fanerógama acuática *Myriophyllum spicatum*), simulando diferentes niveles de eutrofización (sin fitoplancton, y con dos concentraciones de fitoplancton diferentes) y al mismo tiempo, con distintas proporciones de radiación UV-B/PAR (sin UV-B, con UV-B similar a la ambiental y con UV-B aumentada). Como variables se han seguido las tasas de crecimiento, y las concentraciones de pigmentos y compuestos absorbentes de radiación UV (CARUV, de vacuolas y de pared). Se ha comprobado que la tasa de crecimiento de los macrófitos estudiados se ve reducida en presencia de UV-B y que algunas de estas especies aumentan la concentración de CARUV a medida que la proporción UV-B/PAR aumenta. Además, la interacción del aumento de la concentración de fitoplancton y la radiación UV-B tiene un efecto sinérgico negativo, como se demuestra en *N. hyalina*. La comprensión de estos mecanismos puede ser clave para la gestión y restauración de ecosistemas acuáticos cuya base sea la vegetación sumergida.

T13-O121 **Concordance between realized and fundamental niche in *Sigara* along a salinity and anionic gradient**

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Determining the extent to which physiological tolerance of species shapes their occurrence throughout habitats is essential when assessing population viability under potential threats, such as habitat modifications or global warming, and also to understand species geographical distribution ranges. Complementary field and laboratory studies were used to understand different distribution patterns of three species of *Sigara* along a salinity gradient from freshwaters to hypersaline waters in the SE of Iberian Peninsula, one of the most arid areas in Europe. Niche breadth was quantified for stream water conductivity and anionic composition. In addition, physiological tolerance to conductivity and anionic composition was estimated in an experimental approach for eggs, nymphs and adults of each species. Salinity and anionic composition tolerance, especially for the most sensitive young life-states (eggs for the freshwater species, and nymphs for the saline species), explained most of the differences in the distribution of *S. nigrolineata*, *S. scripta* and *S. selecta* found along the salinity gradient. Coexistence of *S. scripta* with the other species can be explained by the overlapping conductivity and anionic composition niche at the low and upper limits of tolerance. There was no physiological limitation for the exclusion of *S. selecta* from freshwaters and less saline waters, and other factors concerning interspecific competition could play an important role for this species. Further research on other physiological and biological traits such as osmotic regulation mechanisms, ionic balance, phenology, reproduction, resistance of eggs to drought, microhabitat preferences, feeding niche or dispersal ability could be of great interest to our understanding of niche differentiation.

T13-O409 **Regulation effects on riparian vegetation composition and structure in the Sado River basin (Portugal)**

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Reduced frequency of flood scour caused by upstream reservoir construction has permitted the establishment of riparian vegetation in the active channels of many rivers in Mediterranean climate, while the increase extent of intensive agriculture on floodplains has displaced habitats there at a large scale. Using historical and recent aerial photographs, we mapped vegetation change downstream of reservoirs constructed from 1949-1978 in the Sado River basin in the Alentejo region of southern Portugal. Unvegetated active channel width decreased an average of 21%, as woody vegetation established in the formerly scoured channels. A substantial portion of this vegetation is nonnative or naturalized cultivars, or else terrestrial upland species. Vegetation surveys for 386 sites identified for the E.U. Water Framework Directive indicate that non-riparian plant cover was higher at sites adjacent to dams compared to sites further away, and this was consistent across sites with varying human impacts. Vegetation encroachment in Mediterranean regions and other biomes tends to reduce habitat diversity because, over time, all stands tend towards later successional stages. Moreover, establishment of vegetation in the channel can reduce channel capacity to convey floods, and thus create a flood risk at lower discharges. In addition to the direct effects on the channel, the diversion of water for irrigation and other uses may induce profound land-use changes on the floodplain, changing the extent and quality of riparian habitats.

T15. Restoration of aquatic ecosystems and ecological services

T15-O74 El Tancat de la Pipa (Parc Natural de l' albufera de València) tras tres años desde su restauración

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El Tancat de la Pipa es una zona restaurada desde 2008 a partir de un antiguo arrozal de 40 ha. Los trabajos de adecuación de la zona llevados a cabo por parte de la Confederación Hidrográfica del Júcar consistieron en la creación de un *ullal* (surgencia de agua), un sistema de filtros verdes (fitodepuración) y dos lagunas someras. El llevar a cabo una buena práctica de restauración ecológica implica el seguimiento post-restauración de varios indicadores. Así, durante más de tres años se ha medido una serie de variables limnológicas (bióticas/físico-químicas) para evaluar si la evolución del humedal actual se produce en el sentido deseado. Actualmente el ullal posee una gran estabilidad ecológica, mediada por la retroalimentación positiva entre la propagación de carófitos y la transparencia del agua y constituye uno de los lugares del Parque con un mayor desarrollo de carófitos. Las lagunas han mejorado su potencial ecológico, de deficiente-moderado al inicio a moderado o bueno-máximo. Éstas, junto con los filtros verdes, constituyen lugares donde se produce un control "desde arriba" del fitoplancton y donde la producción zooplanctónica (mediada por el desarrollo de vegetación) se exporta por sus efluentes. Se ha constatado: (i) aumento de la biodiversidad en muchas comunidades biológicas en relación a otros entornos del Parque, (ii) evidente reducción de nutrientes: alrededor del 50-40% del PT y NT de las aguas que circulan por las lagunas se reducen en sus efluentes, (iii) reducción del 30% en la concentración de clorofila entre las aguas fuertemente eutrofizadas de las entradas al sistema en comparación con las de la salida, etc. Estos resultados ponen de manifiesto el elevado número de servicios fundamentales que este ecosistema proporciona en la actualidad.

T15-O110 Servicios ecosistémicos de los ríos y riberas españoles desde la evaluación de los ecosistemas del Milenio

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Los servicios de los ecosistemas son las contribuciones directas e indirectas que los ecosistemas proporcionan al bienestar humano. La evaluación de los servicios de los ecosistemas de España (EME; www.ecomilenio.es) considera tres tipos esenciales: de Abastecimiento (provenientes de la estructura biótica y geótica de los ecosistemas, como alimentos, agua, energías renovables), de Regulación (provenientes del funcionamiento de los ecosistemas como clima saludable, control de la erosión, fertilidad del suelo) y Culturales (contribuciones intangibles que la población obtiene a través de su experiencia con los ecosistemas y su biodiversidad como el sentido de pertenencia, conocimiento ecológico local, ocio). Para evaluar el estado y tendencias de los servicios que generan los ríos y riberas españoles se han utilizado 138 indicadores de distinta índole, seleccionados y priorizados según los criterios definidos por EME. En síntesis, de los 21 servicios analizados, 14 de ellos (66,7%) se están degradando o utilizando de manera insostenible. Los más afectados son los de regulación y los culturales relacionados con el saber popular, el conocimiento ecológico local y la identidad cultural. En contraposición, algunos servicios de abastecimiento tecnificados (como las plantaciones de choperas, acuicultura, etc.) y los culturales demandados por la sociedad urbana (ecoturismo, educación ambiental), están aumentando. Los ríos y sus riberas son el capital natural que proporciona servicios básicos para la supervivencia y bienestar de los españoles. La gestión sostenible de los ecosistemas acuáticos, hay que integrarla en el espacio de las cuencas hidrológicas, conexionando y coordinando las políticas hídrica, agrícola y forestal.

T15-O149 Metodologia de avaliação do estado ecológico e definição de medidas de requalificação: o caso do rio Corgo

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O Rio Corgo atravessa vários quilómetros de tecido habitacional e industrial em evolução e crescimento, e está a ser objeto do programa de ordenamento que visa encontrar medidas de proteção e requalificação de habitats, assegurando a conetividade do rio com os troços a montante e a jusante, e minimização de efeitos antropogénicos que podem degradar a biodiversidade existente e destruir o potencial da região em termos de espécies de interesse conservacionista. Na primeira etapa, de determinação do estado ecológico, foram realizadas, em 12 pontos de amostragem, no troço urbano e em zonas menos intervencionadas, análises físico-químicas, e uma detalhada caracterização hidromorfológica, utilizando o método RHS (River Habitat Survey) e QBR (Qualitat del Bosc de Ribera). Paralelamente determinou-se o índice IBMWP através da recolha de macroinvertebrados e procedeu-se à caraterização do habitat usado pelas espécies piscícolas autóctones dominantes, por determinação das respetivas curvas de preferência. Curiosamente determinou-se que o estado ecológico no trecho urbano era superior ao segmento a jusante da cidade. Os dados permitiram revelar que os ciprinídeos autóctones apresentavam curvas de preferência idênticas, nomeadamente uma maior abundância em habitats de pedras com mais de 30 cm de diâmetro e vegetação aquática submersa, com substrato de leito rochoso, baixas velocidades (0-0,1 m s^{-1}) e profundidades entre os 21-30 cm ou 41-50 cm. Estas informações permitem definir o tipo de requalificação a nível de micro-habitats mais adequada, bem como medidas de intervenção mais alargadas destinadas a restaurar a conectividade e a melhorar a qualidade da água, como a eliminação de alguns açudes e controlo dos efluentes domésticos que afetam o Rio Corgo a jusante do seu troço urbano.

T15-O289 Modeling phosphorus binding capacity of Phoslock® for controlling cyanobacterial blooms in Cazalegas Reservoir

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System dynamic approaches used in ecological modeling offer a wide

framework for the simulation of processes involved in aquatic ecology. In that extent, an eutrophication model has been developed to recreate the fate of phosphorus (P) in the eutrophic reservoir of Cazalegas (Tagus River Basin, Spain) in order to assess the applicability of a new substrate capable of binding Soluble Reactive Phosphorus (SRP) effectively. The substrate, called Phoslock®, is a lanthanum modified clay which works as a P removal agent under anoxic conditions and a wide range of pH in stagnant waters. The model accounts for the availability of SRP in both water and sediment in relation to a mixture of abiotic and biotic feedbacks by which the occurrence of cyanobacteria is triggered or declined. Recent monitoring programmes carried out in Cazalegas have revealed critical levels of toxic cyanobacteria such as *Aphanizomenon flos-aque* and *Mycrocistis aeruginosa*, among others, which could lead to water cut offs or bathing restrictions in worst cases. In view of that, the aim of the model is: to simulate the SRP availability considering both external and internal loads, to predict the effect of SRP concentration as a driven factor for cyanobacterial growth and to determine the effectivity of Phoslock® as a management tool to reduce P concentrations to tolerable levels.

T15-O305 **Predicting the occurrence of aquatic plant species for restoration purposes in Pyrenean lakes**

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Macrophytes have diminished or even disappeared in Pyrenean lakes affected by hydroelectric exploitation. Macrophyte communities play a key functional role in these oligotrophic lakes by modulating water and sediment biogeochemistry and providing food, habitat and shelter for organisms. Given that some hydroelectric concessions are terminating, we aimed to assess functional restoration of lakes based on macrophyte recolonization. Specifically, our objectives were to model environmental factors determining the presence of macrophytes, and to predict expected macrophyte assemblages in target lakes. The objectives were achieved by fitting logistic and unimodal models of presence/absence for the most frequent macrophyte species. We used environmental variables and species presence/absence data for over 100 lakes from the Catalan Pyrenees. The presence of macrophytes was negatively related to dams and altitude. In addition, the presence of individual macrophyte species was related to factors such as geographic position, catchment and lake size, and water column chemical composition. For instance, the presence of *Isoetes lacustris* was positive related to pH and negatively related to NO_3^-, while *Sparganium angustifolium* was positive related to longitude, pH and Cl and negative related to lake area and K. In summary, dam removal seems necessary to recover macrophyte communities, and the potential of macrophyte species will depend on specific lake and catchment properties. Our results will support the development of adequate restoration strategies by defining environmental variables determining the presence/absence of macrophyte species and by forecasting the assemblage composition of a specific lake following restoration.

T15-O348 A**quatic plants as bioindicators of As, Cu, Pb, U and Zn in contaminated stream waters of Central Portugal**

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Several plants have evolved heavy metal tolerance strategies and detoxification mechanisms that enable them to survive, grow and reproduce in metal contaminated sites. Some of these aquatic plants have been reported to accumulate significant amounts of specific trace elements. This strategy provides a great interest in the identification of areas contaminated with both natural contaminants, originating from rocks or minerals deposits with large amounts of toxic elements, or urban, industrial or generated by the mining industry effluents. This work is part of a wider study, which is being developed across the central region of Portugal, including the uraniferous province of Beiras and constitutes a general description of the results obtained in aquatic species to use for bioindication of contamination and to the application of phytoremediation techniques from mining effluents. We found that the species *Callitriche lusitanica*, *Ranunculus tripartitus*, *Callitriche brutia* and *Lemna minor*, accumulate large amounts of arsenic, from 430 to 2346 mg kg^{-1} (DW). The species *Callitriche stagnalis*, *Fontinalis antipyretica*, *Callitriche hamulata* and *Potamogeton pusillus* accumulate uranium at concentrations from 365 to 1949 mg kg^{-1} (DW). The species *C. lusitanica*, *C. brutia*, *Fontinalis squamosa* and *C. stagnalis* accumulate zinc to a range of 1744 to 2313 mg kg^{-1} (DW). *Myriophyllum spicatum*, *Spirodella polyrhiza*, *L. minor* and *R. trichophyllus accumulate* lead to a values of 91 to 1104 mg kg^{-1} (DW). Finally C. stagnalis, *R. trichophyllus*, *C. hamulata* and *C. brutia* accumulate copper from 82 to 161 mg kg^{-1} (DW). We conclude that some of these species shows great potential for phytoremediation of contaminated effluents by these elements.

T15-O484 **La influencia de la implementación de un régimen de caudales ecológicos en la provisión de servicios ambientais**

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El agua que se recibe en una cuenca provee un conjunto de servicios ambientales que dependen de la fracción de agua que es usada por las plantas a través de la transpiración (agua verde) y del agua que circula por los ríos (agua azul. Los sistemas de gestión tradicionales sólo suelen prestar atención a la componente azul del ciclo, sin embargo el agua verde puede producir un conjunto de servicios ambientales que deben ser también considerados en la gestión del agua. Existen trabajos realizados en ecosistemas mediterráneos que han evaluado los cambios en la capacidad para generar servicios ambientales, al modificarse la porción de agua verde y azul por los cambios de uso del suelo (1). Sin embargo no se ha evaluado cómo puede influir el uso que se haga del agua azul una vez que esta fluye por los ríos, una propuesta de caudales ecológicos produciría un incremento de los servicios

ambientales relacionados con el agua azul y la no implementación de esa propuesta, podría derivar en un incremento de los servicios de agua verde. En ese trabajo se ha evaluado la modificación que se produciría en la generación de servicios considerando una propuesta de caudales ecológicos en la cuenca del río Trevelez (2), en la que un mosaico de agroecosistemas producen diversos servicios que dependen del reparto del agua en sus dos componentes. En este trabajo se ha comparado la división de agua verde y azul desde una situación natural en la cuenca, por otro lado se ha estimado la modificación de la componente azul con los usos actuales del agua del río y también con la propuesta de caudales ecológicos. Con estos tres valores se ha obtenido el cambio en la provisión de servicios ambientales, considerando los cambios que se producen en la componente azul del agua con los usos de la cuenca.

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T16. Tropical rivers

T16-O101 **Lixiviação e perda de massa inicial de espécies ripárias do cerrado brasileiro**

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A lixiviação promove tanto a perda de massa quanto mudanças na composição química original dos detritos, com uma perda de até 30% da massa original, dependendo da espécie de folha. Na maioria dos estudos de decomposição, a lixiviação é negligenciada, principalmente em sistemas tropicais. O objetivo foi comparar a lixiviação dos compostos solúveis de nove espécies ripárias do cerrado brasileiro, em um experimento de microcosmos. Construiu-se 24 "litter bags" (10 mm de malha), com 2,0 ± 0,01 g de peso seco ao ar de cada espécie e sete sacos de cada uma foram incubados em três microcosmos, com água do córrego aerada e agitada. Os sacos foram retirados após 1, 2, 3, 5, 7, 10 e 15 dias. Os resultados indicaram que *Emmotum nitens* e *Richeria grandis* apresentaram uma perda de massa em apenas dois dias, 10,14% (k=0,0046 dia^{-1}) e 17,00% (k=0,0082 dia^{-1}), respectivamente. Os maiores valores de perda de massa foram registrados no terceiro dia de incubação para *Protium heptaphylum*, 26,50% (k=0,0112 dia^{-1}) e *Protium sprucianum*, 20,31% (k=0,0082 dia^{-1}). Em cinco dias, *Myrcina guianensis* e *Vochysia pyramidalis* perderam 6,25% (k=0,0068 dia^{-1}) e 10,83% (k=0,0115 dia^{-1}), respectivamente. Durante as primeiras 24h não houve lixiviação para *M. guianensis*, cuja perda de massa após 15 dias foi de apenas 8,77%. *Calophyllum brasiliensis* perdeu 13,07% (k=0,0073 dia^{-1}) de massa em sete dias. *Maprounea guianensis* em apenas um dia, mostrou uma perda rápida de 9,23% (k=0,0107 dia^{-1}). *Copaifera langsdorffii* lixiviou até ao 10º dia, 17,23% (k=0,0115 dia^{-1}). Os dados indicam que a dinâmica de lixiviação é fortemente relacionada com as características químicas de cada espécie e que não há um padrão que possa ser generalizado

T16-O173 **Efeito do represamento de riachos do Cerrado na decomposição foliar**

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A decomposição em riachos de cabeceira é importante para a integridade dos ecossistemas aquáticos lóticos. Este processo integra a mata ripária e riachos através do aporte de detritos vegetais alóctones, sendo fonte de nutrientes e energia para a comunidade aquática. Impactos antrópicos devido ao uso desordenado da terra vêm alterando o seu funcionamento natural. Alguns desses impactos são o represamento e a alteração da vegetação ripária. O objetivo deste trabalho foi avaliar a decomposição de diferentes espécies de detritos foliares num riacho do Cerrado, Ribeirão do Gama (DF – Brasil) num trecho de Referência (N), num trecho de Represa (R) e num trecho Pós-represamento-Desflorestado (D). Foram utilizadas 4 espécies nativas num experimento de decomposição em "litter-bags": *Maprounea guianensis*; *Protium heptaphyllum*, *Copaifera langsdoffii* e *Calophyllum brasiliensis*. Para cada espécie foram montados quatro réplicas em tempos amostrais de 0, 7, 14, 30, 60, 90, 120 dias durante o período chuvoso. A perda de massa foliar foi maior no trecho de Referência (N) para todas as espécies (F=5,3; p=0,02); *M. guianensis* apresentou o maior coeficiente de decomposição (k=0,016 dia^{-1}), seguido por *P. heptaphyllum* (k=0,008 dia^{-1}), *C. langsdorffii* (k=0,008 dia^{-1}) e *C. brasiliensis* (k=0,008 dia^{-1}). No trecho represado (R) e pós-represa-desflorestado (D) não foram observadas diferenças significativas no coeficiente de decomposição (F=5,3; p=0,6) para as espécies estudadas *M. guianensis* (R-k=0,007 dia^{-1}; D-k=0,011 dia^{-1}), seguido por *P. heptaphyllum* (R-k=0,004 dia^{-1}; D-k=0,005 dia^{-1}), *C. langsdorffii* (R-k=0,005 dia^{-1}; D-k=0,005 dia^{-1}) e *C. brasiliensis* (R-k=0,003 dia^{-1}; D-k=0,006 dia^{-1}). Dessa maneira, o estudo sugere que o uso inadequado da zona ripária tem impactos significativos sobre a decomposição foliar, podendo modificar o funcionamento íntegro de ecossistemas lóticos.

T16-O388 **The role of invertebrate and microbial decomposers in two types of high-altitude tropical streams**

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High-altitude tropical streams have very low water temperature throughout the year; therefore, decomposition of decaying organic matter is expected to be low. Moreover, shredders have been reported to be scarce in high-altitude streams. Our objective was to examine the relative importance of invertebrate and microbial communities in litter processing in in two types of high-altitude páramo streams. We conducted a decomposition experiment in three streams running through mix shrub-land streams and three through *Polylepis* streams, all above 3500 m asl. In each stream, we determined leaf decomposition of three plant species of different foliar quality (based on N:P ratios, and lignin and phenol content): *Alnus acuminata* (Betulaceae), *Gynoxis* sp. (Asteraceae) and *Baccharis* sp. (Asteraceae), using coarse and fine mesh bags during 53 days. Coarse mesh bags allowed access of invertebrates to the leaves, while fine mesh bags excluded invertebrate access. Percentage

of mass loss was significantly higher in *Polylepis* forest than in mix shrub land, and was higher for *Baccharis* sp. than for *Alnus acuminata* or *Gynoxis* sp. Higher loss occurred in coarse mesh bags than in fine mesh bags. Density of shredders in *Polylepis* forest streams (10%) was significantly higher than in mix shrub-land streams (2%). Sporulation (conidial production) was higher for *Baccharis* sp. than for the other two plant species and no differences were detected between the two types of streams. Our results suggest that different riparian vegetation in high-altitude streams can influence litter decomposition rates by changing invertebrate and hyphomycete community composition, especially by reducing the abundance of the shredders functional feeding group.

T16-O418 **Microcrustáceos de sistemas lóticos da Chapada dos Veadeiros, Brasil central**

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Chapada dos Veadeiros, acomodada em uma área de altitude formada por planaltos montanhosos com paredões rochosos e vales com rios encachoeirados do Brasil central, representa uma área relevante para biodiversidade e endemismo no Cerrado. O estudo se desenvolveu em duas bacias hidrográficas: a dos Couros e a do São Bartolomeu, a partir do município de Alto Paraíso de Goiás (14°128'585"S 47°518'616"W). As coletas foram realizadas em 16 trechos de córregos destas bacias. A microfauna foi coletada nos períodos seco (agosto a outubro) e chuvoso (novembro e dezembro), com rede de 68µm de malha e fixadas com formol (4%). Foram identificados 152 microcrustáceos, sendo 115 copépodes e 37 cladóceros. A bacia dos Couros obteve uma maior representatividade, com 68,7% dos Copepoda, especialmente Calanoida, e 97,3% de Cladocera. A bacia do rio São Bartolomeu apresentou 37 microcrustáceos, e representado por Copepoda (97,3%). As diferenças detectadas entre os microcrustáceos das duas bacias refletem as condições ambientais peculiares de cada uma. O rio dos Couros é encaixado nas montanhas e paredões rochosos, raso e estreito, com a formação de áreas de remanso e pequenas piscinas ao longo de seu curso. Táxons típicos de ambientes mais lênticos, como Calanoida, foram registrados neste curso. A bacia do São Bartolomeu tem leito mais amplo com fundo arenoso, seixos pequenos e mais turbulento, apresentando um menor número de indivíduos e de táxons, além de carapaças de copépodes. O estudo das áreas preservadas serve de apoio para recuperar áreas já degradadas e também como parâmetro para manutenção da reserva no futuro tendo em vista a importância econômica dos recursos hídricos principalmente para agricultura e pecuária que são as principais atividades da região.

T16- O434 **Seasonality of phosphorus in the Madeira River (Brazil): implications for the Amazonian flux of phosphorus**

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The Madeira River is a major tributary of the Amazon River, both in terms of water and sediment discharge. Like the Amazon River, it is a typical whitewater river, intensely varying its water level over the year. The headwaters of the Madeira River are in the Andean cordillera, a geologically young mountain range, making it to transport nutrient-rich sediments. Although the amount of P transported by the Amazon River is known (0.28 Tg P y^{-1}), little is known about the transport of P from its major tributaries, including the Madeira River. Our goals were (1) to assess how much P is transported downstream by the Madeira River and (2) to investigate how the amount of total and different forms of P vary intra- and interannually. We monitored 8 stations across a 200 km reach of the Madeira River, near the municipality of Porto Velho (Rondônia, Brazil). We found that P in the Madeira River is directly related to the hydrological level (r^2=0.55; $p<0.05$), suggesting that flood pulse is the main driver of P seasonality. The annual P load of the Madeira River was approximately 0.15 Tg P y^{-1}, indicating that the Madeira River may be surprisingly responsible for about 50% of the Amazon River total phosphorus discharge to the Atlantic Ocean, although its flow is 10 times smaller. Particulate P accounted for about 75% of total P and most of particulate P is probably inorganic, like in the Amazon River. Finally, we suppose that the current construction of hydroelectric reservoirs in the Madeira River combined with likely changes in the Andean climate in response to global climate change could potentially change the future Amazonian flux of P.

Poster

Abstracts

POSTER ABSTRACTS

SS1- Biology and conservation of freshwater mussels: an Iberian perspective

SS1-P138 Reproductive cycle and host fish determination of Portuguese native freshwater mussel species

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Freshwater mussels or naiads (Bivalvia, Unionoida) are among the most critically threatened faunistic groups worldwide. This decline is mainly provoked by habitat loss, fragmentation and degradation but also other factors such as the introduction of invasive species among other biotic and abiotic alterations. Additionally, conservation efforts have been hampered by a lack of life-history information for most species, particularly for traits such as age at maturity, growth rate, longevity, and fecundity. These bivalves have a complex reproductive behavior where their larvae (glochidia) parasitize and depend on specific fish species as hosts for metamorphosis and upstream dispersion. In the present study we describe the reproductive cycle and successfully determined the host fish species for *Anodonta anatina*, *A. cygnea*, *Potomida litorallis* and *Unio delphinus* from the Douro basin, Portugal. Histological techniques were used for the reproductive cycle. To study the hosts, glochidia were extracted from each species and exposed to distinct fish species that co-occur in the same basin. The fish species that successfully transformed glochidia in juveniles were then considered valid hosts. Interestingly, with the exception of *A. cygnea*, almost all effective hosts were native fish species.

SS2-Carbon processing in freshwaters: approaches and perspectives

SS2-P159 Characterization of sedimentary fulvic and humic acids from a coastal lagoon by spectroscopic techniques

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The fulvic acid (FA) and humic acid (HA) fractions from 26 superficial sediments samples of a Mediterranean coastal lagoon were obtained following the Method's for Soil analysis extraction procedure. Fluorescence excitation-emission matrix (EEM) and Ultraviolet/Visible (UV/vis) absorbance were measured in both fractions, and from those measurements a wide range of indexes including the fluorescence index (FI), humification index (HIX), freshness index (BIX), specific absorbance on the ultraviolet (SUVA) as long with the intensities of the main fluorescence peaks identified in the set of EEMs were obtained. The contribution of the peaks to the total fluorescence differed between the FA and the HA fractions. A pigment-like peak, in the region of (390-410Ex and 640-660Em) was identified in both fractions and its contribution differed between fractions and water depth, suggesting its potential to trace the macrophyte and phytoplankton contributions to sediment organic matter. The increase of the FI, BIX and a diminishing SUVA with depth pointed towards a proportional increase of authocthonous sources in the deepest part of the lagoon. The present work confirms the potential of the application of EEMs in the characterization of sedimentary humic substances (HS) and points them as a valuable tool for the identification of the sedimentary organic matter sources.

SS2-P252 Carbon transport and use through Mediterranean river networks: the project CARBONET

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Freshwaters are important components of the continental carbon (C) budget at global and regional scales. Long-term burial in sediments of lentic systems and emissions to the atmosphere are major processes that may alter the distribution of C sinks in continents. However, little is known about the global and local factors governing sediment burial and carbon emissions at the watershed scale, especially considering the probably significant, but mostly unknown interplays between lotic and lentic systems in shaping the continental C cycle. In particular, there is a lack of knowledge on how climate change will affect the C budget of Mediterranean watersheds, which are characterised by intermittent flow regimes and by intensely impounded river configurations. Here we present a recently launched project, CARBONET, which uses a cross-system perspective to study C transport and processing in two Mediterranean watersheds. The main objectives of CARBONET are (1) to comprehend how global (climate, hydrology) and local (human impacts) drivers shape the interplay between lotic and lentic Mediterranean water bodies; (2) to characterize the mechanistic basis of the processes of transformation and storage of organic C; and (3) to estimate the C budget of Mediterranean river networks in current conditions as well as under the effects of global change. In CARBONET these questions are addressed through three complementary approximations: extensive material mass-balances; intensive process-based experimentation in the field and laboratory; and numerical modelling.

SS3-Challenges in assessing the ecological status of rivers and streams

SS3-P84 **Water quality assessment of the Mau River: a multi-stressor case study**

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Freshwater habitats are usually subjected to multiple stressors, as they are end receivers of point- or non-point contamination, besides other anthropogenic impacts, such as morphological degradation and deforestation. Except in extreme scenarios, impacts caused by multiple stressors are mild, because of the dilution of running waters. However, it is desirable that the present methodologies for ecological assessment (within the scope of the Water Framework Directive - WFD) are able to detect the subtle effects of these impacts on resident communities. The Mau River is a small mountain river catchment that receives runoffs from urban, agriculture and deactivated mine areas. Mines until now did not suffer any management requalification plan. We evaluated the ecological status of Mau River using the Portuguese WFD approach based on the spatio-temporal variation of macroinvertebrate communities. Macroinvertebrates are among the most frequent and ancient bioindicators used in water quality assessment due to their relative large size, easy sampling, low to moderate identification effort, and relatively long life cycles. The river was sampled along its catchment on six locations, in two distinct periods (2005-2006 and 2009-2010). In each period, sampling was done in four seasons (winter, spring, summer, autumn). Here, we provide a critical appraisal of the sensitivity of the resident macroinvertebrate community to the multiple stressors present in the Mau River and a comparison of the Portuguese WFD approach with more refined tools in community structure analysis.

SS3-P113 **Assessing the hydrologic status of headwater streams from bryophyte functional diversity**

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Aquatic bryophytes are common in headwater streams, where they present very specialized ecological niches. Thus, functional groups can be successfully used as indicators of fine spatial scale ecological changes. In this study, we focused on the relationships between hydrological alterations, the distribution of aquatic bryophyte communities, and its functional diversity. The distribution of bryophytes in fluvial microhabitats was examined and modeled at 165 locations of Portuguese headwater streams. The response of life forms and life strategies along fine-scale hydrologic gradients was evaluated through multivariate statistical analysis and loess models. Frequency and abundance patterns of bryophyte functional groups suggested that its distribution is mostly determined by two main microhabitat variables: water velocity and wetness gradient. Additionally, we used species distribution models to understand current patterns of distribution of bryophyte functional groups, addressing the relative importance of local and regional environmental predictors. We summarize the distribution trends of functional groups in graphic models and explore habitat segregation along hydrological gradients in undisturbed mountain streams and its use in monitoring the fine-scale variation of flow regimes caused by fluvial change.

SS3-P136 **Choosing the sharpest tool in the box: taxon-weighting improves the precision of family level trait assignment**

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Macroinvertebrate bioassessment is often based on family-level identification with trait descriptions represented by direct aggregations of trait descriptions of constituent species/genus. However, this scenario of homogeneity does not correspond to known patterns of distribution and abundance where some species are common and others rare. We quantified the effects of family level trait assignment associated with fuzzy-coded trait descriptions and contrasting taxonomic weighted algorithms based on (i) national rarity (rarity model), (ii) reference-site frequency occurrences (quality model), measuring the deviation in relation to a null model based on non-weighted, proportional contributions. Variation differed between families and tended to be highest for the traits of maximum size, flow preference and reproduction and lowest for dispersal and aquatic life-stages. While both models showed strong similarities, the quality model was overall more divergent than the rarity model. Revealing how trait diversity can lead to error in higher level taxonomic descriptions, our analyses demonstrate that weighted algorithms could be employed to increase precision according to scenarios of biogeography, season and/or sampling regime. Distinguishing trait variability in terms of even or skewed dispersion (associated with "outlier" taxa) presents options for the further refinement of assessment protocols. Quantitative assessment of trait variability facilitates an informed judgment of the cost-benefit of taxonomic resolution.

SS3-P162 **Biological surveys of aquatic invertebrate communities in arid basins of northern Chile**

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Water bodies located in drylands are especially susceptible to environmental perturbations associated with water scarcity, hydrological variations and overuse by human activities. As a part of the protection of aquatic resources in drylands of northern Chile, an environmental monitoring program using freshwater bioindicators is being developed. This study summarises the results of baseline surveys conducted from 2007 to 2011 at three different basins (Huasco, Elqui and Limarí; 28º 30′ S to 31º 20′ S) to analyse the faunal composition and to observe whether there are differences in aquatic invertebrate community structure at spatial and/or temporal scales. The relationships among community structure and environmental variables, suggest that

geochemical features largely determine the distribution patterns of macroinvertebrates in the basins. In headwaters of Huasco and Elqui, high concentrations of metals associated with hydrothermal alteration, determined a low density and diversity of macroinvertebrates, where Chironomidae (Diptera) reached the highest abundances. Downstream, where river habitats become more favourable for macroinvertebrates, the communities were dominated by Diptera (Ceratopogonidae), Trichoptera (Hydropsychidae), Coleoptera (Elmidae), Ephemeroptera (Baetidae, Leptophlebiidae) and Oligochaeta. Limarí river showed a lower macroinvertebrate richness (39 taxa), in comparison to Huasco (43 taxa) and Elqui (45 taxa). However, the physical-chemical analyses and the presence of Plecoptera indicate a better water quality in this river. Patterns observed in macroinvertebrate communities can be used to generate hypotheses about factors affecting assemblage structure for deeper surveys to be conducted in arid streams of northern Chile.

SS7-Running without water: water scarcity implications for river functioning, conservation and management

SS7-P308 **Assessing drought impacts on biodiversity of European rivers and reservoirs under DROUGHT- R&SPI**

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"DROUGHT-R&SPI - Fostering European Drought Research and Science-Policy Interfacing" is a European research project initiated in October 2011 with 12 partners from 9 European countries, aiming at improving drought preparedness across Europe. Among other tasks, the project will investigate drought impacts on biodiversity of aquatic communities in rivers and reservoirs in Portugal. Droughts have marked effects on the densities and structure of aquatic species populations, community composition and diversity. Drought effects on aquatic-dependent biota are most likely to be "stepped" when hydrological thresholds are crossed, causing abrupt changes in biological community structure and ecosystem processes (e.g. a critical threshold is minimum river flow). During the first year of the project, available data on abundances and diversity of fish, macroinvertebrates and macrophytes in Portuguese rivers will be correlated with river streamflow and water quality parameters. Temporal changes of fish mortality and diversity in reservoirs will be correlated with stored surface reservoir volumes and water quality parameters. Data will further be correlated with drought indices. Analysis will be performed for four river basins: Cávado, Zêzere, Sado and Guadiana, in order to include a climatic gradient. Similar analysis will be done by other partners for other case studies in Europe within DROUGHT-R&SPI. Characteristics of each sampling area (e.g. local topography, river order, typology and hydrological regime) will be used for sampling selection and comparison of results among case studies. Results will be discussed within the project stakeholders dialogue platform, at both national and European scales, to evaluate data constraints and requirements to improve drought monitoring.

SS7-P343 **OASIS: How to run regulated rivers in semi-arid regions? Methods and approaches**

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The Project "OASIS: How to run regulated rivers in semi-arid regions?" (2012-2015) is presented. Translating the general principle of Environmental Flows (EFs) into specific management rules or flow guidelines for riparian vegetation in semi-arid regions is the research challenge of this team. OASIS proposes a hybrid model framework to quantify EFs for the conservation and restoration of streams impacted by regulation. The eco-hydrological models are founded on flow-ecological relationships of riparian forests, and include decision models and cost-benefit analysis of EFs' implementation. An optimal set of riparian vegetation–flow response guilds for perennial and temporary streams will be defined, i.e. functional traits that respond in a quantifiable way to stream flow attributes, namely to the magnitude, frequency, seasonal timing, duration and rate of change. EFs are modelled using Bayesian networks as support decision tools for water managers and users, and cost analysis of flow investments. OASIS is structured into three interconnected tasks: 1) FLOWBASE; establishment of a riparian-flow trait-base; 2) Determination of riparian vegetation-flow response guilds in regulated rivers; 3) Model development and predictive approach of the cost-benefits of EFs' implementation. Contributions to the database and to the methodological approach are welcome.

T1-Aquatic ecotoxicology and environmental risk assessment

T1-P8 **Metals bioavailability and spatial pattern in a tropical reservoir's sediment**

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Sediments are a repository of contaminants in freshwater ecosystems. One way to assess the quality of this compartment, for potentially bioavailable metals, is through the analysis by acid volatile sulfides (AVS) and simultaneously extracted metals (SEM). In order to examine the bioavailability of metals and spatial heterogeneity of these elements into a reservoir for public water supply, sampling was performed over 10 points in Paiva Castro reservoir (São Paulo, Brazil). Levels of SEM (Cr, Cu, Cd, Ni, Pb, Zn), AVS, organic matter (OM), and total organic carbon (TOC) were measured in the sediment samples. Measurements of pH, EH, temperature and dissolved oxygen in the sediment-water interface were also taken. Low amounts of OM, associated with loss of stratification in the water column justify the relatively low values for AVS. The molar ratio of the sum of SEM less SVA indicated that

metals were not bioavailable. The values found are in accordance with regional backgrounds and sediment quality guidelines, TEL (Threshold Effect Level), suggested by the Canadian Council of Ministers of the Environment. For spatial heterogeneity, the analysis did not indicate a clear pattern of increased metal levels toward the dam. Higher values of Cd were found in upstream region. Possibly these values are associated with the entry of effluents from sewage treatment in the region. Results for the elements analyzed show that there are still good quality for Paiva Castro's sediment.

T1-P10 **Bioaccumulation of microcystins in lettuce**

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We investigated the effects of crude extract from the cyanobacterium microcystin-producing *Microcystis aeruginosa* (Kützing) Kützing present in the watering of lettuce (*Lactuca sativa* L.). The aim of the study was to determine whether the bioaccumulation of microcystins (MC) occurs in the foliar tissue of lettuce when moistened with solutions containing total MCs at concentrations generally found in aquatic systems (0.62 to 12.5 µg L^{-1}). Microcystins were found in foliar tissues (8.31 to 177.8 µg Kg^{-1} of wet mass) when lettuces were moistened with solutions containing microcystins at concentrations usually found in aquatic environments (0.62, 2.50, 6.23 and 12.5 µg L^{-1}). The possibility of MC ingestion at doses above those recommended by the World Heath Organization emphasizes the monitoring need of this alimentary exposure pathway by government authorities.

T1-P11 **Effects of microcystins on *Microcystis panniformis* (Cyanobacteria) and *Monoraphidium convolutum* (Chlorophyta)**

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Microcystins (MC) role in nature remains unknown. Studies with high MC concentrations led to the hypothesis that they could cause allelopathical effects in phytoplanktonic organisms. However, high MC concentrations are not usually found in aquatic systems. So, we aimed at the evaluation of the possible allelopathic effects caused by MC, under concentrations similar to those in the environment (0.5, 1, 5 and 10 µg L^{-1}) present in crude extracts of *Microcystis aeruginosa* (Kützing) Kützing BCCUSP232 (MC^+) and BCCUSP03 (MC^-). The target strains (*Monoraphidium convolutum* (Corda) Komárkova-Legnerová CMEA/UFF0201 and *Microcystis panniformis* Komárek et al BCCUSP200) were cultivated under controlled conditions in climatic chambers. The cell density variations were evaluated during 10 days. To compare the results obtained in our experiments with those from literature, we performed an experiment with high MC concentrations (200 and 2000 µg L^{-1}) of the MC^+ extract in *M. convolutum* cultures. Both MC^+ and MC^- extracts stimulated more growth in *M. panniformis* than in *M. convolutum*. The 10 µg L^{-1} treatment of both extracts stimulated growth of green algae and cyanobacteria relatively to other treatments and controls. *M. convolutum* showed growth reduction under 200 and 2000 µg L^{-1} MC concentrations. MC does not cause allelopathic effects on *M. panniformis* and *M. convolutum* in concentrations usually found in natural conditions.

T1-P69 **Enhanced channel complexity in four streams through introduction of large wood: effects on macroinvertebrates**

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Channel complexity affects the physical structure, biotic communities and functioning of stream ecosystems. Large wood is a key element in the creation and maintenance of streams channel complexity in forested areas as it promotes the retention of allochthonous organic matter, enhances habitat diversity and is a food resource for some invertebrates. In an attempt to increase channel complexity and enhance ecosystem functioning, wood was added to 4 headwater stream channels in the north of the Iberian Peninsula. A BACI (before-after/control-impact) design was followed to study the effect of wood introduction on habitat composition and invertebrate community. Therefore, streams were monitored during 1 year prior to wood addition and 1 year after addition in one upstream control and one experimental reach per stream. We hypothesized wood addition would increase storage of organic matter and habitat complexity, and thus, affect the abundance and composition of invertebrate assemblages, increasing the proportion of shredders and the species richness. Areal cover of the different substrate types was visually estimated in each reach, and 10 Surber samples (0.09 m^2 area and 200 µm mesh) taken per reach stratified by substrate type. Each sample was preserved in ethanol (70%) and the macroinvertebrates were sorted, identified and assigned to functional feeding groups. The introduction of wood produced an increase of organic matter and the cover of fine substrata. Invertebrates were most abundant in the organic matter accumulations, less abundant in gravel. Overall, wood introduction affected habitat availability, what in turn resulted in an overall increase of invertebrates at the reach scale.

T1-P70 **Evaluation of toxic effects of a single pulse of copper sulfate on wetland communities in microcosms**

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Intensive agricultural practices have been characterized by an overuse of agrochemicals. The inputs of chemicals in a watershed are likely to affect the ecological integrity, biodiversity and recover capacity of the wetland surrounded, therefore compromising freshwater ecosystem services. This study aims to evaluate the effect of single pulse of copper sulfate ($CuSO_4$) on wetland communities using microcosm under winter Mediterranean conditions. Eighteen outdoor microcosms (length-height-width=0.32-0.24-0.22 m, 20 L volume) were used to set an experiment of 2 doses of copper sulfate with six replicates (high treatment (H): 0.04 mg L^{-1} $CuSO_4$; and low treatment (L): 0.004 mg L^{-1} de $CuSO_4$) and

with six replicates of the control (C) as well. The microcosm experiment lasted 7 weeks after the copper addition. Abundance of plankton and benthic meiofauna were used as structural indicators. Photosynthesis activity measured as Chl *a* and changes in size spectra evaluated with flow cytometry were used as functional indicators. Both structural and, especially, functional indicators showed an effect of copper pulse on wetland communities. The H treatment caused the most dramatic effect, preventing recover capacity. During the experimental period, a recovery in phytoplankton was detected in both treatments, but in the L ones the recovery was faster. This study works towards a deeper understanding of the agrochemicals effects and recovery capacity of wetlands communities. Such knowledge is useful to ensure adequate regulation limits for achieving a balance between development and conservation.

T1-P89 **Recente colapso das escombreiras das minas do Portelo (NE Portugal) e impactos potenciais nos ecossistemas aquáticos**

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Em Janeiro de 2010 uma grande parte dos materiais armazenados nas escombreiras da mina do Portelo foi arrastada para a ribeira do Portelo. O objectivo do presente estudo foi avaliar o processo de recuperação da ribeira afectada por este acontecimento. Amostras de água e de macroinvertebrados foram recolhidas mensalmente entre Janeiro e Julho de 2010 em 4 locais de amostragem: um local não influenciado pela entrada de inertes (controlo) e os outros 3 localizados a 250 m, a 5 e a 15 km da mina. Foram determinados diversos parâmetros físico-químicos, tais como o pH, a condutividade, o oxigénio dissolvido, a matéria particulada em suspensão e diversos metais por ICP-MS e amostradas as comunidades de macroinvertebrados. As águas recolhidas nos 2 pontos mais próximos da mina apresentavam valores de pH baixos (≈ 4) e toxicidade potencial devido às elevadas concentrações de Cu. Nestes locais os macroinvertebrados estavam ausentes. No ponto mais afastado da mina não foram detectados sinais de perturbação. Uma vez que não foram implementadas medidas de mitigação é possível que continuem a ocorrer entradas de água da mina e de sedimentos na ribeira do Portelo de forma contínua, podendo acentuar-se nos períodos em que ocorram fortes chuvadas. O presente trabalho pretende alertar para o facto deste tipo de contaminação poder ter impactos não só nos sistemas aquáticos do Parque Natural de Montesinho, mas também noutros ecossistemas com elevado valor ambiental e económico.

T1-P128 **Enzymatic analysis of *Chironomus sancticaroli* (Diptera: Chironomidae) exposed to organophosphate**

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Organophosphate compounds are used by humans in agro-systems and programs to control vectors of pathogens. Because they are consistently applied, these compounds can reach water bodies affecting aquatic biota. The aim of this study was to evaluate the effects of acute and chronic exposure of the species *Chironomus sancticaroli* to the organophosphate insecticide malathion through the use of three biochemical biomarkers: the activities of acetylcholinesterase (AChE); alpha esterase (EST-α) and beta esterase (EST-β). The organisms were from a colony of the Laboratory of Medical and Veterinary Entomology, Federal University of Paraná (UFPR). They were maintained at room temperature (25±2°C), controlled photoperiod (12h light/12h dark) and humidity (80±10%). Five acute bioassays (96 h) were conducted with 5 insecticide concentrations (0.1, 0.251, 1.37, 1.96 and 2.51 µg L^{-1}) and 2 chronic bioassays (6 days) with 2 concentrations (0.1 and 0.251 µg L^{-1}). Solvent controls with alcohol were maintained for each test. We analyzed 50 larvae per concentration for each measured enzyme, totaling 1,350 larvae. The activities of AChE, EST-α and EST-β decreased by both acute and chronic exposure at all concentrations. In acute exposure AChE, EST-α and EST-β were significantly reduced by respectively 66, 40 and 37% in the concentration of 0.251 µg L^{-1} and more than 80% in the concentrations of 1.37, 1.96 and 2.51 µg L^{-1}. In chronic exposure AChE and EST-α activities were significantly reduced by respectively 28 and 15% in the concentration of 0.251 µg L^{-1}. Our findings show that low concentrations of malathion can change the metabolism of individual larvae, indicating high toxicity and environmental risk of this compound for the species.

T1-P135 **Deleterious effects in liver and gills of *Oncorhynchus mykiss* after acetaminophen chronic exposure**

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The growing presence of pharmaceutical drugs in nature can cause oxidative stress in several non-target species, which could be used as a proxy of adverse effects in contaminated aquatic ecosystems. Acetaminophen is widely used in human medicine as an analgesic and antipyretic drug and it is one of the most sold non-prescription drugs. In some European countries, values up to 6 µg L^{-1} of acetaminophen can be found in water from sewage treatment plants. Such high values cause concern due to the adverse effects on non-target species and potential ecological consequences in aquatic ecosystems. This study aims to test the effect of acetaminophen (N-acetyl-p-aminophenol) in *Oncorhynchus mykiss*. Thus, individuals of rainbow trout were chronically exposed (28 days) to the drug in order to evaluate enzymatic and histological damages. The experiment was carried out under laboratory-controlled conditions, and involved one control (unexposed) group, and 3 different acetaminophen concentrations (12.5, 25 and 50 µg L^{-1}). A total of 15 animals were used in each concentration, with 5 animals in 3 replicates per concentration. After the exposure period, the animals were ice-cold sacrificed and a portion of liver and gills were removed for histological and enzymatic analysis. A qualitative and semi-qualitative evaluation of the liver and gills architecture were performed. Gills morphometry was also quantified. The enzymatic biomarkers quantified were: lipoperoxidation (TBARS), glutathione S-transferases (GSTs), glutathione reductase (GRed), glutathione peroxidase (GPx) and Catalase (Cat). Data show increasing levels of oxidative stress and histological changes in organs, gills and livers of *O. mykiss*, suggesting a dose-dependent relationship with the acetaminophen content in water.

T1-P148 **Biomarkers evaluation in fishes of the Ave River**

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The Ave River is located in a region with high anthropogenic pressure and different pollutant sources that might be disturbing fish populations health. In order to evaluate this, biomarkers of exposure were assed in *Squalius carolitertii* and *Luciobarbus bocagei* captured in places classified with different ecological status. The genotoxic effects were evaluated through the presence of micronuclei in erythrocytes; gill histopathological changes were qualitative and quantitatively assessed; and lipid peroxidation was determined for oxidative damage evaluation. Although micronuclei were observed in both species, barbel presented higher levels. In addition, the incidence of micronuclei was superior in fish from places ecologically classified as poor. The main gill histological changes were lamellar fusion, proliferation of gill epithelium, vasodilatation, aneurisms, edema, lifting and necrosis. For both species, the aneurisms prevalence clearly reflected the pollution gradient among the different places and the severity gradation scale showed higher grades of lifting, lamellar fusion and proliferation of lamelar epithelium in polluted sites, consistent with their ecological status. However, edema and necrosis presented higher severity levels in places previously classified as poor, rather than in places classified with a bad ecological status. These results were then corroborated by the evaluation of lipid peroxidation. Thus, the micronuclei presence, the severity of gill edema and necrosis and the lipid peroxidation, proved to be suitable biomarkers, indicative of the deterioration occurring in the mentioned sites, also showing their usefulness for ecological status classification as early warning signs of water quality decline.

T1-P172 **Heterogeneidade na distribuição de metais em sedimentos de represas da Catalúnia (Espanha)**

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A região da Catalúnia (Espanha) apresenta inúmeros reservatórios, empregados para o abastecimento público e controle de cheias, principalmente. Os reservatórios de Santa Fe (SF), Barasona (BS), Foix (F), Sau (Sa) e Susqueda (Su) foram estudados com o objetivo de observar a heterogeneidade na distribuição de metais em seus sedimentos em diferentes estações de coletas e profundidades. Foram tomadas 33 amostras (draga de Ekman, sedimentos secos a 60o C) representando 12 estações de coletas (1 SF, 4 BS, 3 F, 3 Sa e 1 Su), com análises de 37 elementos traços e 9 macronutrientes (analisados por fluorescência de raios X por dispersão de comprimento de onda). A análise de Cluster (Ward's methods / Euclidean distances) para dados normalizados e transformados (log([elemento]/[Al]+1) sugerem a existência de heterogeneidade espacial, compondo cada reservatório um cluster, mas também mostrou padrões internos, com heterogeneidade num mesmo reservatório, num sentido montante jusante. Os dados também sugeriram não existir diferenças entre as profundidades analisadas. Relativo a alguns elementos vinculados à contaminação antropogênica (Cu, Ni e Pb) as represas BS e SF discriminaram das demais (One-way Anova, $p < 0,05$), de maneira geral com baixos valores normalizados ([elemento]/[Al]).

T1-P209 **Influence of temperature and florfenicol on *Daphnia magna* feeding behaviour**

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In the last decades veterinary pharmaceuticals have been increasingly found in aquatic ecosystems raising concern on their possible adverse effects on non target species. Florfenicol is an antibiotic widely used in animal production, including in aquaculture, which has been detected in freshwater ecosystems. Temperature has been found to increase the toxicity of some antibiotics. Thus, the aim of the present study was to investigate the effects of temperature and florfenicol on the feeding behaviour of the freshwater grazer *Daphnia magna*. The assays were carried out for 24 h at three different temperatures (15, 20 and 25 ºC), in the presence and absence of light with juveniles and adult females and *Chlorella vulgaris* as food at a density of $1.8x10^6$ cells mL^{-1}. The results indicated that temperature changed the effects of florfenicol on the feeding behaviour of *D. magna* highlighting the need of more research on the combined effects of temperature and pharmaceuticals on freshwater grazers.

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T1-P257 **Effects of cadmium and changes in resource quality (leaf species) on freshwater detritus based food webs**

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Few studies exist on indirect effects concerning facilitator species or trophic cascades within detritus based food webs. Detritus processing is vital for river ecosystems and monitoring the ecological quality of river ecosystems should incorporate assessment of toxic effects on processing and consumption of detritus. This work contributes with an example of how indirect effects of cadmium on leaf litter decomposition process can be measured and to what extent microbial communities, shredders; collectors and their interactions might be affected by the presence of alien leaf species. A gradient of cadmium concentrations (50 µg L^{-1} and 200 µg L^{-1}) was used to show differential microbial conditioning of alder and eucalypt leaf litter over a 12 day conditioning period. Effects of cadmium on microbial community structure (Fungi) were assessed with denaturant gradient gel electrophoresis (DGGE), a polymerase chain reaction (PCR)-based fingerprinting technique. Microbial functional endpoint was also assessed by assessing the oxygen consumption of leaf associated microbial communities. Leaf discs conditioned in the different cadmium concentrations were then used in multispecies systems with the shredder *Sericostoma vittatum* (Trichoptera) and the collector *Chironomus riparius* (Diptera) also exposed to a gradient of cadmium concentrations to assess changes in leaf degradation rates through effects on invertebrate feeding and consequent changes in collectors' growth. Results are discussed in terms of how cadmium contamination and resource quality can affect shredder - collector interactions and have significant effects on aquatic macroinvertebrate communities and ecosystem functions.

T1-P258 **Effects of Cadmium and the pesticide Movento on *Chironomus riparius* cellular energy allocation**

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The Cellular Energy Allocation (CEA) is a biomarker methodology developed to assess the effect of stress caused by contaminants on the energy budget of organisms. This technique allows the determination of changes in energy reserves, through quantification of lipid, protein and sugar content and energy consumption by measuring the electron transport system (ETS) activity. In this work, we intend to apply CEA to *Chironomus riparius* exposed to sub-lethal concentrations of cadmium chloride and the insecticide Movento® (Spirotetramat). Because it is not usually applied to benthic macroinvertebrates, CEA needs to be validated by comparing results with other endpoints such as growth and emergence. Results will be presented in terms of sensitivity of different endpoints. The advantage of using CEA methodology as biomarker for an early indicator of stress in freshwater macroinvertebrate species will be discussed.

T1-P261 **Atrazine, glyphosate and quinclorac alter the metabolism and induce oxidative stress in Bullfrog tadpoles**

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The increase in the herbicides consumption can lead to negative responses to non-target aquatic organisms. Atrazine, glyphosate and quinclorac are herbicides broadly used worldwide, applied on crops of fruits, grains, vegetables, among others. The aim of this work was evaluate the survival, biochemical composition, lipid peroxidation levels and activity of Na^+K^+-ATPase and antioxidant enzymes in tadpoles of *Lithobates catesbeianus* (Bullfrog) exposed to three different concentrations of these herbicides. We acquired 252 tadpoles of *L. catesbeianus* in a frog farm in the municipality of Imbé/RS/Brazil. The animals were kept in the laboratory in aquaria under controlled conditions for 7 days, and more 7 days exposed to concentrations of 5, 10, and 20 μg L^{-1} of atrazine, 36, 72 and 144 μg L^{-1} of glyphosate and 0.07, 0.14 and 0.28 μg L^{-1} of quinclorac. After the period of exposure, the gills, liver and muscle of each individual were removed to determine the levels of: glycogen, total protein, total lipid, triglycerides, cholesterol, lipid peroxidation, and the activities of catalase, superoxide dismutase, glutathione S-transferase and Na^+K^+ATPase. Regardless of concentrations, all herbicides were responsible for a significant decrease in biochemical reserves and Na^+K^+ATPase, and an increase in the lipid peroxidation levels and antioxidant enzymatic activities. These herbicides were able to lead to significant changes in biochemical patterns and to induce oxidative stress in tadpoles of *L. catesbeianus*. These responses can influence the success of development, metamorphosis and reproduction. This may be an important factor in the decline of the diversity and amphibian abundance in the world.

T1-P266 **Hydrosoluble compounds of Coniferae in the respiratory electron transport system of *Hyalella castroi***

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Allelochemicals produced by different species of plant play an important role in natural ecosystems. These effects are seen in terrestrial and phytoplankton succession, inhibition of nitrogen fixation, nitrification and others. Among plant allelochemicals, phenolics represent a widely group of compounds with known properties of inhibiting plant growth, and these compounds have high solubility in water. The aim of the present study was to evaluate the effect of plant dry material of two conifers, *Pinus taeda*, an exotic species, and *Araucaria angustifolia*, in the activity of the respiratory electron transport system (ETS) of the native crustacean *Hyalella castroi*. Amphipods and leaves of *A. angustifolia* and *P. taeda* were collected in the summer of 2009/2010 (December, January and February) and winter 2009/2010 (June, July and August) in the Municipality of São José dos Ausentes (28°47'00"S – 49°50'53"W; 1200 m a.s.l.), Rio Grande do Sul, Brazil. After 7 days of exposure to plant dry material containing four different concentrations of phenolics (0.10, 0.25, 0.50 and 0.75 mg/L), animals were used for determining the ETS. The radical scavenging activity of the plant aqueous extracts was also evaluated. The results of this study suggest that hydrosoluble compounds produced by extracts of coniferae species have different antioxidant potential and affect the amphipod ETS in a divergent form, where exotic species showed a negative effect and lack of antioxidant potential. This pattern of response can help to explain how exotic species of conifers, such as *P. taeda*, modify the natural environment and can cause alterations in freshwater ecosystems.

T1-P272 **Analysis of the metabolic and reproductive effects of Quinclorac in *Hyalella castroi***

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Herbicide contamination of surface waters derived from agricultural practices is a problem of worldwide importance. In rice paddy fields, a large amount of pesticides are used, and depending on their field persistence and toxicity, they can contaminate water bodies and may affect living organisms. The objective of this investigation was to examine the effects of quinclorac on the biochemical composition, levels of lipoperoxidation, activity of catalase and superoxide dismutase and reproductive behavior (reproductive pairs, ovigerous females, and number of eggs) in the *Hyalella castroi*. Amphipods were collected in summer 2011, in the southern Brazilian highlands. In the laboratory, the animals were kept in aquaria under controlled conditions for 7 days, and after this period were exposed to 0.07, 0.110, and 0.115 μg L^{-1} of quinclorac for 7 days. After the period of exposure, the animals were immediately frozen for determination of glycogen, total proteins, total lipids, triglycerides, total cholesterol, glycerol, arginine and arginine phosphate, levels of lipoperoxidation, and catalase and superoxide dismutase activity. Each day the reproductive behavior was also observed. All concentrations of quinclorac induced significant decreases

in biochemical reserves, and significant increase in lipoperoxidation levels and in the activity of catalase and superoxide dismutase. The results showed that this pesticide in the concentrations found in water bodies in the natural environmental is toxic. It is recommended that expanded toxicity tests should be conducted using different organisms to give relevant data to help environmental authorities come up with dosage requirements and minimize the risk to human health and the environment.

T1-P280 **Toxicity assessment of aqueous extracts of ashes from forest fires**

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Every year large Mediterranean areas are burnt. Wildfires can cause serious impacts on ecosystems and an increasing interest has been devoted to their effects on water chemistry and aquatic biota. To simulate the runoff from a burnt area, we collected ashes immediately after a fire in Vale de Cambra (Aveiro, Portugal) and composite samples were used to prepare standard aqueous extracts. Trace metals (As, Cd, Cr, Cu, Fe, Hg, Mn, Ni, Pb, Zn) and the sixteen prioritized polycyclic aromatic hydrocarbons (PAHs) were analytically quantified in the aqueous extracts of ashes. An eco-toxicological screening of these aqueous extracts was performed with four freshwater species representing different functional groups and trophic levels. Aqueous extracts of ashes induced a decrease in the growth of the primary producers *Pseudokirchneriella subcapitata* and *Lemna minor*, and inhibited *Vibrio fischeri* luminescence. No toxicity is expected for higher trophic levels given that no significant *Daphnia magna* immobilization was noticed. The results emphasize the need of more research to understand the complexity of the potentially deleterious ecological effects of wildfires on aquatic communities.

T1-P281 **Subterranean karstic areas - characterization of groundwater and sediment's quality**

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The subterranean karstic areas are one of the most unknown territories of national heritage and one of the most fantastic ecosystems full of endemic living creatures. The karstic areas occupy a great area in the Portuguese territory, in which are known more than 3000 caves. Karst aquifers are particularly exposed and impacted by several types of contaminants from point and diffuse sources of pollution, being important to generate useful information for protecting groundwater ecosystems. Hence, this work presents the first characterization of sediment and groundwater quality of one of the greatest aquifer in Iberian Peninsula - Estremenho karst massif. Physical and chemical (PAHs, PCBs, pesticides and metals) analyses were performed. In general, PAHs, PCBs and pesticides were below the detection limit, except naphthalene, fluorene, phenanthrene and acenaphthene. The metals analysed (Cr, Cd, Ni, Pb and Cu) were also below the detection limit unless Cr. This may be related to the tanning industry of the region (Alcanena). Toxicity tests with no target species (*Vibrio fischeri* and *Pseudokirchneriella subcapitata*) were also conducted. The results of Microtox show low toxicity effects, whereas the growth of the freshwater microalgae was significantly inhibited. Although this is a preliminary study, the results emphasize the need to explore in detail the impacts of anthropogenic activities on the groundwater ecosystems, as a starting point to generate useful information for their protection.

T1-P299 **Avaliação da presença de detergente (linear alquilbenzeno sulfonado) na água e sedimento do rio Tietê, Brasil.**

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O rio Tietê localiza-se no estado de São Paulo, região sudeste do Brasil, a qual é ocupada por uma população de aproximadamente 28 milhões de habitantes e apresenta, em alguns trechos, intensa formação de espumas, causada pela presença de detergentes. Assim, este trabalho objetivou a determinação da concentração de linear alquilbenzeno sulfonado (LAS), detergente aniônico mais utilizado em produtos de limpeza doméstico e industrial e a caracterização microbiológica da água e do sedimento do rio Tietê em três regiões distintas do rio nos períodos de seca e estiagem. Foram realizadas análises microbiológicas da água e do sedimento quanto à quantidade de coliformes e bactérias desnitrificantes por meio da técnica de tubos múltiplos. As comunidades de bactérias foram quantificadas pelo padrão de bandas apresentado na eletroforese em gel de gradiente desnaturante (DGGE). No período de estiagem foram encontrados os maiores valores de LAS dissolvido (1,2 mg L^{-1}) e adsorvido (28,1 mg g^{-1}) em relação à época chuvosa na qual foram verificadas espumas, ou seja, presença do detergente na interface ar/água. Verificou-se correlação positiva entre DQO e Sólidos Totais Voláteis, bem como entre LAS e DQO indicando que as concentrações de LAS podem estar relacionadas ao despejo de esgoto doméstico sem tratamento ou com tratamentos ineficientes. Em Pirapora do Bom Jesus e Salto, foram encontradas as maiores quantidades de LAS e também as maiores concentrações de coliformes termotolerantes e de bactérias desnitrificantes, o que pode indicar uma relação entre a concentração de detergente e a microbiota. O padrão de bandas de DGGE também mostra esta possível relação, uma vez que o sedimento com maior quantidade de LAS também apresentou maior riqueza populacional.

T1-P333 **Looking for a reliable method to evaluate toxicity in recreational waters with complex compound mixtures**

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There is a wide concern for the sanitary conditions of recreational waters (RWs), because users contact directly with eventual existing toxics. RWs surveillance is difficult, for the toxicity is frequently due to complex mixtures of compounds whose effects are individual and/or synergistic or antagonistic. Cyanobacteria (Cyb) blooms in RWs are persistent and recurrent worldwide, and some Cyb toxines (Cyb-tox) cause severe animal and human illnesses, even death. From 2008-2010 we analysed the toxicity of numerous RWs within a surveillance program of Cyb

and Cyb-tox (microcystins and cylindrospermopsin) supported by the CEDEX (competent organism). We used a cyto-multitoxicity assay with established cell lines (ECL), previously developed in our lab, which informs of the general cell status by determining 6 parameters. Since the ECL sensitivity to Cyb-tox is 100-1000 times lower than that of primary cultures, samples were 300-fold concentrated prior to analysis. To study possible interferences of the concentrated non-Cyb-tox compounds, comparative toxicity assays were run with 1, 30 and 300-fold concentrated samples. Frequently, and independently of Cyb-tox presence or quantity, the concentration increase caused: no to high influence on the affected parameters, enhancement of the effect, or variable changes, from enhancement to inhibition. The data suggest that diverse compounds were interacting in the sample toxicity, and allow to conclude that: 1) only multi-toxicity tests can reliably inform of real RW sanitary conditions; 2) although sometimes original samples have to be concentrated to detect toxic effects (as for Cyb-tox), and that can lead to overestimate toxicity, the proposed method remains valid, considering the human health safety in RW surveillance programs.

T1-P422 ***Chironomus sancticaroli* Strixino & Strixino,1981 (Chironomidae) em ensaios agudos com a-cipermetrina e malathion**

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O uso de a-cipermetrina (a-cyp) e malathion (MLT) para o controle de pragas agrícolas é continuado e em diferentes culturas, podendo afetar espécies não alvo. *Chironomus sancticaroli* é uma espécie com ampla distribuição, criada em laboratório. O objetivo do estudo foi avaliar o seu uso em ensaios agudos para usa-lo como possível indicador da presença de inseticidas. Foram realizados ensaios com 9 e 7 concentrações de a-cyp (0,003 a 0,05 ppm) e de MLT (0,005 a 0,05 ppm), respectivamente. Para cada tratamento, foram usadas quatro réplicas e os ensaios repetidos três vezes. Foram usadas 120 larvas de 3° instar final ou 4° instar inicial por concentração, mantidas a 25°C(±2) e fotoperíodo (12h), sendo a duração dos ensaios de 96 horas, com leitura de mortalidade a cada 24h. Todos os ensaios tiveram uma série controle com o mesmo padrão de delineamento. Os ensaios com a-cyp e MLT mostraram que estes produtos têm efeitos em concentrações mais elevadas do que as propostas na literatura. As concentrações letais para 24 h para a-cyp foram: CL_{50}=0,0050 ppm, CL_{90}=0,070 ppm e CL_{99}=0,193 ppm. Já os testes com MLT, apresentaram diferentes mortalidades em relação às dosagens e aos tempos de exposição. As concentrações letais para 24 h para MLT foram: CL_{50}=115,5 ppm, CL_{90}=588,9 ppm e CL_{99}=2687,4 ppm. A exposição de 24 horas mostrou-se suficiente para determinar a toxicidade aguda para ambos os pesticidas, porém para MLT o maior tempo de exposição aumentou a sensibilidade do ensaio, sugerindo efeitos secundários de subprodutos. Verificar a presença de compostos potencialmente tóxicos em corpos d'água por meio da toxicidade aguda com *C. sancticaroli* auxilia no gerenciamento de ações sobre os possíveis danos ao ambiente.

T1-P428 **Avaliação da citotoxicidade e genotoxicidade dos sedimentos de reservatórios subtropicais do Brasil**

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Pesquisas na bacia hidrográfica do Rio Uruguai, no sul do Brasil, têm demonstrado alterações das suas características naturais em função, principalmente, da urbanização e da agricultura, e apontam a poluição orgânica como fator preponderante da perda da biodiversidade e funções do ecossistema. A implantação de Usinas Hidrelétricas (UHEs) na região pode comprometer ainda mais a qualidade do ecossistema. O objetivo deste trabalho foi avaliar o potencial citotóxico e mutagênico do sedimento de reservatórios de UHEs nesta bacia: Foz do Chapecó, Ita, Monjolinho e Passo Fundo. As amostragens ocorreram na primavera de 2011 em quatro sítios distribuídos ao longo dos reservatórios. O sedimento foi misturado com água ultrapura na proporção de 4:1, após decantar por 24 horas, foi centrifugado obtendo o elutriato (sobrenadante) e submetido a análises físicas e químicas de pH, condutividade elétrica, fósforo, nitrito, nitrato e demanda química de oxigênio (DQO). Como controle positivo e negativo foi utilizado $CuSO_4$ 0,06 mg L^{-1} e água, respectivamente. Para cada tratamento foram incubadas 100 sementes de *Allium cepa* L. (Alliaceae) (4 repetições de 25 sementes) com fotoperíodo de 12h de luz e temperatura de 25°C para a germinação por 96 horas. Contabilizaram-se as anomalias na mitose. As maiores concentrações de fósforo e nitrato ocorreram no reservatório de Passo Fundo, que possui influência da agricultura, enquanto que no reservatório da Foz do Chapecó, que sofre maior influência urbana, foi registrado maior DQO. Observou-se diferença significativa ($p<0,05$) na taxa de germinação e no comprimento das raízes entre os diferentes reservatórios. Foi verificado baixo efeito fitotóxico, entretanto, com alta concentração de nutrientes indicando entrada de poluição orgânica.

T1-P433 **Toxic effects of mercury to the microalgae *Rhodomonas baltica***

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Mercury is a major marine contaminant of concern. It is very toxic to marine organisms including planktonic microalgae, that play a most important role as primary producers in marine ecosystems supporting marine food webs and contributing to the overall production of oxygen. Furthermore, some microalgae are commercially important due to their wide use as food in the aquaculture industry. The objective of the present study was to investigate the effects of mercury on *Rhodomonas baltica*. Ninety-six hours bioassays were carried out in laboratory conditions. Tests were conducted in 500 mL Erlenmeyer beakers, under aseptic conditions and following generally the OECD guideline 201 for testing with microalgae (1). Inhibition of culture growth and biomarkers related with oxidative stress were assessed as effect criteria. Mercury induced toxic effects on the microalgae at relatively high concentrations. Results raise concern on potential long-term exposure of microalgae to mercury.

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FEDER-01387601) and the Portuguese Foundation for the Science and Technology (FCT) through the OE component.

Reference:
(1)Guideline for testing the toxicity of chemicals No. 201. Freshwater Alga and Cyanobacteria, Growth Inhibition Test. (2011) *Organization for Economic Cooperation and Development. Paris.*

T1-P471 **Effect of two pesticides (Imazalil & Diazinon) in leaf litter breakdown and associated organisms**

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Organic matter breakdown is a process in which different groups of organisms are involved sequentially: detritus is first colonized by fungi and then shredded by invertebrates. Therefore, specific contaminants can affect one step or the other, and contaminants in mixtures can have important synergistic or antagonistic effects depending on the group of organisms they affect. Our objective was to evaluate the effect of two pesticides, the fungicide imazalil and the insecticide diazinon on fungal and invertebrate activity and on leaf breakdown. Biologically significant concentrations of both pesticides were determined first by means of a toxicological study. Then we performed a factorial experiment to analyse the effect of both pesticides individually or in combination on alder leaf conditioning and invertebrate shredding. The combinations of presence and absence of pesticides and the affected phase of decomposition process resulted in a total of 10 treatments. Each treatment consisted in 15 invertebrates individually enclosed in glass recipients with 200 ml of constantly aerated water. Microbial consumption was estimated with an extra set of 4 recipients without invertebrates for each treatment. Every week 3 conditioned alder disks were supplied and water changed. Preliminary results show that at high concentrations of diazinon but not of imazalil causes higher mortality of invertebrates, and that both compounds could affect decomposition.

T2-Biodiversity and biogeography

T2-P19 **Diversity of charophytes in the Neotropical region: Southern Brazil**

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Charophytes, also known as stoneworts, are considered to be the closest living relatives of land plants (Karol et al. 2001). They are an important group of submerged vegetation, playing several important roles in both brackish and freshwater ecosystems (Coops 2002). Considering their important role in aquatic ecosystems and the importance of knowledge of their species diversity, the aim of this study was to characterize the charophyte flora and communities occurring in southern Brazil. In Brazil, until the present moment, two genus of Characeae were identified, *Chara* and *Nitella*, which differ on the number of cells of the coronula, the apical portion of the female gametangia. A total of 33 different species were identified in southern Brazil. Twelve taxa of the genus *Chara* (Characeae, Chlorophyta) were identified, the taxonomic survey in the states of Paraná, Santa Catarina and Rio Grande do Sul recorded seven, one, and nine species for each state, respectively. *Chara guairensis* was the most common species in the area, followed by *C. rusbyana*. The species *C. guairensis*, *C. martiana*, *C. rusbyana*, *C. hydropitys*, *C. braunii* and its varieties were recorded for the first time in Rio Grande do Sul, and the following six for Paraná: *C. angolensis*, *C. diaphana*, *C. guairensis*, *C. kenoyeri*, *C. martiana*, and *C. zeylanica*. For the genus *Nitella*, 21 species were identified. *Nitella subglomerata* was the most common species, followed by *N. acuminata*, *N. clavata*, and *N. opaca*. The species *N. flagellifera*, *N. hyalina*, *N. microcarpa*, *N. mucronata*, and *N. tenuissima* are new citations for Paraná, *N. flexilis*, *N. microcarpa*, *N. mucronata*, and *N. ogivalis* are new citations for Rio Grande do Sul, and *N. blankinshipii*, *N. flagellifera*, and *N. subglomerata* are new citations for Santa Catarina.

References:
(1) Coops H. (2002) *Aquatic Botany* **72**:205-208.
(2) Karol K.G. *et al.* (2001) *Science* **294**:2351-2351.

T2-P20 **Desmídias (Zygnemaphyceae) associada à *Utricularia foliosa* L. na represa Rio São João, Paraná, Brasil**

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O presente estudo objetivou realizar o levantamento taxonômico da desmidioflórula associada à *Utricularia foliosa* em um ecossistema aquático inserido no Parque Nacional do Iguaçu (PNI), uma importante unidade de conservação brasileira que se localiza na região oeste do estado do Paraná. As coletas foram realizadas entre fevereiro de 2010 e fevereiro de 2011. Amostras ficoperifíticas da macrófita aquática *U. foliosa* foram coletadas, sendo em seguida o material biológico fixado em solução Transeau na proporção de 1:1. As análises qualitativas, morfometria e ilustração das microalgas foram realizadas com auxílio de microscópio binocular com ocular micrometrada, acoplado à câmara clara. Um total de 72 táxons foram identificados, estando distribuídos em 14 gêneros. Sete táxons constituem-se novas citações para o estado do Paraná: *Closterium lunula* var. *massartii* f. *nasutum*, *Closterium l.* var. *maximum*, *Euastrum didelta* var. *bengalicum*, *Pleurotaenium coronatum*, *Pleurotaenium* sp., *Staurastrum neglectum* e *Staurodesmus leptodermus*. Os gêneros melhor representados em número de espécies foram *Cosmarium* (14), *Micrasterias* (14) e *Staurastrum* (13). A grande biodiversidade registrada neste estudo nos remete à idéia de conservação e preservação de toda a flora aquática, tanto de criptógamos como fanerógamos, uma vez que ambos constituem-se a base de toda a cadeia produtiva dos ecossistemas aquáticos.

T2-P29 **Diatomáceas: Fragilariophyceae do rio Iguaçu, Parque Nacional do Iguaçu (Paraná, Brasil)**

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As diatomáceas são importantes na estrutura e na função dos ecossistemas aquáticos. Em ambientes lóticos volumosos podem ocorrer em grande diversidade, principalmente pelo elevado sucesso do grupo na colonização de diversificados habitats. A classe Fragilariophyceae é composta por diatomáceas arrafídeas, de taxonomia complexa pela dificuldade na seleção de caracteres diacríticos sob microscopia óptica. Neste estudo, avaliou-se a riqueza da classe Fragilariophyceae do rio Iguaçu, Paraná, baseando-se em coletas realizadas mensalmente, entre 2007 e 2008, em duas estações amostrais (CB1 e CM2). A análise de lâminas permanentes e consulta em literatura específica permitiu a identificação de 13 táxons infragenéricos, distribuídos em duas famílias e seis gêneros. O gênero *Fragilaria* foi o mais representativo com seis táxons: *F. capucina* var. *capucina*, *F. capucina* var. *vaucheriae*, *F. capucina* var. *fragilarioides*, *F. capucina* var. *gracilis*, *F. socia* e *F. rumpens*. O táxon mais frequente foi *Synedra goulardii* registrado em todos os meses de coleta. As riquezas mais elevadas foram constatadas em fevereiro na CB1 com 12 táxons e em maio e agosto na CM2 com 10 e 11 táxons respectivamente, coincidindo com os maiores valores de fosfato. Em novembro obtiveram-se as menores riquezas quando as concentrações de amônio estiveram mais elevadas. *Ulnaria acus*, *Tabellaria* cf. *flocculosa*, *Fragilariforma* cf. *virescens*, *Fragilariforma* cf. *fonticola* apresentaram registros únicos em abril, junho e agosto respectivamente. Apesar das estações de coleta constituírem ambientes heterogêneos em largura, profundidade e velocidade de corrente, não apresentaram diferenças representativas na composição das espécies.

T2-P31 **Diatomoflórula do rio São João e lagoa Poço Preto, Parque Nacional do Iguaçu, Paraná, Brasil**

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Inventariar as espécies da fauna e flora é o um passo importante para a conservação e uso racional de um ecossistema, uma vez que sem um conhecimento mínimo da biodiversidade pouco pode ser feito. O presente trabalho teve por objetivo inventariar as espécies, variedades e formas taxonômicas de diatomáceas da lagoa Poço Preto e do rio São João localizados dentro dos limites de uma importante unidade de conservação ambiental, Parque Nacional do Iguaçu, e assim contribuir para o aumento do levantamento da diatomoflórula. Foram realizadas coletas em julho de 2001 e fevereiro de 2002, na lagoa Poço Preto, e em Julho de 2008 (inverno) e Fevereiro de 2009 (verão chuvoso) no rio São João. Após coletadas as amostras foram preservadas em solução Transeau e posterirormente foram confeccionadas as lâminas permanentes segundo a técnica proposta por Simonsen (1974), modificada por Moreira Filho & Valente – Moreira (1981). Foram identificadas 93 espécies na lagoa Poço Preto e 58 espécies no rio São João, totalizando 151 espécies distribuídas em 36 gêneros; desses, 4 pertencem a classe Coscinodiscophyceae, 3 a classe Fragilariophyceae e 29 a classe Bacillariophyceae. Foram registradas 29 novas citações para o estado do Paraná todas pertencentes à classe Bacillariophyceae. Foi possível observar maior riqueza e diversidade de espécies no período de seca tanto na lagoa Poço Preto, como no rio São João. Os gêneros *Eunotia* e *Pinnularia* apresentaram uma maior riqueza de espécies, abundância e foram encontrados em todas as coletas em ambos os ambientes. Pode-se concluir que a flora diatomológica para os ambientes em analise é rica e diversificada, visto o grande número de indivíduo analisado.

T2-P38 **Composição da comunidade fitoplanctônica do rio Iguaçu, Parque Nacional do Iguaçu, Paraná, Brasil**

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O presente estudo objetivou realizar o inventário taxonômico da comunidade fitoplanctônica do Baixo Iguaçu, sub-bacia do rio Iguaçu, com o intuito de contribuir para o conhecimento e divulgação da ficoflórula deste rio subtropical. O trecho amostrado do Iguaçu encontra-se no interior do Parque Nacional do Iguaçu - importante unidade de conservação do Brasil situada no oeste do estado do Paraná. As coletas foram realizadas em duas estações de amostragem (25° 35′ S; 54° 23′ W e 25° 38′ S; 54° 27′ W), a montante (estação 1) e a jusante (estação 2) das Cataratas do Iguaçu respectivamente, entre maio de 2010 e maio de 2011. O material biológico foi coletado com rede de plâncton (25 micrometros) e preservado em solução Transeau 1:1, sendo a análise das microalgas feita em microscópio óptico binocular com ocular micrometrada. A comunidade fitoplanctônica do Baixo Iguaçu apresentou alta biodiversidade, com um total de 408 táxons registrados. Dentre os grupos taxonômicos inventariados, Bacillariophyceae (52,2%), Chlorophyceae (17,9%), Cyanobacteria (10,8%) e Zygnemaphyceae (10,3%) contribuíram com o maior número de táxons. Os demais grupos, Rhodophyceae, Euglenophyceae, Craspedomonadophyceae, Chrysophyceae, Oedogoniophyceae, Chlamydophyceae, Dinophyceae e Xanthophyceae juntos representaram 8,8% do total de táxons identificados. Os gêneros *Pinnularia* (Bacillariophyceae), *Desmodesmus* (Chlorophyceae), *Lyngbya* (Cyanobacteria), *Closterium* e *Staurastrum* (Zygnemaphyceae) foram os que apresentaram maior riqueza específica. A montante das quedas o número de táxons inventariados foi 258, enquanto que a jusante 344. Do total registrado, 177 foram comuns aos dois locais amostrados, 75 exclusivos da estação 1 e 159 foram exclusivos da estação 2.

T2-P47 **Resposta da comunidade fitoplanctônica a gradientes tróficos em reservatórios mediterrâneos (Catalunha)**

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O objetivo dessa pesquisa foi verificar como a comunidade fitoplanctônica responde as diferentes trofias em uma série de reservatórios mediterrâneos (La Llosa del Caval, La Baells, Sant Ponç, Susqueda, Sau, Foix e Santa Fé) na Catalunha (Espanha). Sau e Susqueda estão na bacia hidrográfica do rio Ter, enquanto que La Baells em Llobregat, La Llosa del Cavall e San Ponç em Cardener, Foix em Foix e Santa Fé em Tordera. As amostragens das análises físicas, químicas e biológicas da água e do

fitoplâncton foram realizadas em amostras integradas da coluna d´água (0-5 m) em setembro a outubro de 2011. A contagem do fitoplâncton foi feita em microscópio invertido e determinadas as densidades e os biovolumes. Os reservatórios La Llosa e San Ponç foram classificados como oligotróficos, La Baells e Santa Fé como oligo-mesotróficos, enquanto Susqueda, Sau e Foix foram classificados, respectivamente, como mesotrófico, eutrófico e hipereutrófico. Um total de 89 táxons foram identificados pertencentes as Classes: Cyanophyceae, Chlorophyceae, Zygnemaphyceae, Prasinophyceae, Bacillariophyceae, Dinophyceae, Euglenophyceae, Chrysophyceae, Cryptophyceae, Haptophyceae e Xantophyceae. A densidade fitoplanctônica variou de 6.304,4 (La Llosa) a 748.986,6 cél mL^{-1} (Foix) e o biovolume de 1,06 (San Ponç) a 34,6 (Foix) $mm^3 L^{-1}$. Pode ser observada uma tendência de aumento da densidade e do biovolume do fitoplâncton com o aumento da trofia dos reservatórios.

T2-P52 **Estoques de carbono do perifíton e seus fatores determinantes em um reservatório subtropical**

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A comunidade perifítica pode representar uma das principais fontes de carbono autóctone nos ecossistemas aquáticos continentais. Desta forma, quantificar seus estoques de carbono é uma importante ferramenta no manejo de reservatórios subtropicais, visando a sustentabilidade dos recursos hídricos. A comunidade perifítica aderida a macrófita aquática *Polygonum punctatum* foi amostrada sazonalmente em 2010 no reservatório de Itupararanga (Ibiúna, São Paulo, Brasil), com o objetivo de verificar sua contribuição nos estoques de carbono nesse reservatório. O perifíton aderido aos pecíolos da macrófita foi raspado utilizando-se pincel e jatos de água destilada. Para a determinação do carbono, o perifíton foi seco em estufa a 60 ºC e suas concentrações determinadas no analisador elementar CHNS-O CE Intruments (Mod. EA1110). Análises físicas e químicas da água também foram realizadas e índices para a classificação da comunidade foram aplicados. A análise de regressão múltipla (adjusted r^2=0,98, p=0,08) revelou que os estoques de carbono no perifíton são controlados principalmente pela condutividade elétrica (p<0,01), temperatura da água (p=0,05) e concentrações de nitrogênio total (p<0,05). A comunidade perifítica apresentou baixa biomassa e sua maior porção foi composta por matéria orgânica. Os resultados da análise elementar demostraram que o perifíton contribui com média anual de 1,9 mg C g^{-1} DW de *P. punctatum*. Dessa forma, pode-se concluir que o perifíton aderido a *P. punctatum* representa baixa contribuição nos estoques de carbono do reservatório de Itupararanga. Agradecimentos FAPESP (Proc. n. 2008/55636-9).

T2-P72 **How to protect amphibians in medium-sized administrative areas: which ones, where and why**

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Amphibians epitomize the modern biodiversity crisis, and attract a great deal of attention from the scientific community as there is a complex puzzle of factors that influences their disappearance. However, these factors are multiple and may vary spatially and, thus, the decline in each locality has its own particular combination of causes. This study shows a suitable methodological procedure to understand threats on amphibian species in medium size administrative areas where local extinction risks are not covered by conservation status in greater administrative areas. For our study case, 10 biological and ecological variables that may affect the survival of 15 amphibian species were categorized and reduced though principal component analysis. The principal components explaining extinction risk were related to ecological plasticity, reproductive potential, and specificity to breeding habitats. Thereafter, linear regressions of every extinction component considering the percentage of protected UTM 10x10 squares where every species occurs showed which species are currently under-protected. Finally, the extinction risk components were joined to a presence-absence matrix, providing an extinction risk value for every UTM 10x10 squares. This procedure indicates where those species needing management measures related to every extinction risk component occurs. In summary, this methodology provides the necessary information to maximize benefits of conservation measures in small areas by identifying: i) which species are under-protected, ii) where most of species occur, and iii) which ecological factors we should focus on.

T2-P79 **Estructura del fitoplancton en 30 lagunas de la costa pacífica tropical seca (Costa Rica y Nicaragua)**

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Ante las previsiones del cambio global, es interesante establecer qué aspectos de la comunidad son resistentes a las grandes perturbaciones tales como los cambios hidrológicos y qué factores pueden estar influyendo en su estabilidad. Por eso se han estudiado treinta lagunas de diferentes tamaños de la llanura costera desde el Estero Real en Nicaragua (12º 53′ 22.6″ N) hasta la laguna Nicaragua en Costa Rica (10º 19′ 42.9″ N). Fueron muestreadas al comienzo de la inundación (junio 2010), luego cuando ésta fue máxima (septiembre) y en la época seca (enero). La riqueza total observada del fitoplancton fue de 295 especies: 114 clorofíceas, 77 diatomeas, 44 cianobacterias, 34 euglenofíceas, 8 criptofíceas, 8 dinofíceas, 6 crisofíceas y 4 xantofíceas. Cuando se analiza la composición especifica, el promedio de la similitud de Jaccard entre lagos en junio (0.21±0.003) fue estadísticamente diferente y superior al que se presentó en las otras dos circunstancias hidrológicas (0.18±0.003), de modo que la beta-diversidad sería menor cuando comienzan las lluvias. El biovolumen promedio (±dt) en junio fue 0.9±2.3 $mm^3 L^{-1}$, en septiembre 0.3±0.6 $mm^3 L^{-1}$ y en enero 1.4±2.1 $mm^3 L^{-1}$; un ANOVA con prueba post hoc demuestra que el biovolumen del periodo seco fue mayor al alcanzado durante las épocas con lluvias. En junio se aprecia una dominancia de las euglenofíceas (33% del total de biovolumen), y diatomeas junto criptofíceas suponen el 40%; en septiembre son euglenofíceas (35%), diatomeas (26%) y clorofíceas (17%) las dominantes; y en enero de 2011 destacan euglenofíceas (35%), diatomeas (26%) y criptofíceas (20%). De modo que la biomasa del fitoplancton de las

lagunas de esta región es sensible a los cambios hídricos pero no de igual modo que la composición.

T2-P157 **Influencia del hidroperíodo sobre las comunidades de invertebrados acuáticos de dos lagunas temporales**

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Los humedales son ecosistemas altamente productivos y diversos. Entre estos sistemas destacan los medios temporales, cuyas comunidades de invertebrados son distintas de las que habitan medios permanentes, al desarrollar adaptaciones morfológicas, ciclos de vida y mecanismos de dispersión que les permiten sobrevivir en periodos de sequía. El objetivo de este estudio fue conocer la respuesta de la fauna a la sequía temporal y con ello verificar las diferencias entre los dos períodos (antes y después de la sequía) tanto de los parámetros ecológicos como de la composición faunística. Para ello se hicieron muestreos mensuales en 2 humedales temporales durante un año. Se tomaron muestras semicuantitativas durante periodos de 60 segundos en cada laguna. Los parámetros ecológicos estudiados fueron la riqueza de familias, abundancia, riqueza esperada (ES=200), índice de Shannon y equidad. La afinidad faunística fue calculada mediante el índice de Jaccard. En un análisis preliminar de los resultados se constatan diferencias entre los dos períodos. Se puede observar que los valores de los parámetros ecológicos estudiados fueron más elevados en el período anterior a la sequía, con un ascenso gradual desde el período post-sequía hasta el período pre-sequía, lo que denota que estos medios son colonizados paulatinamente y alcanzan el máximo justo antes de la sequía. También se observan diferencias en la composición de la comunidad. Algunos grupos fueron más abundantes en primavera y otros lo fueron en los primeros meses después del periodo seco. Esto puede deberse tanto a diferencias en los ciclos vitales como a cambios debido a factores ambientales, ya que estos medios son muy heterogéneos y la mayoría de las especies que los habitan tienen una capacidad de dispersión muy elevada.

T2-P176 **Levantamento das espécies de macrófitas aquáticas do açude Itans (Nordeste semiárido do Brasil)**

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Formas submersas, emergentes ou flutuantes de macrófitas podem ser encontradas nas margens de lagos e em toda zona eufótica. Dentro de um ecossistema natural e equilibrado, as macrófitas e outras plantas aquáticas oferecem um importante habitat para aves aquáticas, invertebrados e peixes (1). Este trabalho teve por objetivo identificar espécies de macrófitas aquáticas presentes em 07 pontos escolhidos aleatoriamente no Açude Itans, localizado no município de Caicó – Estado do Rio Grande do Norte (6°29'20" S e 37°04'00" W), na região semiárida do nordeste brasileiro. O enquadramento sistemático/taxonômico das famílias de angiospermas foi realizado de acordo com o proposto por APG II (2) e os resultados foram analisados através do Índice de Diversidade de Shannon (3). Foram identificadas 4 biótipos de macrófitas aquáticas (emersas, folhas flutuantes, submersas livres e flutuantes), representadas por 7 famílias (Hydrocharitaceae, Nymphaeaceae, Alismataceae, Cyperaceae, Ponderiaceae, Salviniaceae e Araceae), 5 espécies (*Egeria densa* Planch, *Eichhornia crassipes* (Mart.) Solms, *Nymphaea elegans* Hook., *Pistia stratiotes* L. e *Salvinia auriculata* Aubl.) e 3 gêneros (*Eleocharis* sp., *Echinodorus* sp., *Lemna* sp.). Comparando os sete pontos de coleta, observou-se que o ponto 05 foi o mais diverso (0.8451). A heterogeneidade foi maior nos pontos 03 e 04 (0.6667 e 0.4717, respectivamente), e os pontos 05 (0.9358) e 06 (0.8617) foram os que apresentaram maior homogeneidade. A identificação de espécies bioindicadoras de ambientes aquáticos poluídos (*E. crassipes*, *P. stratiotes* e *S. auriculata*), sugere a necessidade de novas estratégias para a gestão do reservatório.

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T2-P220 **Amphibian assemblages and habitat structure in Portuguese low order streams affected by contrasting forests**

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This study examined the amphibian assemblages of 29 low order (1-3) streams from central and northern Portugal, affected by contrasting forest types. Eucalypt (N=10), pine (N=9) mixed (eucalypt and pine; N=2) and broadleaf (N=8) forests were surveyed by active search for adult amphibians in terrestrial habitat (4 transects, 2 m wide, 0-10 m from the stream bank), using a dip-net in aquatic habitat. Stream habitat was characterized using a modified version of River Habitat Survey. Terrestrial habitat was characterized using a bespoke survey based on topography, cover and vegetation complexity. Richness ranged from one to five across sampling sites. The Iberian endemic *Rana iberica* was the most widespread species occurring at 93% of sites with the highest abundances in broadleaf sites. *Triturus boscai* and the Portuguese endemic *Chioglossa lusitanica* (IUCN-vulnerable) occurred at 72% and 36% of sites, respectively. *Rana perezi* and *Bufo bufo* occurred at less than 25% of sites, while *Salamandra salamandra* and *Triturus marmoratus* were rare (present at less than 15% of sites). Amphibian abundances were significantly related to riparian habitat characteristics. *Rana iberica* was largely explained by bank material, rock channel substrate and humid terrestrial cover that were increasingly common at higher altitudes. *Chioglossa lusitanica* was related to the frequency of in stream gravel and cobble and rippled to broken-water flow patterns. *Triturus boscai* was related to herbaceous vegetation. The relationship between these communities and riparian, channel and bank habitat suggest that management of stream and adjacent riparian habitat can mitigate the impact of landuse intensification and the disturbance of plantation forests to amphibian biodiversity in these streams.

T2-P228 **Influence of spatial position of small tributaries and confluences on aquatic insect assemblage**

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We studied the effect of tributary position at stream confluences on aquatic insect assemblage. We tested the hypotheses that i) aquatic insect assemblage at small tributaries that flow into another small tributary (S–>S) differ from small tributaries flowing into mainstem river (S–>L) and ii) that fauna at S–>S is a nested subset of the fauna in S–>L of the same catchment. Irrespective of confluence position in the catchment, we hypothesize that reaches upstream of confluences have a iii) distinct and iv) nested fauna in relation to downstream reaches. The study was conducted in nine watersheds in São José dos Ausentes (RS, Brazil) and insect samples (Surber sampler) were obtained in small streams that flow into a river of similar size (highland tributaries) and those that flow into mainstem river (mainstem tributaries). We sampled reaches upstream and downstream confluences at lowlands and highlands. Rarefied richness was calculated and compared using one-tailed paired t test, where each pair was a watershed. Multivariate Analysis of Variance based on distance was performed to assess if the composition and structure of the fauna differed between the streams types. We evaluated nestedness using the Nestedness metric based on Overlapping and Decreasing Fill. Tributaries that flow into the mainstem river supported greater richness and abundance than streams that flow into small streams. Taxa from highland tributaries were a nested subset of the assemblage belonging to mainstem tributaries. Only confluences located in highland areas affected reaches downstream in terms of assemblage composition and structure. We conclude that the location of small-order tributaries in the watershed is crucial for determining the structure and richness of the aquatic insect fauna.

T2-P259 **Influência da vegetação na distribuição espacial de rotíferos no Açude Taperoá II, Paraíba (Brasil)**

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Os ecossistemas aquáticos continentais têm uma grande diversidade de habitats. Estes podem apresentar estruturas (presença de vegetação aquática, rochas, buracos etc.) e características ambientais (físicas, químicas e biológicas) distintas. Zonas associadas à vegetação, como a zona litorânea favorecem a sobrevivência dos organismos aquáticos, tais como, mais alimento e refúgio. A estrutura do habitat também interfere nas pressões de seleção, causando alterações nas interações competitivas e na predação. Alguns trabalhos revelaram maior abundância de rotíferos associados a macrófitas. O presente trabalho teve como objetivo comparar diferentes habitats entre as áreas litorânea e limnética em relação à diversidade e densidade de Rotifera, em um açude no semiárido paraibano, Brasil. As coletas foram realizadas em duas estações (estiagem e chuvosa) no açude Taperoá II. Foram desenhados dez transectos transversais ao longo de quatro áreas do açude. Os rotíferos foram coletados através de arrastos verticais, sendo filtrados cerca de 200 L de água com rede de plâncton de 45 µm de abertura de malha, com cinco amostras por transecto: duas litorâneas e três limnéticas (50 pontos). Em seguida, o material retido foi fixado e preservado em formol a 4% tamponado com tetraborato de cálcio. Analisando os dados verificou-se que a pluviosidade foi determinante nas densidades de Rotifera, bem como, em sua diversidade, as quais durante o período chuvoso apresentaram-se mais elevadas em relação ao período de estiagem, no entanto algumas espécies foram mais abundantes neste último. Comparando entre os habitats, verificamos que no período seco as densidades foram mais elevadas na zona litorânea, e semelhantes entre os dois habitats no período chuvoso.

T2-P260 **Distribución altitudinal de rotíferos planctónicos en lagos altoandinos tropicales en Colombia**

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Los gradientes altitudinales ofrecen condiciones de historia ecológica más constante con respecto a los otros gradientes espaciales. La diversidad de organismos <2 mm parece variar independientemente de estos gradientes, documentándose mayor riqueza de especies para organismos pequeños respecto a organismos de tamaño superior. Los rotíferos, al poseer tamaños entre los 50-2000 µm, ser cosmopolitas, abundantes y encontrarse ampliamente distribuidos se perfilan como un grupo muy importante en cuanto a estudios limnológicos. Se colectó una muestra cualitativa tanto en la zona litoral como en la zona limnética en cada lago, realizando un arrastre con la red de zooplancton (63 µm), la cual tenía acoplado un frasco plástico de 140 ml. Cada muestra fue narcotizada con agua carbonatada y sacarosa y fijada con solución Transeau. Los rotíferos se observaron en cámaras tipo Sedgwick-Rafter en alícuotas de 1 ml bajo microscopio Nikon. Para la identificación se emplearon diferentes claves taxonómicas. Se estudió la riqueza de especies de rotíferos con relación a la altitud en 15 lagos de los departamentos de Boyacá y Cundinamarca (Colombia) ubicados en un rango de alturas desde 2026 hasta 4029 m. Se registraron 23 morfoespecies de rotíferos pertenecientes a dos subórdenes y a 13 familias, de las que se destacan por su riqueza Brachionidae, Notommatidae y Synchaetidae. La riqueza de especies no disminuye con la altitud. Ciertas especies como *Lecane* y *Synchaeta* parecen exhibir un patrón de distribución a elevadas altitudes, evidenciando la preferencia de las especies de *Synchaeta* por cinturones altitudinales específicos: en este caso, se presenta continuamente desde 3137 m hasta 3768 m. *Polyarthra* se registra en los lagos de menor elevación. Se muestra una mayor riqueza en la zona litoral respecto a la limnética en el 46,6% de los lagos muestreados.

T2-P267 **Influence of floating macrophytes on populations of planktonic microcrustaceans**

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Planktonic microcrustaceans may respond differently to the presence of macrophytes, whose roots can serve as refuge from predators or can difficult the foraging for filter feeding species. The aim of this study is to assess the influence of macrophytes on planktonic microcrustaceans and detect the horizontal daily migration behavior of these organisms. An experiment was conducted using 12 small ponds (13 x 6 x 1.50 m) in two

treatments: six ponds had floating macrophytes - *Eichhornia crassipes* - in one of its edges and six without macrophytes. Predators as fish and *Chaoborus* larvae were absent. After an acclimation period, animals were sampled in the littoral and limnetic zones with a suction pump and a plankton 45 µm mesh net, at midday and midnight. The results between treatments and periods were compared by t-test and variance analysis. Total density of microcrustaceans did not vary significantly between treatments and between hours; *Macrothrix paulensis* was more abundant in tanks with macrophytes while *Argyrodiaptomus furcatus* did not occur; *Moina minuta* and *Thermocyclops decipiens* were more abundant in the night sampling, indicating a daily migration for these species. An analysis of similarity (ANOSIM) showed that species composition did not vary between treatments (r=0.1 and p=0.7). Our results show that macrophytes influence differently the species of microcrustaceans, and that macrophytes may not be the only necessary stimulus for the occurrence of horizontal migration. Other factors, as predation, should be also considered as important for horizontal migration.

T2-P276 **Distribution and ecology of some species of Rhodophyta in the Ebro River Basin**

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The implementation of the Water Framework Directive (2000/60/CE) in the Ebro River Basin and the evaluation of the ecological state of rivers, lakes and wetlands are increasing the knowledge about the distribution and ecology of aquatic organisms, including the red algae (Rhodophyta). After selecting representative reaches of 100 m long we took 1400 macroalgae samples from 240 sites during the period 2006-2011 and between May and October. The organisms were fixed in 4% formalin and were taken to the laboratory to be analyzed under the microscope. In addition to biological sampling, some physical and chemical parameters were measured in situ (pH, temperature, conductivity and dissolved oxygen) and additional water samples were taken to the laboratory for analysis of nitrates, nitrites, ammonum and phosphorus. In this work we show new data concerning the distribution and environmental ranges of six species of Rhodophyta in the Ebro River Basin. 1) *Bangia atropurpurea* was present in different types of rivers, from the high mountains of the Pyrenees to the middle reaches of some major tributaries of the river Ebro, preferring oligo-mesotrophic waters. 2) *Chroodactylon ornatum* was observed as an epiphyte on *Cladophora* sp, showing eurioic behavior. 3) *Chroothece rupestris* was found in sections of limestone mountains in clear water and oligo-mesotrophic conditions 4) *Ch. richteriana* has a restricted distribution in the Ebro basin, and it was found in sections of limestone mountains in oligo-mesotrophic conditions. 5) *Compsopogon coeruleus* was found in the middle and lower reaches of the river Ebro in warm and eutrophic waters. 6) *Thorea hispida* was restricted to the main axis of river Ebro and the lower reaches of its main tributaries, living in wide range of conductivity and nitrate levels.

T2-P291 **Distribución altitudinal de rotíferos planctónicos en lagos altoandinos tropicales en Colombia**

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Los rotíferos, al poseer tamaños entre los 50-2000 µm, ser cosmopolitas, abundantes y encontrarse ampliamente distribuidos se perfilan como un grupo muy importante en cuanto a estudios limnológicos, sin embargo su estudio ha sido poco desarrollado en el trópico americano. Se colectó una muestra cualitativa tanto en la zona litoral como en la zona limnética en cada lago, realizando un arrastre con la red de zooplancton (63 µm), la cual tenía acoplado un frasco plástico de 140 ml. Cada muestra fue narcotizada con agua carbonatada y sacarosa y fijada con solución Transeau. Los rotíferos se observaron en cámaras tipo Sedgwick-Rafter en alícuotas de 1 ml bajo microscopio Nikon. Para la identificación se emplearon diferentes claves taxonómicas. Se estudió la riqueza de especies de rotíferos con relación a la altitud en 15 lagos de los departamentos de Boyacá y Cundinamarca (Colombia) ubicados en un rango de alturas desde 2026 hasta 4029 m. Se registraron 23 morfoespecies de rotíferos pertenecientes a dos subórdenes y a 13 familias, de las que se destacan por su riqueza Brachionidae, Notommatidae y Synchaetidae. La riqueza de especies no disminuye con la altitud. Ciertas especies como *Lecane* y *Synchaeta* parecen exhibir un patrón de distribución a elevadas altitudes, evidenciando la preferencia de las especies de *Synchaeta* por cinturones altitudinales específicos: en este caso, se presenta continuamente desde 3137 m hasta 3768 m. Polyarthra se registra en los lagos de menor elevación. Se muestra una mayor riqueza en la zona litoral respecto a la limnética en el 46,6% de los lagos muestreados.

T2-P295 **Long term phytoplankton dynamics and structure related to environmental variables in a meromictic lake**

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Long term studies have been performed in Lake La Cruz (Spain) by the Limnology Research Group of the University of Valencia since the eighties. These works, spread over several cycles of study, offer the opportunity to evaluate in detail the evolution of the main environmental features and the structure of the phytoplankton community. In this study, we include monthly phytoplankton counts, from years 1987-1988, 1996-1998, 2005-2007, and discrete samplings thereafter. Phytoplankton community during the period of stratification was predominantly composed by the chlorophytes *Monoraphidium minutum* and *Crucigenia rectagularis* in 1987-1988 period, *Lagerheimia quadriseta*, *Pseudoquadrigula* sp and *Chlorella vulgaris* in the 1996-1998 period and by *Pectodyction pyramidale*, *Tetraedron minimum* and *Scenedesmus* sp in the 2005-2007 period. The abundance of desmids cited mainly in tropical lakes has increased significantly from the period 1996-1998. The remaining algal groups showed no significant differences during stratification period. During the mixing period diatoms have become the dominant group to the detriment of cryptophytes, while in the other phytoplankton groups no significant changes were observed. In this work, we evaluated the relationships between the observed

changes in different phytoplankton populations with measurements of environmental variables and studies of other components of the food web, such as the heterotrophic bacterioplankton and picocyanobacteria. Understanding factors that determine the trends in the last decades towards smaller populations or diversity loss will serve as a model for other systems with similar characteristics and for a better knowledge of plankton long term succession and aquatic ecosystem management.

T2-P296 **Riqueza e distribuição de macrófitas aquáticas em reservatório da região sudeste do Brasil.**

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O objetivo deste trabalho foi realizar um levantamento das espécies de macrófitas aquáticas do reservatório de Itupararanga, bacia do rio Sorocaba, São Paulo, Brasil (23°36'44"S, 47°23'51"W) e verificar as condições ambientais relacionadas à sua distribuição espacial. Foram realizadas duas coletas em 2010, uma no período de chuva e outra na seca. Em cada estande de macrófitas foram lançados quatro quadrados flutuantes de 0,25 m². As plantas contidas no quadrado foram coletadas para determinação da massa seca. No período de chuva foram encontrados 12 locais com macrófitas (com 15 espécies) e na seca 9 locais (com 10 espécies). Ao todo foram identificadas 16 espécies e 10 famílias. Espécies emergentes predominaram (12). *Urochloa* sp., *Polygonum* sp. e *Eichhornia crassipes*, foram as mais freqüentes, sendo que as duas primeiras predominaram no período de chuva. Na seca *E. crassipes* foi a mais frequente. O valor médio da biomassa total foi ligeiramente superior na seca (573 gMS m^{-2}) em relação ao período chuvoso (493 gMS m^{-2}), porém sem diferença significativa ($p<0,05$). E. crassipes atingiu maior biomassa na seca (1.245 gMS m^{-2}) e *Polygonum* sp. e *Urochloa* sp. no período chuvoso (750 gMS m^{-2} e 488 gMS m^{-2}, respectivamente). A ocorrência de macrófitas concentra-se na região de cabeceira do reservatório e em braços mais à jusante com influência antrópica e mais eutrofizadas. Estes resultados contribuem para a descrição da composição florística e distribuição de macrófitas aquáticas neste ecossistema. A ocorrência de espécies flutuantes em áreas mais antropizadas não deve ser ignorada, como indicativo do aumento da trofia do reservatório.

T2-P307 **Aguas termales, enclave peculiar para el desarrollo de *Chroothece* sp. (Stylonemathopyceae, Rhodophyta)**

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Pese al gran número de enclaves con características termales que pueden encontrarse en el territorio ibérico, el estudio de las aguas termales desde un punto de vista de la diversidad ficológica, ha sido por lo general un tema poco desarrollado, exceptuando algunos casos localizados (1). Con el motivo del desarrollo de la Flora Ibérica de Algas Continentales en su segunda fase, centrada en Rodofíceas (Rhodophyta), se ha identificado en la localidad de Santa Fe (Granada, España) un taxón hasta ahora nunca descrito en este tipo de ambientes termales: *Chroothece* sp. (Stylonematophyceae, Rhodophyta) (2). Si bien se han identificado otras rodofíceas en estas áreas, pero por lo general asociadas a aguas termales de un carácter más ácido. Los análisis morfo-anatómicos permiten aclarar las dudas taxonómicas de este género. Por otro lado el estudio físico-químico de las aguas, así como una comparativa con áreas similares posibilitan la caracterización del medio. Todo ello es la base para establecer la posible utilización y aplicación de esta especie como bioindicador (3).

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T2-P330 **Diversidade de Cladocera em reservatórios e trechos lóticos da Bacia do rio da Prata (América do Sul)**

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Através de um estudo em macro-escala na Bacia do rio da Prata (Brasil, Argentina, Uruguai, Paraguai e Bolívia), segunda do continente americano em magnitude (área 3.170.106 km², vazão 22.000 m^3 s^{-1}), analisou-se a diversidade de Cladocera em trechos compostos por 15 reservatórios (regiões lêntica e semi-lêntica) e 14 trechos de rios livres de represamento. As amostragens ocorreram no período de verão (janeiro) e inverno (junho) do ano de 2010, através de arrastos verticais com uma rede de plâncton cônica de 68 µm. Algumas variáveis limnológicas (temperatura, oxigênio dissolvido, clorofila-a, fósforo total, etc.) foram simultaneamente obtidas a fim de correlacionar com os atributos ecológicos das associações de Cladocera. No total foram encontradas 57 espécies, pertencentes às famílias Sididae, Daphniidae, Bosminidae, Moinidae, Macrothricidae, Ilyocryptidae e Chydoridae. As maiores abundâncias ocorreram no trecho alto da bacia (menores latitudes), região com as maiores temperaturas e predomínio de reservatórios; já nos trechos lóticos, a abundância dos cladóceros foi negativamente afetada por altos valores de velocidade da correnteza e sólidos em suspensão. Em relação aos períodos amostrados, ocorreram reduções drásticas da abundância no inverno, principalmente na porção inferior da bacia (altas latitudes), devido, possivelmente, as maiores variações da temperatura da água entre verão (29 °C) e inverno (13 °C). Padrões espaciais de variação da diversidade (Shannon-Wienner) não foram encontrados, no entanto, trechos com presença de reservatórios apresentaram as maiores diversidades, exceto em regiões com processos avançados de eutrofização devido à influência de grandes centros urbanos/industriais e agricultura intensiva.

T2-P347 **Algas de los pastizales húmedos del nacimiento del río Genil (Sierra Nevada, Granada).**

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Los pastizales higrohidrófilos de Sierra Nevada (Granada, España) son ambientes frágiles, actualmente amenazados por la presión humana y ganadera. Hasta el momento no han sido objeto de atención desde el punto de vista ficológico, desconociéndose las especies de algas que forman parte de los mismos. En el presente estudio se identificaron las

algas presentes en estos ambientes, incluyendo arroyos y pastizales; y se examinó la existencia de cambios en las comunidades con respecto al gradiente de humedad y altitud. Con esta finalidad se recolectaron muestras, a lo largo del periodo libre de hielo de 2011, a diferentes cotas altitudinales del barranco de San Juan, situadas en tres ambientes con distinto grado de humedad, desde arroyos hasta prados húmedos. Se midieron los parámetros limnológicos básicos: temperatura, pH y conductividad. Los grupos con mayor representación de especies fueron diatomeas y desmidiáceas, lo que confirma la afinidad de estos grupos por ambientes poco profundos, de aguas ácidas y turbosas. Entre las especies estudiadas destacan las de los géneros *Geitlerinema*, *Lemanea*, *Spirotaenia*, *Tetracyclus* y *Tribonema*. Los análisis estadísticos indicaron diferencias entre ambientes y cotas, siendo el prado húmedo el que presentó mayor número de especies, y la cota baja la menos similar. Desde el punto de vista de las interacciones con otras especies y la gestión de estos sistemas, es importante la alta frecuencia relativa de cianobacterias fijadoras de nitrógeno de los géneros *Nostoc*, *Cylindrospermum* y *Anabaena*. Los resultados obtenidos ponen de manifiesto la importancia de las algas en los prados húmedos de Sierra Nevada, siendo necesario un mejor conocimiento de las mismas para realizar una adecuada gestión de estos frágiles ecosistemas.

T2-P369 **Heterópteros aquáticos e semiaquáticos dos lavrados de Roraima, Amazônia, Brasil**

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Os heterópteros aquáticos ocupam os mais diversos nichos em ambientes com diferentes estados de conservação (1). O objetivo deste trabalho foi contribuir para o incipiente conhecimento da fauna de Heteroptera em igarapés de lavrado (savana ou cerrado, de acordo com Barbosa et al. 2007 (2), em Roraima. Os locais de amostragem estão localizados em módulos do Programa de Pesquisa em Biodiversidade - PPBio, Campus do Cauamé e Campus Experimental da Embrapa – Água Boa. As coletas foram realizadas em fevereiro/2010, em um trecho de 50 m, com rapiché e retiradas 6 amostras aleatórias de cada. Os espécimes foram identificados ao nível de gênero. Foram coletados 103 indivíduos, pertencentes a 8 famílias e 13 gêneros: Belostomatidae (*Belostoma, Lethocerus* e *Weberiella*), Corixidae (*Tenagobia*), Gerridae (*Neogerris* e *Tachygerris*), Mesoveliidae (*Mesovelia*), Naucoridae (*Limnocoris*), Notonectidae (*Notonecta*), Pleidae (*Neoplea* e *Paraplea*) e Veliidae (*Microvelia* e um gênero não identificado). O local com mais gêneros e indivíduos foi o Cauamé (10 gêneros e 67 indivíduos). A Embrapa apresentou 8 gêneros e 36 indivíduos. O táxon com maior número de indivíduos foi *Tenagobia* (n=28), seguido por *Notonecta* (n=22) e *Limnocoris* (n=15). Apresentaram poucos indivíduos os gêneros *Tachygerris* e *Mesovelia* (n=1), *Neogerris* (n=2), *Neoplea* e *Paraplea* (n=3). Corixidae, Mesoveliidae, e Gerridae apresentam nova ocorrência para o ambiente lavrado, assim como Hebridae e Pleidae para o estado (3). Através deste trabalho, foi possível ampliar o conhecimento desta fauna nesta fitofisionomia do extremo norte do país.

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T2-P370 **Anisoptera (Odonata) imaturos do igarapé Azul, Roraima, com ocorrência de uma nova espécie para o Brasil**

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Odonata é uma ordem que reúne cerca de 5700 espécies. O estado larval de cerca de um terço das espécies não é conhecido. O país com maior número de espécies conhecidas na América do Sul é o Brasil, seguido de Venezuela e Peru (1). O objetivo deste trabalho foi listar as espécies de Anisoptera coletados no igarapé Azul, Roraima. As coletas foram realizadas em outubro/2009, no igarapé Azul (município de Mucajaí), com rede de 30 cm de diâmetro. Os espécimes foram identificados em nível de gênero e espécie (alguns identificados pelo adulto após criação e emergência) e estão depositados nas coleções zoológicas do Laboratório de Invertebrados Aquáticos – UFRR e no Museu Integrado de Roraima. Foram listadas 18 espécies, em 15 gêneros, a saber: 1) Gomphidae - *Ebegomphus* sp., *Zonophora* sp., *Phyllogomphoides* sp., *Progomphus* sp., *Aphylla* sp., *Melanocacus cf mungo*; 2) Corduliidae - *Lauromacromia dubitalis*, *Aeschnosoma forcipula*, *Aeschnosoma auripennis*; 3) Libelullidae - *Diastatops estherae*, *Diastatops* sp.2, *Oligoclada* sp.1, *Oligoclada* sp.2, *Elasmothemis* sp., *Gynothemis* sp., *Macrothemis* sp., *Zenithoptera* sp. e *Planiplax* sp. A espécie *L. dubitalis*, que é considerada extremamente rara, teve sua ninfa descrita em por Fleck (2002) (2) e apresenta nova ocorrência para o Brasil. As informações sobre as espécies registradas no Brasil foram retiradas da lista de Dennis Paulson (http://www.pugetsound.edu/academics/academic-resources/slater-museum/biodiversity-resources/dragonflies/south-american-odonata/), atualizada em março/2012. Sendo assim, este trabalho contribui não só para o conhecimento sobre este grupo para Roraima, mas também para o Brasil.

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T2-P372 **Riqueza de macrófitas aquáticas e algas perifticas no Campus Experimental do Água Boa – Embrapa, RR, Brasil**

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Estudos ecológicos relativos a macrófitas aquáticas e ao perifiton sempre evidenciam a importante contribuição dessas comunidades para o metabolismo do ecossistema. As macrófitas aquáticas são plantas flutuantes, fixas ou livres, habitando desde brejos até ambientes totalmente alagados [1]. A esses vegetais encontram-se aderidos firme ou frouxamente à comunidade de algas perifiticas que é composta de microorganismos autótrofos que são a base da cadeia alimentar em muitos ecossistemas aquáticos [2]. O presente trabalho teve como objetivo conhecer a riqueza dos diferentes grupos de algas perifíticas e de macrófitas aquáticas que ocorrem em área de savana no estado de Roraima e sua relação com os fatores ambientais. Foram feitas coletas sazonais, no Campus Experimental do Água Boa, em uma represa. As

plantas aquáticas, para herborização, foram coletadas e fotografadas sendo identificadas com auxilio de bibliografia especifica. Os vegetais coletados para retirada das algas perifiticas foram acondicionados em sacos plásticos, no Laboratório de Ecologia Vegetal do Centro de Estudos da Biodiversidade – UFRR, onde foi realizada a raspagem com pincel para remoção dos organismos aderidos. O material foi fixado em solução de Transeau e analisado em microscópio óptico acoplado com câmera fotográfica. Para a análise da classe Bacillariophyceae, as amostras foram submetidas ao processo de oxidação. O levantamento floristico revelou a presença de 29 espécies, 25 gêneros e 21 famílias de plantas aquáticas. Foram identificadas 24 gêneros em 5 classes de algas perifiticas. As classes Bacillariophyceae e Zygnemaphyceae que foram abundantes caracterizam os corpos d´água como tropicais, oligotróficos e ácidos corroborando os dados das análises físico-químicas.

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T2-P373 **Levantamento de macrófitas aquáticas no igarapé Caranã - Boa Vista / Roraima**

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As macrófitas aquáticas são os vegetais vasculares cujas partes fotossintetizantes ativas estão permanentemente, ou por alguns meses, a cada ano, submersas ou flutuantes e que são visíveis a olho nu [1]. Outros autores também utilizam a mesma definição, entretanto complementam com "em água doce ou salobra" [2]. Este estudo foi realizado com o objetivo de realizar levantamento florístico, estimando a riqueza e a similaridade das espécies coletadas no igarapé Caranã (rio Canarã), em Boa Vista (RR), BR. As plantas férteis foram coletadas em quatro expedições: sendo duas realizadas no período mais chuvoso (entre os meses de junho a agosto); e duas realizadas no período menos chuvoso (entre os meses de setembro a novembro) do corrente ano. Os indivíduos coletados foram herborizados conforme as técnicas adequadas para plantas aquáticas e identificados no Laboratório de Ecologia Vegetal. Foram identificadas 16 espécies de macrófitas aquáticas, distribuídas em 14 gêneros e 13 famílias. A família com maior representatividade foi Cyperaceae com 3 espécies, seguida por Lentibulariaceae com 2 espécies. Em relação ao hábito, a forma predominante foi emergente, que é justificada devido à retirada da mata ciliar do igarapé Caranã, ocasionando a redução das espécies anfíbias. Verificou-se que, apesar da ação antrópica, o igarapé Caranã ainda pode ser objeto de muitos outros estudos, sendo sugerido que estes sejam realizado em um maior período.

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T2-P379 **Avaliação da ocorrência de Cyanobacteria em microbacias com diferentes usos da terra na Amazônia legal, Brasil**

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A comunidade fitoplanctônica é muito variada nos ambientes e tem como característica refletir toda e qualquer alteração ambiental sofrida. Cyanobacteria é extremamente sensível aos influxos ambientais e bioindicam a qualidade de vida do sistema, especialmente pelas flutuações na densidade e composição das espécies. O objetivo deste trabalho é avaliar a distribuição e ocorrência de Cyanobacteria em três microbacias e correlacionar com diferentes usos da terra. Para o desenvolvimento desse estudo foram determinadas três microbacias da rede hidrográfica do ribeirão Taquaruçu Grande: córrego Serrote com características de conservação, córrego Mutum com atividades agropecuárias e córrego Machado localizado em área urbana. As microbacias se localizam no município de Palmas, Tocantins, na Amazônia legal brasileira. Foram realizadas coletas trimestrais de água bruta durante dois ciclos hidrológicos (2007 e 2008) e a comunidade fitoplanctônica foi avaliada pelo método de Uthermoll (1958). Observou-se 18 espécies de Cyanobacteria distribuídas em 11 gêneros. A densidade se caracterizou principalmente pela contribuição de *Cylindropermopsis raciborskii* e representantes de Pseudoanabaenaceae (*Pseudoanabaena* spp. e *Geitlerinema* spp.). A microbacia de uso agrícola se destacou por maiores riqueza e densidade no período das chuvas provavelmente pelo aporte de nutrientes através do escoamento superficial do solo para o corpo hídrico. Comportamento semelhante ocorreu na microbacia da área de proteção ambiental, porém esta apresentou um reduzido número de espécies. Já a microbacia de uso urbano apresentou a maior diversidade, densidade e abundância relativa em comparação aos outros pontos avaliados que quase não se alteraram a partir de outubro de 2007.

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T2-P401 **Diversidade gama da comunidade zooplanctônica e eventos climáticos em uma planície de inundação neotropical**

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As planícies de inundação destacam-se entre os sistemas mais produtivos e de elevada biodiversidade e o regime desses sistemas é fortemente afetado por eventos climáticos. O objetivo desse estudo foi verificar de que forma o pulso de inundação age como função de força sob a diversidade gama do zooplâncton na planície de inundação do alto rio Paraná (Brasil) em anos de La Niña (2000 e 2001) e El Niño (2005 e 2007). Acredita-se que a dinâmica da inundação (dias e área de alagamento, intensidade de alagamento e índice de conectividade entre os ambientes) seja responsável pelo aumento do número de espécies na planície. A diversidade gama variou significativamente entre os anos, sendo os maiores valores registrados em 2001, ano de seca extrema na região, e em 2007, ano de grande cheia. Esses resultados não permitiram que fossem

encontradas associações significativas entre o aumento da diversidade gama e os fatores discriminadores da dinâmica da inundação. Os resultados apontaram que tanto o pulso de inundação (potamofase) quanto o pulso de seca (limnofase) são responsáveis pelo aumento do número de espécies zooplanctônicas na planície. Durante a potamofase, o alagamento permite um maior intercâmbio de espécies entre os ambientes (efeito da homogeneização), e no período de limnofase, a ausência do efeito de diluição permite a concentração de um maior número de espécies por unidade de área. Assim, é possível afirmar que as alterações dos eventos climáticos são favoráveis para a biodiversidade zooplanctônica em uma planície neotropical.

T2-P406 **Padrão espacial e temporal conservativo da diversidade zooplanctônica em uma planície aluvial neotropical**

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As planícies aluviais são conhecidas por apresentar uma alta biodiversidade, devido às frequentes variações espaciais e temporais das comunidades aquáticas. O objetivo deste estudo foi comparar a diversidade alfa, beta e gama zooplanctônica em diferentes escalas espaciais (locais e sistemas) e temporais (anos e meses) e identificar quais dessas escalas contribuem mais para a diversidade gama da comunidade em uma planície aluvial neotropical. As amostragens do zooplâncton foram realizadas trimestralmente em 36 ambientes nos anos de 2000 e 2010. A diversidade gama foi de 245 (2000) e 305 espécies (2010). A diversidade alfa diferiu entre os anos, meses e sistemas apenas em 2010. Por outro lado, a diversidade beta diferiu somente entre os sistemas em 2010. As variações espacial e temporal da diversidade alfa e a variação espacial da diversidade beta no ano de 2010 resultaram no incremento da diversidade gama neste ano. O ano de 2000 sucedeu a operação de um reservatório a montante, o qual afetou a dinâmica de inundação e, consequentemente, os componentes da diversidade. Todas as escalas espaciais e temporais explicaram significativamente a diversidade gama (partição aditiva da diversidade) nos dois anos; porém, a substituição de espécies devido à variação espacial, produzida pela heterogeneidade de habitat, contribuiu mais para explicar a diversidade gama do que a variação temporal mensal, embora ambos tenham contribuído para manter o pool regional de espécies. Além disso, mesmo com alterações da diversidade alfa e beta entre os anos 2000 e 2010, a contribuição relativa da variação espacial e temporal foi semelhante, sugerindo que o padrão de variação espacial e temporal da diversidade zooplanctônica foi consistente mesmo sob uma defasagem temporal de 10 anos.

T2-P407 **Comunidade zooplanctônica nos sistemas de uma planície de inundação: influência do pulso hidrossedimentológico**

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Em planícies de inundação, grande parte das transformações abióticas e bióticas possui extensa relação, positiva ou negativa, com os atributos do pulso e importantes considerações foram feitas em relação ao incremento da similaridade, entre os diferentes ambientes, durante o período de potamofase. Este trabalho avaliou a relação entre os atributos da comunidade zooplanctônica e os atributos do pulso, nos períodos de limnofase e potamofase, através da freqüência de classes de composição e abundância intra-sistemas, em ambiente SIG, na planície de inundação do alto rio Paraná. Prediz-se que a diminuição do número de classes de composição de espécies esteja relacionada ao aumento dos valores do índice de conectividade, frequência e amplitude de potamofase, bem como que ocorra um menor número de classes de abundância de organismos, durante essa fase. Por outro lado, espera-se que o aumento do número de classes de composição de espécies esteja relacionado ao aumento da amplitude de limnofase, ao mesmo tempo em que nessa fase, será registrado um maior número de classes de abundância de organismos zooplanctônicos. Obteve-se uma associação inversa entre a freqüência de classes intra-sistemas, dos mapas de composição de espécies, e os atributos do pulso, durante a potamofase, bem como se observou um aumento da dissimilaridade intra-sistema, após os períodos de limnofase. Verificou-se a importância de uma menor variação, quanto à expansão e retração dos sistemas, para o estabelecimento da comunidade, considerando a associação positiva entre as frequências de classes de abundância e o atributo elasticidade vertical.

T2-P426 **Distribuição de Bivalvia (Mollusca) no gradiente fluvial de um riacho subtropical Brasileiro**

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A distribuição de bivalves em ambientes de água doce é mais restrita às áreas marginais e rasas, e ocorre ao longo do leito do rio de acordo com as características da correnteza, tipo de sedimento e disponibilidade de alimento. O objetivo deste trabalho foi avaliar a diversidade e distribuição de Bivalvia num gradiente longitudinal no rio Irani, Santa Catarina, Brasil. Os espécimes analisados constam de levantamentos no rio Irani, rio de baixa ordem no sul do Brasil, no período de 2005 a 2009. Foram registrados 1066 indivíduos pertencentes às famílias Hyriidae, Mycetopodidae, Corbiculidae e Sphaeriidae, distribuídos em seis gêneros e onze espécies. Os pontos com maior abundância e riqueza foram os localizados na parte superior do rio, a montante do barramento de duas Pequenas Centrais Elétricas, enquanto que para o ponto localizado na foz os bivalves foram registrados. Sphaeriidae foi amplamente distribuída ao longo do rio, constituindo a segunda família mais numerosa (438 indivíduos; 41,1%), e com maior riqueza (8 táxons). Registrou-se a presença de *Sphaerium cambarense*, recentemente descrita para o Rio Grande do Sul, Brasil, ampliando, assim sua distribuição. Corbiculidae, representada por *Corbicula largillierti*, uma espécie exótica, foi abundante e dominante (550 indivíduos; 51,6%), entretanto, restrita aos pontos a jusante do barramento, indicando que o reservatório constitui uma barreira física à dispersão. A analise de agrupamento NMDS (Bray-Curtis), distinguiu dois grupos constituídos por: 1) pontos a montante do barramento e 2) pontos a jusante do barramento. No entanto, nos pontos de ocorrência de *C. largillierti*, esta foi dominante, fato esse associado à baixa riqueza e abundância das espécies nativas, sugerindo a redução e uma possível extinção local das espécies nativas.

T2-P446 **Distribuição de larva de Coleoptera de corpos d'água em clima subtropical na bacia do Rio Uruguai, Brasil**

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A fauna de coleóptera aquática da bacia do rio Uruguai é pouco conhecida, compondo junto com os demais invertebrados aquáticos uma grande lacuna referente ao conhecimento da diversidade e distribuição. Assim, o objetivo desta pesquisa foi conhecer a distribuição da fauna de coleóptero aquático em diferentes ambientes pertencentes à bacia do alto rio Uruguai. Para esse estudo foi analisada a coleopterofauna de sete rios em ambientes lóticos e lênticos artificiais (reservatório). Os espécimes estudados foram coletados em diferentes excursões de 2004 a 2010. Os dados foram analisados quanto à composição, abundância (número de indivíduos) e riqueza de táxons. Os indivíduos foram identificados até o nível taxonômico de família, com exceção dos elmídeos, em que se procedeu à identificação ao nível de gênero. Foram analisados 829 indivíduos pertencentes a onze táxons e sete famílias. As famílias registradas para área de estudo foram: Elmidae, Hydrophilidae, Hidrobiosidae, Psephenidae, Dytiscidae, Gyrinidae e Staphilinidae. Para os elmídeos foram registrados os gêneros *Macronychus*, *Xenelmis*, *Heteremis* e *Phanocerus*, além, de duas morfoespécies. A maior riqueza de táxons foi verificada para os ambientes lóticos, entretanto, em termos de números de indivíduos os maiores valores foram registrados para os ambientes lênticos. As famílias Dytiscidae, Gyrinidae e Staphilinidae foram exclusivas de ambientes lóticos, enquanto as demais foram registradas para os dois ambientes. Os elmídeos constituíram a família com maior distribuição nos rios/ambientes amostrados. Nossos resultados apresentam uma contribuição ao conhecimento dos coleópteros aquáticos na bacia do alto rio Uruguai e demonstram a importância dos ambientes lóticos na manutenção da diversidade dessa fauna.

T2-P473 **An ubiquitous perspective of the intraspecific diversity of the aquatic fungus *Articulospora tetracladia***

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The cosmopolitan *Articulospora tetracladia* is a dominant sporulating species on decomposing plant-litter in streams of Northwest Iberian Peninsula. In an attempt to elucidate the intraspecific genetic diversity of *A. tetracladia* of Iberian Peninsula, isolates were attained from various types of substrates from streams of North and Central Portugal and North Spain, between 2000 and 2010. Genetic diversity of these fungal populations was assessed by denaturing gradient gel electrophoresis (DGGE) fingerprints and by using ITS1-5.8S-ITS2 barcodes. The ITS1-5.8S-ITS2 barcodes published at the National Center for Biotechnology (NCBI) or National Institute of Technology and Evaluation Biological Resource Center (NBRC) were retrieved to probe into the genetic diversity of *A. tetracladia* isolated from Iberian Peninsula and other parts of the world (Central Europe, UK, Canada, Japan and Malaysia). The PCR-DGGE of ITS2 region of 50 Iberian fungal isolates distinguished 8 OTUs. The ITS sequences of 68 fungal isolates yielded 9 OTUs, but 5 fungal isolates were not assigned to any of these OTUs. The *A. tetracladia* strains did not exhibit cohesiveness based on sampling date or substrate or geographic location. Overall results indicate that, apart Malaysian genotypes, A. tetracladia genotypes are geographically widespread irrespective of sampling time, sites or substrates. Moreover, PCR-DGGE appeared to be a rapid tool for assessing intraspecific diversity of aquatic hyphomycetes.
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T3-Climate change

T3-P6 Riparian forest adaptations in European rivers: a response to altered flow regimes by climate change

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Climate change will dramatically affect fluvial regime of European rivers and inherently its fluvial ecosystems, such as riparian vegetation. In this study we conducted an adaptation strategy assessment of woody riparian vegetation to climate change driven flow regimes in two European river types, temperate and Mediterranean. Spatio-temporal evolution of riparian vegetation was evaluated by modeling in two study sites located in Austria and Portugal where for each country two different climate-change scenarios were considered and compared with the actual one. Although climate change is forecasted to be similar in both countries, different fluvial regimes prompt singular adaptation strategies in each study site. The Portuguese study site stands for a Mediterranean flow regime, where the discharge is strongly related to precipitation, with a low discharge interspersed by flash floods in winter and opposed to a dry river bed in summer. In this study site, results were consistent for the applied scenarios, with river channel widening and substantial decrease of the initial succession phases, leading to species lost, aging of the remaining riparian vegetation and spreading of upland forest inwards the river. The Austrian study site has a typical glacio-nival hydrological regime with the maximum discharge in the late spring season. Climate change will favor the occurrence of rain over solid precipitation conducting to an increased winter discharge and a reduced peak discharge in summer due to depleted glaciers. In this country, both climate change scenarios reveal a similar pattern on riparian vegetation with younger phases progressively replaced by more mature phases achieving a much more stable situation in which older succession phases are dominant.

T3-P33 **Effect of temperature and a dominant shredder in the variability patterns of macroinvertebrate assemblages**

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Climate models predict an increase in mean global air temperature up to 6.4 ºC during this century. The consequences of this increase in temperature are mostly unknown for stream ecosystems. In this study

we assessed the individual and combined effects of rising temperature and presence of a dominant detritivore (*Allogamus laureatus*) on the decomposition of submerged oak litter and associated fungal and shredder communities. For this, a headwater stream was divided longitudinally in two sides; one side was kept at ambient temperature (12.4 ºC, average) while the other side was warmed ~3 ºC above ambient temperature. Oak litter bags were incubated in spring 2011 at both stream sides, with half of bags having one *A. laureatus* larvae. Replicate litter bags were collected every two weeks over six weeks for determination of oak litter remaining mass, fungal biomass and sporulation rate, and detritivore density. Variability patterns of fungal and shredder communities were also determined. The presence of *A. laureatus* stimulated decomposition of oak litter only at ambient temperature. Warming stimulated fungal biomass only in the presence of *A. laureatus*. Neither temperature nor *A. laureatus* presence affected fungal sporulation rate or species richness. Shredder and fungal communities did not seem to respond to either warming or *A. laureatus*. These results suggest that warming limits the ability of a dominant shredder to decompose litter, in contrast with previous studies. This study highlights that the effects of global warming on ecosystem functioning are complex as they are moderated by biotic factors. More research is needed on the effects of simultaneous changes in environmental factors and communities on ecosystem processes.

T3-P77 **Evaluation of the effect of drought in the benthic macroinvertebrate community structure**

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The benthic macroinvertebrate community consists of organisms with a wide diversity of anatomical, physiological and ecological adaptations. This diversity allows macroinvertebrates to colonize all types of aquatic ecosystems and make them one of the most popular indicators of water quality through the use of a large number of methodologies from the application of diversity and richness indices to methods quantifying community structure. One of the main factors affecting the benthic macroinvertebrate community structure is the change in flow patterns induced by climatic change or by human action. The purpose of this study was to understand how the benthic macroinvertebrate communities respond to flood reductions caused by the absence of rainfall. To achieve this objective I compared community structure at some northern Portuguese water courses after a long period without rainfall with "normal" hidrological year.

T3-P115 **Diel changes in physiological damage and UV-B protection mechanisms of an aquatic liverwort in the field**

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Stratospheric ozone reduction has led to increased UV-B radiation at ground level, and this may damage photosynthetic organisms. Some habitats frequently dominated by bryophytes, such as mountain streams above the treeline, may be particularly affected by enhanced UV-B. Given that UV-B level varies daily, these changes may influence bryophyte physiological damage and UV-B protection mechanisms. Thus, we studied the diel changes in these processes in the leafy aquatic liverwort *Jungermannia exsertifolia* subsp. *cordifolia in situ* (Lavieja stream, 1280 m, La Rioja, northern Spain) during two consecutive summer days. Photosynthetic (PAR), UV-A and UV-B radiations, together with water temperature, were monitorized as the main environmental variables influencing physiology. The response variables were chlorophyll fluorescence and UV-absorbing compounds (UVACs), differentiating in this case the soluble (vacuolar) and insoluble (cell wall-bound) fractions, and analyzing both the global amount of UVACs and seven individual hydroxycinnamic acid derivatives. Variables related to photosynthetic performance (Φ_{PSII}, F_v/F_m, Performance Index) or photoprotection against high PAR (NPQ) showed clear diel changes in response to, presumably, PAR. The first three variables showed an inverse relationship with respect to irradiance, whereas the last one showed a direct relationship. These changes indicated dynamic photoinhibition as well as protection of PSII from excess radiation through the xanthophyll cycle. Variables related to UV-B protection through UVACs did not show clear diel changes. It can be concluded that the liverwort was constitutively well UV-B protected, and thus well acclimated to the radiation climate experienced in the stream.

T3-P116 **DNA damage in an aquatic liverwort can be induced by UV-B in the laboratory but not in the field**

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DNA damage is one of the main effects caused by the UV-B enhancement derived from stratospheric ozone reduction. UV-B-induced DNA damage has been little studied in bryophytes, especially in liverworts, which are considered the earliest diverging land plants and whose responses to UV-B may be of evolutionary importance in the water-to-land transition. In this context, we studied the diel changes in DNA damage in the aquatic liverwort *Jungermannia exsertifolia* subsp. *cordifolia* in response to UV-B under both laboratory and field conditions. The aim of our work was to evaluate the role of DNA damage as UV-B biomarker. DNA damage was measured in terms of the amount of thymine dimers using specific antibodies. In the laboratory, the samples were exposed to an artificial day, and DNA damage significantly increased in the period in which UV-B was applied (around midday). After UV-B cessation, a quick and complete DNA repair took place. However, DNA damage could not be detected in any of the field samples analyzed at any time of the day during two consecutive days. This could be due to the efficiency of protection and repairing mechanisms in this liverwort under field conditions. In the laboratory, the low amount of thymine dimers produced and the rapid repair also indicated such a good efficiency. Thus, this liverwort is well adapted to the UV-B levels experienced both in the laboratory and the field, and DNA damage can be considered as a good biomarker of artificially enhanced UV-B, but not of the natural UV-B increase that occurs at midday.

T3-P200 **Ecological concepts and the management of semiarid freshwaters under climate change**

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Annual changes in water level is the main regulatory source of ecological processes in the semiarid region reservoirs. This factor is related to manifestations of the variability of regional climate conditions and global climate change, such as the recurrence of ENSO (El Niño Southern Oscillation). The Taperorá II reservoir (07°11'44"S 36°52'03"W) was monitoring during September-December of 1998, January-April of 1999, September-December of 2006 and January-April of 2007 to compare nutrient and phytoplankton dynamics between ENSO (1998; 2006) and non-ENSO (1999; 2007) years. The 1998 ENSO promoted a very intense dry period, the reservoir was 1 % of your total volume, that resulted in a complete mixed water column, an alkaline pH, high electric conductivity (X=6,11 mS cm^{-1}), inorganic nutrient content (X=0,28 mg SRP L^{-1}; X=1,16 mg NID L^{-1}) and chlorophyll (X=0,40 mg L^{-1}). Phytoplankton assemblages were dominated by cyanobacterias S-strategists. The diluter effect of increased rainfall in February and March/1999 promoted a reduction of conductivity (X=1,04 mS cm^{-1}) and dissolved nutrients (X=0,037 mg SRP L^{-1}; X=0,62 mg NID L^{-1}). Phytoplankton assemblages were dominated by C-strategists opportunist organisms of the nanoplankton. The 2006 ENSO was moderated, promoted a long dry period but lower intensity than 1998. The reservoir presented 40% of your total volume resulting in a moderated NID contents (X=0,11 mg SRP L^{-1}; X=0,019mg NID L^{-1}), electric conductivity (X= 0,46 mS cm^{-1}) and chlorophyll (X=0,008 mg L^{-1}). The phytoplankton was dominated by S-strategists, diatoms and cyanobacteria. In 2007, after ENSO, the rain promoted a similiar diluter effect, but the intensity of this disturbance was lower. The phytoplankton assemblage was dominated by diatoms.

T4-Ecohydraulics

T4-P224 **Efeitos da colocação de substratos artificiais nos movimentos de *Luciobarbus bocagei* numa passagem para peixes**

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As passagens para peixes por bacias sucessivas constituem o dispositivo de transposição para a ictiofauna mais frequente em rios Ibéricos. A literatura recente tem demonstrado um interesse crescente na colocação de substratos artificiais neste tipo de dispositivos, com o objectivo de melhorar a respectiva eficácia. Contudo, a informação é bastante escassa relativamente à forma como diferentes regimes de escoamento, criados pela colocação de substratos (blocos), influenciam os movimentos piscícolas. O objectivo principal deste estudo é avaliar o desempenho de dois regimes de escoamento diferentes, caracterizados por diferentes profundidades relativas (d/h), em que d é a profundidade da água e h é a altura de blocos artificiais colocados no fundo da passagem, nos movimentos para montante numa passagem experimental de bacias sucessivas construída à escala real. Foram efectuadas duas séries de ensaios, cada uma com 20 réplicas, representando dois regimes de escoamento criados pela colocação de blocos artificiais no fundo do dispositivo - d/h> 4 (regime 1) e 1,3<4 (regime 2) – com o intuito de analisar a proporção da eficácia e o tempo de transposição da passagem de uma espécie potamódroma, o barbo Ibérico (*Luciobarbus bocagei*). Apesar de não terem sido detectadas diferenças significativas na eficácia da passagem de barbos entre os dois regimes de escoamento, o tempo de passagem foi significativamente menor durante o regime 2. Os resultados deste estudo mostraram que a profundidade relativa do escoamento é importante para o tempo de passagem dos peixes e enfatizaram a utilidade da colocação de substratos como potenciais facilitadores de movimentos em passagens de bacias sucessivas.

T4-P246 **Does substrate density influences fish passage success in pool-type fishways?**

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Fragmentation of freshwater systems is one of the more dramatic human-induced impacts on the environment, leading to disconnections among riverine habitats. Barriers, such as dams and weirs, promote these disconnections which severely affect fish movements along the river's longitudinal dimension. To minimize this impact and enhance connectivity, fishways are installed at the barriers. Several authors state that heterogeneity on the bottom of fishways (logs, boulders or stones) may potentiate fish passage. The aim of this work is to study the behaviour and performance of the Iberian barbel (*Luciobarbus bocagei*) in a full-scale experimental pool-type fishway with different bottom substrate arrangements. High and low boulder density treatments were tested for two different flows. In each treatment, 20 fish were studied individually by analyzing their movements and timing within the flume. Water velocity was measured, in its three components, with a 3D Vectrino Acoustic Doppler Velocimeter and related to fish swimming behavior, negotiation timing and success. Results show that fish responded with greater success to higher discharges (Q) independently of substrate density. Density proved to be important only for low discharges, where low density yielded better results. These findings express that boulder substrates placed at the bottom of fishways may potentiate fish negotiation of such devices. In situations where only low discharges can be achieved, care must be taken to accommodate substrates in low density arrangements.

T4-P274 **Metodología cartográfica especialmente diseñada para embalses de pequeño tamaño aplicada en el levantamiento**

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Conocer en detalle la morfología de un embalse es un factor primordial para una buena gestión de estos sistemas de explotación del agua. Los sistemas convencionales de cartografía, por costes y operatividad, son inviables en embalses de pequeño tamaño como los que abundan en la

Comunidad Gallega. Los indicadores hidromorfológicos de los embalses son claves para discernir entre el buen y máximo potencial ecológico en el contexto de la DMA. Con el fin de clasificar y cartografiar en detalle 15 pequeños embalses que integran la 'Rede de Pequenos Encoros' de la Demarcación de Galicia Costa, se ha diseñado un sistema de adquisición cartográfica de bajo coste pero de alta resolución, empleando material muy ligero, transportable y que funciona perfectamente en zonas someras (> 0,5 m de profundidad). Este sistema está compuesto de una pequeña ecosonda comercial con sistema dual monohaz/sidescan, un GPS, un Plotter de ayuda a la navegación y un sistema de alimentación autónomo, todo ello montado sobre una pequeña embarcación hinchable (2,5 m eslora y 0,3 m calado). Las salidas cartografías generadas incluyen mapas y modelos digitales del terreno para hacer cálculos automáticos de área y volumen. Gracias a la incorporación del transductor sidescan se realiza un inventario cartográfico de objetos, estructuras de fondo y un mapa inicial de clasificación de fondos que puede ser de gran utilidad como complemento a una campaña de sedimentos superficiales. En este trabajo se presenta la configuración del sistema empleado, y se muestran algunos ejemplos (resolución, operatividad y manejo). Esta cartografía además de ayudar en la gestión, cubre este aspecto tan importante e innovador del cálculo del potencial ecológico, puesto que son de bajo coste y de obtención rápida de resultados.

T4-P356 **HIDRONDA: automated system for simulation of wave field in inland waters**

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HIDRONDA is a system designed to simulate wave fields in lakes and reservoirs, which integrates two modules. The first module processes input data and the second module, called ONDACAD, applies a numerical model to estimate wave fields. The wave field simulation is produced by a parametric model which uses fetch and wind fields as input data. The HIDRONDA computational procedure was tested for the Itaipu Reservoir, in Southern Brazil, under severe wind scenarios. The severe wind field was obtained through the application of regional frequency analysis for the western region of the State of Paraná. The parametric method SMB, embedded in the ONDACAD model, yielded wave height fields using both wind velocity and fetch as input data. The HIDRONDA´s results for several reservoirs are available at https://sites.google.com/site/hidronda.

T4-P360 **Fetch distribution in the reservoir of Vossoroca**

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Most of the methods designed to determine the wind-induced wave height require the length scale (fetch) over which the wind blows. The choice of the best method depends whether the water body is in the ocean or in continental areas. The Saville's method is applied for fetch estimation in bays, lakes and reservoirs, and was chosen in this study. The application of Saville´s Method requires a large number of both graphical and mathematical steps, which poses some difficulty to find the maximum fetch in a large water body. In this study, a computational procedure was developed to implement the Saville´s Method. The computational procedure was tested for the Vossoroca Reservoir, in Southern Brazil. The results were fetch maps for each of the sixteen selected directions.

T4-P390 **Início do ano hidrológico em Portugal com base no balanço hídrico mensal de Thornthwaite**

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O ano hidrológico em Portugal inicia-se no dia 1 de Outubro. A precipitação que ocorre após o início do ano hidrológico contribui para a recarga dos aquíferos e a evapotranspiração contribui para a remoção de parte dessa água armazenada. O balanço hídrico indica quando um processo se sobrepõe ao outro, com recarga e depleção de reservas hídricas, sucessivamente. Sendo Portugal um país que apresenta alguma variabilidade espacial e temporal na distribuição da precipitação, procurou-se, com base no balanço hídrico mensal de Thornthwaite, verificar a validade do início do ano hidrológico no dia 1 de Outubro em várias regiões do país. Foram selecionadas, a partir do Sistema Nacional de Recursos Hídricos (htpp://snirh.pt), treze estações meteorológicas com dados contínuos de precipitação mensal e temperatura média mensal, nas principais bacias hidrográficas, para realização do balanço hídrico. Com base nos resultados da diferença entre a precipitação e evapotranspiração potencial (P-PET) e o excedente hídrico (EH), verificou-se que o início do ano hidrológico apresenta alguma variação espacial em Portugal continental, variando de Setembro a Novembro da zona Noroeste à zona Sudeste, respetivamente.

T5-Ecosystem processes

T5-P35 **The indicative value of zooplankton in assessment of the ecological state of a highly eutrophic lake**

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With the implementation of the Water Framework Directive, the EU member states have to classify the ecological status of surface waters following standardized procedures. As a matter of surprise to many lake ecologists, zooplankton was not included in the Directive as a biological quality element (BQE) although that it is considered an important component in the pelagic food web of lakes. In the present study we aimed to find out, on the basis of a long-term (47 years, 1964-2011) research of highly eutrophic (total phosphorus 54 mg m^{-3}, total nitrogen up to 2000 mg m^{-3}), large (270 km^2) and shallow (mean depth 2.8 m) Lake Võrtsjärv (Estonia), zooplankton indicators reflecting the ecological state of highly eutrophic lakes and to identify which of them could be used in assessment of the state of lakes. Altogether 80 species (24 cladoderans, 13 copepods and 43 rotators) were identified. The annual average abundance and biomass of the zooplankton were 580±40 thous. ind m^{-3} and 0.75±0.05 g m^{-3}, respectively. Statistical (diversity and community) analyses were used to explain the role of several zooplankton

indicator species in describing long-term changes in the ecological state of Lake Võrtsjärv. During 47 years, essential changes took place in the state of the lake and, in parallel, in the character of zooplankton community. Some zooplankton species of oligo-mesotrophic waters have totally (*Asplanchna herricki*, *Bythotrephes longimanus*) or almost (*Conochilus unicornis*, *Kellicottia longispina*, *Eudiaptomus gracilis*, etc.) disappeared. At the same time, the abundance of several indicator species of eutrophic waters (*Anuraeopsis fissa*, *Keratella tecta*, *Trichocerca rousseleti*, etc.) has increased.

T5-P75 **La alelopatía em macrófitos estructura la comunidad del fitoplancton: efectos indirectos en la restauración**

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Los macrófitos sumergidos resultan importantes en el mantenimiento de la transparencia del agua debido a mecanismos de interferencia con las microalgas (competencia directa por los recursos y/o producción de alelopáticos). El objetivo de este estudio es conocer el diferente efecto alelopático que tienen los macrófitos sobre el fitoplancton, más concretamente el efecto de las caráceas *Chara hispida* y *Nitella hyalina* y la fanerógama *Myriophyllum spicatum* sobre una comunidad natural de fitoplancton procedente de la Albufera de Valencia (mediterráneo español) y sobre un monocultivo de *Monoraphidium contortum*. Se ha llevado a cabo un experimento utilizando monocultivos de los tres macrófitos. Agua filtrada de estos cultivos que contenía los supuestos alelopáticos fue fertilizada para descartar efectos de la competencia directa e inoculada con las microalgas de la comunidad natural y el cultivo de *M. contortum*. La experiencia duró 10 días, cada 24 h se midió la concentración de clorofila a in vivo y la turbidez y se determinó la composición fitoplanctónica de la comunidad natural en tres momentos. Un análisis univariante evaluó las diferencias entre tratamientos. Tanto en el caso de la comunidad algal natural como en el monocultivo de *M. contortum*, la clorofila a y la turbidez fueron significativamente mayores en el control (sin alelopático) que en los tratamientos con alelopáticos de cada especie de macrófitos. El test de Tukey demostró que el efecto de *M. spicatum* fue diferente al de los carófitos, tanto para la clorofila a como para la turbidez en el caso del monocultivo de *M. contortum*. Se demuestra el efecto alelopático y su especificidad tanto para el macrófito que lo genera como para las microalgas que lo resisten.

T5-P78 **Effects of light intensity on leaf litter quality for the shredder *Sericostoma vittatum***

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Forested streams are highly heterotrophic relying on terrestrially derived organic matter to support aquatic food webs. Riparian canopy reduces the amount of solar radiation that reaches the water surface creating a patchy distribution of shaded (S) and light (L) areas in the stream channel. Here we evaluated in situ the effects of light patches (S 0.281 µmol m^{-2} s^{-1} vs. L 35.653 µmol m^{-2} s^{-1}) on the conditioning of leaf litter and its resulting quality for the endemic shredder *Sericostoma vittatum*. Additionally, we conducted a microcosm experiment to test the preference of these invertebrates (kept under a 12h light : 12h dark photoperiod or continuous dark conditions) for S or L leaves. Oak (*Quercus robur*) leaf litter conditioned for 3 weeks under S and L conditions were assessed for mass loss and litter quality: C, N, P, lignin, toughness, fungal biomass and chlorophyll concentration in the biofilm. These leaves were provided weekly to eight groups of 10 larvae, kept in 0.5 mm mesh cages, in corresponding S or L areas of the watercourse. Consumption and invertebrate mass were evaluated weekly for one month. No significant differences were found in mass loss. However, N, P and chlorophyll concentrations in the biofilm were higher on L leaves ($p<0.001$). Both L and S shredders preferring L leaves showed better survival. No significant differences were found in growth among groups likely due to higher consumption rates on the tough S leaves. We concluded that L/S patchy patterns in the stream channel may affect shredders foraging behaviour and fitness through changes in the quality of the leaf litter biofilm. We suggest that riparian areas management (e.g. canopy density) may have subtle but important effects on detritus dynamics in streams.

T5-P85 **Effects of fine sediments on decomposition of chestnut leaves: a microscosm approach**

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Sediment inputs due to human activities became an important cause of streams impairment. Still, very little is known on the specific effects of such problem on stream processes such as leaf breakdown. Here, we assessed the effects of sediments on microbially-mediated litter decomposition. Preconditioned chestnut (*Castanea sativa*) leaf disks were exposed to a gradient of sediments granulometry (real mixture; <63 µm; 63-500 µm; 500-1000 µm) in Erlenmeyers kept under shaking (120 r.p.m.) for 10 days. Mass loss was higher in control and real mixture microcosms followed by 500-1000 µm, 63-500 µm and <63 µm sediments. Losses in leaves toughness followed the general pattern of mass loss. Fungal biomass evaluation suggested that sediments may inhibit microbial decomposition eventually by hypoxic effects, stronger in low diameter sediments. The granulometric heterogeneity of the real sediment seems to favor oxygenation and abrasion, stimulating leaves degradation. Additional experiments were performed in order to evaluate the effects of sediment (real mixture) on leaf decomposition in fine mesh bags. Tests run, as above, in microscosms with free disks (F) or disks contained in bags (B) either with (S) or without sediment. Results indicate a clear depressing effect of sediments on mass loss and fungal colonization when leaves were enclosed in bags; no significant differences were found among B and BS or B and FS/F. Although bags may act as a protective structure against leaf abrasion, sediments may accumulate and obstruct water flow, contributing to an underestimation of leaf decay rates when using mesh bags. More tests in situ are needed to confirm these preliminary results.

T5-P240 **Colonização de folhiço em um riacho de Mata Atlântica, Brasil**

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O presente trabalho consistiu em um experimento temporal de colonização de pacotes de folhas para testar o efeito da espécie vegetal, da exclusão elétrica e do tempo de exposição sobre a fauna de macroinvertebrados em um riacho de 2a ordem de montanha no Parque Estadual Intervales, Sudeste do Brasil. Foram selecionadas duas espécies vegetais segundo a concentração de fenóis totais (Equivalente de Ácido Gálico - EAG), sendo a espécie A de alto teor (7,26 mg EAG) e a espécie B de baixo teor (1,66 mg EAG). Doze conjuntos de oito pacotes de folhas (15 g em cada pacote) foram organizados, sendo seis compostos por folhas da espécie A (três conjuntos controle e três conjuntos com corrente elétrica) e seis compostos por folhas da espécie B (três conjuntos controle e três conjuntos com corrente elétrica). Os conjuntos foram depositados em áreas de remanso, e as retiradas ocorreram com 3, 7, 14, 21, 28, 42, 56 e 71 dias de colonização. Foi observado um efeito significativo dotempo de colonização sobre a riqueza taxonómica padronizada (resíduos da regressão entre a abundância x riqueza) (ANCOVA, F=10,054; p=0,002). Ao longo do tempo de colonização houve uma mudança na configuração da fauna de macroinvertebrados, possivelmente devido à perda de massa do folhiço o que resultou em diferença na riqueza padronizada de gêneros, porém com a manutenção da abundância de indivíduos. A corrente elétrica foi insuficiente para excluir os macroinvertebrados aquáticos de maior porte, ao contrário do esperado e das observações iniciais feitas em campo.

T5-P241 **A fauna de folhiço em corredeiras e remansos de riachos de Mata Atlântica, Brasil**

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O presente trabalho teve como objetivo analisar a fauna de folhiço em corredeiras e remansos em dois riachos de 2ª ordem no Parque Estadual Intervales, Sudeste do Brasil. A coleta consistiu em amostrar acúmulos de folhiço em remansos e corredeiras, utilizando um amostrador de Surber (malha 250 µm). Em cada um dos riachos foram amostrados folhiços de cinco corredeiras e cinco remansos. No total foram coletados 1.914 indivíduos. O primeiro eixo da Análise de Correspondência Destendenciada explicou 46,02% da variabilidade e separou a fauna coletada em folhiço de remanso daquela coletada em folhiço de corredeira. O segundo eixo explicou 19,36% da variabilidade e separou a fauna coletada nos dois riachos. Os efeitos do mesohabitat sobre a riqueza padronizada (residuos da regressão entre a abundância x riqueza) e a abundância não foram significativos. Os dados do presente trabalho revelaram que a fauna de folhiço de corredeira difere daquela de folhiço em remanso. A discretização da fauna em diferentes mesohabitats é um resultado frequentemente documentado em vários estudos. Por outro lado, os dados mostram que o mesohabitat não afeta significativamente a riqueza padronizada nem a abundância de macroinvertebrados.

T5-P242 **Fauna de macroinvertebrados em folhas com diferentes características em um riacho de Mata Atlântica,** Brasil

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O presente trabalho consistiu em um experimento temporal de colonização de pacotes de folhas para testar o efeito da espécie vegetal e da exclusão elétrica sobre a fauna de macroinvertebrados em um riacho de 2ª ordem de montanha no Parque Estadual Intervales, Sudeste do Brasil. Foram selecionadas três espécies vegetais segundo a concentração de fenóis totais (Equivalente de Ácido Gálico - EAG), sendo a espécie A de alto teor (7,26 mg EAG), a espécie C de médio teor (4,2 mg EAG) e a espécie B de baixo teor (1,66 mg EAG). Foram montados pacotes de 9 g de cada espécie vegetal separadamente, e de uma mistura das três espécies (3 g de cada). Para cada espécie vegetal, três réplicas controle e três réplicas com corrente elétrica foram posicionadas em áreas de remanso ao longo do riacho, totalizando 24 unidades amostrais. Não foi observado efeito significativo do tipo de folha ou da corrente elétrica sobre a fauna de macroinvertebrados como mostrado por Análise de Correspondência Destendenciada como por ANOVA. Os dados revelaram também que a fauna (riqueza, abundância e composição) não diferiu entre os tipos de folhas (com muito, moderado ou pouca quantidade de fenóis total) ou pela presença ou ausência da corrente elétrica nos pacotes de folhiço. Não foi observada uma maior riqueza de gêneros de macroinvertebrados nos pacotes com maior variedade de espécies vegetais. Não houve diferenças entre as faunas coletadas em folhas com diferentes características (quantidades de fenóis totais). A corrente elétrica foi insuficiente para excluir os macroinvertebrados aquáticos de maior porte, ao contrário do esperado e das observações iniciais feitas em campo.

T5-P263 **Canopy cover influence on water temperature and macroinvertebrate communities in Mediterranean streams**

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The presence of riparian canopy cover along streams can regulate water temperature regime as well as the stream energy fluxes and nutrient cycling; and thus, influencing the structure and functioning of stream ecosystems. The goal of this study was to evaluate the influence of riparian canopy cover on stream water temperature and benthic macroinvertebrate communities. Eight streams from the NE Spain were selected. In each stream, a 2 km stretch that had a close-canopy and an open-canopy contiguous reaches (ca. 1 km each reach) were identified. Ten sampling points were located along the stretch; and at each point stream water temperature was recorded with a data logger every 20 min during a period of one year. The canopy cover was measured as the Leaf Area Index every 100 m along the 2 km stretch. In summer 2010, under full canopy cover, macroinvertebrate samples were collected at each sampling point, differentiating between hard and soft substrate. No consistent patterns of a daily average water temperature were found between the open-canopy and close-canopy reaches. Nevertheless, daily maximum water temperatures and daily temperature oscillations were higher in the open-canopy reaches than in the close-canopy reaches in

most, but not in all the studied streams. Differences in macroinvertebrate community structure were also observed. Macroinvertebrate abundance and taxon richness were higher in the open-canopy than in the close-canopy reaches. Our results suggest that other factors (e.g. food resources), besides water temperature, could be driving the differences between reaches in the macroinvertebrate community.

T5-P320 **Temporal variability in hydrological and biogeochemical linkages in a Mediterranean stream-riparian interface**

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The hydrologic regime of Mediterranean streams is characterized by episodic floods and summer droughts. The high hydrological variability, especially associated with floods, modifies the physical, chemical and morphological characteristics of the stream, and affects the lateral hydrologic exchange between the stream and the riparian zone. This study aims to examine the hydrological and biogeochemical linkages between surface stream and the riparian groundwater under variable stream flow conditions. The study was done in Riera d´Arbúcies (NE Spain) from April to October 2011. In March, a major flood occurred (14 $m^3 s^{-1}$). From September to October we induced an experimental drought to force expanding the range of hydrologic conditions, since this stream usually has permanent flow year round. We selected a 130-m reach in which we installed 24 piezometers which were distributed in 6 transects across the riparian zone. The discharge and morphology of the stream channel was measured weekly at 14 transects. We also collected water from the stream and from the wells, and measured water temperature, dissolved oxygen (DO), nutrient concentrations, and the water level elevation in the wells. The temporal variation in water table elevation showed a fast response to changes in stream discharge, suggesting a strong hydrological linkage between the stream and the riparian zone that could be detected even at the most distant well from the stream channel (ca 15 m into the riparian zone). Groundwater chemistry also showed considerable temporal variation following stream hydrologic conditions and changes were mostly related to redox conditions. Groundwater had higher DO and nitrate and lower ammonium concentrations at the beginning of the study than during the drought conditions.

T5-P324 **Efecto de las plantaciones de *Platanus hybrida* Brot. en la descomposición en arroyos de cabecera**

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En los arroyos de cabecera forestados la dinámica de la cadena alimenticia está íntimamente relacionada con las características de la vegetación de ribera. El objetivo del presente estudio fue comprobar que las plantaciones alóctonas de ribera de *Platanus hybrida* afectan al funcionamiento de los arroyos de cabecera forestados, al disminuir la calidad de la materia orgánica disponible para la red trófica detritívora. Para contrastar esta hipótesis se ha estudiado la descomposición de *Alnus glutinosa* en 6 arroyos Mediterráneos, tres de ellos con vegetación de ribera nativa como sistemas de referencia y los otros tres impactados por plantaciones alóctonas de *P. hybrida* distribuidas a lo largo del curso fluvial. La tasa de descomposición fue significativamente más alta en los arroyos impactados (0.208-0.221% PSLC grados día) que en los arroyos de referencia (0.126-0.164% PSLC grados día). Este incremento de la velocidad del procesado de la materia orgánica está relacionado principalmente con un aumento de la abundancia, pero también de la riqueza, tanto de los macroinvertebrados totales como de los trituradores asociados a las bolsas de descomposición.

T5-P368 **Is there any bias between contemporary and subfossil cladoceran assemblages?**

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Sediment and freshwater samples have different temporal and spatial resolutions. In this work, we compared a set of contemporaneous cladoceran samples for the last thirty years with a sedimentary sequence from a surficial core spanning the same period. Ordination analyses (CA in contemporaneous samples and PCA in sediment samples) were carried out to investigate the patterns of species abundances in both data sets. Then, Procrustes rotation and PROTEST permutation tests were applied to the CA and PCA ordinations to test for the significance of results. These analyses have revealed that both sets are controlled by lake-depth and littoral configuration. However, a bias towards pelagic community was found in freshwater samples, while species which tend to form small populations (e.g. *Aeshna quadrangularis, A. affinis, Leydigia leydigii, Pleuroxus truncatus, Tretocephala ambigua, Dunhevedia crassa*) were found in the sedimentary sequence. This confirms the role of lake sediment as a drain for cladoceran subfossils.

T5-P385 **Ciclagem de nitrogênio em bacias de micro escala preservadas no nordeste brasileiro**

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A ciclagem do nitrogênio (N) representa um importante parâmetro para determinar a produtividade e a qualidade das águas em bacias de drenagem (1). As bacias de micro escala refletem rapidamente as alterações sofridas no ambiente possibilitando verificar possíveis alterações no seu entorno (2). O presente estudo visa avaliar a ciclagem do N em microbacias em áreas preservadas de Mata Atlântica no nordeste do Brasil buscando determinar padrões naturais de N para a região. Amostras de água foram coletadas mensalmente (agosto 2010 - agosto 2011) para determinar os fluxos de N nos corpos d'água. Amostras de solo foram coletadas trimestralmente em duas microbacias para determinar as taxas de mineralização e nitrificação líquida. As concentrações de NO_3^-, NO_2^- e NH_4^+ nas amostras de água foram analisadas por cromatografia iônica e o N orgânico dissolvido (NOD) por espectrofotometria. A mineralização e nitrificação foram determinadas utilizando o método de incubação de laboratório segundo Piccollo et al. (3) modificado. Nos corpos d'água os fluxos e concentrações de N inorgânico dissolvido (NID) foram superiores ou similares ao NOD na maioria das bacias, sendo o NO3- a forma predominante. Os maiores fluxos de N foram registrados nos meses de máximas pluviométricas, sugerindo maior entrada de N

nos corpos d'água através do escoamento superficial. No solo o $N\text{-}NH_4^+$ foi superior ao $N\text{-}NO_3^-$. As taxas de mineralização e nitrificação foram similares a outros sistemas tropicais.

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T5-P405 **How do hydrological linkages between riparian forests and streams affect biogeochemical properties of these zones?**

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Riparian and stream ecosystems are tightly coupled through the exchange of water and nutrients, conforming a functional landscape unit that is especially significant as a biogeochemical hot spot. The aim of this study is to contribute to the understanding of hydrological and biogeochemical linkages between surface stream water and riparian groundwater in a forested temperate Mediterranean zone. The study was carried out in a permanent stream at Montseny (NE Spain). Across the riparian zone, 28 piezometers were installed across 4 transects. Additionally, two piezometers were placed to continuously monitor river and groundwater table oscillations. Stream and groundwater hydrology and chemistry have been studied over a period of two years (April 2010 to May 2012). Groundwater table elevations were measured and dissolved oxygen concentration, temperature, conductivity, pH, redox and nutrient concentrations in groundwater were determined every 15 days in all piezometers. Groundwater table elevations show a seasonal pattern clearly related to the vegetative period, showing a decrease and temporal oscillations due to evapotranspiration from the forest. Also, substantial temporal patterns can be identified in groundwater chemistry, showing periods of water exchange between the stream and the groundwater from the stream edge zone piezometers. Our results highlight the importance of the study of linkages between riparian and stream compartments to fully understand biogeochemical processes that take place in them.

T5-P408 **Variação temporal da biomassa perifítica em lagos conectados de planície de inundação**

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Para avaliação da biomassa perifítica, a análise de clorofila *a* é um bom índice para a determinação autotrófica, pois exclui outros microrganismos e detritos associados ao substrato. Com isso, esse estudo objetivou avaliar o principal fator regente sobre a biomassa perifítica na planície de inundação do Alto Rio Paraná (Brasil) e responder se há interação entre os fatores anos, períodos hidrológicos e subsistemas da planície. A biomassa perifítica obtida de pecíolos de *Eichhornia azurea* (Sw.) Kunth foi avaliada através da análise de clorofila *a*, e as amostragens realizadas nos meses de fevereiro e dezembro (águas altas), maio e agosto (águas baixas) caracterizando os períodos hidrológicos, em quatro anos (2000, 2001, 2010, 2011), em cinco lagos conectados de três subsistemas (Baia, Ivinhema, Paraná), totalizando 720 amostras. A interação dos fatores foi testada utilizando a análise de variância trifatorial (ANOVA) ao nível de confiança de 95% ($p<0,05$). Os três fatores isoladamente apresentaram diferença significativa de acordo com a ANOVA ($F_{ano}=49,006$, $p<0,05$; $F_{período}=59,866$, $p<0,05$ e $F_{subsistema}=57,194$, $p<0,05$). Quanto às interações, somente ano*subsistema ($F=46,506$, $p<0,05$) e período*subsistema ($F=56,441$, $p<0,05$) foram significativas, sendo a interação entre todos os fatores não significativa ($F=0,0693$, $p=0,93$). A influência dos subsistemas no padrão de resposta da biomassa perifítica foi comprovada pela significância da interação deste fator com os demais, mostrando assim que tais sistemas têm grande importância na produtividade da planície de inundação, seja ao longo dos anos ou em diferentes períodos.

T5-P429 **Space-temporal variability of environmental variables in a subtropical floodplain wetland (São Paulo, Brazil)**

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The flood-pulses are a main factor driving ecological processes in floodplain ecosystems. The main goal of this study was to investigate the influence of the hydrological pulses on the space-temporal dynamics of physical and chemical variables of a wetland adjacent to Jacupiranguinha River (São Paulo, Brazil). Eleven sampling points were distributed among the wetland and four campaigns were carried out, covering the rainy and the dry periods. Measures of pH, dissolved oxygen, electrical conductivity and redox potential were taken using a multiparametric probe. Water samples were collected for nitrogen and phosphorus analyses, including their dissolved fractions. Total alkalinity and suspended solids were also quantified. Superficial sediments were collected and analysed for organic matter, nitrogen, phosphorus and heavy metals (Cd, Pb, Cu, Mn, Hg). The flood-pulses from Jacupiranguinha River, besides contributing to the inputs of nutrients and sediments to the wetland, accounted for decreasing in spatial gradients of physical and chemical variables in the water column. This homogenization effect was evidenced by the Cluster Analysis. The effect of seasonality, and, therefore, of the flood-pulses on the environmental variables in the water column was significant according to MANOVA. The Principal Component Analysis discriminated two groups represented by the rainy and dry periods. Although, statistical analysis showed no significant influence of seasonality on the composition of the wetland's sediments, important changes were observed, particularly with regard to the nutrients enrichment and metals accumulation, processes that may result in profound ecological implications.

T5-P470 **Does the age and composition of riparian stand affect ecosystem functioning in streams?**

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A common watershed restoration practice to improve water quality and stream ecosystem services is replanting riparian corridors. This restoration

practice may have consequences on ecosystem processes because the stream biota, particularly microbes and macroinvertebrates, obtain energy from riparian leaf-litter inputs. In this study, we assessed whether leaf age and type of widespread tree species in the Iberian Peninsula, namely oak, alder and eucalyptus, affect leaf litter decomposition in streams. Leaf litter from single and mixtures of juvenile and mature leaves were placed in coarse mesh bags in different ratios (25:75, 50:50 and 75:25) and immersed in a stream. After 20 days, leaf mass loss, fungal biomass, and invertebrate biomass and diversity were examined. Our results indicate that alder had higher fungal biomass than other leaf types. Leaf age did not affect fungal biomass in oak or eucalyptus. Fungal biomass decreased with the decrease in percentage of young alder leaves. Leaf type and age affected invertebrate biomass, which was higher in alder than oak or eucalyptus. Mixtures with 75%-juvenile and 25%-mature alder leaves had the highest invertebrate biomass. The number of invertebrates was greater in alder than in other leaf types, and did not differ between leaf type and age in oak and eucalyptus. Invertebrate taxon richness was highest in oak, and it was affected by leaf age in alder. This study provides evidence that composition and age of riparian forest may influence key ecological processes in streams with practical implications for watershed management strategies. The study was supported by FEDER-POFC-COMPETE and FCT (PTDC/AAC-AMB/117068/2010).

T5-P472 **Long-term effects of riparian-plant diversity loss on a stream invertebrate shredder**

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We used a pool of 3 common riparian-plant species in Portugal (alder, oak and eucalyptus) to examine the potential long-term impacts of riparian diversity loss on the feeding behaviour and body composition of a stream invertebrate shredder (Limnephilidae). Fine-mesh bags containing mixtures of the 3 leaf species were immersed in a mixed-forested stream to allow microbial colonization. After 2 weeks, colonized leaves were transferred to microcosms containing stream water and all combinations of 1 to 3 non-colonized leaf species enclosed in mesh containers. The experiment ran for 6 months. In each month, a portion of leaf material was used to inoculate new microcosms containing non-colonized leaf material, keeping the leaf species composition constant. After 2 and 6 months, those leaves were used to feed invertebrate shredders for a period of 8 days. Leaf consumption and FPOM production by the shredder were affected by leaf species diversity, with higher values in mixtures with 3 leaf species. Leaf mass loss and FPOM production were also affected by leaf species identity, but not by time of leaf diversity loss. C:N ratio of FPOM was affected by leaf identity and showed a positive linear relationship with initial leaf C:N ratio. Invertebrate C:N ratio increased along time of leaf diversity loss. Results suggest that the riparian-plant diversity loss can affect leaf consumption, FPOM production and invertebrate body composition, but effects did not appear to change at longer times. FEDER-POFC-COMPETE and FCT supported this study (PEst-C/BIA/UI4050/2011, PTDC/AAC-AMB/117068/2010), IF (SFRH/BD/42215/2007) and SD (SFRH/BPD/47574/2008).

T6-Environmental management and water quality

T6-P7 **Does the phytoplankton community always follow the water quality heterogeneity in reservoirs?**

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The heterogeneity is an intrinsic characteristic of ecological systems. Regarding the spatial heterogeneity, there are two main approaches in ecology: the physical heterogeneity of the organisms in the space or the heterogeneity of qualitative or quantitative values of parameters in the space. These approaches are closely related, as the environmental heterogeneity affects directly the organism's distribution. Previous works showed that Guarapiranga, an important water supply reservoir in São Paulo, Brazil, presents spatial heterogeneity in many environmental aspects (water quality, trophic status, and metals in water and sediment). Organisms' distribution has never been evaluated. Our aim was to test if environmental heterogeneity in Guarapiranga affects the phytoplankton distribution. We collected integrated water column samples for physical, chemical and phytoplankton analysis in nine spots from Guarapiranga. The hierarchical cluster analysis based on the environmental characteristics formed three clear groups: Embu-Graçu region, in the higher part of the reservoir; Parelheiros region; and the down part of the reservoir. Our results corroborate the water quality heterogeneity of Guarapiranga. However, the cluster analysis based on phytoplankton did not form any clear group of sites. Thus, the phytoplankton community does not follow the water quality heterogeneity pattern and is being driven by other forces than the ones intrinsic to the reservoir, probably of human origin. During the field work, the environmental agency was adding copper sulphate in the down part of the reservoir. The algaecide application can be considered an anthropogenic disturbance for the phytoplankton community, and probably is the main force interfering with its natural dynamics in Guarapiranga.

T6-P12 **Estudio de los peces como indicadores del potencial ecológico de los embalses españoles**

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El objetivo central de este estudio ha sido analizar la respuesta de la asociación piscícola de los embalses españoles a varios tipos de presión antrópica general en orden a definir las métricas de tipo biológico más adecuadas para el BQE (Biological Quality Element) de los peces con carácter bioindicador y poder desarrollar un índice que permita evaluar el potencial ecológico de estos cuerpos de agua. El análisis se ha llevado a cabo siguiendo una aproximación tipológica. El estudio se ha llevado a cabo a partir de 152 embalses pertenecientes 5 cuencas hidrográficas. Los resultados indican que existen dos tipologías de embalses claramente definidas según sus características ambientales. Igualmente se han detectado tres tipos de asociaciones ícticas en base a la estructura de los diferentes gremios funcionales considerados en

el análisis: asociaciones caracterizadas por el elevado porcentaje de especies nativas, intolerantes y reofílicas; asociaciones caracterizadas por la presencia de especies con hábitos tróficos bénticos, tanto invertívoro como detritívoros y omnívoros, con tolerancia intermedia o baja y potamodromas; y asociaciones caracterizadas por la abundante presencia de especies exóticas, con hábitos pelágicos, desde invertívoros a omnívoros, limnéfilas y tolerantes. Los tres tipos de asociación los podemos encontrar en las dos tipologías de embalses diferenciadas. El análisis cruzado efectuado sobre el conjunto de métricas funcionales y las variables de presiones antrópicas dio como resultado la selección de cinco métricas candidatas a formar parte de un índice de integridad biótica multimétrico: riqueza de especies, % de especies intolerantes, % de especies detritívoras-omnívoras, % de especies limnofílicas y % de biomasa de especies invertivoras-omnívoras.

T6-P14 **Calidad de aguas en la cuenca alta del río Águeda, W España**

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La calidad de agua del río Águeda y cuatro de sus afluentes (Rubiós, Payo, Perosín, Frío) ha sido analizada en la zona de cabecera mediante parámetros físico-químicos y biológicos. Para ello se eligieron siete puntos entre 800 y 900 m de altitud sobre el nivel del mar que fueron muestreados en septiembre de 2011. La abundancia de macroinvertebrados bentónicos, el número de sus taxones, el índice IBMWP, la diversidad biológica, el índice EPT (Efemerópteros - Plecópteros - Tricópteros) y el índice EPT/Quironómidos mostraron valores bajos en el tramo alto del río Águeda y en los ríos Rubiós y Perosín. Probablemente en el río Rubiós estas alteraciones se deban a la minería, pues en décadas anteriores hubo intensa actividad para extraer wolframio. En los ríos Águeda y Perosín podrían ser debidas a obras de canalización del cauce y/o a la escasez de caudal. En los cuatro puntos restantes la calidad del agua es calificada como buena o muy buena.

T6-P21 **Effects of fish farm in net cages on phytoplankton structure in a subtropical reservoir, Paraná, Brazil**

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The aim of this study was to evaluate the trophic state and spatial-temporal changes in the phytoplankton biomass during an experimental net cages culture of jundiás and surubins of Iguaçu in an arm of Salto Caxias reservoir, Brazil. Sixty adult fishes were placed in three sets of ten net cages in one reservoir's arm and a second arm was used as a control. Two sample stations were selected in the affected arm and other two in the non-affected arm. Samples were carried out bimonthly between September 2010 and July 2011. There wasn't significant difference between the arms, for both abiotic variables and phytoplankton structure. The aquaculture area was classified as oligotrophic, showing low influence of the net cages. Two functional groups were observed (F and K) that may occur in shallow oligotrophic environments with high water transparency. Biomass values were higher in the rainy period. The dry period was represented mainly by Bacillariophyceae taxa and the rainy period by Cyanobacteria and Chlorophyceae. According to the CCA and the analysis of variance, temporal changes were verified separating the dry period (autumn/winter) from the rainy period (spring/summer). The effects of the net cages on nutrients and phytoplankton structure were small, probably due to the low number of net cages and fish employed, the area hydrodynamics, with lotic traits and the strong influence of the wind.

T6-P64 **Estudo de alguns parâmetros relativos ao estado ecológico da ribeira da Granja (Vila do Conde, Portugal)**

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A diretiva quadro da água (DQA-2000/60/EC), em vigor desde dezembro de 2000, estabelece objetivos de qualidade que visam a obtenção de um bom estado de qualidade de todas as águas interiores de superfície e subterrâneas até 2015, e introduz o conceito de "estado ecológico" de um ecossistema, que inclui o estudo de um amplo leque de parâmetros e fatores com vista à determinação da "saúde" do sistema. Este trabalho, realizado no âmbito de um projecto interdisciplinar de alunos da licenciatura em Engenharia do Ambiente da Universidade Fernando Pessoa, tem por objectivo efectuar o estudo da qualidade da água e de alguns parâmetros relativos ao estado ecológico da Ribeira da Granja, (bacia hidrográfica do rio Ave) de modo a determinar as suas principais fontes de poluição e propor medidas que visem a sua reabilitação. Para isso foram recolhidos dados relativos à sua hidro-morfologia, amostras de água para determinação de parâmetros físico-químicos, amostras da comunidade de macroinvertebrados bentónicos e determinados alguns índices de qualidade. Os resultados obtidos permitiram concluir que se trata de um curso de água com elevado grau de degradação devido a problemas relacionados com artificialização do canal e receção de efluentes domésticos e industriais.

T6-P65 **Estudo de alguns parâmetros relativos ao estado ecológico do Rio Este (Portugal)**

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A diretiva quadro da água (DQA-2000/60/EC), em vigor desde Dezembro de 2000, introduz o conceito de "estado ecológico" de um ecossistema, que inclui o estudo de um amplo leque de parâmetros e fatores de um ecossistema aquático com vista à determinação da "saúde" do sistema. Esta diretiva estabelece objetivos de qualidade que visam a obtenção de um bom estado de qualidade de todas as águas interiores de superfície e subterrâneas até 2015, o que implica a sua avaliação, monitorização e adoção de mitigadoras de efeitos adversos, tendo como suporte o estudo de ecossistemas aquáticos. Este trabalho, realizado no âmbito de um projecto interdisciplinar de alunos da licenciatura em Engenharia do Ambiente da Universidade Fernando Pessoa, tem por objectivo efectuar o estudo da qualidade da água e de alguns parâmetros relativos ao estado ecológico do Rio Este, (bacia hidrográfica do rio Ave) através da recolha de dados relativos à sua hidro-morfologia, de amostras de água para determinação de parâmetros físico-químicos e microbiológicos,

recolha de amostras de macroinvertebrados bentónicos e da aplicação de índices de qualidade. Os resultados obtidos permitem concluir que o rio apresenta, com exceção da zona da nascente, uma fraca qualidade da água, e que todos os parâmetros analisados indiciam uma forte degradação do estado ecológico do mesmo devido a problemas relacionados com artificialização do canal, receção de efluentes domésticos e industriais e má utilização das margens do mesmo.

T6-P87 **Strategy for monitoring cyanobacterial blooms using a stepwise approach based on sequential methodologies**

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Climatic changes are increasing the frequency of massive growth of cyanobacteria in freshwaters, thus putting at risk water quality and human health, when toxic strains become dominant. Therefore, effective management strategies to predict and control cyanobacterial blooms are preferable to large investments in the mitigation of the consequences. WHO has proposed alert levels based on chlorophyll *a* concentration and cyanobacterial cell density, but these may not be the most adequate parameters for estimating the risks associated with a cyanobacterial bloom. Instead, concentrations of cyanobacteria-specific pigments (phycocyanin) can rapidly indicate an alert level; sampling only becomes necessary when phycocyanin concentration rises above the thresholds defined as indicators of bloom formation. However, fluorometry does not give information on the dominant species and their toxic potential. Here, we propose a conceptual framework based on a stepwise monitoring approach, using a sequence of methodologies: 1) fluorometry (quantification of phycocyanin) gives a real-time screening of cyanobacterial abundance; 2) if pigment concentrations indicate the imminence of a cyanobacterial bloom, microscopic identification and cell counting must be performed; 3) if the bloom is confirmed as emergent, molecular approaches (16SrDNA-DGGE, cloning and sequencing) will aid in the assessment of the spatial diversity and identity of dominant cyanobacteria; 4) to assess the potential for cyanotoxin production (such as microcystin, nodularin and cylindrospermopsin), PCR and RT-PCR will be used and, when justified, cyanotoxins must be analytically quantified; 5) the ecological assessment of the cyanobacterial toxic potential can be performed using phytoplankton and zooplankton target species.

T6-P95 **Evaluación integral de la cuenca del río Rivera de Huelva (SO España) con un Sistema de Información Geográfica**

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En la cuenca del río Rivera de Huelva se sitúan los 5 embalses que abastecen a Sevilla y su área metropolitana, gestionados por la Empresa Metropolitana de Abastecimiento y Saneamiento de Aguas de Sevilla (EMASESA). La gestión activa que se realiza en cada uno de ellos se basa en el conocimiento de su funcionamiento a través de un Programa de Vigilancia que la empresa aplica desde hace más de 25 años. Esta vigilancia no sólo se ocupa de la masa de agua sino que se extiende a las subcuencas de cada embalse y, en particular, a las principales fuentes de contaminación que puedan alterar significativamente la calidad del agua embalsada y comprometer su uso para el abastecimiento a la población. Con el fin de conocer los riesgos potenciales asociados principalmente a los usos que se realizan en esta cuenca, EMASESA junto con la Universidad de Sevilla han desarrollado un Sistema de Información Geográfica que va a permitir: i) disponer de toda la información relevante sobre sus características físicas y las fuentes potenciales de contaminación puntual y difusa que puedan afectar a la calidad del agua de los embalses de abastecimiento; ii) disponer de un modelo para la estimación de la carga contaminante aportada a los embalses que permita elaborar un mapa de presiones y riesgos sobre la calidad del agua, así como diseñar un programa de medidas y vigilancia, y iii) diseñar un Protocolo de Actuación para la elaboración del SIG que permita hacerlo extensible a otros embalses.

T6-P102 **Características limnologicas de los embalses Alto Andinos**

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En el estudio se evaluo las características fisicoquímicas y planctónicas de los embalses Salve Faccha, la Mica, Mogotes y Sucus que se encuentran ubicados en los páramos alto Andinos a 3900 msm, para lo cual la Empresa Pública Metropolitana de Agua Potable y Saneamiento opera estos sistemas para abastecer agua de consumo humano al Distrito Metropolitano de Quito. Se investigó la dinámica espacial, temporal y vertical de la calidad del agua, la comunidad planctónica, la clorofila a, nutrientes y sus interrelaciones a fin de conocer el posible estado trófico. En fitoplancton se identifico en el Embalse de Salve Faccha un total de 13 especies, la Bacillariophyta con 54.4% al total de la biomasa, las Chlorophytas con 31.4% y las Crysophyta con 6.2%. La Mica un total de 12 especies, la Bacillariophyta con 35.3%, las Crysophitas con 23.5% y las Euglenophyta y Cryptophytas con 13.7% y 12.9%. Mogotes un total de 12 especies, la Pyrrophyta con 56.5% al total de la biomasa, las Chlorophitas con 19.5%, las Euglenophyta y Bacillariophytas con 8.9% y 5.4%. Sucus un total de 9 especies, las Bacillariophyta con 56.7% al total de la biomasa, las Chlorophitas con 28.4% y las Cyanophytas con 10%. Las características físico-químicas y planctónicas adaptadas a los modelos de eutrofización para lagos tropicales nos permitió clasificar a Salve Faccha: Mesotrófico con tendencia en un 39% de probabilidad a Eutrófico. La Mica: Mesotrófico con tendencia en un 29% de probabilidad a Eutrófico. Mogotes: Oligo – con tendencia en un 43% de probabilidad a Mesotrófico. Sucus: Oligo con tendencia en un 43% de probabilidad a Mesotrófico. Esta información nos permite cumplir con un sistema de control ambiental permanente y un manejo sustentable del recurso.

T6-P103 **Procedimiento para la evaluación del estado químico en los embalses de la C.H. Júcar (España)**

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Se ha desarrollado una metodología de trabajo para evaluar el estado químico en los embalses del ámbito de la Confederación Hidrográfica del Júcar, a partir del estudio previo de las presiones antropogénicas significativas y la monitorización de sustancias contaminantes. La caracterización de las presiones por fuentes de contaminación difusa se ha basado en tres indicadores: 1) cálculo de la tasa de ocupación que representan las superficies de uso agrícola en las subcuencas drenantes de los embalses; 2) presencia de concentraciones significativas de plaguicidas en las aguas subterráneas que descargan hacia la red fluvial situada aguas arriba de embalses; y 3) aplicación de fitosanitarios de origen agrícola en las cuencas drenantes. Las presiones por fuentes de contaminación puntual se han caracterizado en base a seis indicadores: 1) inventario oficial de vertidos autorizados a las aguas superficiales con presencia de sustancias peligrosas; 2) informes de auditorías ambientales; 3) relación de embalses con navegación de embarcaciones con motor de explosión; 4) informes de vigilancia del servicio de policía de aguas; 5) resultados de la Red de control de sustancias peligrosas en ríos; y 6) observaciones in situ de presiones puntuales en los embalses, no contenidas en los indicadores anteriores. A partir de esta caracterización, se ha determinado que 15 de las 26 masas de agua categoría embalse están sometidas a presiones antropogénicas significativas. En cada uno de estos embalses, se ha tomado una muestra integrada y se ha realizado el análisis de las sustancias contaminantes que pueden estar presentes en el agua. Por último, se han comparado los resultados analíticos obtenidos con las normas de calidad ambiental establecidas en el Real Decreto 60/2011.

T6-P127 **Análisis del funcionamiento de pasos de peces existentes en la cuenca del Ebro**

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A raíz de la implantación de la Directiva 2000/60/CE del Parlamento Europeo y del Consejo de 23 de octubre de 2000, por la que se establece un marco comunitario de actuación en el ámbito de la política de aguas (en adelante DMA), los cursos europeos deben alcanzar una serie de exigencias ecológicas antes del 2015. Uno de los indicadores para evaluar el estado ecológico de una masa es la continuidad del río, la cual esta mermada por la existencia de estructuras transversales que dificultan la migración de los peces. Con objeto de evaluar la continuidad fluvial en aquellas masas de la cuenca del Ebro que se encontraban en riesgo medio y alto de no alcanzar los objetivos fijados por la DMA la Confederación Hidrográfica del Ebro ha realizado una evaluación de los pasos de peces existentes en la demarcación del Ebro, la mayor parte de ellos escalas de artesas sucesivas en vertido libre. Los principales aspectos evaluados en los pasos han sido el emplazamiento, el diseño del paso, el caudal de diseño, el caudal de llamada, la entrada al paso para los peces y su estado de mantenimiento. En función de estos aspectos se ha determinado el grado de permeabilidad, estableciéndose cuatro categorías: alto (el paso es funcional para todas las especies y periodos del año a excepción de períodos de crecida), medio (el paso es funcional para la mayor parte de las especies presentes durante la mayor parte del año), bajo (pueden ser permeables para especies con grandes capacidades natatorias y en momentos muy puntuales) y nulo (es imposible que un pez pueda remontar. En total se identificaron 131 pasos de los cuales se han evaluado 118. Respecto a los grados de permeabilidad de los 118 pasos evaluados 4 presentaban un grado de funcionalidad alto, 16 medio, 22 bajo y 76 nulo.

T6-P144 **Conservation status of the middle course of the Aulencia River**

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The aim of this study is to determine the conservation status of the middle course of the Aulencia River (Guadarrama River Basin), inside the "Parque Regional del Curso Medio del Río Guadarrama y su Entorno", downstream Valmayor reservoir. For this evaluation we compare the information obtained by biotic indices versus community structure descriptors; physical chemical water quality assessment and a riparian forest quality were analysed too. Two sampling sites were selected, each of those was divided into two mesohabitats according to water velocity. Six fieldwork campaigns were accomplished during the autumn of 2011, collecting samples of benthic macroinvertebrates, using a Surber sampler. We measured water velocities and flows, physical chemical characteristics of water, and the QBR index. Physical chemical results point to the existence of sources of domestic waste waters, confirmed by macroinvertebrate structure descriptors and IBMWP index. Comparison with data obtained by other authors ten years ago, indicate that pollution conditions of these waters and ecological characteristics were similar.

T6-P152 **Ecological state of basque country inland wetlands: comparison of two evaluation approaches**

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On behalf the Basque Water Agency, the ecological state of 15 inland wetlands from the Basque Country was evaluated during the 2009/10 hydrological cycle by means of two different methodologies. On the one hand, we applied the methodology used during the period 2001-2009 on these wetlands. On the other hand, we applied the methodology proposed by the Spanish Ministry of the Environment in order to homogenize the methodologies fostered by different water agencies. The analyses focus on phytoplankton and macrophytes metrics. For phytoplankton, the first approach has been applying ITP (Planktonic Trophic Index), chlorophyll a and cyanophyceae blooms, whereas Spanish ME has proposed total biovolume and Chl a. For macrophytes, the first method is based on cover of representative community, IVH (Wetlands Assessment Index) and presence/extent of populations of introduced species; whereas the new approach proposes the following metrics: presence/absence of hydrophytes; species richness; total cover of hydrophytes, helophytes and/or macrophytes; cover of eutrophia-indicator species; and cover of exotic species. The proportion of wetlands

classified in the different ecological status showed little but positive variation in general terms, both for phytoplankton and for macrophytes. Regarding phytoplankton, the former 47% of water bodies in 'good' ecological status, change to 54% when the new methodology is applied. With regard to macrophytes, the former method classified the 93% of water bodies in worst that good ecological status, and 13% of wetlands changed significantly their ecological state because of the new methodology, moving from 'moderate' or worse to 'good' status. In conclusion, most of the wetlands remained stable, regarding environmental objectives.

T6-P154 **Uma ferramenta para avaliar o estado ecológico de um rio (Brasil): a pesquisa participativa na educação básica**

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O ambiente escolar como disseminador de conhecimentos e formador de cidadãos, por sua responsabilidade social, deve abordar a problemática ambiental que vem afetando os recursos naturais e propor meios para enfrentar tais problemas, com atividades que promovam reflexão, participação, comprometimento e mudança de atitudes, despertando um senso crítico nas relações do homem com a natureza. Desta forma, a parceria entre escola, universidade e sociedade, faz da extensão um processo acadêmico importantíssimo na formação do aluno, na qualificação do professor e na sociedade como um todo, buscando a formação de cidadãos conscientes, engajados na promoção da sustentabilidade dos recursos a sua volta. Neste contexto, o objetivo deste trabalho foi promover a aplicação de noções básicas de ecologia aquática para elaboração do diagnóstico da qualidade da água de um rio com alunos e professores da rede pública. O projeto foi realizado em trechos do rio em uma ação conjunta entre docente e seus alunos de pós-graduação com alunos e professores da rede pública municipal, abordando temas que envolveram a perspectiva histórica, geomorfologia, usos do solo e cobertura vegetal, biodiversidade animal e vegetal, processos ecológicos e aspectos físicos e químicos da água. Houve um predomínio de peixes do gênero *Astyanax* sp. e macroinvertebrados típicos de ambientes com poluição orgânica. A condutividade elétrica, nitrogênio e fósforo total na água apresentaram maior oscilação entre os locais de coleta e períodos de estudo, resultante do processo de eutrofização ocasionado pelo despejo de esgoto em alguns trechos do rio. Através dos resultados obtidos, houve um aumento da conscientização da comunidade escolar sobre a importância da utilização sustentável desse importante recurso natural.

T6-P158 **Concentrações de metais em rios e reservatórios subtropicais: influência das formas de uso e ocupação do solo**

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Programas de monitoramento em ecossistemas aquáticos subtropicais devem ser intensificados para garantir os usos múltiplos, incluindo a potabilidade. As medianas das concentrações de Fe, Al, Cu, Cr e Hg totais em rios e reservatórios de São Paulo, Brasil, obtidas pela Companhia Ambiental do Estado de São Paulo entre 2005 e 2010, foram utilizadas para avaliar a influência do uso e ocupação do solo na qualidade da água. Os ambientes lóticos e lênticos foram classificados em UGRHIs (Unidades de Gerenciamento de Recursos Hídricos) de conservação, agropecuárias e industriais, de acordo com as formas preponderantes de uso e ocupação. Os metais, embora presentes naturalmente nos ecossistemas, podem apresentar concentrações elevadas em decorrência das atividades antrópicas e, devido a sua toxicidade, gerar incompatibilidades com o Padrão de Potabilidade (PP) estabelecido pelo Ministério da Saúde do Brasil. Ao todo, 13.095 dados foram analisados. Nos rios e reservatórios, as medianas de Hg (0,0001 mg L^{-1}) e Cu (0,005 mg L^{-1}) não foram afetadas pelas formas de uso e ocupação. As UGRHIs industriais apresentaram, para rios e reservatórios, medianas das concentrações de Cr (0,01 mg L^{-1}) superiores àquelas observadas nas agropecuárias (0,005 mg L^{-1}). Em geral, as medianas das concentrações de Fe e Al superaram os valores do PP (0,3 e 0,2 mg L^{-1}, respectivamente) e foram influenciadas pelo tipo de UGRHI. Os rios situados em UGRHIs agropecuárias, industriais e de conservação apresentaram medianas de Fe de 2,5, 2,3 e 1,6 mg L^{-1}, respectivamente, todas acima do PP. As estações de tratamento de água devem monitorar a evolução das formas de uso e ocupação no entorno dos mananciais e sua influência sobre as concentrações de Fe e Al, cujos valores superaram os limites fixados para fins de potabilidade.

T6-P161 **Análise espacial dos impactos sobre o Sistema Cantareira: São Paulo – Brasil**

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O Sistema Cantareira produz cerca de metade da água consumida pelos 19.673 mil habitantes da Região Metropolitana de São Paulo (RMSP), Brasil. Sua área produtora de água é de 227.950 ha. É considerado um dos maiores sistemas produtores de água do mundo: produz 33 mil litros de água por segundo. A bacia de captação do Juquery tem 33.771 ha, 14,8% da área do sistema Cantareira. O Parque Estadual da Cantareira (PEC) tem 67% de sua Zona de Amortecimento dentro da bacia de captação do reservatório Juquery. Nesta bacia, encontra-se também o núcleo urbano do município de Mairiporã onde somente 20% do esgoto é coletado e tratado. O PEC está localizado na porção mais alta da região e abriga diversas nascentes que deságuam no Juquery. Imagens do satélite ALOS-AVNIR foram classificadas para seu uso e ocupação por máxima verossimilhança com pertinência fuzzy (Fisher Kappa Index = 0,97). A área da bacia de captação foi delimitada a partir da imagem TOPODATA. Uma álgebra entre a Zona de Amortecimento do PEC e a bacia de captação do Reservatório do Juquery gerou uma área de interesse com 22.659 ha, fora a parte do PEC que está dentro da bacia. Outra operação algébrica foi feita com a imagem uso e ocupação e a área de interesse. Constatou-se 63,6% de cobertura arbórea. Amostragem preliminar de indicadores (nitrato, amônia, coliformes fecais e diversidade bentônica), foi realizada em sete pontos de deságüe no canal do rio Juquery, em cinco datas diferentes. Foram observados baixos níveis de nitrato, amônia, coliformes fecais e diversidade bentônica nos pontos mais distantes do reservatório. Nos pontos mais próximos do reservatório todos os níveis se mostraram mais altos. Apesar da intensa cobertura vegetal dentro destas sub-bacias, percebe-se que elas não estão totalmente protegidas.

References:
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T6-P180 **Abundância de cianobactérias na represa Billings e sua relação com os parâmetros físico-químicos da água**

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O complexo Billings é um reservatório estratégico para a cidade e região de São Paulo, porque suas águas são usadas para vários propósitos, entre eles suprimento de água para a população. As cianobactérias têm dominância destacada em reservatórios brasileiros, e as suas florações podem causar diversos prejuízos ambientais e econômicos nesses ecossistemas. Portanto o objetivo deste estudo foi avaliar a qualidade da água em duas estações da represa Billings e sua correlação com a riqueza e a abundância de cianobactérias. Dois pontos de amostragem foram selecionados e as coletas realizadas em março, agosto e setembro de 2010 e janeiro de 2012. Vários parâmetros físico-químicos foram avaliados conjuntamente com a riqueza e a densidade das cianobactérias. A classe Cyanophyceae dominou quanto à densidade em todas as coletas realizadas. Tal predominância também foi encontrada nos estudos de Nishimura (2007) no braço Taquacetuba do Complexo Billings. Observou-se também a presença de florações da espécie *Microcystis aeruginosa* nos dois pontos em agosto, setembro e janeiro. Em março, *Microcystis* ainda apresentou alta densidade, mas foi ultrapassada por *Planktothrix* e *Cylindrospermopisis*. A temperatura, o pH, o oxigênio dissolvido e as formas nitrogenadas foram os principais fatores que contribuíram para a abundância da classe Cyanophyceae. Um estudo comparativo envolvendo várias represas (Sant´Anna, 2007) mostrou que a represa Billings reúne as melhores condições para o desenvolvimento das cianobactérias, tais como temperatura e pH elevados, como encontrado nesse estudo. A condição eutrófica da represa Billings foi, portanto, confirmada através dos padrões de nutrientes, oxigênio dissolvido e predominância das cianobactérias.

T6-P181 **Road construction impact on the ecological quality of Caldeirões stream (Azores, Portugal)**

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Ribeira dos Caldeirões is a typical insular stream, being steep, narrow and short, with a torrential regime, and bedrock, boulders and cobbles substrate. Located in the Northeast side of São Miguel Island (Azores), in an agricultural area, was affected in 2010 by the construction of the new road along the island mainly by the location of construction site along its margins, and consequent disturbance in the flow, vegetation and channel characteristics. The BACI approach, a classic method for measuring the impact of a disturbance or event on benthic communities was applied to evaluate how the road construction changed the environment, to determine which biological components were adversely affected, and to estimate the magnitude of the effects. The analysis was done using the data on macroinvertebrate communities before the road construction (years 2008, 2009), during (year 2010) and after (year 2011), in spring and autumn seasons. As control we used Ribeira da Praia, a stream similar to Ribeira dos Caldeirões in terms of channel, riparian vegetation and water quality. A noticeable change in the community structure in Ribeira dos Caldeirões was detected with the disappearance of good quality indicator organisms and the decrease in diversity, abundance and richness at post construction. A considerable decrease in the ecological quality was observed, with values varying prior to construction between very good and fair to post construction varying from fair and fairly poor. The ecological quality in Ribeira da Praia improved to Good status in 2010 and 2011. These results show that road construction can have great impact on macroinvertebrate community and stream ecological quality.

T6-P188 **Relação entre a assembléia de macroinvertebrados bentônicos e o estado trófico em um reservatório neotropical**

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O objetivo deste trabalho foi verificar as respostas da assembléia de macroinvertebrados bentônicos aos fatores ambientais ao longo de um reservatório tropical de cabeceira (Itupararanga, Brasil). As coletas foram realizadas com uma draga de Van-Veen ao longo do reservatório nas regiões litorâneas e profundas na entrada dos principais tributários, na região central e próximo da barragem. Foram coletadas amostras no período de seca e no período de chuvas. As concentrações de oxigênio dissolvido, condutividade elétrica, temperatura e pH foram medidas *in situ* usando um multissonda e a transparência da água foi determinada com o auxilio de disco de Secchi. As concentrções de fósforo total na água e clorofila a foram determinadas e utilizadas para o calculo do Índice de Estado trófico. Foram também determinadas as concentrações de matéria orgânica, fósforo total e azoto e a composição granulométrica do sedimento. A fim de verificar quais as variáveis ambientais que teriam mais influência na composição da assembléia de macroinvertebrados bentônicos, foi realizada uma análise de correspondência canônica (CCA). O número total de táxons registrados foi de 28. A família Chironomidae (Diptera) foi a mais rica (19 táxons). Condições ambientais, como altas concentrações de nutrientes na água e matéria orgânica no sedimento, bem como as concentrações de oxigênio dissolvido foram as variáveis que mais influenciaram a assembléia de macroinvertebrados bentônicos. *Chironomus* sp., *Limnodrilus hoffmeisteri* e *Branchiura sowerbyi* estão no grupo que pode ser considerado como bio-indicador de condições eutróficas e *Tanytarsini* spp., *Fissimentum* sp., *Pelomus* ssp e *Goeldichironomus* sp. são taxa predominantes em estações com condições mesotróficas.

T6-P190 **Glyphosate contamination in water: developing a methodology for aquatic ecosystem monitoring**

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The use of pesticides exceeds two million tons per year. In aquatic environments contamination by pesticides can occur through direct application or runoff from surrounding areas. The world's top selling herbicide is glyphosate [N-(phosphonomethyl) glycine] whose consumption in Brazil attains up to 200 million liters per year. Glyphosate has a high potential of transport as a consequence of its solubility in water. The analysis of the presence of this herbicide in aquatic environments

requires a cautious study to permit the tracking and monitoring of its action on the environment. Among the methods employed in the analysis of glyphosate are liquid and gas chromatography, and 31P NMR spectroscopy. These methods are complex, expensive and require care in the extraction and pretreatment of the sample. The aim of this study was to develop an efficient and low-waste methodology for the analysis of glyphosate in aquatic ecosystems by ionic liquid chromatography, a technique also used to evaluate nutrients in the water. A reagent 45 521 - Sigma Aldrich® PESTANAL® was used for the glyphosate stock solution and triplicate standard solutions at various concentrations were stored in three different ways: amber glass kept at 4 °C, plastic containers and in amber glass, the latter two stored at room temperature. The glyphosate analyses were performed in an ion chromatograph ICS-2100 (Dionex). Preliminary results indicated that the glyphosate was not degraded in the presence of light and that the temperature did not influence the storage. The method, which proved to be fast and simple, with a direct reading of the sample without previous treatment, allows the analysis of water with low generation of pollutants, which fits into the modern trend of using clean chemistry for environmental monitoring.

T6-P195 **Assessment of the effects of paper mill effluent on water quality in the Gallego River, Spain**

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Paper mill effluents are characterized by high organic matter content and temperature; they can degrade surface waters, mainly in rivers with low flow. For this reason, we aim to evaluate the effect of a paper mill effluent on the water quality of a river in a semi-arid region. To that end, physical-chemical and biological parameters (macroinvertebrates and diatoms quality indices and community structure) were studied in the Gállego River (Ebro River basin, NE Spain) upstream and downstream a paper mill effluent discharge. During the study period, downstream sites had lower dissolved oxygen concentration and pH, and higher COD, BOD and ammonium and sulphate concentration. Moreover, there was an average increase in water temperature of 2 ºC after the effluent. The quality index of macroinvertebrate (IBMWP) varied from Good (upstream) to Very Deficient (downstream); whereas quality indices of diatoms (IBD, EEC, IPS) varied from Moderate to Deficient in the same direction. Diversity (Shannon index) of diatom and macroinvertebrate communities also decreased downstream; which also affected the community structure as it evolved into a more generalist species and indicator of poor water quality. Therefore, these results suggest that the organic and acid nature of paper mill effluent degrades aquatic ecosystems, reducing their quality and the services they provide.

T6-P198 **Estudio comparativo del efluente y la microfauna presente en sistemas de depuración de aguas residuales**

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En la actualidad los sistemas de depuración de aguas residuales se basan en procesos biológicos en los que los actores principales son los microorganismos. Estos seres vivos eliminan la carga contaminante de las aguas residuales de origen doméstico. Conociendo los parámetros biológicos, fisico-químicos y de funcionamiento de un sistema de tratamiento de aguas residuales se puede relacionar el rendimiento en la reducción de la contaminación con la composición de la microfauna. El objetivo de este estudio ha sido determinar la relación entre la población de protozoos y la calidad del agua efluente en tres tratamientos de aguas residuales urbanas: aireación prolongada, biorreactor de membrana (MBR) y lecho bacteriano durante un año. Para evaluar la relación entre ellos, se han analizado los parámetros físico-químicos del agua influente y efluente de cada sistema, se han calculado las cargas orgánicas con las que han trabajado y se han identificado las poblaciones de protozoos en cada sistema. La identificación de las especies de protozoos presentes en los sistemas de tratamiento ha permitido realizar el cálculo del índice de Madoni. Los resultados del estudio muestran como se desarrollan distintas poblaciones de protozoos dependiendo del sistema de tratamiento y la correlación de estas poblaciones con los parámetros físico-químicos que determinan la calidad del agua efluente. Por tanto, una de las conclusiones del trabajo es que la caracterización de la microfauna asociada a un sistema de tratamiento de aguas residuales nos permite conocer el buen o mal funcionamiento del mismo.

T6-P199 **Estudio de la comunidad zooplanctónica (microcrustáceos y rotíferos) en un humedal artificial de flujo libre**

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En este trabajo se ha estudiado la composición y la abundancia de la comunidad del zooplancton en relación con los parámetros fisico-químicos en un humedal artificial de flujo libre que trata las aguas procedentes de un sistema de lagunaje. El muestreo se ha realizado entre los años 2008 y 2011 con un total de 40 muestras. Los parámetros fisico-químicos analizados han sido: pH, conductividad, temperatura del agua, oxigeno disuelto, turbidez, sólidos en suspensión totales, sólidos en suspensión volátiles, DBO_5, DQO, nitrógeno, fósforo y clorofila *a*. El rango de valores obtenidos para los distintos parámetros ha sido: temperatura (7,6-22 ºC); pH (6,7-8); conductividad (871-2036 µs cm^{-1}); oxígeno disuelto (0,2-5,8 mg L^{-1}), turbidez (1,6-66,3 NTU); clorofila *a* (0-47,3 µg L^{-1}); nitratos (0-22,9 mg L^{-1}); ortofosfatos (0,4-9,6 mg L^{-1}); DBO_5 (0-27 mg L^{-1}). En cuanto a la comunidad de zooplancton se han encontrado 17 especies que se reparten en tres grupos: 12 especies de rotíferos, 3 especies de ciclópidos y 2 especies de cladóceros. El rotífero *Lepadella patella* se ha presentado en el 60% de la muestras con una abundancia máxima de 200 ind/L. El copépodo que se ha encontrado con más frecuencia ha sido *Paracyclops fimbriatus* (50% de las muestras), con una abundancia que alcanzó 1240 ind/L. Las dos especies de los cladóceros *Alona rectangula* y *Moina micrura* han sido encontradas en una sola muestra aun si *Alona rectangula* ha sido con una abundancia de 611 ind L^{-1}, y *Moina micrura* con sólo 0,13 ind L^{-1}. Los nauplius de ciclopidos han sido encontrados en casi todas las muestras (87,5%). La riqueza específica en cada muestra ha sido muy baja, variando entre o y 6 especies por muestra. El estudio ha permitido vincular la contaminación del sistema con la baja diversidad y riqueza de especies zooplanctónicas.

T6-P204 **Establishing physico-chemical reference conditions in Mediterranean streams according to the WFD**

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Type-specific physico-chemical reference conditions are required for the assessment of ecological status in the WFD context. Mediterranean streams often present a marked seasonal pattern in hydrological, biological and geochemical processes which could affect physico-chemical reference conditions. This study establishes general physico-chemical reference conditions for different Mediterranean stream types. 116 potential reference sites were sampled in spring, summer and autumn in 2003. All sites were subjected to a screening method for the selection of reference sites and classified using a pre-established stream typology that establishes five different stream types. Reference conditions (reference value and reference threshold equivalents to high-good class boundary) were calculated using two different methods according to the availability of reference sites: the reference site 75th percentile approach of all reference sites and the 25th percentile of the population approach. The majority of the studied potential reference sites were selected as reference sites. Regarding type-specific reference conditions, only siliceous headwaters could be considered different from the rest because lower conductivity and pH. All reference stream types presented seasonal differences in some parameters, except for temporary streams due to the high natural variation of this stream type. For those parameters which presented seasonal differences in a specific stream type, the least restrictive values were proposed as reference conditions. This presentation highlights main results obtained in a recent publication (1). Study funded by the GUADALMED-2 Project (REN2001-3438-C07-01) and CGL2010-21458.

Reference:
(1) Sánchez-Montoya M.M. *et al.* (2012) *Water Research* **46**:2257-2269.

T6-P212 **Caracterización espacio-temporal de variables físico-químicas y biológicas de un arroyo salino**

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El arroyo de la Muera (Salinas de Añana) constituye el único arroyo de aguas salinas de la Comunidad Autónoma del País Vasco, lo que ya de por si le confiere un gran valor por su rareza. Este valor, en términos de rareza se puede extrapolar a nivel ibérico y más aún a nivel europeo. En la actualidad, el arroyo se encuentra sometido a una fuerte presión antropogénica debida a los labores de restauración de las Eras del complejo de las Salinas de Añana (paso de maquinaria por el cauce), vertidos de aguas residuales, eliminación casi total del bosque de ribera, etc. En este contexto se ha realizado un estudio, a lo largo del eje longitudinal del río Muera durante dos ciclos hidrológicos en los que se han monitorizado tanto variables físico-químicas como biológicas. Se analiza su comportamiento en relación con la salinidad, la carga orgánica y otros impactos. El arroyo presenta un estado entre mesotrófico e hipertrófico. Dentro de la comunidad biológica destaca el estado crítico en que se encuentra la mayor parte de especies halófilas. Finalmente se proponen medidas de gestión destinadas a la conservación de este ecosistema y a la mejora de su estado ecológico.

T6-P215 **Effect of the catchment land use on macroinvertebrate assemblages in Neotropical streams**

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Agricultural practices are one of the main economic resources of Brazil and need a large amount of land for crop development. Moreover, this expansion leads to an intensive removal of vegetation in catchment and riparian buffer areas. The Brazilian Forest Code determines 30 m of the riparian vegetation, but in 2012 is being set a new code where this area is only for 15 m for each bank of water bodies. We analyzed the landscape and evaluated the effects of land use in the catchment and riparian buffer on macroinvertebrates assemblages in Neotropical streams. We contrasted landscape attributes with benthic assemblages of 20 streams in southern Brazil. The Mantel test showed an association between the benthic assemblages and the land use in the riparian buffer and catchment areas (rM=0.27, p=0.003; rM=0.29, p=0.007, respectively). The agriculture and grazing are the main causes of variability in the composition of the benthic assemblages in the catchment area. In the riparian buffer area, agriculture and exposed soil are the main factors causing variation in the assemblages. We observed a significant effect of the amount of vegetation in the buffer area on the taxonomic richness of macroinvertebrates (F=5.5; p=0.03; df=1.17). Among the streams analyzed, 79% showed irregularities in relation to Brazilian law. This suggests that the proposed new Brazilian Forest Code will cause harm to aquatic diversity in streams, and demonstrates the need of integrating scientific information and policies when managing natural resources, in particularly aquatic ecosystems.

T6-P216 **Estado das massas de água das regiões hidrográficas do Norte (RH1 e RH2) e medidas de requalificação**

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A DQA impõe que os Estados Membros assegurem o "bom" estado das massas de água de superfície até 2015. Neste contexto, monitorizaram-se em 2010 e 2011 na Região Hidrográfica 1 (RH1) do Minho e Lima e na RH2 do Cávado, Ave e Leça 28 massas de água, 14 em cada uma delas, abrangendo 3 tipologias. A monitorização, desenvolvida de acordo com os protocolos do INAG, incluiu os seguintes elementos de qualidade: invertebrados bentónicos, fitobentos (diatomáceas), fauna piscícola, macrófitos, físico-químicos de suporte e elementos hidromorfológicos. Os elementos biológicos foram amostrados durante o período da Primavera, enquanto os respectivos elementos físico-químicos de suporte foram amostrados sazonalmente (Primavera, Verão, Outono e Inverno). O Estado das Massas de Água, tal como o Estado Ecológico e Estado Químico, foram determinados pelo elemento de qualidade ecológica/química que apresentou a pior classificação, de acordo com o estabelecido no manual

"Critérios para a Classificação do Estado das Massas de Água Superficiais - Rios e Albufeiras". Os dados foram posteriormente tratados no software STREAMES-EDSS 1.0 (Arturo Elosegui da Universidade do País Vasco, com o apoio da Agência Vasca da Água - URA), um Sistema de Suporte à Decisão Ambiental, apoiando o processo de tomada de decisão na gestão fluvial. O referido software foi utilizado para indicar o estado das massas de água em estudo e apresenta possibilidades de requalificação para a sua melhoria.

T6-P219 **Desarrollo de un índice multimétrico para la evaluación de la calidad ecológica de la cuenca del Limarí, Chile**

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En este estudio se presenta un índice multimétrico basado en las comunidades de macroinvertebrados bentónicos con el propósito de diseñar una herramienta que refleje la calidad ecológica del sistema y por medio de este mejorar la gestión del recurso hídrico en la Cuenca Hidrográfica del Río Limarí, ubicada en la zona hidrológica semiárida del norte de Chile, en la cual se encuentra el sistema de riego por embalses más grande del país. Todos los cauces de la cuenca fueron muestreados, estableciendo veinte estaciones de muestreo, las cuales fueron seleccionadas considerando distintos grados de intervención, desde sin o poca alteración (referencia) hasta muy impactadas. En cada localidad los macroinvertebrados fueron colectados utilizando una red Surber de 0.09 m^2 de área y de 250 µm de luz. Paralelamente, se tomaron medidas de variables fisico-químicas, hidromorfológicas y de hábitat para determinar el gradiente de estrés que afecta a las comunidades del área en estudio, determinado por la conductividad eléctrica y la degradación hidromorfológica. Posteriormente, se seleccionaron cinco métricas (taxa familias EPT, % colectores, taxa familias reptadoras, % insectos y taxa familias tolerantes) que respondieron significativamente (Pearson ≥ 0.6) al gradiente de presiones y que, finalmente, constituyeron el índice multimétrico de la cuenca, incorporando distintos atributos ecológicos representados por la riqueza, la composición, el modo de alimentación, el tipo de locomoción y la tolerancia/intolerancia. Finalmente, los resultados obtenidos sugieren que este índice es un buen indicador de la calidad de las aguas de la Cuenca del Río Limarí, pudiendo ser una herramienta útil en la evaluación y monitoreo de otras cuencas semiáridas del norte de Chile.

T6-P221 **The effects of eucalypt, pine and broadleaf forests on river habitats in Portuguese upland streams**

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Production forest monocultures have increased in recent years. In Portugal, where 39% of total land surface is forested, pine and eucalypt forests account for 27% and 23%, respectively. Changes to the river habitat are considered a key factor associated to the impact of plantation forests on river ecosystems. As part of a multi-faceted study of the effects of production forests on riverine biodiversity we studied the effects of production forestry on ecological habitat in Portuguese upland streams. Twenty-nine streams of different forest types: eucalypt plantation (N=10), pine plantation (N=9), mixed (eucalypt and pine, N=2), and broadleaf forest (N=8) were described using a modified version of the River Habitat Survey; water quality was tested on-site for conductivity, pH, temperature and dissolved oxygen and water samples were collected for analysis of nutrients, key ions, terpenes, lipids and phenolics. Forest types revealed a complex effect on riparian shading of stream channels. While shade from pine, eucalypt and broadleaf were all associated with these respective forest types, eucalypt plantations were also positively associated with shading from invasive *Acacia* sp. Pine plantations were associated with a higher portion of understory herbaceous shade. Differences in channel and bank habitat were most strongly related to altitude and slope. Dissolved lipids were higher in eucalypt and in pine plantations compared to broadleaf forests. Although nutrients concentrations were higher in eucalypt plantation compared to other forests types, unequivocal interpretation was confounded by variation in underlying geology. These results reinforce how changes in the river habitat may contribute to ecological change when natural forests are replaced by monoculture plantations.

T6-P232 **Avaliação da qualidade da água e do sedimento do rio: ênfase na caracterização da microbiota**

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O presente trabalho visou avaliar a qualidade da água e do sedimento do rio Sorocaba, em três pontos localizados nas cidades de Votorantim, Sorocaba e Laranjal Paulista. As coletas foram realizadas na época da estiagem e época chuvosa. Através dos resultados obtidos pode-se verificar que as menores concentrações de oxigênio dissolvido (OD) e os maiores valores de turbidez e condutividade foram encontrados na coleta realizada na época chuvosa. Na estiagem foram encontrados os maiores valores de coliformes termotolerantes e de bactérias desnitrificantes. As amostras referentes ao ponto da cidade de Sorocaba apresentaram os menores valores de OD (4,82 e 3,70 mg L^{-1} nos períodos de estiagem e chuvoso, respetivamente) e de pH (4,83, na estiagem). Também em Sorocaba constatou-se a maior quantidade de STV (40,871 g L^{-1}), o que mostra maior quantidade de matéria orgânica no sedimento. Já na cidade de Votorantim foram verificadas as maiores densidades de coliformes termotolerantes na água e no sedimento no período de estiagem. A concentração de nitrato verificada na água, no mês de fevereiro, em Sorocaba foi a mais alta (937 mg L^{-1}), é provável que isso tenha ocorrido devido à ausência das bactérias desnitrificantes na água e à alta densidade de bactérias oxidantes de nitrito. Em contrapartida, na estiagem a concentração de nitrato foi baixa (0,33 mg L^{-1}), pois neste ponto de amostragem a quantidade de bactérias desnitrificantes encontradas na água foi maior mostrando que o nitrato foi reduzido. Estes resultados mostram que o rio Sorocaba está impactado devido às diversas ações do homem, por isso é necessário um contínuo investimento em saneamento na sua bacia de drenagem.

T6-P234 **Influencia de los descensos de nivel en la calidad biológica del agua en el Limnoembalse de Pareja**

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El Limnoembalse de Pareja (cuenca alta del Tajo, Guadalajara) se generó como consecuencia de la construcción, en el año 2006, de un dique de cola en el embalse de Entrepeñas, constituyendo una medida mitigadora de los impactos ambientales y socioeconómicos provocados por la gestión del mismo. Su objetivo es generar una lámina de agua de nivel máximo constante. Sin embargo, se ha constatado descensos de nivel tras periodos de escasez de precipitación, lo que podría afectar a la calidad del agua. La monitorización del embalse ha permitido constatar que el nivel descendió ligeramente por debajo del de máxima capacidad entre agosto y octubre de 2008 y más notablemente entre julio y diciembre de 2009. Por otro lado, se ha estudiado la calidad del agua en el periodo 2008-2011 mediante muestreos limnológicos estacionales, en los que, entre otros parámetros, se han analizando indicadores biológicos como el contenido en clorofila *a* o la biomasa total de fitoplancton. Los resultados ponen de manifiesto que las mayores concentraciones de clorofila *a* y de biomasa de fitoplancton en el limnoembalse se han registrado durante los periodos de descenso de nivel en la lámina de agua. Los análisis de regresión simple entre estos parámetros biológicos y el nivel del agua indican una relación significativa entre ellos. De este modo, el descenso del nivel y la consecuente pérdida de renovación de la lámina de agua, parecen incrementar la proliferación de fitoplancton ya propia de la época estival, suponiendo una pérdida de calidad que podría llegar a comprometer la viabilidad del limnoembalse.

T6-P236 **Can phytoplankton be used as a DMA indicator in temporary lakes?**

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Phytoplankton is one of the biological elements included as indicators for assessing ecological status under the WFD. The representativeness of the results obtained through the two annual surveys that establish the Spanish Phytoplankton sampling protocol in lakes and reservoirs (M-LE-FP-2011) depends on the degree of variability of phytoplankton composition and abundance. Spanish temporary lakes included as water bodies of the WFD are prone to natural disturbances that cause a large variability, both seasonal and interannual, in their physicochemical conditions. This situation will certainly affect the phytoplankton that develops in them. Samples were taken during the spring of 2011 in four Spanish temporary inland lakes with different physicochemical characteristics (salinity and hydroperiod) in order to check the degree of variability of phytoplankton composition and abundance throughout the period in which the samples could be taken in this kind of lakes by the WFD. Phytoplankton composition and biovolumen data were obtained and allowed differentiation between fresh and saline lakes and confirm the great variability of the biological element. The above mentioned variability is tied to a high degree of uncertainty in the results of ecological quality evaluation through this biological quality element. It can also be concluded that the costs of a more adequate evaluation procedure would increase substantially compared to those derived from the current protocol.

T6-P251 **Perspectives on efficiency in monitoring networks for riparian habitats in the context of two EU Directives**

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Four sampling networks were assessed and compared with the purpose of evaluating the possibility of integrating the ecological monitoring of water resources and of an EU priority habitat (riparian forests, 91E0*) in one same sampling network. This was done by verifying how a set of sampling networks would cover the variability of different environmental, socio-economic and conservation indicators expressing causes of variation and conservation status of this habitat in the North of Portugal. Two of the analyzed networks were obtained from the Water Framework Directive (WFD) national implementation program. These networks were compared in terms of sampling performance with the two other networks created in the SIMBioN project, a program specifically designed to monitor biological and ecological values listed in the EU Habitats Directive. In order to accomplish this spatial (ArcGIS) and statistical analyses (R software) were used to verify which of these four networks would show a better performance in representing the potential variability of the riparian habitat. The networks generated in the conservation-oriented SIMBioN project showed better results for all performance indicators analyzed. Nonetheless, such differences were not equally strong across all tested indicators, suggesting that some objectives underlying the conservation-oriented Habitats Directive could still be met with data from the WFD network. Analyses of direct status and trend indicators from both types of networks, not available at this stage, will be needed before designing a unified sampling network that could simultaneously respond to the monitoring needs of both EU Directives.This research was partially supported by FCT through FEDER/COMPETE - project grant PTDC/AGR-AAM/104819/2008 (EcoSensing).

T6-P256 **Utilização de microinvertebrados aquáticos em estudo de biomonitoramento: um estudo de caso no Parque Estadual**

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Os microinvertebrados aquáticos são organismos microscópicos, que apresentam grande diversidade e abundância, vivendo tanto no ambiente bentônico como no perifítico. Assim, o presente estudo tem como objetivo testar a viabilidade do uso de Copepoda, Rotifera, Gastrotricha e Tardigrada como bioindicadores de qualidade de água no Parque Estadual do Rio Preto, Brasil. O desenho amostral foi planejado com o intuito de comparar pontos com pouco impacto e pontos com intensa ação antrópica. Para isso, utilizou-se 7 pontos amostrais, sendo 5 no interior e 2 fora do Parque, a partir de transectos de 50 m subdivididos em 5 parcelas iguais

(10 m). Em cada uma das 5 parcelas foram coletadas 2 amostras aleatórias do sedimento e/ou perifiton. Usou-se "corer" de 3 cm de diâmetro que foi enterrado 5 cm no sedimento. As coletas foram feitas entre os meses de outubro 2011 a fevereiro 2012. Os animais foram anestesiados com água gasosa e posteriormente fixados com formol 4% tamponado. Em laboratório os animais foram separados e fixados em lâminas/microtubos com uma solução de glicerina-formaldeído, 3:1. Até o momento foram encontrados 5421 indivíduos, dos quais 4155 eram de locais com pouca ação antrópica e 1266 de locais com intensa ação antrópica, sendo 1333 gastrotricas (329 em locais impactados, 1004 em locais não impactados), 1101 rotíferas (349 em locais impactados, 752 em locais não impactados), 180 tardígradas (22 em locais impactados, 158 em locais não impactados) e 2807 copépodas (566 em locais impactados, 2241 em locais não impactados). Embora as coletas sejam iniciais, se no decorrer do trabalho esse panorama se manter o mesmo, os microinvertebrados estudados possuirão o real potencial para ser usado como ferramenta de controle ambiental e da qualidade dos recursos hídricos.

T6-P277 **Qualidade da água do Rio Norte (Espírito Santo, Brasil) em área sob influência de central hidrelétrica**

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A Bacia do Rio Itapemirim situa-se entre os meridianos 40º 48' e 41º 52' W e os paralelos 20º 10' e 21º 15' S, abrangendo uma área de 687.000 ha. As nascentes mais distantes do Rio Itapemirim constituem os rios Norte Braço Esquerdo e Norte Braço Direito, que se unem no Município de Alegre, formando o Rio Norte. Recentemente, foram construídas duas Pequenas Centrais Hidrelétricas (PCHs), provocando a inundação permanente de um trecho às margens do Rio Norte. O diagnóstico da qualidade da água é de fundamental importância para a indicação da sua utilização, prevenindo problemas de saúde pública e impactos ambientais negativos (2). O objetivo desse trabalho foi avaliar a qualidade da água dos rios Braço Norte Direito, Braço Norte Esquerdo e Rio Norte, no período chuvoso, com base em parâmetros físicos e químicos. Amostras de água foram coletadas mensalmente, no período de outubro/2010 a fevereiro/2011, a montante e a jusante das barragens. Foram obtidos os seguintes resultados: Rio Braço Norte Direito: transparência: 38 a 40 cm; temperatura da água 17 a 24 °C; OD: 1,6 a 3,0 mg L^{-1}; pH: 8,0 a 8,5; alcalinidade: 18 a 20 mg L^{-1}, dureza: 8 a 12 mg L^{-1}; turbidez: 20 a 22 NTU; DBO: 0,1 a 0,5 mg L^{-1}; Rio Braço Norte Esquerdo: transparência: 35 a 40 cm; temperatura da água: 17 a 24,5 °C; OD: 2,0 a 2,8 mg L^{-1}; pH: 7,9 a 8,4; alcalinidade: 14 a 18 mg L^{-1}; dureza: 6 a 10 mg L^{-1}; turbidez: 15 a 20 NTU; DBO: 0,1 a 0,5 mg L^{-1}. Rio Norte: transparência: 36 a 42 cm, temperatura da água 17,5 a 24,5 °C, OD: 1,7 a 2,8 mg L^{-1}, pH: 8,0 a 8,4, alcalinidade: 18 a 20 mg L^{-1}, dureza: 10 a 14 mg L^{-1}, turbidez: 20 a 25 NTU, DBO: 0,1 a 0,3 mg L^{-1}. Os valores encontrados nos três rios são muito próximos, indicando uniformidade no padrão de qualidade da água. O nível de OD permaneceu abaixo do recomendado pelo CONAMA (1).

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T6-P278 **Estimation of water quality parameters through Landsat TM and Deimos-1 images**

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Water quality of lakes and reservoirs has been studied for years as water quality can deteriorate due to eutrophication processes. The objective of this work is to develop simple empirical algorithms to estimate inland water quality parameters such as chlorophyll-a concentration, total suspended particles concentration and transparency, by means of remote sensing techniques, in particular data from Thematic Mapper (TM) sensor images onboard Landsat-5, which may be applicable to the Albufera of Valencia. This work also aims to take advantage of the spectral equivalence between TM and the recent sensor Deimos-1 to extend the existing TM algorithms and thereby improve the temporal resolution from 14 to 3 days. For this purpose several field campaigns were carried out in the Albufera of Valencia, data gathered were useful to increase the database used in the development and validation of algorithms, and for validating these algorithms with Deimos-1 Images. Comparison between ground measured data and model results showed mean errors of ±24%, ±17%, ±27%, for chlorophyll *a* concentration, total suspended particles concentration and transparency, respectively, in the case of TM images, and ±22%, ±15%, ±40%, respectively, for the Deimos-1 scenes. Once validated, the proposed algorithms have been applied to a set of Deimos-1 images obtaining maps of the spatial distribution of the above mentioned parameters in the Albufera of Valencia for different seasons in a year.

T6-P283 **Valoracion del estado en masas de agua del programa de control operativo (demarcacion hidrográfica Miño Sil)**

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Durante la primavera de 2011 se realizó la toma de muestra y análisis del indicador de calidad biológica *fauna de invertebrados bentónicos*, en 63 puntos de control ubicados en masas de agua de la categoría río incluidas en el programa de control operativo de la C.H. Miño-Sil. En el conjunto de las muestras recolectadas se determinaron un total de 89 taxones diferentes de invertebrados bentónicos, identificados mayoritariamente a nivel de familia. Fue identificada una media de 21 taxones por punto de control, aunque la distribución de los mismos fue muy desigual, oscilando entre 4 y 44 taxones. Los resultados obtenidos han permitido evaluar el estado de calidad y conservación de las correspondientes masas de agua en función de dicho indicador y, en combinación con los resultados físico-químicos registrados en el marco de explotación de la red de control de calidad de las aguas (Red ICA) de la demarcación, calcular el Estado Ecológico. A su vez, dado que esta misma red de control permite disponer de resultados analíticos para la valoración del Estado Químico, también se ha llevado a cabo la clasificación de las masas de agua según su Estado. En este trabajo, se muestran paso a paso los resultados obtenidos tanto para la determinación del Estado

Ecológico, desde el punto de vista biológico y físico-químico, como del Estado Químico; así como la valoración final de Estado para cada masa de agua en estudio.

T6-P284 **Aparicion y seguimiento de un afloramiento de cianobacterias en el embalse de Caldas de Reis (Pontevedra)**

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La eutrofización de las masas de agua embalsadas es considerada como uno de los principales factores que promueven el desarrollo y crecimiento masivo de cianobacterias potencialmente tóxicas. El embalse de Caldas de Reis es utilizado para el abastecimiento de agua potable (municipios de Caldas de Reis y Mancomunidad de O Salnés). En los últimos años, el embalse ha destacado por albergar afloramientos de cianobacterias del género *Microcystis*. En esta comunicación se describen las principales características fisicoquímicas del embalse, junto con la variación temporal de la composición y abundancia de la comunidad fitoplanctónica presente en sus aguas entre mediados de la primavera y finales del otoño del año 2011. Se presta especial atención a las cianobacterias y al afloramiento registrado entre los meses de junio y noviembre, periodo en que se incrementaron los trabajos de toma de muestras y análisis (parámetros fisicoquímicos "in situ", nutrientes, fitoplancton y microcistinas -variante MC-LR-). Según los resultados obtenidos, la mayor densidad fitoplanctónica se registró entre mediados de septiembre y de octubre, con una clara dominancia de las cianobacterias (>90% respecto del total). El género *Microcystis* y la especie *Microcystis aeruginosa* fueron identificados como los responsables del "bloom". En ninguna de las muestras recogidas durante el afloramiento (muestras integradas de la zona fótica) se detectó o cuantificó la variante MC-LR (límite de cuantificación analítico de 0,3 µg L^{-1}). Este hecho coincide con lo ocurrido en el año anterior, donde no se detectó MC-LR, ni otras variantes también frecuentes en afloramientos cianobacterianos (MC-RR y MC-YR), durante el "bloom" de *M. aeruginosa* registrado en el embalse en los meses de septiembre y octubre de 2010.

T6-P290 **Qualidade da água do Córrego do Capim, afluente do Rio Norte, Espírito Santo, Brasil**

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O monitoramento dos parâmetros físico-químicos da água é fundamental para o enquadramento em classes de qualidade, visando ao uso em atividades agropecuárias (3) e à tomada de decisões no sentido de se preservar o ambiente (2). O Córrego do Capim é um afluente do Rio Norte que percorre a área do Ifes – Campus de Alegre, recebendo influência de atividade agrossilvipastoril. O objetivo desse estudo foi avaliar alguns parâmetros físicos e químicos da água do Córrego do Capim em três pontos sob diferentes graus de influência antrópica. Amostras de água foram coletadas, nos meses de setembro, outubro e dezembro de 2010, compreendendo o período chuvoso. As médias dos valores encontrados nos três pontos de coleta foram: Ponto 1: temperatura: 24,6°C; OD: 4,53 mg L^{-1}; pH: 7,32; alcalinidade: 16 mg L^{-1}; dureza: 23,3 mg L^{-1}; turbidez: 122,8 NTU; amônia: 0,01 mg L^{-1}; nitrito: 0,05 mg L^{-1}; nitrato: 0,33 mg L^{-1}. Ponto 2: temperatura: 24,3°C; OD: 5,41 mg L^{-1}; pH: 7,26; alcalinidade: 12,6 mg L^{-1}; dureza: 25,6 mg L^{-1}; turbidez: 150,3 NTU; amônia: não detectado; nitrito: 0,05 mg L^{-1}; nitrato: 0,43 mg L^{-1}. Ponto 3: temperatura: 24,8°C; OD: 4,78 mg L^{-1}; pH: 7,45, alcalinidade: 21,3 mg L^{-1}; dureza: 23,3 mg L^{-1}; turbidez: 140,9 NTU; amônia: não detectado; nitrito: 0,01 mg L^{-1}; nitrato: 0,40 mg L^{-1}. O aporte de sedimento para o leito do rio, provocado pelas chuvas, tornando a água barrenta e aumentando o teor de matéria orgânica pode explicar o baixo valor de saturação do oxigênio e a turbidez elevada. Os valores de alcalinidade e dureza também estão baixos, o que pode ser explicado pela natureza dos solos da região, pobres em cálcio e magnésio. A turbidez permaneceu acima do recomendado pelo CONAMA para águas de Classe 2 (1).

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T6-P292 **Tratamento de efluentes do cultivo de camarão da Amazônia por sistema com macrófita aquática**

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A aquicultura provoca impactos ambientais e um dos impactos se deve ao lançamento de efluentes nos corpos de água. Assim, é necessário o desenvolvimento de técnicas para reduzir o lançamento dos efluentes. Uma possibilidade é não utilizar ou reduzir a renovação de água dos viveiros de cultivo. Neste trabalho nós não utilizamos renovação de água no cultivo do camarão da Amazônia (*Macrobrachium amazonicum*), no entanto, ao final do cultivo foi necessária drenagem do viveiro para se efetuar a despesca. A água drenada possuía elevadas concentrações de diferentes formas de nitrogênio (338,2 µg L^{-1} de N-total) e fósforo (100,9 µg L^{-1} de P-total) e para a redução destas concentrações utilizou-se um sistema de tratamento com a macrófita aquática *Eichhornia crassipes*. Um experimento em triplicado foi realizado, no qual se avaliou as características da água de abastecimento do viveiro no início do cultivo, as características da água ao final do cultivo e as características da água nos sistemas de tratamento após um dia, três dias, sete dias, quatorze dias e vinte e um dias. A redução dos valores de material particulado em suspensão foi em média de 90% com apenas um dia de permanência do efluente no sistema de tratamento. A redução de ortofosfato foi em média de 54 % também em apenas um dia. A concentração de nitrato foi em média de apenas 12% com um dia e de 50% em três dias. Três dias de permanência do efluente nos sistemas com a macrófita aquática foram suficientes para a remoção dos nutrientes acrescidos pelo cultivo de camarão da Amazônia.

T6-P306 **Mountain's Mirrors**

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Pico Island in the Azores known as the "Mountain Island" due to its volcano, the highest mountain in Portugal (2351 m) and the highest tip in the Middle Atlantic Ridge, stands in the middle of the Azores archipelago. Pico with its 445 km^2 is the second largest and the youngest

island of the archipelago and 16% of its surface lies above 800 m. Pico's wildness due to a sparse population (14144 inhabitants) and recent volcanic origin coupled with a stunning scenery, particular native fauna and flora and strong traditions, led to the protection of 35% of its territory (156 km²) now under the name of Natural Park of Pico Island. Lakes mirror the quality of the landscape not only literally but also because the quality of their water strongly reflects the pressures inflicted by human activities. Therefore, considering the size of the protected area, it would be expected that water quality of numerous lakes and ponds in Pico Island to be excellent. Unfortunately it is not the case as two out of the five lakes monitored since 2005 under the WFD demands, display a GOOD quality. So, the available 6 years' data for these lakes are presented and discussed regarding the protection levels of their location and the pressures they are subjected. Some measures are advised to be included in the integrated planning and management system of islands protected areas that is being developed within the SmartParks Project that has embraced Pico as a case study.

T6-P309 **Conservação e qualidade da água em uma grande área protegida de Mata Atlântica em perímetro urbano**

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O Parque Estadual da Cantareira (PEC) é uma das maiores áreas protegidas em perímetro urbano do mundo, composta por aproximadamente 19.768,43 acres de Mata Atlântica. Em seu interior nascem inúmeros riachos que contribuem para o abastecimento de parte da população da Região Metropolitana de São Paulo, de 20 milhões de habitantes, além de tributários do rio Tietê, o maior rio da região. De acordo com a legislação ambiental brasileira, por estarem em uma Unidade de Conservação de Proteção Integral, estes corpos de água destinam-se à preservação dos ambientes aquáticos, devendo ser mantidas suas condições naturais ou propiciando seu retorno a tais condições no caso de terem sido alteradas. No entanto, pouco se conhece sobre a qualidade da água dos riachos e muito menos sobre o que seria a condição natural para o PEC. Neste sentido, realizou-se um primeiro trabalho com o objetivo de avaliar a qualidade da água de riachos por meio da análise de 20 variáveis (físicas, químicas, biológica e hidrobiológica) em 30 pontos de amostragem. Coletas de água foram realizadas no período de estiagem e cada ponto foi amostrado três vezes, entre julho e setembro de 2011. A ordenação PCA separou os pontos, sobretudo, em função de nitrato, nitrogênio total e potencial de oxi-redução. De um modo geral, pontos nos quais estas variáveis apresentaram valores relativamente maiores são facilmente acessados pelo público. No entanto, mesmo tais pontos apresentam boa qualidade da água. Exceção ocorre em um riacho que vem de fora e que despeja suas águas, alteradas pela presença de esgoto, em um corpo de água na margem do PEC. A boa qualidade da água observada, no geral, pode ser explicada, em parte, pelo fato do PEC localizar-se em uma serra e receber água, praticamente, apenas por precipitação.

T6-P311 **Sugarcane agroecosystems and biofuel: dissolved inorganic nitrogen in streams and the role of riparian forest**

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The sugarcane has a marked presence in Brazil's history and has substantial expression in the national economy. Due to the production of ethanol as biofuel the area of sugarcane in the country has grown considerable in the last 10 years. Like most annual crops, sugarcane requires the application of fertilizers to support an economically viable production. A rate of 80-100 kg ha^{-1} yr^{-1} of nitrogen (N) fertilizer is applied to sugarcane crops in Brazil. However, crop management, coupled with the deforestation of riparian forests, has promoted several impacts on water resources. Sugarcane cultivation in Brazil may lead to an excess of nitrogen in soils, and because of its high mobility, much of these N excess may be transported to aquatic systems. In this way, the present study aimed to detect the concentrations of dissolved inorganic nitrogen (DIN) in streams that drain sugarcane plantations, correlating the DIN to the role played by riparian forest. The study has being conducted in two watersheds predominantly covered with sugarcane. One of the watersheds (W2) presents coverage of riparian forest in the permanent preservation area, while in the other watershed (W1) the coverage area of riparian forest is practically negligible. The NO_3^- was the DIN form predominantly founded. The concentrations of NO_3^- and NH_4^+ were significantly higher in W1 (median values of 0.80 and 0.13 mg L^{-1}, respectively) compared to W2 (median values of 0.36 and 0.01 mg L^{-1}, respectively). Thus, the obtained results indicate the importance of riparian forest in minimizing the input of DIN in the streams that drain sugarcane plantations.

T6-P312 **Qualidade microbiológica da água do Rio Norte, ES, Brasil**

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A presença de bactérias coliformes termotolerantes ou de *Escherichia coli* na água de um rio indica que esse rio recebeu matéria fecal de animais endotérmicos ou descarga de esgotos (3). A Bacia do Rio Itapemirim, localizada em uma região montanhosa, onde predominam as atividades de agricultura e pecuária, tem sofrido contínua influência da ação do homem. As nascentes mais distantes do Rio Itapemirim, localizadas na serra do Caparaó, constituem os rios Braço Norte Esquerdo e Braço Norte Direito, que se unem no Município de Alegre, formando o Rio Norte. O objetivo desse trabalho foi avaliar a qualidade microbiológica da água, com base na contagem de coliformes totais e termotolerantes, em um trecho sob influência de PCH (Pequena Central Hidrelétrica), no período chuvoso. As amostras de água foram coletadas nos meses de outubro/2010, dezembro/2010 e fevereiro/2011, a montante e a jusante das barragens, amostrando-se os três rios. Utilizou-se a técnica dos tubos múltiplos, expressando-se os resultados em NMP (1). Os valores obtidos para coliformes totais foram: $1{,}7x10^4$ (out/2010); $1{,}8x10^4$ (dez/2010); e $1{,}1x10^4$ (fev/2011). Para coliformes termotolerantes,

os valores obtidos foram: 8,5 x 10^3 (out/2010); 8,8x10^3 (dez/2010); e 7,5x10^3 (fev/2011). A Resolução CONAMA 357/2005 (2) estabelece, para águas de Classe 3 (águas destinadas ao abastecimento para consumo humano, após tratamento, e à recreação de contato secundário), o valor máximo de 2.500 NMP/100mL. Nos três rios amostrados, o NMP está acima do valor permitido em todas as amostras. Os altos valores de NMP registrados mostram contaminação fecal da água e sugerem que a sua utilização para consumo humano ou para recreação deve ser evitada.

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T6-P332 **Diagnóstico ambiental de organoclorados em sedimentos da Bacia do Rio Uberabinha, Minas Gerais, Brasil**

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Os pesticidas organoclorados são substâncias orgânicas tóxicas persistentes que podem ser encontradas em vários compartimentos ambientais: água, solo, ar, sedimento, fauna e flora. Em decorrência da utilização de agrotóxicos ter se constituído uma das características fundamentais do padrão tecnológico da agricultura brasileira desde os anos sessenta, os compostos organoclorados contaminaram diversos ecossistemas aquáticos, inclusive aqueles do Bioma Cerrado, o qual é considerado um Hotspot mundial. Este estudo teve por objetivo avaliar os níveis de pesticidas organoclorados presentes em sedimentos de 35 cursos de água pertencentes à bacia do Rio Uberabinha, sendo a maioria dos pontos localizados em áreas de Cerrado. Para extração de organoclorados foi utilizada a técnica de Ultra-Som (EPA - Método 3550C). Dos dezenove compostos organoclorados analisados, dez foram detectados nos cursos de água estudados sendo que os níveis de concentração variaram de 0 a 12.2 µg kg^{-1}. Aldrin, 4,4-DDE e Endrin Aldeído foram os compostos mais frequentes e também os que apresentaram as maiores concentrações. Embora no Brasil não exista uma legislação que estabeleça concentrações limites de organoclorados no sedimento dos cursos de água, as concentrações encontradas no presente estudo podem ser consideradas elevadas se comparadas a outros trabalhos desenvolvidos com este mesmo escopo. Dessa forma, medidas de monitoramento devem ser incentivadas já que o sedimento é considerado um dos compartimentos mais importantes no contexto da ciclagem de matéria e fluxo de energia, pois é resultante da integração de todos os processos que ocorrem em um ecossistema aquático, além de ser utilizado como local de refúgio e alimentação para inúmeras espécies de invertebrados aquáticos.

T6-P335 **Increase of eutrophication levels in rivers of the Ebro River Basin (NE Spain)**

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In most developed world, water pollution has been controlled by the introduction of effective sewage treatment plants. However, there is a common acceptance that major increases in primary production in water bodies, i.e. the excessive plant growth such as algae and macrophytes due to high inputs of nutrients, is now the most important problem in lakes and rivers. Although the process of eutrophication is reasonably well understood in lakes, there is currently no conceptual understanding of how eutrophication develops in rivers. A widely used approach for determining the flux of carbon in rivers is the measurement of metabolism. In this study, community metabolism was measured by historical data since 1996 taken every 15 minutes for dissolve oxygen in 30 stations of the Ebro River basin (NE Spain). In addition to the dissolved oxygen concentration, we also used 15 minutes intervals historical data for temperature, pH, water column level, ammonium concentration, and monthly sample data for nitrates, phosphates and magnesium concentrations in each of the 30 selected stations. The results showed that there was an increased concentration of dissolved oxygen, and hence of carbon, in 28 out of the 30 stations studied. Furthermore, generally increased pH values were observed, indicating an increase in eutrophication. Data also showed the importance of hydraulic flushing in controlling algal growth, suggesting that short-retention-time rivers showed different effects compared to long retention-time, impounded rivers.

T6-P339 **Total dissolved phosphorus concentrations in streams of watersheds covered with sugarcane**

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Phosphorus (P) is a nutrient that limits net primary productivity in natural and anthropogenic ecosystems. The inputs of phosphorus in a watershed occur naturally (weathering of the bedrock, wet or dry atmospheric deposition), and by the use of organic and inorganic P-fertilizers. In sugarcane plantations, approximately 20 and 40 kg P $ha^{-1}.y^{-1}$ is applied in the form of organic and inorganic fertilizers. When these fertilizers are not assimilated by the plants, they are transported to rivers and lakes, and may cause eutrophication. This study aims to investigate the effects of P-fertilizers in two streams draining sugarcane plantations. One of the watersheds (W2) presents riparian forest cover, while in the other watershed (W1) the riparian forest cover is practically negligible. The median concentration of total dissolved phosphorus for rainwater, stream W1 and stream W2 were 0.052 mg L^{-1}, 0.082 mg L^{-1}, and 0.072 mg L^{-1}, respectively. No significant differences were observed between the concentrations of total dissolved phosphorus in rainwater and the streams of the W1 and W2. According to the results obtained so far the inputs of total phosphorus in the watersheds W1 and W2 were not reaching the streams. We will present some hypotheses explaining why high inputs of P-fertilizers were not detected in small streams.

T6-P342 **Presença de *Aeromonas* em uma criação de tilápias do Nilo, Espírito Santo, Brasil**

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As bactérias do gênero *Aeromonas* são comuns em ambientes aquáticos e algumas espécies podem ocasionar alta taxa de mortalidade, em criação

intensiva de peixes (3), além de representar risco para os seres humanos (2). A lagoa Juara, localizada a 20º06' E e 40º14' N, a 5 km do Oceano Atlântico, no Estado do Espírito Santo, Brasil, possui uma criação de tilápia do Nilo (*Oreochomis niloticus*) em tanques-rede. A lagoa estudada, além da criação de peixes, é usada para fins recreativos. O objetivo desse trabalho foi avaliar a presença de *Aeromonas* na água e nos peixes dos tanques-rede e a resistência da bactéria a antimicrobianos. Amostragens foram realizadas mensalmente, no período de abril de 2008 a março de 2009. Em cada campanha foram coletados dois peixes e uma amostra de água de cada um dos seis tanques-rede disponibilizados. Também foi coletada uma amostra da água da lagoa, em seis pontos predeterminados, no entorno dos tanques-rede. Assim, foram coletados 144 peixes, 72 amostras de água da lagoa e 72 amostras de água dos tanques-rede. Foi feito o plaqueamento em meios seletivos ADA e m-aeromonas, submetendo-se as colônias típicas a testes bioquímicos, para identificação da espécie (1). A resistência a antimicrobianos foi avaliada pelo método de difusão em discos. Nas amostras de água e na superfície dos peixes *A. hydrophila* foi a espécie mais isolada, seguida por *Aeromonas caviae* e *Aeromonas sobria* e no rim dos peixes as espécies isoladas foram *A. hydrophila* e *A. veronii*. O teste com antimicrobianos revelou resistência de todos os isolados à amoxicilina e resistência variável à eritromicina. Atenção deve ser dada ao uso de antimicrobianos, considerando-se a resistência apresentada pelas bactérias.

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T6-P345 **Parâmetros físico-químicos da água de uma piscicultura em tanques-rede**

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A criação de peixes em tanques-rede tem se tornado popular, mas o arraçoamento pode levar à eutrofização, comprometendo a qualidade da água (3). O objetivo desse trabalho foi avaliar a qualidade físico-química da água de um sistema de cultivo de tilápias do Nilo (*Oreochromis niloticus*) em tanques-rede, localizado na Lagoa Juara, Estado do Espírito Santo, Brasil. Amostras de água foram coletadas mensalmente, no períodos seco e chuvoso, em seis pontos, no entorno dos tanques-rede, com uma distância de 50 m entre os pontos. Um total de 36 amostras foram coletadas em cada período. As análises de temperatura e oxigênio dissolvido foram realizadas *in situ*. No laboratório foram determinados o pH e os teores de nitrito, nitrato, nitrogênio amoniacal e fósforo total (1). Os valores obtidos para os períodos seco e chuvoso foram, respectivamente: temperatura (ºC): 24,8 e 27,6; oxigênio dissolvido (mg L^{-1}): 7,0 e 4,6; pH: 7,1 e 7,0; nitrito (mg L^{-1}): 0,007 e 0,0029; nitrato (mg L^{-1}): 0,1248 e 0,0537; nitrogênio amoniacal (mg L^{-1}): 0,2022 e 0,3024; fósforo total (mg L^{-1}): 0,0678 e 0,0223. Os valores foram maiores no período seco, exceto para a temperatura e para o nitrogênio amoniacal. A Resolução CONAMA 357 (2) estabelece, para águas de Classe 2 (águas destinadas à aquicultura e à atividade de pesca), os seguintes valores: oxigênio dissolvido: não inferior a 5 mg L^{-1}; pH: 6 a 9; nitrito: 1 mg L^{-1}; nitrato: 10 mg L^{-1}; nitrogênio amoniacal: 3,7 mg L^{-1}, para pH ≤ 7,5; fósforo total: até 0,03 mg L^{-1}. As concentrações de fósforo total, no período seco, e de oxigênio dissolvido, no período chuvoso, não atendem aos valores permitidos, podendo prejudicar o cultivo.

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T6-P353 **Development of a bioreactor system for carbon dioxide sequestration by microalgae**

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The environmental pollution and the greenhouse effect caused by the use of fossil fuels in industries and automobiles are considered the biggest impact caused by industrialization, as approximately 85% of all sulfur emissions and 75% of CO_2 emissions are caused by fossil fuels usage. The rapid environmental degradation observed nowadays is not a point of interest only to environmentalists, but, to the world society, the major victim of the consequences. Increasing demands are made by institutions and governments to take suitable and sustainable measures to reduce the CO_2 and SO_2 emissions to avoid consequential natural disasters. One possible and very economical solution has been studied in a laboratorial scale with an old photosynthetic microorganism, the microalgae. These organisms present a high photosynthetic rate and work as underwater micro factories whose biochemical processes decrease the greenhouse gases emissions (1). This work presents the results of the studies on the power of carbon dioxide fixation in terms of microbiological and chromatographic analysis for the natural algal biomass of a eutrophic reservoir, located in the northeastern region of Brazil. To carry out these studies a tubular vertical 4x6-set photo bioreactor automated system was constructed. For better gas absorption and homogenization, an air-lift method was applied. Some abiotic parameters such as pH, temperature, nutrients and light disposal which influence the biomass concentration were simulated in the photo bioreactor. The species composition and the population densities (nº of cells mL^{-1}) were determined which made it possible to infer on the optimal values of the operational variables to produce and guarantee the highest CO_2 fixation.

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T6-P355 **Soils under different land use as diffuse source of eutrophication in a tropical reservoir**

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Reservoirs are themselves collectors and digesters of the inputs and the effects of the anthropogenic activities developed in the watershed. In these systems, water quality reflects the impacts of human activities throughout the drainage basin, influenced by the types of management and land use. The characterization of physical and chemical properties of soils around of the reservoirs is critical to detect cases of diffuse pollution

in these ecosystems, allowing the use of sustainable management aimed at mitigating its effects. The aim of our study was to evaluate the potential availability of pollutants from soils under different land use for the tropical reservoir Dourado, located in the semiarid region of Brazil. Soil samples were collected and chemically characterized in four types of land use around the reservoir: native forest, grass cultivation, livestock and garden. The principal components analysis (PCA) using nine abiotic variables (OM, Ca^{2+}, Mg^{2+}, Na^{+}, K^{+}, pH, CEC, P and V) explained 80.9% of the variability of the data in the first two axes. PCA indicated that the salinity of the reservoir in soils planted with grass were positively correlated with the levels of exchangeable Na^{+}. PCA also indicated the potential for nutrient enrichment with land use livestock being correlated with the levels of available P in soil. The Tukey's test ($p<0.05$) showed significant differences between soils under different land use and the potential for providing pollutants into the reservoir, with emphasis on the land use livestock, which showed high concentrations of P and K. Our study concluded that the land use of livestock had a high potential contribution as a diffuse source of nutrients to the Dourado reservoir.

T6-P359 **Effects of macrophytes and internal loading on a freshwater shallow lake: a nutrient enrichment approach**

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A nutrient enrichment (N and P) was conducted in a 6-month laboratory experiment with sediment samples of the freshwater shallow lake of Talayuelas (Cuenca, Spain). Microcosms comprised water and sediments, thus allowing macrophytes growth and diffusive fluxes across the sediment-water interface. The potential role of macrophytes was assessed by removing them from half of the containers. On this sense, their growth importantly determined the nutrient dynamics. Macrophytes removed ammonium from water when the enrichment was moderate or it was merely due to the internal loading. On the other hand, a higher release of dissolved P to the water occurred after macrophytes died. Moreover, macrophytes apparently outcompeted phytoplankton since low average chlorophyll *a* concentrations in water coincided with the peak of macrophytes development. Overall, nutrient additions intermittently stimulated phytoplankton growth; however, the long-term effect of the internal loading produced a more sustained growing. Also, the highest artificial nutrient enrichment produced a slight reduction of the macrophyte's coverage. Still, our results agree with those showing a higher macrophyte resistance to nutrient loading in Mediterranean lakes compared to those from colder regions. Our findings are important in demonstrating that lake water quality could not be improved as expected if only the external loadings of nutrients are considered. Furthermore, our results indicate that macrophytes should have a major role in the nutrients cycling within this shallow lake, acting either as a sink or a source of nutrients depending on their development, and consequently they should be considered as key factors for a sustainable management of the site.

T6-P361 **El flujo invernal en sistemas someros hipertróficos: una vía para su recuperación**

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El incremento de flujo en invierno en los lagos someros hipertróficos produce una reinicialización de la sucesión que lleva a una fase de agua clara y si se pudiera mantener hasta la primavera, podría facilitar el desarrollo de las plantas sumergidas que contribuyen a la estabilidad de las fases de agua clara. Se estudia el efecto del flujo invernal en la Albufera de Valencia. La hidrología de la Albufera está regulada por el cultivo del arroz que afortunadamente conserva prácticas tradicionales como la inundación invernal de los campos. Cuando al final de esta etapa se desagua el marjal por medio de la abertura de las compuertas en las golas de la Albufera, aumenta la tasa de renovación del agua en el lago. Dependiendo de las condiciones del incremento de flujo "flushing" se produce una fase de aguas claras y se abre una breve ventana en el ciclo anual (de no más de un mes), en la que la comunidad planctónica cambia totalmente de composición y estructura. Se pasa de la total dominancia de cianobacterias con concentraciones de clorofila mayores de 200 mg m^{-3} y razones de biomasa zooplancton/fitoplancton muy bajas, a una comunidad de diatomeas céntricas y clorofíceas, con concentraciones de clorofila 100 veces menores y razones zooplancton/fitoplancton más altas. El macrozooplancton filtrador, representado principalmente por *Daphnia magna*, aparece solo en esta fase clara y ayuda a mantenerla. Se observa también una reducción del TP y un incremento de la razón N/P. Alargando y efectuando el "flushing" con aguas de calidad (bajo contenido de materia orgánica, fertilizantes y pesticidas) se podría restaurar el desarrollo de los macrófitos propios de este lago somero. Volver a los macrófitos es un reto, que en otras lagunas similares se ha conseguido mediante este método. Trabajo financiado por el proyecto CGL2009-12229, MICINN.

T6-P374 **Oligochaeta as a tool in water resource monitoring: a study case in neotropical streams**

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Oligochaeta have been successfully used in monitoring water quality, mainly due to its tolerance to various pollution sources. The aim of this study was to evaluate the water quality in urban and rural streams through the Oligochaeta fauna, and to determine the species potentially indicatives of environmental conditions. Thus, ten Brazilian neotropical streams were sampled semi-annually, in the dry and rainy season, with the Surber sampler. The highest abundances were observed for *Stephensoniana trivandrana* and *Brinkhurstia americanus* in rural streams, while in urban streams predominated *S. trivandrana* and *Pristina breviseta*. Through the results of MRPP we observed significant differences in species composition among the streams. The IndVal results showed eight species potentially indicator, in accordance with a Monte Carlo test. The highest values were recorded for indicators *B. americanus* (32) in rural streams and *Limnodrilus hoffmeisteri* (29) in urban streams. The species *Dero (Aulophorus) hymanae* and *D. (A.) lodeni* were also indicators of urban streams. The family Tubificidae, especially

L. hoffmeisteri, is known to live in organic environments and tolerate low oxygen concentrations, as well as the species of *Dero*. Although oxygen was not a limiting factor for Oligochaeta, sediment type and organic matter were important for their distribution. In addition, several of these species are associated with organically enriched environments for domestic wastewater, especially in urban streams. In this way, the necessity of programs and investments in water resources management is evident, mainly because many of these streams are tributaries of the main source of public water supply in the region.

T6-P375 **The efficiency of an Environmental Management System at a technical school in Brazil**

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The development of new technologies has increased the production of waste, like electronic junk, batteries, cell phones, which cause many problems mainly concerning to the separation and disposal of them. This change in the waste composition has induced many companies to adopt some measures of environmental protection, considering reduces the loss of consumer market concerned with sustainability. Among these measures the adoption of an Environmental Management System (EMS) and selective collection of waste are the most useful tools. The aim of this study was to follow the implantation of an EMS in a Brazilian school of environmental technical education. Through the development of environmental education activities such as workshops and lectures that addressed the importance of separating their garbage associated with the implementation of selective collection of waste has promoted awareness, especially of the school community involved in the project. The results showed that most students know the process of waste recycling (63%), but said they did not do it at home. After the diagnostic phase of the material produced in the schools, students effected the selective collection of recyclable and non-recyclable materials through stalls of separation provided by the company responsible for collecting the material. Electronic waste and cooking oil has to be collected by specialized companies, which give the correct destination of such waste. The results showed that there was awareness among students about the importance and efficiency of the existence of an EMS. Thus, it is hoped that the promotion and dissemination of environmental actions are routine in schools and become examples so that the whole community is aware of the need of prior separation of garbage and recycling.

T6-P414 **Temporal-spatial variation of limnological parameters in tropical reservoirs, northeastern Brazil**

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Reservoirs located in semi-arid regions of northeastern Brazil are generally more susceptible to eutrophication due to input of nutrients from the watershed, high evapo-transpiration rates and high residence time of water. The aim of this study was to analyze the trophic state and the spatial and temporal dynamics of the limnological variables, by comparing two reservoirs used to water supply. The two reservoirs were located in the same watershed but have different morphometric characteristics. Monthly samplings were collected in Marechal Dutra and Cruzeta reservoirs during the dry season (June to December/2010) and the rainy season (January to March/2011). The reservoirs were classified as eutrophic (M. Dutra; average chl-a=22.11 µg L^{-1}, TP=92.59 µg L^{-1}; Cruzeta; average chl-a=57.20 µg L^{-1}, TP=130.54 µg L^{-1}). The behavior of the reservoirs was warm polymictic, with a little chemical segregation expressed by dissolved oxygen during the dry season and mixing during the rainy season, influenced by rainfall and variations in the volume of the reservoirs. Significant differences occurred among the sampling points only in the M. Dutra reservoir (chl-a: P=0.001; SSF: P=0.012 and Secchi: P=0.018), while Cruzeta presented homogeneous throughout the period. The seasonal variation occurred in both reservoirs in relation to physico-chemical variables such as temperature, dissolved oxygen, pH and conductivity in M. Dutra, and temperature, dissolved oxygen, water transparency and total nitrogen in Cruzeta. These variations can be explained by differences in morphometric characteristics of the reservoirs and the use and land occupation in the watersheds of the reservoirs, besides the influence of the hydrological period of the region.

T6-P415 **Clasificación de los embalses de la cuenca del Ebro según los índices de estado trófico y potencial ecológico**

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Entre los meses de Junio y Septiembre de 2010 y de 2011 se llevó a cabo la evaluación de la calidad de las aguas de 32 embalses de la cuenca del río Ebro, algunos no coincidentes en los 2 años de estudio. Las muestras recolectadas fueron la integrada de la columna de agua, las correspondientes al máximo de O2 y al máximo de clorofila a y la del fondo. Se realizaron perfiles verticales de variables físicas y se tomaron muestras para el análisis y determinación de diversas variables químicas y de fitoplancton y zooplancton. Con los resultados obtenidos se han calculado diversos índices de calidad y se han obtenido 3 tipos de clasificación distintos: (1) Estado trófico (2) Potencial Ecológico Experimental y (3) Potencial Ecológico Normativo con el fin de clasificar estos embalses según el potencial ecológico de las masas de agua en cumplimiento de la DMA. Los resultados muestran que estos 3 índices son coincidentes en sus resultados en 11 de los 32 embalses estudiados en 2010 y en 5 de los 32 estudiados en 2011, por ejemplo, en el embalse de Ebro (en ambos años), en el de Ardisa (en 2010) y en el de Santolea (en 2011). El estado trófico y el PEexp coinciden en resultados en 8 embalses en 2010 y 7 embalses en 2011. El estado trófico y el PEnorm obtienen resultados similares en 7 embalses en 2010 y en 13 embalses en 2011. Los resultados menos coincidentes se obtienen al comparar los PEexp y PEnorm. Los resultados obtenidos en el embalse de Pajares en 2011 muestran disparidad de resultados en las 3 clasificaciones obtenidas. Resultados como estos, llevan a la dificultad de categorizar finalmente el PE de los embalses y muestran que debe revisarse el PEnorm ya que otros índices más próximos al estado real de estas masas de agua, las clasifican en no tan buen estado.

T6-P416 **A new Phytoplankton Biotic Integrity index for ecological status assessment of Azorean lakes**

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Phytoplankton is a key element in aquatic ecosystems, especially in lentic systems where is the most important primary producer. Acknowledging it, the EU Water Framework Directive (WFD) includes phytoplankton as a biological quality element for the ecological quality assessment of surface waters. To meet this goal in the Azores, several efforts have been made including a biomonitoring program for the 24 designated lakes in the archipelago. Phytoplankton data from the biomonitoring program of these lakes in the past nine years is presented and discussed in order to apply and test different biological indices (e.g. Q, IGA and IT) for ecological state classification of each lake. Phytoplankton biotic indices proposed to other regions (such as IGA that has been implemented in other river basins of the Iberic-Macaronesian region) are not applicable to Azorean lakes, mostly because they do not include several important species present in the Azorean lakes or because they cannot differentiate properly the ecological preferences of species in the special environmental conditions of the region. The regional character of IGA and IT biotic indices, based on species sensitivity, limited them. Considering this, a new phytoplankton index (P-IBI) is proposed for ecological quality assessment of Azorean lakes. The P-IBI is a multimetric index of biological integrity that takes into account the phytoplankton composition and biomass according to lake types. P-IBI showed a high correlation with the major environmental variables responsible for the differentiation of phytoplankton communities (alkalinity, conductivity, maximum depth and nutrients) and trophic indicators (secchi depth, chlorophyll a and total phosphorus) unlike the other tested indices.

T6-P419 **El disco de Secchi y e n los embalses del Ebro**

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En el estudio de 44 embalses de la cuenca del Ebro, con el fin de establecer la calidad ecológica en la red de control operativo de embalses, en aplicación de la Directiva Marco del Agua, se determinó la zona fótica en base al disco de Secchi y el cuantómetro de PAR, para determinar el coeficiente de extinción de la luz, siendo los resultados diferentes para 16 embalses según se aplique uno u otro método. Así, en el embalse de Yesa, usando el disco de Secchi, la zona fótica calculada es menor que la obtenida con el cuantómetro por la presencia de sólidos en suspensión, que dispersan la luz en las capas poco profundas pero no la extingue. En el embalse de Ortigosa, al contrario, se sobreestima la zona fótica por la existencia de un máximo profundo de clorofila situado debajo de la profundidad del disco de Secchi, produciéndose una extinción real de la luz no detectable por el mismo. Las variaciones entre los dos métodos utilizados se deben a que la turbidez, los sólidos en suspensión y el fitoplancton modifican la transparencia del agua, y por consiguiente facilitan o dificultan la visión del disco de Secchi dando resultados distintos a la extinción luminosa real, sobre todo los máximos profundos de clorofila. Para comprobar cuál de los dos métodos es el más eficaz, se ha evaluado el grado de relación lineal entre las dos técnicas utilizadas y las variables modificadoras, de modo que el método con un mayor grado de relación lineal con el coeficiente de extinción y menor con éstas será el más eficaz. Así, el uso de las mediciones de PAR proporciona un valor mucho más preciso de la zona fótica que el disco de Secchi en aquellas situaciones en las que domina el efecto Tyndall o que se desvían de lo habitual en la regularidad del perfil vertical de la columna de agua.

T6-P421 **Macroinvertebrados bentônicos da Chapada dos Veadeiros – importância dos organismos bioindicadores**

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A Chapada dos Veadeiros é uma região com vegetação de cerrado localizada a 230 km de Brasília e tem uma área de aproximadamente 65.514 ha, constituída por cinco municípios (Alto Paraíso, Cavalcante, São João D'Aliança, Colinas do Sul e Teresina de Goiás), apresentando uma das maiores biodiversidades do Brasil. O estudo foi realizado no município de Alto Paraíso (14°128'585"S 47°518'616"W) onde foram coletadas amostras em dois pontos distintos, realizadas entre junho e setembro de 2011. A coleta foi realizada com redes de bentos tipo "D" e peneiras. Os indivíduos coletados foram conservados em álcool 80%, sendo posteriormente identificados até o nível de gênero e catalogados. Foram aplicados índices biológicos e calculada a abundância dos indivíduos coletados. No ponto1 (Captação) foram observados 46 táxons com predominância de *Laccophilus* (Dytiscidae), enquanto que no ponto2 (Usina) foram observados 36 táxons com predominância de *Cloeodes* (Baetidae). A partir do levantamento da fauna bentônica pode-se concluir que os pontos coletados são ambientes que possuem água de boa qualidade tanto pela diversidade de organismos, quanto pela presença de indivíduos biodindicadores de boa qualidade de água. Temos como exemplo organismos das ordens: Ephemeroptera, Plecoptera, Trichoptera. Para completar a análise de qualidade ambiental levou-se em consideração o índice BMWP (Biological Monitoring Working Party Score System), adaptado para o cerrado obtendo para ambos os pontos de coleta resultados variando de bom a excelente. Dessa forma este trabalho constitui uma ferramenta importante para o estudo da qualidade da água da Chapada dos Veadeiros, pois o biomonitoramento dos locais coletados constitui um instrumento fundamental para estudos de impactos sobre ambientes aquáticos.

T6-P424 **Influencia del caudal en la abundancia y diversidad de larvas de Trichoptera en cuatro ríos de Galicia**

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Se presentan los resultados de un trabajo realizado en los ríos Deva, Tuño, Cadós y Fragoso durante los años 2001 y 2002. A excepción del río Fragoso en el momento del estudio, los otros tres ríos presentaban tramos con caudal regulado por el funcionamiento de centrales hidroeléctricas. El objetivo del estudio fue identificar las características y la composición de la comunidad de larvas de Trichoptera. Se plantearon muestreos

estacionales durante los cuales se tomaron muestras de agua y se midieron los parámetros físicos y químicos in situ en cinco estaciones de muestreo establecidas en los ríos muestreando tramos de cabecera, tramos medios y tramos bajos. Las muestras de fauna se tomaron en diferentes microhábitats (musgos, sustrato de fondo y macrófitos). La selección de las estaciones de muestreo se realizó teniendo en cuenta la localización de la central por lo que se tomaron muestras aguas arriba, inmediatamente después de la misma y unos kilómetros más abajo, con el objetivo de observar el efecto de esta construcción. Se han identificado un total de 95 taxones de los cuales 80 son especies y 15 son individuos a nivel de géneros. Estos datos proceden del estudio de un total de 13.594 larvas de tricópteros. En la presente comunicación se presentan los resultados finales del estudio y se analiza la influencia de las variaciones de caudal en la diversidad y abundancia de la fauna de Trichoptera.

T6-P430 **Pesca artesanal e identidade dos pescadores do alto rio Uruguai, Brasil**

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O rio Uruguai é considerado um dos mais importantes rios da América do Sul, cuja nascente está localizada no sul do Brasil. Recentemente este rio e as comunidades que vivem no seu entorno vem protagonizando grandes transformações impulsionadas pela construção de usinas hidrelétricas para geração de energia. O objetivo deste estudo foi analisar os modos de trabalho e a constituição identitária dos pescadores artesanais de uma colônia localizada na área de abrangência da Usina Hidrelétrica Foz do Chapecó, no estado de Santa Catarina, Brasil, a partir das modificações que vem ocorrendo no cenário em que estão inseridos. Essa pesquisa se caracteriza como um estudo qualitativo, sendo que para sua realização foram utilizados Survey, grupo focal e entrevistas semiestruturadas. A atividade pesqueira no rio Uruguai vem passando por grandes transformações que envolvem aspectos como a mudança no ambiente aquático e a regulamentação da atividade no país. A pesca artesanal na região se caracteriza como uma atividade tradicional, sendo que a organização da vida social da comunidade ribeirinha se dá em torno do rio e implica em relações de cooperação e solidariedade. O aprendizado da pesca artesanal se dá por meio da observação e da oralidade, pressupondo o vínculo social com os pescadores mais velhos e reafirmando esta atividade como um modo de vida, que exige uma inserção mais profunda e duradoura no contexto socioambiental. A liberdade e a autonomia no exercício do trabalho também se apresentaram como questões centrais na constituição do ser pescador e no prazer que esta atividade representa.

T6-P431 **Distribuição espacial de metais em sedimentos da represa Guarapiranga, São Paulo-SP, Brasil**

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O Reservatório do Guarapiranga é um dos mais importantes para abastecimento da Região Metropolitana de São Paulo. Cerca de 3,8 milhões de habitantes são atendidos (SABESP, 2012), e o reservatório tem apresentado uma degradação significativa na qualidade da água devido ao despejo de esgoto doméstico sem tratamento e de efluentes industriais. O uso e ocupação do solo aliados aos usos da terra interferem de forma dinâmica na qualidade da água e na comunidade biótica que irá se estabelecer nos corpos hídricos. No presente estudo foram coletadas 14 amostras de sedimento de fundo do reservatório avaliando os indicadores estratégicos geoquímicos, pela distribuição de metais ambientalmente disponíveis nesse compartimento. Os resultados obtidos foram comparados com os valores orientadores TEL e PEL estabelecidos pelo Canadian Council of Ministers of the Environment (CCME). Os sedimentos apresentaram elevadas concentrações de Cu, Zn, Cr, As, Mn, V, Ti. As concentrações médias de Cu excederam em muitas vezes os valores de TEL e PEL, enquanto que as concentrações médias de Zn, Cr e As excederam os valores de TEL. Com o estudo das distribuições espaciais desses elementos na represa foi possível identificar algumas áreas onde se localizam as prováveis fontes de contaminação e estabelecer correlações entre os elementos avaliados. Fapesp supported this study.

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T6-P435 **The use of macroinvertebrate biotic indices in response to WFD in insular lentic system (Azores)**

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The Water Framework Directive (2000/60/EC) demands a good status for aquatic habitats, by monitoring the existing fauna, flora, physical-chemical, geomorphological structure and hydrology, and comparing to the local reference conditions. The monitoring campaigns in the Azores have been revealing the insular systems' particularities related to islands' of volcanic origin, small size, young age, the torrential character of freshwater environments, geology and hydrology that condition the development and settlement of macroinvertebrate communities. The location in the middle of the Atlantic Ocean increases difficulties in the colonization and reproduction of macroinvertebrates. The biotic indices used to meet the WFD ecological classification demands were developed for continental systems and, in general, do not respond to insular systems. For instance, the macroinvertebrate communities show low abundance and absence of some important groups used in quality indices (e.g. Plecoptera) that strongly conditions its final value. The objective of this study was to analyze the correlation between several macroinvertebrate biotic indices (e.g. IBMWP, ASPT, FBI) and physical-chemical variables of the lakes and determine which suits best the particularities of insular lentic systems. The results showed clearly the need to develop or adapt indices to give adequate responses to the WFD.

T6-P438 **Seasonality of benthic diatom communities across a trophic gradient: biomoritoring implications**

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Data from water chemistry and diatom communities can differ drastically depending on when data were collected. Water chemistry can be more variable throughout a sampling season and among seasons, as a result of precipitation events and climate regimes, besides the influence of human

inputs. Diatoms have been typically considered to be responsive to short term environmental conditions due to their short generation time. Moreover, the response time of diatoms to changes in water chemistry can vary among streams with different severities of impairment. Investigating temporal variability is imperative for determining how biomonitoring results may be affected by fluctuations in environmental conditions and assemblage composition. The objective of this study was to characterize the relationships between diatoms and fluctuations in nutrient concentrations, in order to identify how temporal variation of water chemistry affects diatom communities and IPS diatom index scores. To achieve our objective, we examined two temporal scales: an intensive monthly sampling in five rivers, from oligotrophic to heavily nutrient loaded (la Tordera siliceus basin for one year) and an extensive long-term sampling in 20 sites biannually sampled. A bimodal relation between P concentration and diatom communities was observed, with community composition differing more over time in oligotrophic and in nutrient enriched rivers. Conversely, IPS diatom index variability had an unimodal relation with the P gradient, with maximum differences amongst sampling dates in moderate concentrations

T6-P447 **Efeito de diferentes coberturas vegetais sobre a qualidade microbiológica da água de nascentes**

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As nascentes são locais onde o lençol freático aflora, formando o início de um curso d'água. Quando bem preservadas, suas águas apresentam boa qualidade para o consumo humano e são consideradas Patrimônio Natural. O objetivo desse trabalho foi avaliar o efeito de diferentes coberturas vegetais na qualidade microbiológica da água em oito nascentes (N) do Assentamento Paraíso, Município de Alegre, Estado do Espírito Santo, Brasil. Caracterização da cobertura vegetal: N1: microbacia em floresta primária Estacional Semidecidual; N2: microbacia com 50% da área em floresta e 50% em pastagem, estando a nascente cercada em um raio de 50 m; N3, N4, N5, N6 e N7: microbacias com cobertura de pastagem e cercadas, diferenciando-se N3 por possuir vegetação em estágio inicial de recuperação dentro da área cercada, N4 pela presença de bebedouro para bovinos acima da área cercada, N5 por estar situada em área escarpada (inclinação acima de 75%), N6 por estar em pastagem degradada, N7 pela presença de pomar dentro da área cercada; N8: microbacia em pastagem sem cerca, com a presença de um curral acima da nascente. Amostras da água de cada nascente foram coletadas em novembro/2011, janeiro/2012 e março/2012, compreendendo o período chuvoso. Para a análise de coliformes utilizou-se a técnica dos tubos múltiplos (1). O valor de NMP/100 mL para coliformes termotolerantes em N2, N3, N4, N6 e N7 foi menor que 300, para N1 foi 319, para N5 foi 526, e para N8 foi 686. Todas as contagens estão acima dos valores permitidos para água destinada ao consumo humano (2). Destaca-se a importância do cercamento das áreas de nascentes, para evitar a aproximação de animais. Em meio junto à floresta, a presença de coliformes termotolerantes na água se deve à presença de animais silvestres.

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T6-P448 **Monitoramento do desenvolvimento de *Azolla* sp. por meio de sensoriamento remoto terrestre**

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Neste trabalho procurou-se avaliar o desenvolvimento foliar da *Azolla* sp. utilizando-se a metodologia de classificação supervisionada. Foram colocadas 0,12 m² de plantas de *Azolla* sp. em um tanque-rede circular, disposto dentro de um viveiro de cultivo de peixes do Instituto Federal do Espírito Santo - Campus de Alegre, Espírito Santo, Brasil. Com uma câmera fotográfica digital, imagens foram capturadas diariamente, sempre com a mesma altura da câmera, mesmo zoom e no mesmo horário. O processamento das imagens foi realizado com o software SPRING 5.2. A exatidão dos mapeamentos foi analisada com base nos parâmetros desempenho geral (%), confusão média (%), abstenção média (%) e índice Kappa (K %), calculando-se o incremento da área (% m²) a partir do incremento foliar (IF %). Os seguintes resultados foram obtidos: dia 1: 0,1265 m², IF = 0,00%, desempenho geral: 97,19%; confusão média: 2,81%; abstenção média: 0,00%; K: 94,46%; dia 2: 0,1679 m²; IF: 32,72%; desempenho geral: 97,19%; confusão média: 2,81%; abstenção média: 0,00%; K: 94,46%; dia 3: 0,2111 m²; IF: 66,87%; desempenho geral: 96,75%; confusão média: 3,25%; abstenção média: 0,00%; K: 94,96%; dia 4: 0,2670 m²; IF: 26.48%; desempenho geral: 95,40%; confusão média: 4,60%; abstenção média: 0,00%; K: 93,15%; dia 5: 0,3616 m²; IF: 35,16%; desempenho geral: 96,81%; confusão média: 3,19%; abstenção média: 0,00%; K: 94,83%; dia 6: 0,3629 m²; IF: 36%; desempenho geral: 95,19%; confusão média: 4,81%; abstenção média: 0,00%; K: 90,75%. O maior incremento foliar ocorreu do segundo para o terceiro dia (IF 66,87%). A técnica de classificação digital de imagens parece ser eficiente para monitorar o desenvolvimento de plantas aquáticas.

T6-P450 **Parâmetros físicos e químicos da água do Córrego Horizonte, Espírito Santo, Brasil**

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O Córrego Horizonte, afluente do Rio Norte, atravessa a fazenda do Instituto Federal do Espírito Santo – Campus de Alegre e o Distrito Rive, recebendo efluentes diversos. O objetivo deste trabalho foi verificar alguns parâmetros físicos e químicos da água do Córrego Horizonte, no período chuvoso. Amostras de água foram coletadas mensalmente, de outubro de 2009 a abril de 2010, em quatro pontos: P1: livre de efluentes; P2: efluentes de uma granja de suínos; P3: efluentes de esgoto doméstico e hospitalar; P4: efluentes de uma piscicultura. Os valores médios dos parâmetros analisados em cada ponto foram: P1: temperatura: 24,7 ºC; OD: 2,2 mg L^{-1}; pH: 7,1; amônia: 3,5 mg L^{-1}; nitrito: 0,4 mg L^{-1}; P2: temperatura: 25,3 ºC; OD: 1,7 mg L^{-1}; pH: 7,1; amônia: 3,1 mg L^{-1}; nitrito mg L^{-1}: 0,8; P3: temperatura: 24,9 ºC; OD: 1,8 mg L^{-1}; pH: 7,2; amônia: 4,5 mg L^{-1}; nitrito: 1,0 mg L^{-1}; P4: temperatura: 25,3 ºC; OD: 4,7 mg L^{-1}; pH: 7,5; amônia: 3,2 mg L^{-1}; nitrito: 1,4 mg L^{-1}. Nitrato e fósforo não foram detectados em nenhuma das análises. Os parâmetros analisados apresentaram variação, nos diferentes meses de amostragem e nos diferentes pontos, mas permaneceram dentro dos limites estabelecidos pela Resolução CONAMA 357/2005 (1), para águas de Classe 2. Em P3 a amônia estava

acima do limite aceitável, o mesmo ocorrendo com o nitrito em P4. O oxigênio dissolvido permaneceu abaixo dos limites recomendados, em todas as análises, fato que pode ser explicado pelo excesso de matéria orgânica na água, consumindo oxigênio no processo de decomposição (2). Apesar de cada ponto de amostragem acumular os efluentes dos pontos anteriores, a diferença entre os valores encontrados em cada ponto foi mínima, indicando que a capacidade de autodepuração do Córrego Horizonte não foi ultrapassada.

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T6-P451 Índice de coliformes no Córrego Horizonte, afluente do Rio Norte, Espírito Santo, Brasil

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O Córrego Horizonte, afluente do Rio Norte, atravessa a fazenda do Instituto Federal do Espírito Santo – Campus de Alegre e o Distrito Rive, recebendo efluentes diversos. O objetivo deste trabalho foi verificar o índice de coliformes totais e termotolerantes na água do Córrego Horizonte, no período chuvoso. Amostras de 100 mL de água foram coletadas mensalmente, de outubro de 2009 a abril de 2010, em quatro pontos de amostragem: P1, livre de efluentes; P2, efluentes de uma granja de suínos; P3, efluentes de esgoto doméstico e hospitalar; e P4, efluentes de uma piscicultura. Utilizou-se a técnica dos tubos múltiplos, expressando-se os resultados em NMP 100 mL^{-1} (1). Os valores máximos obtidos em cada ponto para coliformes totais e para coliformes termotolerantes foram, respectivamente: P1: 43 e 23; P2: 460 e 460; P3: 1100 e 460; P4: 240 e 110. Considerando-se apenas o índice de coliformes, a água do Córrego Horizonte pode ser considerada como de Classe 2, cujo limite de coliformes termotolerantes é 1000 NMP 100 mL^{-1} (2). O maior índice de coliformes foi encontrado no P3, embora o P4 receba maior carga de efluentes. Não foi possível comprovar a influência das chuvas sobre os parâmetros microbiológicos, uma vez que o volume de precipitação variou muito ao longo do período de estudo. Um maior índice de coliformes na água pode ser encontrado no período seco, devido à redução significativa do volume de água do córrego, mantendo-se constante o volume de efluentes despejado (3).

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T6-P456 Macroinvertebrate monitoring to evaluate sediments and waterways conservation in a protected ecosystem

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Habitat degradation associated with sedimentation and waterway modification is a major cause of the decline of macroinvertebrate assemblages. Assessing the biodiversity of macroinvertebrate fauna in freshwater ecosystems is an essential component of both basic ecological inquiry and applied ecological assessments. Patterns in benthic macroinvertebrate communities were assessed within the protected Paul de Arzila ecosystem to determine structuring mechanisms related to abiotic and biotic influences of the sediments and watershed. Paul de Arzila is an interior freshwater wetland of international concern, included in the Natura 2000 network, located on the left margin of Mondego River, Northwest Portugal. The biodiversity of the Paul de Arzila watershed is dependent upon the diversity and persistence of mainstream, tributary, and seep habitats. However, the structure and function and habitats of macroinvertebrate communities are susceptible to degradation from increasing surface and groundwater withdrawals, urban development, and water retention structures, such as low-head dams. Our results describe spatial and temporal patterns of distribution and abundance of macroinvertebrates and the status of stress factors in the ecosystem that are affecting these communities. Monitoring has vital importance to the conservation of resident species some of them threatened by extinction and therefore protected by international laws.

T6-P457 Plankton communities in reservoirs of the Ebro river watershed as ecological status indicators

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Phytoplankton and zooplankton communities were sampled and studied quantitatively during summer 2010 and 2011 in 44 reservoirs of the Ebro River Basin, belonging to six different types under the Spanish classification scheme, as a part of the implementation of the European Water Framework Directive. The relationship between plankton community structure and environmental variables was elucidated by means of direct gradient analysis (CCA). A total of 289 phytoplankton and 132 zooplankton species (rare species were removed) and 17 environmental variables were included in the analysis. A strong eutrophication gradient along the first ordination axis was found, with chlorophyll *a*, total P, Secchi depth and total N being the best correlates. The scores along the first CCA axis were used to assign eutrophy tolerance values. They were assigned for the species located in both extremes of the gradient, from oligotrophic to hypertrophic conditions, following the scores ranking, with values ranging from 1 (minimum tolerance) to 15 (maximum tolerance) and an index is calculated as the weighted sum (with the relative density as weighting factor) of the tolerance scores of all plankton species found in a reservoir. This index was highly correlated with ecological status variables as chlorophyll *a*, total P or Secchi depth and other phytoplankton index. It was also validated with data sets from 2009, where the index also showed significant correlations with the main indicators of eutrophy. This proposed metric, using the 2010 and 2011 data sets, is an ecological status assessment metric for the study area and could be applied to other Iberian reservoirs to validate its performance for a broader spatial and temporal scale.

T6-P464 **High-resolution automatic water quality monitoring of reservoirs from the Júcar River Basin Administration**

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The timely information regarding water quality of freshwater ecosystems is essential in determining assessments in systems monitoring. In the case of reservoirs, the use of Automatic Monitoring Systems (AMS) allows to continuously monitoring and assesses water quality, obtaining prompt reliable measures at a time when transient events occur in the water column. For this purpose, different AMS have been installed and commissioned in some reservoirs from the framework of the Júcar River Basin Administration (Confederación Hidrográfica del Júcar, East Spain). These AMS are equipped with submersible probes of some representative environmental variables (turbidity, pH, Red-Ox, underwater light, conductivity, temperature, oxygen, chlrophyll-*a*). Data received in the control center from the AMS have been review continuously and corrective measures have been performed when necessary. These AMS are not totally unattended and the quality of collected data has also relied in a routine maintenance program (cleaning, servicing, etc.). Moreover, for calibrate readings, periodic verification samplings has been conducted by personnel of the Limnology Unit of the University of Valencia and ADASA SISTEMAS. The results addressed here represent time-course high resolution profiles obtained with some of the AMS installed in the network. These AMS have been successful in providing information on changes in the water quality and its evolution over time, therefore giving support for management decisions. On this sense, through these efforts, we try to improve the management program established to supervise those reservoirs of the catchment intended for human water supply.

T6-P485 **Caracterízación horaria de los cambios producidos en el caudal por una central hidraúlica**

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En el presente trabajo se incluye un análisis y una caracterización de parámetros hidrológicos a partir de datos de aforo y de datos de caudal turbinado, en una minicentraleléctrica que dispone de datos horarios. Dado el detalle de los datos, se pueden obtener algunos valores que no se consiguen con datos diarios. Entre estos datos encontramos los que caracterizan el pulso de funcionamiento de la central, de esta forma podemos medir, la magnitud, la duración la velocidad de ascenso y descenso y compararla con las del régimen natural del río. Estas mediciones nos ayudarían a evaluar las posibles afecciones que ocasionan los cambios del régimen, y sus consecuencias en las poblaciones biológicas del mismo. El trabajo se ha desarrollado en el río Urumea, este río tiene una sucesión de centrales fluyentes con pequeños azudes, de las que cuatro han dejado de funcionar y otras cuatro están produciendo, de estas últimas una de ellas dispone de una estación de aforo que mide tanto el agua que fluye por el río, como el agua que fluye por el canal que deriva a la central. Del análisis de los datos se han observado que hay diferencias significativas entre el caudal natural y el turbinado en las centrales en la velocidad de descenso, la magnitud y en el número de pulsos, además en la duración del descenso, que presenta valores ligeramente superiores a los del caudal natural. Esta caracterización junto a los muestreos biológicos que se están realizando en los tramos afectados y en los tramos libres, nos van a permitir relacionar qué aspectos del régimen de turbinado pueden tener mayores resultados ambientales y en consecuencia se podrán realizar recomendaciones en la gestión de las centrales, que mejoren la coordinación entre la producción, y la conservación del río.

T7-Estuarine ecology

T7-P321 **Estuaries from a meiofaunal perspective: biodiversity patterns of benthic nematodes**

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Estuarine meiofauna communities have been only recently considered to be good indicators of ecological quality status, in contrast with macrofauna which is widely used in the assessment and monitoring of aquatic systems. Meiofauna features, such as their small size, high abundance, rapid generation times and absence of a planktonic phase, make these assemblages potential target indicators. In estuaries, we must account not only for great natural variability (e.g. salinity, sediment type and dynamics, oxygen availability, temperature, flow speed) but also for the multiple anthropogenic pressures (high local population density, presence of harbours, dredging activities) that act upon the systems. The meiobenthic community of the Mondego estuary (Portugal) was analyzed, with especial emphasis on the spatial and temporal biodiversity patterns along the entire estuarine gradient. Both taxonomic and functional approaches (density, number of taxa, Margalef and Shannon-Wiener indices, Index of Trophic Diversity and Maturity Index) were applied to nematode communities in order to describe the community structure and to relate it to environmental parameters. The results showed that, at all sampling locations and times, salinity and grain size composition were the main abiotic factors controlling community distribution. Additionally, a low temporal variability was observed, which may indicate that natural variability may be superimposed by the anthropogenic pressures present in some areas of the estuary. The integration of both taxonomic and functional attributes proved to be important in assessing the ecological status of estuaries, reinforcing the need to develop a nematode-based multimetric index.

T7-P449 **Comparison of the zooplankton communities in two estuaries with different levels of pollution (NW Portugal)**

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The increased pollution resulting from anthropogenic activities has been inducing changes in coastal areas all over the world. In addition, the organisms present in these ecosystems are facing the challenges imposed by abiotic variation resulting from global climate change. Zooplankton communities are considered of crucial importance for coastal and estuarine pelagic ecosystem functioning, since they connect producers to several fish species that depends all life or in the juvenile phase from this important food source. Recent evidences suggest that both abiotic changes and pollution can have negative effects on the zooplankton biodiversity and structure. The aim of this research was to assess the effects induced by different levels of historical and dynamic pollution on estuarine zooplankton communities of South Europe, taking advantage of the comparison of the communities of two adjacent estuaries in the NW coast of Portugal with different levels of pollution (Minho and Lima Rivers estuaries). The zooplanktonic community structure, composition and temporal variation were comparatively evaluated from April 2010 to June 2011. Zooplankton sampling was done monthly in 7 transects per estuary, during the high tide, and abiotic factors were measured/determined. The results suggest that there are significant differences in main taxonomic groups between the two estuaries, in good agreement with water quality and also with other stressful conditions that may have been induced by global climate change. This study was done in the scope of the post-doc project of Luis R. Vieira (FCT: SFRH/BPD/47407/2008) and of the project SIGNAL, funded by the Portuguese Foundation for the Science and Technology and COMPETE funds (PTDC/AAC-AMB/110331/2009).

T8-Fish ecology

T8-P143 **Comparing the performance of two fish sampling gears in a set of reservoirs of the Ebro basin**

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During the last five years, intensive reservoir fish assemblage assessments have been promoted by the Ebro Water Confederation, within the Framework Directive context. Using a combination of remote (hydroacoustics) and direct sampling gears, fish assemblages of 11 reservoirs were quantified and characterized. Two different fish sampling gears, a passive one: gillnetting, and an active one: boat electrofishing, were used. In this study, the differences among both gears and their performance in terms of species composition and their relative abundance and biomass are discussed. Boat electrofishing seems to be a proper method to complete the information obtained by gillnetting and hydroacoustics in littoral and water body tail areas (less that 2 m depth), as long as it is performed with appropriate equipment and methods. Through this sampling method it was possible to find some life stages and native species, usually strongly linked to benthic, fluvial or shore habitats that would, otherwise, have remained undetected. The relative importance of some exotic predator species, such as black bass or pike, is also pointed out by this gear. It is shown how gillnetting and boat-electrofishing can provide complementary effort-standardized data, so metrics derived from both direct sampling techniques can add valuable information to ecological potential assessment methods, still under development.

T8-P189 **Influência das trombas d'água na ictiofauna da encosta leste na região sul brasileira, Paraná-Brasil**

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Os rios costeiros são ecossistemas instáveis, sujeitos a forte desestruturação por trombas d'água. Avaliamos a influência da instabilidade ambiental na composição específica e estrutura trófica na ictiofauna dos rios Cabral e das Pombas. Foram feitas coletas bimestrais com pesca elétrica nos dois rios (jul/96 a set/97) e os resultados agrupados em 3 períodos: Pré-cheia (jul-dez), Cheia (jan-mar) e Pós-cheia (abr-set). Cada trecho foi caracterizado quanto ao tipo de substrato, a correnteza da água e a profundidade e a distribuição dos microhabitats. O habitat e composição específica foram avaliadas nos 3 períodos e a dieta dos peixes em dois períodos: Pré-Cheia (sem interferência de enchentes) e Cheia (com interferência). Cada guilda foi descrita quanto à estratégia alimentar e à origem do alimento. Os dois rios apresentaram variações nas características físicas e químicas da água e do habitat em função das cheias intensas de verão; mais intensas e duradouras no rio Cabral. Foram coletadas 21 espécies em cada rio sendo as maiores amostras obtidas nos períodos Pré-Cheia e Pós-Cheia, quando houve maior disponibilidade de microhabitats. No rio das Pombas a ictiofauna recuperou-se rapidamente em número de espécies e abundância. A análise de 248 estômagos de peixes do rio Cabral e 357 do rio das Pombas indicou que no primeiro as dietas variaram quanto a estratégia alimentar, a origem do alimento ou a ambas. No rio das Pombas as dietas variaram principalmente quanto a estratégia. No rio das Pombas, as guildas tiveram maior uniformidade na participação relativa na estrutura trófica e no rio Cabral houve predomínio de poucas guildas. Desta forma, conclui-se que estrutura trófica destas comunidades apresentaram maiores diferenças entre os rios do que sazonalmente.

T8-P239 **Benthophagous fishes as an ecological tool to evaluate benthic macroinvertebrate communities**

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Benthic macroinvertebrate (BM) communities are commonly used as bioindicators of anthropogenic impacts on freshwater ecosystems. The efficiencies of sampling gears and methods are related to environmental characteristics and study objectives. Currently, based on the high foraging capacity of benthofagous fishes, some studies have used stomach content analysis as a complementary tool in BM community evaluations. Our objective was to compare the similarity

of BM communities sampled from sediments with those sampled from fish stomachs. We used Petersen dredges to collect sediments and gill nets to collect fishes from multiple sites in the Grande River, Paraná River basin, southeast Brazil, in January, March and July 2010. Due to their higher abundance, three potentially benthophagous fish species (*Eigenmannia virescens*, *Iheringichthys labrosus*, *Leporinus amblyrhynchus*) were selected for stomach contents analysis. The BM communities sampled from both methods were dominated by Chironomidae. About 61% of BM families found in the sediment were present in fish stomachs (53% in *E. virescens*, 16% in *I. labrosus* and 26% in *L. amblyrhynchus*). The BM community composition found in fish stomachs differed significantly from that found in sediments for all analyzed species (ANOSIM; *E. virescens*, R=0.38; p=0.001; *I. labrosus*, R=0.29; p<0.001; *L. amblyrhynchus*, R=0.35; p<0.001) but some overlap was observed. Philopotamidae were found only in fish stomachs. The three fish species showed foraging preferences for some invertebrate groups. Therefore, stomach contents of benthophagous fishes can be used as a complementary tool to assess the effectiveness of conventional sampling gear to evaluate BM communities and to evaluate alimentary preferences of benthophagous fishes.

T8-P403 **Influencia das atividades antrópicas na ictiofauna em dois rios no estado do Paraná, Brasil**

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As atividades antrópicas têm exercido influência sobre peixes. Efeitos negativos na bacia do rio São João, estado do Paraná, são despejo de poluentes químicos e biológicos de origem doméstica, industrial e agropecuária e destruição da floresta ciliar em vários pontos. Coletas mensais (de julho/2010 a junho/2011) em 8 estações no rio São João (S1 a S8) e 2 estações no rio Lajeado do Carambeí (L1 e L2); o esforço foi de 24 h, com despescas a cada 12 h, utilizando-se redes de espera de diferentes malhagens, tarrafas, espinhéis, covos e puçás. Foram calculados os índices de riqueza (Margalef), diversidade (Shanon-Weaner), equitabilidade (Pielou) e dominância (Simpson). Foram capturados 6.217 exemplares. A estação S1, mais próxima às nascentes, destacou-se pela presença de *Trichomycterus davisi*, considerada indicador de ambientes pouco degradados. As estações S4 e L1 apresentaram os menores valores de diversidade e equitabilidade. A estação S4, poucos metros abaixo da confluência destes rios, caracteriza-se por um grande aporte de poluentes domésticos e industriais, além da ausência de floresta ciliar e predomínio de gramíneas exóticas nas margens. No rio Lajeado do Carambeí, entre as estações L1 e L2, ocorre um grande aporte de poluentes de origem doméstica e industrial, favorecendo a presença de *Phalloceros* cf. *harpagos*, gênero considerado tolerante à perda da qualidade ambiental, pois é capaz de sobreviver e se reproduzir em corpos de água hipóxicos. Na estação L2 foi possível constatar a presença de matéria orgânica abundante, alterando a tonalidade e o cheiro da água, resultando na mortalidade de muitos peixes. As estações L2 e S4 apresentaram as maiores densidades de organismos aquáticos associados à matéria orgânica, um importante indicativo de degradação ambiental.

T8-P482 **Dinâmica temporal do ictioplâncton em ambientes do semiárido Paraibano, Brasil**

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O conhecimento da variação temporal do ictioplâncton fornece informações valorosas acerca do período reprodutivo dos peixes. Nesse aspecto, o presente estudo objetivou analisar a dinâmica temporal dos ovos e larvas de peixes, no açude Taperoá II e num trecho do rio Taperoá, semiárido paraibano, Brasil, relacionando-a com as variáveis ambientais. As coletas foram realizadas de junho de 2009 a maio de 2011, nos três turnos, abordando regiões limnéticas e marginais com macrófitas. Utilizou-se rede de arrasto do tipo piramidal e um peneirão (malha de 500 µm). A ANOVA detectou diferenças temporais significativas em todas as variáveis ambientais. Coletou-se um total de 487 indivíduos, 125 ovos (maioria em clivagem inicial) e de 362 larvas (maioria em pré-flexão). O mês de maio de 2011 apresentou o maior número de capturas do ictioplâncton, representando um período intenso de desovas, induzido pelo maior volume pluviométrico ocorrido. Outros períodos de desova também foram identificados, sendo a maioria relacionada com a pluviosidade, enquanto que uma minoria foi atribuída a espécies residentes, não dependes das chuvas para desovarem. A ANOVA não detectou diferenças significativas das densidades de ovos e larvas entre os meses amostrados, mas a análise de regressão múltipla evidenciou que a pluviosidade e as concentrações de fosfato e nitrito tiveram relação significativa com estes. Essa relação indica que a maioria das espécies de peixes presentes nestes ambientes, desova nos períodos chuvosos, certamente pela maior disponibilidade de habitat e alimento. Entretanto, mesmo não apresentando relação significativa, elevados valores de condutividade elétrica e temperatura, e menores concentrações de oxigênio dissolvido, coincidiram com os picos de densidade do ictioplâncton.

T8-P483 **Estudo populacional de *Leporinus piau* (Fowler, 1941) em um açude do semiárido Paraibano, Brasil**

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Dados da estrutura populacional de peixes dão importantes informações para o uso, manejo e preservação dos estoques pesqueiros. No semiárido paraibano, local onde as populações são influenciadas pelas grandes alterações hidrológicas, objetivou-se determinar alguns aspectos da estrutura populacional de *Leporinus piau*. As coletas foram realizadas de outubro de 2005 a outubro de 2006, bimensalmente, no açude Taperoá II, Taperoá, Paraíba, Brasil. Nas amostragens foram utilizados vários apetrechos de pesca. Os indivíduos coletados foram classificados em classes de comprimento e a relação peso-comprimento foi estabelecida. Analisou-se o sexo dos indivíduos macroscopicamente e determinou-se a proporção sexual. Coletaram-se 89 exemplares, com comprimentos de 6,15 a 22,00 cm. Observou-se um maior número de indivíduos pequenos, entre 4 e 12 cm nos períodos de estiagem, sugerindo um recrutamento recente. No mês de junho de 2006 (período chuvoso) a espécie não foi registada, fato que possivelmente esteve relacionado com aspectos migratórios da reprodução. A ANOVA, comparando as médias de

tamanho nas três estações estudadas mostrou que os indivíduos apresentaram em média, um maior tamanho durante o período chuvoso [F(2; 86)=4,53; p=0,013]. Os indivíduos coletados nos períodos de estiagem de 2005 (12,6 cm em média) e estiagem de 2006 (12,8 cm) eram significativamente menores que os indivíduos do período chuvoso de 2006, atingindo 17,7 cm em média (teste de Tukey; p<0,05). Foram registrados indivíduos de 9 a 271,8 g, com crescimento do tipo alométrico negativo (b=2,73). Houve um predomínio significativo de machos durante o período estudado (X^2=9,93; g.l.=1; p<0,01), numa proporção de 2,4:1,0.

T9-Food webs

T9-P22 **Aquatic food webs of the oxbow lakes in the Pantanal: a new site for fisheries?**

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Flood pulse and biotic inter-relationships control food web dynamics at river floodplain systems. Pantanal Plain in Paraguay River Basin (Brazil) occupies an area of 140,000 km² of periodically flooded areas and it is divided in 12 sub-regions with different characteristics related to the flood pulse duration, vegetation, type of soil and resource uses, mainly fishing. In this study, we modeled, using Ecopath with Ecosim (EwE), three oxbow lakes at South Pantanal Plain, where there is no fishing activity, in order to test ecosystem similarity, to identify keystone species and type of food web control and, at least, to simulate if these environments can support moderate fishing pressure. We found that food webs of oxbow lakes are similar to each other, because although they depend mainly on the presence or absence of predators, they are homogenized by the flood-pulse. The highest values of Keystoneness species index in the three models highlight the role of top predators (*Hoplias malabaricus*, *Serrasalmus* spp., *Pseudoplatystoma reticulatum*, birds and mammals) and therefore, we identified the action of a mixed control food web in the three systems (detritus plus top predators). Simulation outputs indicate that only moderate fishing can be sustained in these oxbow lakes, given that increasing fishing reduces biodiversity (by Kempton index) and could negatively impact the top predators and increase their probability to become locally extinct.

T9-P42 **Variación estructural de las redes tróficas de ríos a múltiples escalas**

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La incorporación de la escala espacial en el estudio de las redes tróficas de los ríos puede influir en la forma en la que las especies interactúan y, resultar en una red trófica funcionalmente diferente. En este estudio se analiza el efecto de la escala espacial sobre las principales propiedades estructurales de las redes tróficas de seis ríos de régimen mediterráneo. Estas propiedades describen los hábitos tróficos de las especies, la complejidad de conexiones y los niveles tróficos. La construcción de estas redes tróficas se ha realizado siguiendo un diseño de muestreo anidado, siendo utilizado para estimar los componentes de la varianza asociados a diferentes escalas espaciales, es decir, a diferentes tamaños de tramos: 100 m, 50 m, 25 m y 10 m. En este trabajo, además de comparar el efecto parche-tramo, el diseño de muestreo anidado que se presenta, permite analizar las propiedades estructurales haciendo frente a la cuestión de la dependencia de las redes tróficas dentro de una zona de estudio. Los resultados muestran que muchas de las propiedades estructurales específicas del tramo se diferencian de las específicas de los parches. Además el análisis de la variabilidad a través de los distintos tamaños de tramo nos muestra que la mayoría de las propiedades estructurales de las redes tróficas estudiadas presentaron una variabilidad significativa a la escala de 25 m. Por otra parte, los resultados revelan que el análisis de la varianza anidado puede detectar variaciones en las propiedades estructurales de las redes tróficas tanto a grandes como a pequeñas escalas.

T9-P187 **Efeitos da pluviosidade nas teias tróficas de macroinvertebrados em um riacho tropical no Brasil**

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Riachos tropicais são sistemas dinâmicos que apresentam habitats estruturalmente heterogêneos, nos quais organismos aquáticos continuamente colonizam em resposta às variações sazonais. Este estudo teve como objetivo analisar teias tróficas de macroinvertebrados sujeitas a diferentes condições pluviométricas. Amostras foram coletadas com Surber durante períodos de menor e maior pluviosidade em dois pontos amostrais em um riacho litorâneo no sul do Brasil. A representação gráfica do fluxo de energia foi obtida com software Pajek. Foram calculados nove descritores (proporção de espécies basais, intermediárias, de topo e onívoros, densidade de ligações, índice de conectância, comprimento máximo e mínimo da teia e número de compartimentos tróficos), riqueza de Margalef, diversidade de Shannon-Weanner e utilizada análise multivariada de correspondência. Locais com maior integridade ambiental (Ponto 1) permitiram que, mesmo com a interferência da sazonalidade, a proporção e ocorrência dos grupos alimentares apresentasse similaridade entre os períodos. Em locais com maior interferência antrópica (Ponto 2), a variação temporal alterou a dieta dos macroinvertebrados. Nos dois trechos amostrados, a sazonalidade atuou diretamente na estruturação das teias tróficas e o aumento do fluxo hídrico ocasionou a desestruturação das comunidades. As características locais também influenciaram no padrão de estruturação da comunidade de macroinvertebrados, resultando em diferenças na composição das espécies entre as teias tróficas aquáticas. Eventos sazonais são característicos nestes sistemas e muitos organismos aquáticos podem apresentar mecanismos a fim de reduzir os efeitos do estresse ambiental e permitir a manutenção de algumas interações tróficas.

T9-P223 **Stable isotope analysis of food webs along a stream gradient: initial results**

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Stable isotopes constitute a powerful tool to determine sources of organic C assimilated by consumers and trophic position in food webs. In streams

and rivers the structure of biological communities changes according the downstream gradient in physical conditions and ecosystem processes. Thus, prior to the establishment of trophic patterns within any stream or river, the longitudinal changes in stream conditions and isotopic signatures should be evaluated. In this study we analysed the major food web components, resources and consumers, along the Tea Stream (Galicia, NW Iberian Peninsula) with stable isotope techniques for C and N. In July 2010, replicate samples of the commonest taxa representing all trophic levels and potential C sources were collected at 6 study sites along the fluvial gradient of the stream. Regression analyses, parametric mean comparisons and a qualitative examination of data through biplots showed that there was a general tendency to maintain the $\delta^{15}N$ levels along the stream, while $\delta^{13}C$ levels exhibited a decreasing pattern (mainly in consumers) towards the proximity with the stream mouth. The composition of dominant consumers and fluvial resources also varied along the Tea Stream. This study reveals the importance of considering the longitudinal variation in local habitats (biotic and abiotic features) when establishing the stream food web structure.

T9-P318 **Influência dos nutrientes sobre a taxa de herbivoria de *Ceriodaphnia cornuta* e de *Notodiaptomus cearensis***

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O controle da produção do fitoplâncton dá-se através da herbivoria. À medida que o sistema aquático torna-se mais eutrofizado, as espécies zooplanctônicas mudam de grandes filtradores (Cladocera e Copepoda Calanoida) para pequenos filtradores (Rotifera e Copepoda Ciclopoida). Para tentar entender como a concentração de nutrientes afeta a taxa de herbivoria de duas espécies, foram realizados dois experimentos em laboratório, utilizando diferentes concentrações de compostos nitrogenados e fosfatados, para simular diferentes estados tróficos (mesotrófico, eutrófico e hipereutrófico), por 24 horas. Os experimentos foram realizados com o copépodo Calanoida *Notodiaptomus cearensis* e com o cladócero *Ceriodaphnia cornuta*. As algas utilizadas nos experimentos vieram de uma cultura mista e estavam nas seguintes concentrações: com a espécie *N. cearensis*: 73,8% de *Aphanothece* sp., 22,2% de *Ankistrodesmus* sp., 4% de *Scenedesmus* sp. No experimento com a *C. cornuta* 65,2% de *Aphanothece* sp., 19% de *Ankistrodesmus* sp., 6,5% de *Chlorella* sp., 4,3% de *Merismopedia* sp., 3,0% de *Scenedesmus* sp., 2,0 % de *Cosmarium* sp.. No experimento com o copépodo *N. cearensis*, constatou-se uma menor taxa de herbivoria no meio mesotrófico e uma maior no hipereutrófico, embora as taxas de mortalidade tenham sido mais elevadas neste último tratamento. No meio eutrófico, não se verificou consumo. Analisando o cladócero *C. cornuta*, constatou-se uma taxa de herbivoria semelhante e maior nos meios mesotrófico e eutrófico. No meio hipereutrófico o consumo foi muito baixo. Isto é compatível com os resultados observados em campo, em que se encontra *C. cornuta* em ambientes mesoeutróficos não sendo comumente observadas em estados tróficos mais elevados e *N. cearensis* em oligotróficos e hipereutróficos.

T9-P387 **El bucle microbiano en la marisma de Doñana: influencia del gradiente hidrológico y trófico**

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El Espacio Natural de Doñana es un claro ejemplo de humedal costero que se ha visto sometido a una intensa presión antropogénica, a pesar de existir medidas legales para su protección. Actualmente, el patrón hidrológico de las Marismas de Doñana sigue una dinámica propia del clima mediterráneo, con un marcado carácter estacional que provoca significativas variaciones en estos ecosistemas. En humedales mediterráneos el patrón hidrológico es uno de los factores más importantes que determinan la disponibilidad de nutrientes y la composición de la comunidad planctónica. La combinación de la frecuencia y el origen de las entradas de agua (gradiente de salinidad) y de nutrientes puede generar situaciones muy dispares, en cuanto a la composición taxonómica y también funcional de la comunidad que compone el bucle microbiano. El objetivo de este estudio fue determinar la contribución relativa de los grupos funcionales del bucle microbiano y la composición taxonómica del fitoplancton a lo largo del gradiente de circulación-confinamiento y de estado trófico de las Marismas de Doñana (20 masas de agua) con el objeto de entender la evolución de la comunidad planctónica ante situaciones cambiantes, ya sea la regulación de flujos antrópica o el progresivo cambio global.Los resultados preliminares mostraron que el compartimento dominante en el bucle microbiano era el autótrofo (diatomeas, euglenas y cianobacterias), favorecido por la circulación y la entrada de nutrientes inorgánicos, y el bacterioplancton en situaciones con elevado contenido en materia orgánica y concentraciones de P total. La mixotrofia fue indetectable, y la escasa presencia de flagelados heterótrofos se limita a lucios y caños que presentan una proporción N:P elevada tanto para la fracción orgánica como inorgánica.

T9-P439 **Reservatórios e nicho trófico: suas interações na UHE Serra da Mesa, Goiás, Brasil**

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A construção de barragens e reservatórios altera a composição da dieta dos peixes locais, pois desestabiliza as comunidades e desencadeia, por exemplo, falta de recursos e altera a distribuição e abundância dos consumidores. O objetivo deste trabalho foi analisar a organização da cadeia trófica de peixes em função da complexidade de ecossistemas como reservatórios, na UHE de Serra da Mesa, Goiás, Brasil. Foram realizadas quatro coletas bimestrais entre 2009 e 2010. A análise da dieta foi realizada de modo indireto, através da extração do conteúdo estomacal. Foram coletadas 36 espécies de peixes pertencentes a cinco ordens. Foram identificados os itens extraídos de 1061 indivíduos. Cerca de 25% dos peixes foram classificados como piscívoros; 22,2% como carnívoros (insetos, moluscos etc.); 25% onívoros; 11,11% detritívoros; 5,55% insetívoros e 11,11% herbívoros. O item mais freqüente (13 espécies, 17,8%) e abundante (21,3% dentre os itens) foi detritos/sedimentos; oligoqueta apresentou menor freqüência (uma espécie, 1,3%) e abundância (0,0025%). Apesar da espécie *Cichla piquiti* ter sido

a mais coletada, os itens encontrados na dieta desta não representaram muita abundância, isto ocorreu devido à ausência de itens em muitos estômagos. Através da ordenação dos itens por espécie utilizando a DCA, verificou-se que nas coletas I e II houve um menor número de grupos tróficos (maior chance de competição e sobreposição) em relação as coletas III e IV. Os resultados demonstraram que o reservatório de Serra da Mesa por ser de grande porte, possui uma disponibilidade muito grande de recursos alimentares, fato observado na composição diversificada entre as dietas das diferentes espécies.

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T10- Invasive species

T10-P57 **Trophic relationships between introduced species and native fish community at the Lake Titicaca**

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Ecological consequences of alien species are difficult to predict and sometimes they are still unknown long after introductions occur. The introduction of silverside pejerrey (*Odontesthes bonariensis*) and rainbow trout (*Onchorhynchus mykiss*) in the Lake Titicaca has altered both the abundance and composition of native species (1). Disease introductions, overexploitation of resources and pollution of some tributary rivers have caused alterations of habitats and food web structures (2). Thus, the trophic structure and feeding behavior of native fish in the Lake Titicaca were characterized through stable isotope analysis (SIA). 156 individuals belonging to 18 species were captured between November 2010 and February 2011. Isotope composition of fish species showed 4 different groups ranging from 5.88‰ to 10.75‰ for $\delta^{15}N$, and from -20.11‰ to -15.1‰ for $\delta^{13}C$ ($p<0.05$). Highest $\delta^{15}N$ values were found in both introduced species because fish represent their main food source. However, two native species (*Orestias ispi* and *Orestias imarpe*) also have similar values possibly due to fish egg ingestion. Based on a Bayesian mixing model (SIAR) we propose an approach to measure trophic interactions between introduced and native species. Silverside could act as competitor or predator firstly to *Orestias imarpe*, whereas rainbow trout is more generalist and affected native species specially *Orestias gracilis*, *Orestias gilsoni*, *Orestias tomcooni*, and the pelagic *Orestias ispi*. These results emphasize that some native species may change their habitat or dietary preferences as a consequence of competition with introduced species.

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(2) Vila I *et al.* (2007) *Aquatic Ecosystem Health and Management* **10**:201-211.

T10-P97 **La presencia de depredadores (*Gambusia holbrooki*) no incrementa la mortalidad larvaria de *Ischnura genei***

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Trabajos recientes sugieren que la mera presencia de peces depredadores incrementa la mortalidad larvaria en zygópteros. Para estudiar la generalidad de este fenómeno se realizó un experimento en el laboratorio usando el caballito del diablo *Ischnura genei* y un pez depredador exótico (*Gambusia holbrooki*) que habita con el en Cerdeña, mediante tres tratamientos que permitían comunicación química, visual y química-visual. Se colocaron en diez acuarios (cinco con *G. holbrooki* y cinco sin ella) 120 larvas de *I. genei* separadas en tres recipientes por acuario, de forma que cada acuario albergaba cuatro larvas no emparentadas (2 machos y 2 hembras) distribuídas aleatoriamente. Las tres clases de recipientes determinaban el tipo de comunicación entre su interior y el acuario y por lo tanto el tipo de percepción que existía entres larvas y peces. Las larvas fueron alimentadas con nauplios de *Artemia* y con *Tubifex*. Aunque el pez utilizado es una especie introducida en Cerdeña, los depredadores reaccionaban activamente cuando detectaban visualmente las larvas de odonatos. Los resultados indicaron que la mortalidad de las larvas no se vió influenciada por la presencia de los depredadores bajo ningún tipo de comunicación, consiguiendo superar la metamorfosis aproximadamente un tercio del total. La causa de esta elevada mortalidad parece deberse al efecto del canibalismo, ya que se encontraban larvas mutiladas tanto muertas como vivas (amputación de patas y lamelas) e individuos que abandonaban los recipientes, trepando fuera del agua prematuramente, muriendo desecados, tanto en acuarios con como sin depredador.

T10-P151 **Clonal reproduction and phenotypic variability of *Azolla filiculoides* Lam. in differentiated habitats**

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Vegetative reproduction and phenotypic variability of *Azolla filiculoides* Lam., a recent invader of Mediterranean wetlands, has been assessed experimentally. Fragmentation of individuals was quantified along 254 days. The results showed that *Azolla* has a high potential for vegetative reproduction by fragmentation in the absence of environmental constraints, but this attribute changed across time. Phenotypic variability was quantified by growing *Azolla* in *a priori* stable and unstable habitats. Alometric measures, presence of sexual structures and coloration were recorded along 17 weeks. Under unfavourable environmental conditions, *Azolla* demonstrated higher morphological plasticity and developed more sexual structures to ensure population reestablishment compared to favourable habitats. Both effective vegetative reproduction and high phenotypic plasticity enhance *A. filiculoides* success as a potential invasive species in temporary ecosystems.

T10-P168 **Estudo das variáveis ambientais que influenciam a direcção de dispersão terrestre de *Procambarus clarkii***

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O lagostim vermelho da Luisiana, *Procambarus clarkii*, é uma espécie invasora dispersa pelos sistemas aquáticos a nível mundial. O objectivo deste trabalho foi identificar variáveis ambientais que afectem os padrões de movimentação deste lagostim através de meio terrestre. Testou-se em laboratório a sua movimentação em resposta a gradientes de humidade, temperatura, luminosidade, inclinação e vegetação. Para esse efeito colocou-se um lagostim no meio de um corredor com 2 metros de comprimento, sendo cada um dos extremos sujeito a diferentes valores do gradiente a testar. As experiências foram replicadas 30 vezes para cada variável, filmando-se sempre o comportamento, e os resultados foram analisados recorrendo a um teste de qui-quadrado. Não houve preferências significativas relativamente à presença de vegetação e aos gradientes de humidade e luminosidade. Quanto à temperatura, os lagostins apresentaram uma tendência significativa para se movimentarem para a zona mais fresca. O movimento do lagostim foi igualmente afectado pelo declive, havendo uma preferência significativa para uma deslocação no sentido descendente. A obtenção deste conhecimento será importante para prever a invasibilidade dos sistemas aquáticos, assim como para a identificação de medidas para a prevenção e controlo da expansão desta espécie.

T10-P175 **Desiccation survival of two successful freshwater invaders in Portugal**

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Some of the most invasive species found in Portuguese freshwaters are the Red Swamp crayfish (*Procambarus clarkii*) and the Asian clam (*Corbicula fluminea*). These species may have strong ecological and economic effects. Therefore, it is fundamental to understand the mechanisms involved in the dispersal of these two species, particularly those mediated by human activities. One of the major factors limiting the passive dispersal in freshwater environments is the desiccation of organisms during the transport (1). So, in this study we access the survival desiccation capacities of *P. clarkii* and *C. fluminea*. We performed a laboratory experiment to check how long each species would survive out of water, under controlled conditions and in the absence of wind, at a temperature of 24ºC. Probit analysis was used to assess the probability of desiccation survival and the LT_{50} and LT_{90} values were calculated for both species. *C. fluminea* presented a LT_{50} of 37.8 hours and a LT_{90} of 51 hours. For *P. clarkii* we obtained 11.9 and 17.6 hours for LT_{50} and LT_{90}, respectively. The high values for the desiccation survival may help to explain the success of both species and their high dispersal rates. From our results, desiccation survival should not act as a strong limiting factor during the transport of these organisms to new areas.

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T10-P179 ***Didymosphenia geminata* bloom as the main factor controlling invertebrate community in a regulated river**

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Didymosphenia geminata is a stalk-forming freshwater diatom which has been found primarily in oligotrophic lakes and rivers. However, it has emerged recently as a global invasive species, and several reports of nuisance blooms have increased over the last decade worldwide, include in the Ebro river basin (Tomás *et al.*, 2010). Its presence and abundance have been related to the dam and low concentrations of inorganic phosphate (Miller *et al.*, 2009). It has been suggested that *D. geminata* is the unique algae with phosphatases in the stalks surface, which are able to hydrolyze organic phosphate to inorganic, which passes to the cell via a central tube in the stalk, favoring the success of this algae in oligotrophic ecosystems (Ellwood and Whitton, 2009). we found a *D. geminata* bloom in the oligotrophic river Lumbreras (Ebro basin, Spain), located in the south of La Rioja Region. The bloom began just after a dam, with the concentration of *D. geminata* quite high during 2.5 km. At this point, where a domestic sewage without previous treatment increased 7 times the inorganic phosphate concentration in the river, the algal bloom disappeared. The objective of the present study was evaluate the possible impact of this algal bloom in the fluvial ecosystem. We studied the macroinvertebrate community in several sites downstream the dam with different physico-chemical and morphological characteristics and different concentrations of *D. geminata*. Results point to *D. geminata* biomass as the main factor controlling the macroinvertebrate community in the river. A higher relative abundance of chironomid larvae and lower family diversity were the most relevant effects of *D. geminata* dominance.

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(1) Ellwood N.T.W. and Whitton B.A. (2007) *Hydrobiologia* **592**:121-133.
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(3) Tomás P. *et al.* (2010) *Aquatic Invasions* **5(3)**:285-289.

T10-P255 **Predicting the potential distribution of decapod invaders under climate change: an analysis of uncertainty**

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In an effort to predict the impact of climate change on invasive species distributions, forecasts from niche based models have been increasingly used. We investigated the reliability of these models for predicting the future climatic suitability to four highly problematic invasive decapods of the Iberian Peninsula: *Cherax destructor*, *Eriocheir sinensis*, *Pacifastacus leniusculus* and *Procambarus clarkii*. Predictions were made for three future time periods (2030, 2050 and 2080) under a low and a high greenhouse gases emissions scenario using an ensemble of five distinct predictive algorithms: generalized linear models, artificial neural networks, support vector machines, random forests and alternating decision trees. Three criteria were examined to infer

the robustness of the forecasts: ability to predict current distributions, inter-model variability and degree of environmental extrapolation. Our results indicate an overall decline in climatic suitability for the 4 invaders as time progresses. However, we also identified highly distinct levels of predictive uncertainty among species. Good indicators of reliability were found for *Procambarus clarkii* and *Pacifastacus leniusculus*, whereas the predictions for *C. destructor* showed low predictive performance, low inter-model agreement and wide areas of environmental extrapolation. For *E. sinensis*, models also showed high variability with respect to areas projected to lose climatic suitability. Overall, our results highlight the need to consider and evaluate multiple sources of uncertainty when using NBM predictions for invaders under current and future conditions.

T10-P265 **Dispersão passiva de juvenis de *Procambarus clarkii* através de um vector animal**

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As aves aquáticas podem transportar externamente pequenos animais aquáticos. Neste contexto foi realizada uma experiência para determinar a capacidade dos juvenis de lagostim vermelho da Luisiana (*Procambarus clarkii*) se agarrarem a patas de pato, concluindo-se que o tempo de repouso das patas afecta a probabilidade de transporte. Realizou-se também uma experiência para determinar a capacidade dos juvenis se agarrarem às penas de um pato morto dependendo do movimento do pato e da profundidade da água. Os resultados desta experiência levaram-nos a concluir que os juvenis se podem agarrar a um pato em movimento e que a profundidade afecta significativamente a probabilidade de se agarrarem. Por último realizou-se uma experiência para determinar o tempo de sobrevivência dos juvenis de lagostins quando fora de água agarrados a um vector animal. Para isso recrearam-se condições semelhantes às do voo de patos e obtiveram-se valores de LT_{50} e LT_{90} respectivamente de 2,24 e 4,88 minutos. Estes resultados permitem perceber melhor os mecanismos potenciais de dispersão passiva desta espécie, contribuindo para desenvolver métodos para conter a expansão da espécie.

T10-P357 **Survival, growth, and physiological responses of Red swamp crayfish (*Procambarus clarkii*) to hypoxia condition**

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The red swamp crayfish (*Procambarus clarkii*) is distributed throughout the globe. This species invasiveness success is related to bio-ecological traits which cope with a wide range of environmental conditions, namely in degraded aquatic systems. The aim of this study is to investigate the tolerance and physiological response of *P. clarkii* to hypoxia conditions in laboratory conditions, throughout the evaluation of body condition, hepatosomatic status and growth. A significant correlation between the daily consumption of dissolved oxygen (DO) and the availability of this gas in the environment was observed. Individuals subjected to hypoxia (approx. 3mg L^{-1}) did not show body condition and hepatosomatic status significantly different from the control group. No significant differences on growth and reproductive performance were also observed between the two groups. Morover, *P. clarkii* presented a high tolerance to very low DO levels, exhibiting mortality only when exposed to concentrations bellow 0.5 mg L^{-1} during several hours. Results emphasizes the great adaptability of this species to environmental constrains, explaining their occurrence in extremely degraded habitats where oxygen are a limiting factor for most of the aquatic organisms.

T10-P445 **Interações biológicas de *Dendrocephalus brasiliensis* (Anostraca) em ambientes naturais e experimentais**

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O Anostraca neotropical dulcícola *Dendrocephalus brasiliensis*, popularmente conhecido como branconeta, tem ocorrência natural no nordeste brasileiro e vem sendo introduzida em outras regiões do país, especialmente em estações de aqüicultura, possivelmente competindo com locais. Este trabalho objetivou estudar a dinâmica populacional, produção secundária e interações biológicas de *D. brasiliensis* com espécies zooplanctônicas em ambientes naturais e experimentais, a fim de avaliar os possíveis impactos de uma eventual introdução dessa espécie em ambientes naturais onde a mesma não ocorra originalmente. Foram realizados estudos ecológicos em três lagoas temporárias no município de Urucuia (MG, Brasil) onde *D. brasiliensis* ocorre com diferentes densidades populacionais. As coletas foram realizadas por 7 dias consecutivos ao final do período chuvoso (abril/2011). Concomitantemente, foram realizados estudos em tanques experimentais onde espécies zooplanctônicas nativas do Estado de São Paulo (Brasil) foram estudadas na presença e na ausência de branconeta. Foram analisadas variáveis físicas, químicas e biológicas, além da estrutura e dinâmica populacional do zooplâncton. As análises qualitativa e quantitativa do zooplâncton evidenciaram baixa riqueza de espécies nos ambientes com maiores densidades de *D. brasilienses*. Os grupos zooplanctônicos tiveram ligação com a presença e com a densidade do Anostraca. Análises fitoplanctônicas e de clorofila a evidenciaram que lagoas com alta densidade fitoplanctônica podem ser favoráveis a alguns grupos como os rotíferos em altas densidades de *D. brasiliensis*. Nos ambientes experimentais, a espécie mostrou forte interação competitiva com cladóceros filtradores como *Diaphanosoma birgei*.

T11-Lentic ecosystems

T11-P17 **Florações de *Planktothrix agardhii* e *Cylindrospermopsis raciborskii* em reservatório brasileiro**

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Foram analisadas a estrutura, a distribuição vertical e a dinâmica semanal e sazonal de cianobactérias relacionando-as com as condições ambientais de um reservatório do semiárido brasileiro. As amostragens foram realizadas em perfil vertical semanalmente e sazonalmente em 2009 e 2010. Foram coletadas amostras para análise de variáveis físicas e químicas da água (séries do fósforo e nitrogênio, sílica, pH, oxigênio dissolvido, penetração da luz, turbidez, condutividade e temperatura da água) e das comunidades de cianobactérias (identificação, densidade, biomassa, clorofila) com garrafa de Van Dorn. Foram analisadas a biomassa, abundância, dominância e procedida a análise da variabilidade vertical e temporal. A comunidade esteve representada por dez espécies pertencentes às ordens Chroococcales, Oscillatoriales e Nostocales. As espécies *Planktothrix agardhii* e *Cylindrospermopsis raciborskii* apresentaram elevadas biomassas ao longo de toda a coluna d' água, de todas as semanas de estudo e dos dois períodos sazonais. Ao longo do estudo foram abundantes as espécies *Aphanizomenon* sp., *Anabaena* sp., *Geitlerinema amphibium* e *Microcystis panniformis*. Durante o período seco, quando ocorreu estratificação térmica e elevada turbidez, apenas *P. agardhii* foi dominante enquanto que no período de chuvas quando não houve estratificação térmica e a turbidez foi menor, *C. raciborskii* e *P. agardhii* foram dominantes. As condições de temperaturas sempre acima de 24 ºC, desestratificação térmica, boa disponibilidade de luz, elevadas concentrações de fósforo e condutividade elétrica, baixa relação NT:PT, pH alcalino foram determinantes para a co-abundância, co-dominância e a permanente floração multiespecífica de espécies de cianobactérias pertencentes aos grupos funcionais H1, M, S1, Sn.

T11-P28 **Complexidade estrutural em lagoas marginais e sua importância na distribuição da fauna bentônica**

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Avaliar os fatores ambientais que influenciam na composição dos organismos é essencial para compreender os processos ecológicos reguladores de cada sistema. Nesse estudo, analisou-se a comunidade de macroinvertebrados bentônicos em duas lagoas, marginais ao rio Paranapanema (São Paulo, Brasil). A lagoa dos Cavalos (LC) tem formato circular, não apresenta vegetação de entorno ou bancos de macrófitas em seu domínio. A lagoa do Barbosa (LB) tem formato alongado e possui *Echinochloa polystachya* em suas margens, na porção final há cobertura de *Myriophyllum* sp. e *Eichhornia azurea*. Amostraram-se vinte pontos em cada lagoa com auxílio de pegador de Van Veen, nos quais se mensurou a profundidade, a temperatura, o O_2 dissolvido, a transparência, o pH e a condutividade da água. Foi feita a análise granulométrica e de teor de matéria orgânica do sedimento. A taxa de sedimentação de material particulado foi estimada pela instalação de câmaras. Quanto às características limnológicas, a LC mostrou-se um ambiente homogêneo. Todas as variáveis, exceto a profundidade, apresentaram diferença significativa entre as lagoas, em função disso, nítidas altercações entre as comunidades foram observadas. *Chironomus gigas* foi dominante, compondo mais de 70% da comunidade na LC. A diversidade de táxons foi maior na LB, onde houve a formação de um compartimento, evidenciado principalmente pelas diferenças no teor de oxigênio e nas características do sedimento nessa região, altamente orgânico. As plantas aquáticas, principais responsáveis pela produção de detritos, favoreceram o desenvolvimento de grupos como *Campsurus* sp., possivelmente pela maior disponibilidade alimentar conferida, e, aliadas aos caracteres morfométricos próprios da LB, foram determinantes para a variação espacial encontrada.

T11-P34 **Circulação das águas do reservatório do Castanhão (NE-Brasil)**

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Os principais mecanismos que atuam na formação da estrutura vertical e horizontal de grandes reservatórios são: ventos, descargas de superfície, mistura vertical e corrente. O objetivo geral deste trabalho foi a realização de um levantamento expedito (snapshot) a fim de se estabelecer, a priori, um padrão de circulação para à região da entrada de água do reservatório, assim como quantificar as vazões nesta região. Localizado na região central do Ceará, com precipitação média anual de 700 mm, tem como principais agentes geradores de pluviosidade a Zona de Convergência Intertropical (ZCIT) e o aquecimento da Temperatura da Superfície do Mar (TSM) no Atlântico Sul. Na quadra chuvosa, o regime de ventos é de ENE, com intensidade média de 2,0 m s^{-1}. As velocidades de corrente e vazões foram obtidas com um ADCP (Sontek/YSI) e os dados hidrográficos, clorofila (Chl-*a*) e turbidez com um CTD (JFE/ASTD687). As maiores velocidades ocorreram em superfície, chegando a 1,17 m s^{-1}, fluindo preferencialmente para SW, enquanto que em meia água e no fundo observou-se uma inversão do campo de correntes, com velocidades médias de 0,34 m s^{-1}. As vazões de afluência observadas variaram entre 285,9 e 327,2 m^3 s^{-1}, sendo de 4 a 5 vezes maiores que as vazões obtidas com uso de modelos de previsão. A condutividade média foi de 0,3 uS cm^{-1}, a Chl-*a* variou entre 1,3 e 2,6 ppb, e a turbidez de 0,8 a 1,6 FTUn. A variação das propriedades físico-químicas da água mostra um soerguimento do hipolímnio até a superfície nas regiões de inversão de correntes e na tomada de água para a fruticultura irrigada. Os pigmentos fotossintéticos apresentaram comportamento oposto à turbidez, onde os valores máximos ocorreram em zonas de mínima turbidez.

T11-P55 **Modelação da dinâmica do zooplâncton das albufeiras: um complemento essencial aos planos de monitorização?**

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O presente trabalho avalia a aplicabilidade de modelos dinâmicos na previsão de tendências dos grupos mais abundantes de zooplâncton que ocorrem na Albufeira do Azibo (NE Portugal). Como não é utilizada

para produção de energia hidroeléctrica, as flutuações no nível de água são pouco acentuadas, o que torna este sistema apropriado para avaliar os efeitos das modificações naturais das variáveis ambientais nas comunidades zooplanctónicas. Previamente ao desenvolvimento dos modelos realizaram-se análises de regressão de forma a permitir discriminar as relações existentes entre a componente biótica e abiótica. Apesar destas análises serem estáticas, os dados recolhidos incluiram gradientes de alteração ao longo do tempo, de forma a captar a dinâmica destas comunidades. Para a construção dos modelos preditivos compilaram-se dados obtidos entre janeiro de 2000 e dezembro de 2002 e entre janeiro de 2007 e dezembro de 2009. Para além das amostras de zooplâncton, foram incluídas variáveis físico-químicas e meteorológicas, monitorizadas com periodicidade trimestral. A validação dos modelos baseou-se em dados independentes (não incluídos durante a construção dos modelos), obtidos entre janeiro de 2010 e dezembro de 2011. Apesar do carácter preliminar deste estudo, os resultados obtidos mostraram padrões de variação das comunidades zooplanctónicas face a cenários de alteração na qualidade da água. Será discutida a utilidade do desenvolvimento destes modelos, que ao testar cenários de alteração, permitem desenvolver medidas para evitar ou minimizar impactes sobre as comunidades zooplanctónicas e as repercussões na cadeia trófica à qual estas estão ligadas directa ou indirectamente.

T11-P59 **Presença do cladócero exótico *Bosmina coregoni* na Albufeira da Aguieira (Bacia do Mondego - Portugal)**

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Dados paleolimnológicos indicam que o centro de origem de *Bosmina coregoni* (Cladocera, Bosminidae) se localiza no Nordeste da Europa. De acordo com vários autores esta espécie tem irradiado de forma centrífuga a partir do seu centro de origem, tendo sido referenciada na Alemanha, Polónia, Norte de Itália, Bélgica e Dinamarca. Até 2010, a sua ocorrência na Península Ibérica era desconhecida. Nesse ano foi detectada pela primeira vez em Portugal na Albufeira da Aguieira (latitude 40º 20' 26.604'' N; longitude 8º 11' 48.15'' W). Durante o inverno e a primavera esta albufeira é meso-eutrófica. Após o início do Verão é geralmente classificada como eutrófica, ocorrendo "blooms" de cianobacterias e flutuações acentuadas no nível da água. No presente trabalho é realizada uma descrição taxonómica das populações ibéricas bem como uma análise da variação sazonal da população de *B. coregoni* que ocorre Albufeira da Aguieira. Relativamente à abundância desta espécie verificou-se que foi mais elevada durante o inverno e primavera, períodos em que a temperatura da água é mais baixa e em que as cianobactérias estão ausentes.

T11-P60 **Comunidade zooplanctónica da albufeira da Aguieira: variações e factores estruturantes**

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O presente trabalho tem como objectivo estudar a comunidade zooplanctónica da Albufeira da Aguieira. Esta albufeira localiza-se na Bacia do Mondego (latitude 40º 20' 26.604'' N; longitude 8º 11' 48.15'' W) e entrou em funcionamento em 1981, destinando-se quase exclusivamente à produção hidroeléctrica. Durante o inverno e a primavera é considerada meso-eutrófica, enquanto que no verão e outono é classificada como eutrófica, ocorrendo flutuações de grande amplitude no nível da água e blooms de cianobactérias. No total dos pontos amostrados, foram observados 12 taxa de Rotifera, 7 de Cladocera e 3 de Copepoda, sendo os mais abundantes o rotífero *Keratella cochlearis* (amostra de maio), o cladócero *Chydorus sphaericus* (amostra de setembro) e o copépode *C. numidicus* (amostra de dezembro). É de realçar a reduzida abundância de zooplâncton herbívoro macrofiltrador como é o caso das espécies do género *Daphnia*. A grande abundância de *C. sphaericus* na coluna de água, em zonas pelágicas, poderá ficar a dever-se ao facto da cota de água na albufeira estar num nível bastante baixo em setembro. Outro aspecto a realçar é a sua abundância máxima coincidir com a ocorrência de um bloom de cianobactérias. A Análise Canónica de Correspondência (CCA) identificou dois gradientes que influenciam a comunidade zooplanctónica. O primeiro é um gradiente temporal relacionado com a temperatura e o outro traduz um gradiente trófico associado à biomassa fitoplanctónica (concentração de clorofila *a*), transparência condutividade, nitratos e nitritos.

T11-P68 **Resposta do fitoplâncton à hidrologia da planície de inundação do lago Januacá (Amazonas, Brasil)**

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De acordo com o conceito do pulso de inundação, o ciclo hidrológico influencia a estrutura da comunidade fitoplanctônica em função do maior ou menor contato entre o rio principal e os ecossistemas adjacentes. A diluição pelas chuvas pode promover em determinadas fases o aumento na riqueza e semelhança na composição de espécies fitoplanctônicas de lagos em relação à composição da comunidade fitoplanctônica do rio principal. A pesquisa objetivou analisar a estrutura da comunidade fitoplanctônica do lago Janauacá sob influência do rio Solimões durante as cheias de junho de 2009 e maio de 2010, quando ocorre o transbordamento do rio principal. O fitoplâncton no lago Janauacá apresentou 58 taxa na primeira cheia, caracterizada como excepcional e 191 taxa na segunda, com representantes das seguintes classes, respectivamente: Chlorophyceae (41,4%; 36,6%), Bacillariophyceae (24,1%; 15,2%), Cyanophyceae (8,6%; 18,3%), Zygnemaphyceae (6,9%; 12%), Euglenophyceae (6,9%; 8,4%), Xanthophyceae (0%; 3,7%), Crysophyceae (1,7%; 1,6%), Dinophyceae (5,2%; 2,6%) e Cryptophyceae (5,2%; 1,6%). A ordenação das unidades de amostragem por meio do Escalonamento Multidimensional Não-Métrico (NMDS), a partir dos coeficientes de similaridade de Jaccard, evidenciou grupos bem delimitados pelos períodos sazonais, indicando que a comunidade fitoplanctônica no lago Janauacá não foi similar à encontrada no rio Solimões. A inundação permite a transferência de nutrientes, de organismos e de energia entre o rio e a planície possibilitando heterogeneidade de nichos e a variação nos atributos da comunidade fitoplanctônica com relação ao rio principal.

T11-P109 **Cálculo de escorrentías y aportes a los embalses del rio Rivera de Huelva**

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En la cuenca del río Rivera de Huelva se sitúan 5 embalses que abastecen a Sevilla y su área metropolitana gestionados por la Empresa Metropolitana de Abastecimiento y Saneamiento de Aguas de Sevilla (EMASESA). Dentro del proyecto MODELO DE SEGUIMIENTO Y GESTIÓN DE LA CONTAMINACIÓN EN CUENCAS VERTIENTES A EMBALSES que realiza la Universidad de Sevilla para la Empresa, como paso previo al estudio de la contaminación que potencialmente puede llegar a cada uno de ellos, se han estimado las escorrentías que pueden producirse en cada una de las subcuencas de los embalses. Para ello se ha utilizado el método del Número de Curva (NC) siguiendo lo aproximación de Témez mediante el empleo de ArcGIS 9.3. El método, que permite considerar la condición precedente de humedad del suelo, se ha aplicado de forma agregada a nivel de cuenca-piloto. Estas son definidas como las cuencas vertiente de los principales tributarios de cada uno de los embalses. Para el cálculo del NC se han utilizado los mapas de pendientes, suelos, y usos y aprovechamientos reclasificados. El modelo ha sido calibrado con los datos de aportes de cada uno de los embalses. Además de la escorrentía producida para una precipitación determinada, el NC permite estimar a partir de qué precipitación comienzan a funcionar cada una de las cuencas-piloto, así como la cantidad de agua que aportan. Los valores de NC medio obtenidos varían entre 49 y 87.

T11-P126 **Estado de conservación de los lagos de la cuenca del Ebro, selección y jerarquización de métricas**

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El proyecto de evaluación del estado de los lagos de la cuenca del Ebro según la Directiva Marco del Agua, realizado entre los años 2007 y 2010, ha permitido recopilar información para el establecimiento del estado ecológico de un total de 60 lagos, repartidos en 15 tipologías definidas por el CEDEX. Los 4 años de seguimiento han permitido constatar el mejor estado de conservación de los lagos catalogados en las tipologías de montaña, así como la necesidad de seleccionar y jerarquizar las métricas en función de la tipología evaluada. Al inicio del proyecto (año 2007) no se contaba todavía con una propuesta oficial de métricas, de modo que fue necesaria la valoración y selección de las métricas y los protocolos de muestreo que mejor permitieran recopilar los datos necesarios para la evaluación del estado de los lagos. En proyectos enfocados a la gestión y el seguimiento, la inversión de tiempo y recursos es relevante para su funcionalidad, de modo que, en el presente estudio, para determinar el estado ecológico de los lagos se sugiere un número reducido de métricas con las que obtener la máxima información sobre su estado y determinar las políticas de gestión. En conclusión, en el estudio aquí presentado se ha observado como las diferentes tipologías de lagos necesitan aproximaciones particulares y, por lo tanto, el uso de distintas métricas, para evitar errores de evaluación y/o información irrelevante.

T11-P130 **Efeitos do CDOM sobre a profundidade da camada de mistura e o clima de luz em pequenos lagos no Brasil**

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O carbono orgânico dissolvido (DOC) representa um grande reservatório de carbono em muitos sistemas e pequenas mudanças em suas concentrações podem ter uma grande significância no funcionamento dos ecossistemas aquáticos (1). A matéria orgânica dissolvida colorida (CDOM) compreende uma fração bastante expressiva no pool do DOC (2). Este estudo buscou determinar a influência de CDOM sobre o clima de luz, a atenuação da luz visível e a espessura da camada de mistura em 18 lagos do Sistema Lacustre do Médio Rio Doce, Minas Gerais. Foram realizadas duas coletas (novembro de 2007 e fevereiro de 2008), sendo determinadas as profundidades da penetração da radiação fotossinteticamente ativa (PAR), o coeficiente de atenuação escalar da luz (Ko), a irradiância média do epilímnio (Eo) e a espessura da camada de mistura (Zmix) da coluna de água nos diferentes sistemas. Adicionalmente foram coletadas amostras de água da superfície para a determinação da concentração de CDOM e clor-*a* nos lagos estudados. As medidas de Ko, Zmix e Eo apresentaram uma diferença marcante entre lagos e períodos de coleta, variando de 0,39-2,99 m^{-1}, 1-8 m e de 18,4%–53% para Ko, Zmix e Eo, respectivamente. Tanto a variação de Ko, quanto a variação da espessura da camada de mistura entre os lagos estudados podem ser explicados pelas mudanças nas concentrações de CDOM na coluna de água, ($r2=0,72$, $p<0,001$ e $r2=0,65$, $p<0,001$, respectivamente). Os resultados confirmam que a concentração de carbono orgânico dissolvido na coluna de água influencia diretamente no regime de luz e no regime térmico dos lagos do Médio Rio Doce. São discutidas as possíveis causas nas diferenças na concentração de CDOM encontradas entre os lagos estudados.

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T11-P155 **Impacto de los grandes herbivoros en lagunas temporales Mediterráneas**

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Las lagunas temporales son hábitat de gran interés para diferentes especies vegetales y albergan además organismos y procesos que no se encuentran en otros hábitat. Por esta razón estos medios son objeto de protección en algunos lugares de Europa. En algunas de estas zonas los grandes herbívoros (tanto domésticos de razas autóctonas, como salvajes) resultan muy numerosos. Para estos animales, las lagunas temporales, constituyen una fuente de alimento y de agua, sobre todo en periodos más secos. La actividad desproporcionada de los grandes herbívoros podría alterar el normal desarrollo de las poblaciones de diferentes especies vegetales, de modo directo como fuente de alimento o indirectamente por alteración de las condiciones del hábitat. El estudio que se presenta tiene como objetivo principal evaluar las variaciones de la riqueza y composición de especies vegetales, asociadas a la abundancia relativa

de herbívoros (como medida del impacto de estos animales) y se ha llevado a cabo en el sistema de lagunas temporales del Parque Nacional de Doñana. Los muestreos se han realizado durantes dos periodos hidrológicos diferentes, y se ha investigado la abundancia de herbívoros (cérvidos, jabalíes y ganado doméstico) a partir de la presencia de rastros y excrementos y la composición relativa de diferentes especies vegetales de cada laguna. Además, en el estudio se consideraron las características físicas y químicas de los puntos muestreados. Los resultados obtenidos se discuten en el panel correspondiente.

T11-P165 **Associação de macroinvertebrados aquáticos às raízes de uma macrófita flutuante em ambientes lacustres (Brasil)**

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Em seis lagoas e duas épocas distintas (março e agosto de 2009), os atributos ecológicos da comunidade de macroinvertebrados aquáticos associados à *Eichhornia azurea* foram comparados identificando os fatores ambientais controladores. As amostras de *E. azurea* foram coletadas e os macroinvertebrados extraídos após lavagem em solução de formol e água, com posterior filtração em peneira de 250 µm de malha. Foram identificados 50 taxa de macroinvertebrados, com maior riqueza registrada para os insetos aquáticos (37 taxa) distribuídos em oito ordens; sendo a ordem Diptera a mais abundante nos dois períodos de estudo. Por outro lado, maiores valores de riqueza total de taxa foram registrados em agosto. Oxigênio dissolvido e pH apresentaram o maior número de correlações significativas positivas com os diferentes taxa. Os animais mais frequentes coletados nas seis lagoas estudadas em março e agosto de 2009 foram Hirudinea, Oligochaeta, Hydrachnidiae, Conchostraca, Ostracoda, Noteridae, Ceratopogonidae, Chironomidae, Culicidae, Caenidae, Pleidae, Aeshnidae, Libellulidae, Coenagrionidae e Nematoda. A complexidade estrutural das raízes de *E. azurea*, bem como a oferta de alimento são os fatores que permitiram a colonização e a manutenção da elevada riqueza e abundância de macroinvertebrados aquáticos observada nesse estudo. O conhecimento da biologia e ecologia desses animais é fundamental na preservação da biodiversidade dos ecossistemas aquáticos continentais, uma vez que os macroinvertebrados são importantes indicadores de áreas prioritárias para a conservação, pois são utilizados como bioindicadores da qualidade da água, auxiliando na avaliação de impactos ambientais, os quais comprometem a integridade ecológica do ecossistema como todo.

T11-P197 **Nutrients and organic matter load to Pinilla Reservoir (Madrid): water quality, and management implications**

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One of the key components of the water supply scheme for the Madrid metropolitan area is the chain of reservoirs in the Lozoya River. In general terms, these reservoirs supply water with good quality, but the first reservoir of the series (Pinilla Reservoir) suffers recurrent anoxic layer developments and re-dissolution of metals from the sediment. This study wants to identify the main sources of nutrients and organic matter from the upstream watershed, and the role of the different materials on the processes that impoverishes water quality in the reservoir. From data gathered during a one-year intensive sampling program covering the whole watershed, we applied a multidisciplinary approach using classical constituents load calculations (LOADEST), watershed scale models (SPARROW), fluorescence spectroscopy of the dissolved organic matter and PARAFAC, and mass balances and empirical modeling of reservoir processes. The analyses identified several hot spots for nutrient and organic matter load to watercourses, including a WWTP that directly discharges into the reservoir. All those locations showed strong signatures of labile, human derived organic matter. Urban land uses were specially relevant for loads of ammonia, oxygen demand, and total nutrients. Mass balances and empirical models in the reservoir suggest that anoxic layer development is tied to both sediment oxygen demand and allochthonous inputs of chemical oxygen demand. Our results suggests that controlling the concentration of ammonia in the effluent of the treatment plant and spills related to the water cycle in urban areas would be the most effective measures to mitigate the eutrophication status of the reservoir.

T11-P268 **Produção de efípios em Cladocera: interferência do habitat**

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As comunidades aquáticas são diretamente influenciadas pelos pulsos de inundação e períodos de água baixa que ocorrem todos os anos na Amazônia. Desta forma, os organismos que vivem nestes ambientes precisam desenvolver estratégias para adaptar-se a esta situação. Cladocera produzem efípios por reprodução sexuada, quando as condições ambientais se tornam limitantes à sua vida ativa na coluna de água. Este trabalho objetivou analisar a produção de ovos efipiais em fêmeas de Cladocera, no Lago Tupé, Amazônia, Brasil, comparando entre diferentes habitats. As coletas foram realizadas em períodos distintos do ciclo hidrológico, compreendendo fases de enchente e vazante do lago, em áreas com macrófitas, nas margens, na zona pelágica, no fundo e no sedimento. Foram filtrados entre 500 e 980 L de água, com uma moto-bomba, por um filtro de nylon de 55 µm e as amostras fixadas com formol a 6%. Para a coleta das amostras de fundo foi usado um coletor Schindler-Patalas (12 L) coletando 36 L. Nas coletas de sedimento foi usado um coletor CORER com mensageiro. Também foram analisados parâmetros ambientais, como a temperatura, a condutividade elétrica, o oxigênio dissolvido e o pH. Os resultados obtidos mostraram haver diferença na biodiversidade e densidades dos cladóceros entre os habitats, assim como nas taxas de fecundidade e produção de efípios. A presença da macrófita *Utricularia* sp., assim como os períodos do ano, parecem interferir na dinâmica populacional destas espécies, assim como na sua estratégia reprodutiva.

T11-P273 **The role of light and nutrients on periphytic auto-heterotrophic balance**

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Periphyton communities are responsible for most of the primary production in clear-water and shallow lakes. Several studies report that these communities are mainly composed of autotrophic cells, but heterotrophic microorganisms can significantly contribute to the periphyton carbon pool. Interactions within periphyton matrix may include positive or negative associations. Dissolved organic carbon (DOC) released by algae can be utilized by bacteria, but both can compete for essential nutrients. The objective of this experiment was to access the effect of light and nutrients on the algal portion of this community. We manipulated nutrient concentrations and light availability on a factorial design, and then we added periphyton inocula from tropical shallow lakes. After 60 days, we measured chlorophyll α (Chla) concentration and periphyton biomass (BM), and calculated its autotrophic portion as the ratio between Chla and BM. Factorial ANOVA was used to determine the influence of light and nutrient availability. Chla/BM ratio was significantly affected, positively by light and negatively by nutrients, and the light influence was stronger in high nutrient concentrations. We suppose that at high light incidence and low nutrient availability, the carbon fixation is higher and cannot be assimilated due to the lack of phosphorus, so the DOC release may be enhanced, favoring the heterotrophic growth. In lower light conditions, the demand for chlorophyll production is higher, so there will be less spare of DOC if enough phosphorus is available, decoupling the growth of algae and bacteria. Therefore, we found that different frameworks of light and nutrient availability can cause changes on the periphyton matrix due to the interactions between algae and bacteria.

T11-P279 **Patrones de productividad asociados a variables fisicoquímicas en lagos altoandinos tropicales de Colombia**

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Se registró el comportamiento de algunos estimadores indirectos de productividad en tres especies de macrófitas: *Ranunculus flagelliformis*, *Myriophyllum quitense* y *Callitriche heterophylla*, y se correlacionó con variables ambientales como temperatura, pH, profundidad y saturación de oxígeno del agua para establecer si existe algún patrón ecofisiológico que sea determinante en la productividad primaria de los lagos andinos tropicales. Como estimadores indirectos de productividad se revisó la cobertura relativa de las especies (%), el contenido de clorofilas *a* y *b* (mg g^{-1}), y la relación alométrica entre biomasa seca y longitud del vástago (BS/LV; g cm^{-1}). *C. heterophylla* fue la especie con mayor cubrimiento, al estar presente en siete de nueve lagos y alcanzó en promedio 23,5% de cobertura. Su valor promedio de BS/LV indica que ésta especie tiene las mayores tasas de crecimiento. *M. quitense* abarca un amplio rango de profundidades (entre 0,15 y 1 m), mostró una cobertura promedio de 16,5%, pero con menores contenidos de clorofila total y, al igual que *R. flagelliformis*, sólo está presente en 4 lagos. Esta última especie tuvo la menor cobertura promedio (6,5%), y un alto contenido de clorofilas. Ninguno de los estimadores de productividad mostró relación con la profundidad, lo cual demuestra que existen otras variables ambientales determinantes, como la saturación de oxígeno, negativamente correlacionada con el contenido de clorofila *b* en *M. quitense*, y negativamente correlacionado con el radio de clorofilas *a/b* en *R. flagelliformis*. Igualmente, se encontró una relación positiva entre las variables ambientales profundidad y saturación de oxígeno. Los resultados obtenidos contribuyen a la delimitación del nicho de las tres especies.

T11-P287 **Estructura de los crustáceos zooplanctónicos de alta montaña tropical en la cordillera oriental de Colombia**

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Se estudiaron los crustáceos zooplanctónicos de once lagos andinos tropicales ubicados entre 3100 y 3800 metros de altura durante los años 2010 y 2011. Se tomaron muestras en la zona limnética a tres profundidades y en la zona litoral utilizando una botella Schidler-Patalas con red de 57 µm. Las muestras fueron analizadas bajo estéreo-microscopio Motic utilizando cámaras Bogorov de 5 ml de capacidad y con microscopio Nikon. Se encontraron 32 categorías en donde los cladóceros fueron el grupo más abundante (45%) seguidos por los copépodos calanoides (32%) y los ciclopoidos (12%). Los lagos presentaron entre 7 y 16 categorías taxonómicas. *Acroperus harpae* y *Bosmina* cf. *tubicen-chilense* presento la distribución más amplia. Los crustáceos son más abundantes en la zona limnética que la litoral y en la primera son más abundantes a media profundidad. El análisis nMDS muestra lagos con una estructura particular diferenciada y otros relacionados entre sí. La composición taxonómica presenta elementos neotropicales, muchos de los cuales están confinados a la alta montaña. La estructura de los crustáceos en las lagos al parecer está relacionada con la presencia de trucha, la profundidad del lago y las condiciones físico-químicas.

T11-P288 **Eutrophication gradient in cascade reservoirs in semiarid region, northeastern Brazil**

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Anthropogenic impacts on aquatic ecosystems have increased pollution and led to the cultural eutrophication of freshwater ecosystems, resulting in a deterioration of water quality. In the micro region of the semiarid Northeast of Brazil, several cascades of reservoirs were built considering their multiple uses, mainly for water supply; this is the case of Dourado (Zmax 9m) and Marechal Dutra (Zmax 18m) reservoirs. By being located in a region with high evaporation index and low precipitation, there is a trend towards greater concentration of nutrients in these water bodies. Our aim was to verify the trophic gradient of these reservoirs during the dry and rainy seasons. Monthly samples were taken during the period May 2011 to February 2012. Tendencies pointed out by principal components analysis (PCA) indicated an eutrofication gradient, with higher values of TP, DO, Chl-a in Marechal Dutra reservoir. For Dourado reservoir was not observed any heterogeneity between the sampling

points, opposite behavior was observed in the Marechal Dutra. Higher concentration of nutrients were found during the rainy season (May 2011 to July 2011) in the Dourado reservoir, and during the dry season in the Marechal Dutra. An eutrophication gradient in cascade reservoirs (Dourado-Marechal Dutra) was indentified in the semiarid region, resulting in higher eutrophication (more nutrients and chlorophyll-a) in Marechal Dutra, mainly in the sampling point near the dam (>zmax). A plausible explanation for this pattern would be that Marechal Dutra reservoir, downstream the Dourado reservoir, receives input of nutrients from the punctual and diffuse sources upstream the city (Currais Novos), converging to an eutrophication process and therefore, algal blooms.

T11-P329 **Knowledge, prediction and management of toxic Cyanobacteria blooms in the Sardinian reservoirs (Mediterranean)**

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The affirmation of toxic Cyanobacteria is considered the worst and most frequent typology of Harmful Algal Blooms (HABs) in freshwater environments, with serious consequence for human health. Under this scenario, the development of useful tools in the early prediction of toxic Cyanobacteria blooms is considered very important, as well as any indication to better manage these events. With this main objective, a research project, financed by Autonomous Region of Sardinia (L.R. 7/2007), has been carried out since 2010 in four man-made lakes (lakes Bidighinzu, Monte Lerno, Sos Canales and Torrei) of Sardinia (Italy) whose waters are used for drinking and characterised by different trophic state. The presence of potentially toxic species was observed: for some of them it was a confirmation (i.e., *Planktothrix agardhii-rubescens* group), whereas for others, this was the first report (i.e., *Anabaena Viguieri* (Denis & Fremy) and *Aphanizomenon klebahnii* (Elenkin) Pechar et Kalina) for the Mediterranean area. *A. Viguieri* and *Aph. klebahnii* are listed as toxic (microcystins). The highest cellular densities of Cyanobacteria were observed in Monte Lerno Lake in October 2010 (278 10^6 cell L^{-1}) and in Bidighinzu Lake in August 2010 (896 10^6 cell L^{-1}). Also the major toxin peaks were relieved in these two lakes and were of 4.49 ppb in Monte Lerno Lake, in April 2011, and of 2.30 ppb in Bidighinzu Lake in October 2011. nMDS highlighted significant differences among the lakes regarding the abundances of toxic Cyanobacteria and non-toxic Cyanobacteria. Further, Pearson correlations indicated a strong relationship between trophic status (Bidighinzu and Monte Lerno are the most eutrophic among the four investigated reservoirs) and the presence of toxic Cyanobacteria.

T11-P389 **Caracterização limnológica de reservatório produtor de energia elétrica na Amazônia legal**

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A crescente formação de lagos com finalidade para geração de energia é responsável por alterações ambientais e sociais significativas. Problemas de desmatamento, assoreamento e eutrofização tem se tornado cada vez mais frequentes em reservatórios brasileiros. Diante deste contexto o presente trabalho tem por objetivo avaliar as características limnológicas de um reservatório de clima tropical localizado na região norte do Brasil, na região oriental da Amazônia Legal. A área de estudo é o reservatório da Usina Hidroelétrica de Lajeado, inserido no médio curso do Rio Tocantins, localizado no estado do Tocantins. As amostras foram coletas com periodicidade trimestral, nos meses de janeiro, abril, julho e outubro de 2009, em 17 pontos amostrais. Com o auxílio de uma sonda multiparamétrica foram obtidos os seguintes parâmetros *in situ*: temperatura da água, potencial redox, oxigênio dissolvido, pH, condutividade elétrica, sólidos totais dissolvidos e turbidez. Em laboratório, de acordo com APHA (2005) foram analisados: clorofila-a, nitrogênio total, fósforo total e DBO. O índice de estrado trófico foi calculado de acordo com Lamparelli (2004), os valores obtidos demonstram um reservatório classificado como eutrófico com tendências a supereutrófico. A análise de componentes principais (ACP) realizada com as variáveis limnológicas representou 72,85% da variabilidade dos dados em quatro eixos, e os 27,15% restantes, referem-se aos demais eixos. De acordo com as associações das variáveis limnológicas com os eixos pode-se observar que o eixo 1 apresentou correlações positivas dos valores de temperatura da água (0,89) e fósforo total (0,84) fatores que evidenciam a classificação eutrófica do reservatório.

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T11-P394 **Influência da precipitação pluviométrica na reflectância espectral da água do reservatório Passo Real (RS), Brasil**

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A reflectância da água relacionada aos índices pluviométricos permite a caracterização das alterações no metabolismo da água. Este estudo estabeleceu a relação entre o índice pluviométrico e as alterações nos valores de reflectância da água no reservatório da UHE Passo Real- RS, Brasil. Os dados de reflectância foram obtidos a partir de 11 imagens do sensor Moderate Resolution Imaging Spectroradiometer (MODIS). Os valores de precipitação pluviométrica foram extraídos a partir da média de 31 estações pluviométricas da Defesa civil do Estado do Rio Grande do Sul. A análise levou em consideração a precipitação pluviométrica no período de 5, 10, 15, 20, 25 e 30 dias anteriores à passagem do satélite. Foram utilizados os dados de reflectância da banda do vermelho, centrada em 648 nm, para identificar a relação com a chuva. O ano de 2009 apresentou dois períodos distintos quanto ao regime de chuva, um seco, entre os meses de Janeiro a Julho e, outro, chuvoso entre Agosto e Dezembro. A reflectância apresentou a taxa de 0,28 a 2,05% no período seco enquanto no período chuvoso foi de 0,44 a 3,27%. Verificaram-se correlações significativas entre a reflectância da água com a chuva antecedente à passagem do sensor, sendo que o valor acumulado de chuva em 20 dias anteriores à imagem de satélite foi o que apresentou a melhor correlação identificada no compartimento aquático do rio Jacuí (0,88) e no rio Jacuí-Mirim (0,83). O compartimento aquático definido pelo rio Ingaí com a melhor correlação (0,78) ocorreu com o acumulado de chuva no período de 25 dias.

T11-P395 **Is zooplankton community structure affected by physical, chemical and environmental changes in Azorean lakes?**

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Lakes are a key element of the Azorean landscape. In the Azores, these water bodies have been subject of numerous studies but the zooplankton component has been neglected. Although zooplankton is not listed in Annex V of the Water Framework Directive (WFD) as one of the biological elements for establishing reference conditions in lakes, it is a very important chain in food webs of these ecosystems. In fact, situated between the regulators (fish) and producers (phytoplankton), zooplankton provide information on top-down and bottom-up processes and their impact on water clarity. The main purpose of this work was to analyze zooplankton community structure (species richness and species composition) in relation to lake water chemistry, lake morphology and anthropogenic pressures in lakes and watersheds. To attain this goal, twenty three lakes distributed through four Azorean islands were sampled seasonally. Two sampling methods were used: a Schindler-Patalas box, with a 61 µm net, at 1 meter depth (3 replicates per lake) and a vertical haul with a 55 µm plankton net from maximum depth. The samples were preserved in formaldehyde (5%) saturated with sucrose. Zooplankton data were analysed in relation to twenty seven environmental variables. In some islands some species were found for the first time, (*e.g. Ledygia leydigi*), but since zooplankton checklist date from 1996, it is expected that new records for the Azores will soon be added to an updated checklist. Zooplankton community structure response to environmental and physical chemical changes will be further discussed.

T11-P396 **Mapeamento de variáveis limnológicas no reservatório da Usina Hidrelétrica (UHE) Dona Francisca, RS – Brasil**

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A transformação de um ambiente lótico em um ambiente lêntico – reservatório, ocasiona diversas alterações no sistema aquático, as quais podem ser verificadas com o monitoramento contínuo das variáveis limnológicas. Este trabalho objetivou mapear a distribuição espacial e temporal de variáveis limnológicas no reservatório da UHE Dona Francisca. Foram coletados dados limnológicos entre os meses de fevereiro e outubro de 2009, em 22 estações amostrais distribuídos equitativamente nos 23,16 Km² de extensão do reservatório. As variáveis limnológicas determinadas foram: Clorofila *a* (Chl-a), Total de Sólidos em Suspensão (TSS), Carbono Orgânico Dissolvido (COD), profundidade do Disco de Secchi (DS), temperatura da água, Condutividade Elétrica (CE) e pH. Os resultados mensais obtidos para cada variável foram inseridos em um Modelo Numérico do Terreno, interpolados com uso de média ponderada e transformados em mapas temáticos. Estes mapas permitiram constatar consideráveis variações temporais e espaciais das características limnológicas do reservatório durante o período estudado. Fatores externos ao ambiente aquático como as precipitações pluviométricas e a temperatura do ar influenciaram diretamente as características da água. Nos meses com menores acumulados pluviométricos (março e abril) obtiveram-se maiores valores de DS, Chl-a e CE, situação que se inverteu nos meses mais chuvosos (agosto e setembro). Para o TSS foi encontrado um lapso de tempo de um a dois meses entre a ocorrência de períodos de menores e maiores precipitações e as concentrações mínimas e máximas de sólidos em suspensão (junho e outubro, respectivamente). Desta forma, foi possível comprovar o potencial que o mapeamento limnológico apresenta para a compreensão da dinâmica aquática daquele ambiente lêntico.

T11-P427 **Características limnológicas e a reflectância da água do reservatório Passo Real, Rio Grande do Sul, Brasil**

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A análise da reflectância da água pode indicar a presença de substâncias em suspensão ou dissolvidas na água de um ambiente aquático. O objetivo do trabalho consiste em identificar faixas espectrais relacionadas às condições limnológicas do reservatório Passo Real no Estado do Rio Grande do Sul – Brasil. Foram utilizados dados de reflectância da água obtidas pelo espectrorradiômetro FieldSpec e de quatro variáveis limnológicas em 31 estações de amostragem no reservatório, coletadas nos meses de outubro de 2009 e março de 2010. As variáveis medidas foram: totais de sólidos em suspensão, carbono orgânico dissolvido, clorofila-a e transparência da água. Com a interpretação dos dados foi analisada a resposta espectral da água do reservatório e constatou-se a influência dos constituintes opticamente ativos. Maiores concentrações de totais de sólidos em suspensão resultaram em um aumento de reflectância nos comprimentos de onda de 570 a 680 nm. As principais feições de absorção foram na região do vermelho (610 e 680 nm) foram associadas à clorofila-a e sob altas concentrações também foi observada feição de absorção na região do azul (438 nm). A análise de dados limnológicos em conjunto com dados da radiação refletida pela água foi muito importante para entender a resposta espectral padrão naquele reservatório.

T11-P458 **La Albufera de Valencia: flujos hídricos y cargas de nutrientes, elementos clave en la calidad del agua**

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La Albufera de Valencia es una laguna costera hipertrófica, rodeada de arrozales y poblaciones, cuya heterogeneidad espacial y temporal viene determinada por los flujos hídricos que recibe por sus más de 54 acequias influentes, de las cuales 20 le aportan el 85% del caudal total. El flujo medio que recibe el lago se ha estimado por medidas directas de entradas y salidas realizadas entre los años 2006 y 2010, resultando un valor promedio de 6,3 $m^3 s^{-1}$, lo cual supone unas aportaciones medias del periodo por encima de los 200 Hm^3 $año^{-1}$, que resultan ser menores que las de décadas atrás. Sin embargo, este caudal no es regular a lo largo del año, sino que presenta periodos de mayor y menor flujo en función del cultivo del arroz y de las lluvias. Las concentraciones de clorofila muestran valores medios de 200 mg m^{-3}, y máximos que sobrepasan los 350 mg m^{-3}, si bien la Albufera presenta breves fases claras al final

del invierno coincidiendo con los flujos hídricos de vaciado del marjal circundante, en las que las concentraciones de clorofila son inferiores a 10 mg m^{-3}. Las imágenes de teledetección permiten obtener mapas del estado trófico de la Albufera y de su heterogeneidad espacial, validadas con los datos de campo. Se ha constatado que las cargas de nutrientes que recibe continúan siendo muy elevadas, por lo que en la situación actual no puede pensarse en la recuperación del buen estado ecológico del lago. Las aportaciones de aguas procedentes del terciario de las EDAR de su alrededor no soluciona su carácter hipertrófico, sino que más bien resulta contraproducente por su elevada concentración de nitrógeno, con valores promedio de 50 mg N L^{-1} y cargas de hasta 10 toneladas N $día^{-1}$. Proyecto financiado por MICINN-FEDER I+D referencia CGL2009-12229 (IP: M.R. Miracle).

T11-P462 **Chironomids communities in the twin lakes of Sete Cidades (S. Miguel, Azores)**

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In spite of chironomids being the most speciose and abundant taxonomic group among macrobenthic freshwater communities in the Azores, few works have been done regarding their temporal variation in freshwater communities. The twin lakes of Sete Cidades share several of the environmental features and shape biological communities (watershead, antropogenic pressures, chemical nature of substrate), but often seem to display ecological responses to environmental factors. The work herein presented describes temporal responses of chironomids to environmental drivers in both lakes. To achieve this, bimonthly exuvial sampling was conducted for six months, between September 2011 and February 2012. In the two lakes the number of pollution tolerant species increased from September to October (e.g. *Glyptotendipes* sp., *Chironomus* sp.) when pollution sensitive species begin to recover until February (e.g. *Paratanytarsus* sp., *Polypedium* sp.), a clear indication of an improvement in lakes' condition corroborated by physicochemical data. Chlorophyll concentration was also correlated with the observed variations in chironomids revealing the close relation between benthic and water column components of the ecosystem. Overall, this study indicates that the chironomid community bears great promise for assessment of lakes. The method's greatest advantages are probably its ease of sampling, suitability for almost all aquatic habitats and a high number of chironomid species in samples, which provides a whole spectrum of responses to various stresses.

T12-Microbial ecology

T12-P9 **Parasitic chytrid fungus affects rotifers populations in Rio Grande Reservoir (SP, Brazil)**

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Many organisms can parasite rotifers. The occurrence of a parasitic chytrid fungus affecting rotifers populations in Rio Grande reservoir is here reported for the first time. In March 2009, zooplankton samples were collected in 12 sampling spots along the central axis of Rio Grande reservoir (São Bernardo do Campo, SP, Brazil), for physical, chemical and zooplankton analysis. Affected rotifers were considered the ones showing sporangium structures. The fungus was identified as belonging to the phylum Chytridiomycota, class Chytridiomycetes. Affected rotifers were found in all sampling spots in Rio Grande reservoir and 14 out of 27 rotifers species were affected. The most abundant rotifers species were *Proales* sp., *Collotheca* sp. and *Polyarthra aff. vulgaris*. *Proales* sp. and *P. aff. vulgaris* were the most affected species, however, *Collotheca* sp. was not affected at all, indicating that the parasitic chytrid fungus affects preferentially some rotifers species and may influence the rotifers distribution along the reservoir gradient. A clear gradient was observed in the zooplankton community in Rio Grande reservoir, with rotifers density decreasing near the dam. The proportion of affected rotifers displayed an opposite pattern, increasing near the dam. Although the fungus was identified in low taxonomic resolution, the report of its occurrence is extremely important as the parasitic chytrid fungus affected the host abundance along the reservoir, and may be affecting the dynamic of the whole zooplankton community. Moreover, further investigation should be carried out in order to identify the chytrid fungus in higher taxonomic resolution and, thus, to better understand the dynamic and interaction of the affected populations.

T12-P36 **Effects of light, depth and seasonality on bacterial activity in a hypereutrophic shallow lagoon**

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Bacteria play a determinant role in the carbon flux of aquatic food webs. The aim of this work is to study bacterial activity in a hypereutrophic system in relation to depth, light and seasonality. Bacterial activity was estimated by using two radiotracers: ^{3}H-leucine and ^{3}H-thymidine, whose incorporation reflect protein and DNA synthesis, respectively. The results obtained with both radiotracers can provide relevant ecological information. The study was performed in a central location of the Albufera of Valencia, a shallow coastal lagoon located 15 km south of Valencia (Spain), and consisted of eight experiments. Six experiments were carried out in winter and two in summer. Water samples were collected from three depths and incubated in situ in the light and dark. Bacterial abundance and biomass were estimated in samples stained with DAPI and counted by epifluorescence microscopy. Bacterial production was calculated from the incorporation rates of radiotracers and bacterial activity was subsequently calculated as the ratio between bacterial production and biomass. No clear pattern of bacterial activity with depth was observed with any of the radiotracers, although differences were found. Bacterial activity estimated with ^{3}H-leucine was higher in summer than in winter. Samples incubated in the light yield higher bacterial activity than those incubated in the dark. In the case of ^{3}H-thymidine, bacterial activity did not differ between summer and winter or between light treatments. Bacterial abundance, biomass and activity values laid within the ranges described in the literature for eutrophic lakes. The results suggest uncoupled synthesis of bacterial protein and DNA and indicate a complex relationship between bacterial activity and depth. Work funded by the project CGL2009-12229, MICINN.

T12-P61 **Is litter breakdown affected by the identity of dominant species in fungal decomposer assemblages?**

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Changes in community dominance are expected as an early outcome of the anthropogenic induced stresses that threaten freshwaters worldwide. These changes in community structure might impair ecosystem processes. Here, we addressed the effect of modifications in the identity of the dominant species in aquatic hyphomycete assemblages on the decomposition of alder leaves and associated fungal activity. In laboratory microcosms that simulate stream conditions, alder leaf discs were inoculated with two fungal assemblages, each composed of three species known to dominate communities during early decomposition (early assemblage: *Lemonniera terrestris*, *Tetrachaetum elegans* and *Tricladium chaetocladium*) or late decomposition (late assemblage: *Articulospora tetracladia*, *Clavariopsis aquatica* and *Tetracladium marchalianum*). For each assemblage type, the identity of the dominant species was tentatively manipulated by inoculating the microcosms with distinct proportion of conidia so that there were an even inoculum, and three uneven inocula (each dominated by a different species). Over the incubation time, all early assemblages became dominated by the same species (*T. elegans*), while manipulation of the number of conidia in the inocula successfully determined the identity of the dominant species in late assemblages. Total conidial production and respiration rates differed among early assemblages, while no differences were found in litter decomposition rate and associated fungal variables among late assemblages. The absence of a relationship between community dominance (and identity of the dominant species) and community performance suggests that assemblages even composed of a low number of species have the capacity to buffer changes in processes due to changes in species dominance.

T12-P137 **Influence of biotic and abiotic factors on the allelopathic activity of a *Cylindropermopsis raciborskii* strain**

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Cylindrospermopsis raciborskii is a toxic cyanobacterium of tropical origin which presence was reported in an increasing number of countries. Different factors may explain its invasive success: wide physiological tolerance to light and temperature intensities (1) and flexible nutrient uptake strategies (2). Recently, it was demonstrated that allelopathy may also account for its geographical expansion (3). A previous work showed that a *C. raciborskii* strain (LEGE 99043), caused a significant inhibition in the growth of the ubiquitous microalgae *Ankistrodesmus falcatus*. This work aimed to study whether the production or release of allelopathic compounds in that strain is influenced by biotic and abiotic parameters, similarly to what occurs with other cyanobacterial species. *C. raciborskii* was grown at different initial cellular density, intensity of light and temperature, and pH values, as well deprivation and excess of nutrients. Culture filtrates from different periods of growth were obtained, and *A. falcatus* was inoculated in those filtrates. The results showed significant inhibitory activity, at both low and high initial cell densities, and at different periods of growth. Certain abiotic parameters: high light and temperature intensities, and phosphate deprivation, further enhanced the allelopathic activity. The broad and distinct patterns of inhibition, suggest the action of several unidentified allelopathic compounds, which may bear particular ecological advantages. Taken as a whole, the results strengthen the potential role of allelopathy in the expansion of *C. raciborskii* into temperate climates.

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T12-P226 **Responses of microbial communities from Antarctic lakes to the increase in temperature**

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Lakes situated in the Maritime Antarctica region show an important biological activity during the austral summer. The increase in temperature and the availability of light through the water column, after the lake ice cover melt, allow an intense productive period. This melting process also produces inputs of inorganic nutrients and organic matter from the catchment, increasing its availability for the organisms. Our experimental work is focused on the response of the primary and secondary producers to the increase in temperature under high availability of light and nutrients. To test the effect of temperature, thermostatic baths were used to measure the productive response of microbial planktonic community, benthic mosses and catchment microbial mats. Our results showed a significant response of the community against the increase in temperature. The response was higher for the planktonic community and for the microbial mats being less protected to the effect of temperature. Therefore, the sensitivity of these systems to changes in temperature make them an important tool to study and monitor the climate change in the Antarctic area that is being affected by local warming.

T12-P334 **Fungal abundance and diversity during the decomposition of *Miconia* leaves in Brazilian Cerrado streams**

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Fungi are the main decomposers of organic carbon in headwater streams, a process that differs in temperate and tropical ecosystems. Noticeable differences also occur between lotic and lentic waters where plant litter decomposition contributes mostly to nutrient release. The aim of this study was to examine leaf litter decomposition rates, fungal biomass, abundance and diversity associated with leaf litter in 1st and 3rd order streams, the latter being disturbed by a dam. Senescent leaves of *Miconia* sp. were enclosed in litter bags and submerged for 3, 7, 15, 30, 45, 60 and 90 days. Decomposition rates were lower in the 1st order stream (k=0.002-0.004 d^{-1}) than in the 3rd order stream (k=0.0116 d^{-1}) or the

lentic system (k=0.0098 d^{-1}). Lower nutrient content and higher dissolved oxygen levels were found in the 1st order stream than in the 3rd order stream or the lentic system, which may have accounted for differences in decomposition rates. Maximum fungal abundance differed between the 1st (36-52x10^8 CFU mg^{-1}) and the 3rd order streams (2.9x10^8-3.54x10^8 CFU mg^{-1}), and the highest values were found in the lentic system (5-5.6x10^8 CFU mg^{-1}). Fungal abundance was high and remained stable until 60 days and decreased after 90 days in all systems. Yeasts seemed to have a greater role in the initial decomposition stages. Fungal biomass reached a peak at 60 days remaining stable after 90 days in the rainy season, but it was low during the entire dry season in all systems. Eighteen species of aquatic hyphomycetes were identified in the 1st order stream and no hyphomycetes were found in the 3rd order stream or the lentic system, and this may be related to the disturbance of water flow regime and insolation. Leaf breakdown in the Cerrado streams may be driven by nutrient availability as pointed by Gonçalves et al. (2007) and disturbances of water flow appear to affect the decomposing communities.

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T12-P354 **Evaluation of the performance of extraction of oil from microalgae with different solvents**

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The expressive increase in the production and consumption of fossil fuels on a global scale makes possible to predict their scarcity in the next 50 years. These fuels are responsible for 85% of the emissions of sulphur and 75% of the emissions of carbon in the atmosphere, contributing significantly to the environmental variations due to their contribution to the greenhouse effect and acid rain. One viable alternative to fossil fuels is to partially or totally replace petrodiesel with biodiesel because of its physical-chemical similarities. One alternative biodiesel feedstock is microalgae whose high oil content in some species makes it attractive. Microalgae grow and reproduce fast. Basically, they need only light and carbon dioxide as nutrient. Some species show about 60% of oil related to mass. This work aimed to use microalgae from a eutrophic reservoir located in the city of Carpina, 60 km from Recife - Brasil, to verify the efficiency of extracting oil using eight different solvents in Sohxlet equipment after having or not undergone ultrasonic treatment. In this way, it was possible to determine the best solvent or best combination of solvents for extraction. The phytoplankton community was represented mainly by: cyanobacteria (*Oscillatoria* sp. and *Merismopedia* sp.), Chlorophyta (*Pyrobotrys* sp.) and Euglenophyta (*Lepocinclis* sp.). The solvent with the best performance for the extraction of oil was a mixture of chloroform/methanol after ultrasonic treatment, followed by the use of methanol without previous ultrasonic treatment. It was also observed that the solvent chloroform/methanol followed by the use of ultrasonic application improved the extraction of oil of microalgae at a rate of approximately 30%. The best extraction was 24.64% (m/m).

T12-P362 **Bacterial antibiotic resistance and resistance genes in an impacted river**

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This work aims to study the abundance and dynamics of resistant fecal bacteria in an impacted stream that receives the discharges from an urban WWTP and from an antibiotic synthesis industry (AB), in less than one kilometer. For this purpose, water and sediment samples were collected to carry out susceptibility tests. Two methods were used: the agar dilution method (ADM) (*Escherichia coli*, Total Coliforms & *Enterococcus*) [cephalexin & amoxicillin] and the disc diffusion method (DDM) (*E. coli*) [penicillin, ampicillin, doxycycline, tetracycline, erythromycin, azithromycin & streptomycin]. Quantitative PCR was also carried out for the quantification of betalactamase resistance genes *bla*TEM, *bla*CTX and *bla*SHV. Density values obtained ranged over 4 log units, increasing after spills. With regard antibiotic resistance (ADM), most *E. coli* and TC were found resistant to amoxicillin, with major values after the AB discharge. In the case of Enterococcus, higher resistance to cephalexin was found. The percentage of resistance was higher in sediments closer to the AB sampling points, which may confirm that resistant bacteria are being accumulated in those points close to AB outflow. Results from the DDM showed that 100% of isolates were resistant to penicillin and erythromycin and generally high values of resistance to the rest of antibiotics were found. Multiple Antibiotic Resistance was greatly extended, and highly MAR (resistance to 4 or more antibiotics) reached values of 41% in water and 50% in sediments. Quantification of betalactamase resistance genes indicated an increase of the studied genes after discharges in case of water samples, with regard to sediments, it can be observed an increase of *bla*CTX and the emergence of *bla*SHV after the discharges in the river. *bla*TEM remains constant.

T12-P380 **Picocyanobacteria-feeding *Spirostomum teres* in the oxycline of a meromictic and monomictic lakes**

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Spirostomum teres is a very well known ciliate from oxic/anoxic boundary of water column of stratified water bodies and has been used in cyanobacteria-toxicity tests. However, information on its feeding behaviour is lacking. Fine-scale stratification of the ciliate grazing rates upon picocyanobacteria (PCY) were studied in mixolimnion and monimolimnion of the meromictic Lake La Cruz (Cuenca, Spain) and in the oxycline of warm-monomictic crater lakes Alchichica and La Preciosa (Puebla, Mexico). Fluorescently Labelled Bacteria (FLB) method was employed; DTAF pre-stained *Aeromonas* mimicking the natural PCY size distribution and/or *Synechococcus*-like cultured picocyanobacteria isolated from the lakes were offered to ciliates. Cells containing vacuoles with PCY also showed feeding upon FLB. *S. teres* was actively feeding both in anaerostat assays (bubbling with helium; Spain) and in BOD-bottles assays in *in situ* conditions (Mexican lakes). The feeding

rates were not linearly proportional to the incubation time, which was in agreement with the observed pattern of vacuole formation. FLB that had been quickly collected into very small vacuoles with 1 to 3 bacteria during the first 5 to 10 min exposure were moving through the cell and finally joined large vacuoles in the posterior end of the cell in the laboratory experiments. Also *in situ* experiments (Mexico), exposure for 20 min gave lower filter feeding results than for 10 min. Maximum clearance over 1500 nl $cell^{-1}$ h^{-1} was observed upon dissolved oxygen concentration below 1 mg L^{-1} and photosynthetic active radiation, PAR below 2 ‰. Combined use of PCY-photosynthesis products and digestion in the anaerobic conditions with an optimum light for PCY activity is hypothesized.

T12-P382 **Comparación de fingerprints de RNA y DNA para la discriminación de poblaciones activas i latentes de Archaea**

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Trabajos recientes de nuestro grupo de investigación han revelado una predominancia de grupos de archaea no cultivados (principalmente Crenarchaeota de los linajes Miscellaneous Crenarchaeotic Group (MCG) y Group C3 y Euryarchaeota del linaje Thermoplasmata) tanto en el hipolimnion anóxico como en los sedimentos de lagos cársticos. Sin embargo, la falta de representantes cultivados dificulta enormemente la interpretación de los datos ambientales ya que se desconoce tanto su metabolismo potencial como sus características fisiológicas. Así pues, determinar la actividad de estas poblaciones "in situ" y establecer su papel ecológico es difícil y requiere la aplicación y combinación de diferentes técnicas moleculares independientes de cultivo. Por este motivo, hemos ensayado y optimizado varios protocolos de extracción de RNA y DNA de comunidades de archaea de sedimentos anóxicos, plancton hipolimnético y biofilms naturales con el objetivo de comparar los "fingerprints" para el 16S rRNA obtenidos a partir de RNA (cDNA) y DNA. Asumiendo que las células activas renuevan continuamente sus ribosomas y que por tanto poseen un mayor contenido en rRNA, la comparación diferencial entre ambos perfiles permite discriminar aquellos grupos activos "in situ" de los latentes. La interpretación de estos resultados en relación con las condiciones físico-químicas en los diferentes hábitats estudiados permite además relacionar estos grupos de Archaea con metabolismos relevantes dentro del marco de procesos biogeoquímicos dominantes en estas lagunas cársticas, dominadas por un ciclo del azufre muy activo.

T12-P469 **Intraspecific diversity affects plant-litter decomposition in freshwaters**

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Aquatic hyphomycetes play a key role in the decomposition of allochthonous plant litter in freshwaters. *Articulospora tetracladia* Ingold is a dominant sporulating species in streams of the Iberian Peninsula. Previous studies showed positive relationships between fungal species richness and plant litter decomposition (1) and these relationships are expected to change with the environmental context (3). However, the relationships between intraspecific fungal diversity and key ecological processes remain largely unknown (but see 2). We used a microcosm approach to examine the effects of intraspecific diversity of *A. tetracladia* on leaf litter decomposition in the absence and presence of cadmium (Cd). Alder leaves were inoculated with combinations of 1, 2, 4, 6 and 8 strains (4 different genotypes based on internal transcribed spacer region) and the effects were analysed in terms of leaf mass loss and reproductive output. In the absence of Cd, both processes were affected by intraspecific diversity and augmented with increasing number of genotypes. The exposure to Cd significantly reduced leaf decomposition and fungal reproduction, irrespective of the number of genotypes present in the assemblage. The examined functions were greater in mixed genotypes than expected based on individual genotype performances. Moreover, the variance of fungal performances decreased with increasing genotype diversity (portfolio effect). Our data demonstrate the need to consider genetic information when assessing the effects of microbial diversity on ecological processes. FEDER-POFC-COMPETE and FCT supported this study (PEst-C/BIA/UI4050/2011, PTDC/AAC-AMB/113746/2009) and SD (SFRH/BPD/47574/2008). *, both authors gave the same contribution to the work.

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T12-P486 **Effects of inter- and intra-specific diversity of aquatic fungi on leaf litter decomposition: a microcosm experiment**

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Most studies addressing the relationships between biodiversity and ecosystem functioning focus on the species level but there is increasing evidence that intraspecific diversity matters. We manipulated the composition and the number of species and genotypes (intra-specific diversity) of aquatic fungal assemblages in microcosms to evaluate the effects of fungal biodiversity loss on biomass production and leaf litter decomposition. Results showed that the performances of fungal assemblages increased with the increase in biodiversity, particularly for biomass production, but this relationship tends to attenuate at higher levels of biodiversity. Leaf decomposition was affected by the number of genotypes and genetic divergence of the fungal assemblage, while fungal biomass was affected by assemblage composition, the number of species, the number of genotypes and genetic divergence. Results suggest that different biodiversity measures are needed to fully describe ecosystem functioning, probably because different mechanisms may explain biodiversity effects on related ecological processes. FEDER-POFC-COMPETE and FCT supported this study (PEst-C/BIA/UI4050/2011, PTDC/AAC-AMB/113746/2009; PTDC/AAC-AMB/117068/2010)

T13-Multiple stressors

T13-P86 **Tolerance and behavioural responses of saline water beetles to acute heat and osmotic stress**

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Tolerance and behavioural responses to environmental stress determine species´ capacity to deal with environmental changes; these relations influence individual survival and the persistence of populations. Information about lethal and sublethal responses is recognised as fundamental for species conservation. We used an experimental approach to explore the tolerance and behavioural responses (i.e. flight and emersion from the water) to a combination of acute heat and osmotic stress on six species of water beetles (belonging to *Enochrus*, *Nebrioporus* and *Ochthebius* genera) that inhabit saline water bodies on the Iberian Peninsula. In general, only heat stress affected survival and behavioural responses, whereas the effects of osmotic stress and the interaction between both stressors were less significant. Behavioural responses were highly dependent on the stress tolerance of the species, and response patterns were similar between congeneric species. For *Enochrus* and *Nebrioporus* species, 35-40 ºC were critical temperatures for maximum behavioural activity, and 45 ºC was lethal. In *Ochthebius* species, survival was recorded for overall treatments and behavioural responses increased with heat stress. In general, species occupying lotic habitats, less environmentally unstable habitats, were more sensitive to heat stress and displayed greater behavioural activity at critical stress levels than lentic species. However, *Enochrus* species displayed a similar tolerance, although *E. bicolor* flew more than *E. falcarius* in concordance with its higher dispersal capacity. These results indicate that species occupying lotic saline habitats in the Iberian Peninsula could be more sensitive to rapid temperature increases than their lentic relatives.

T13-P111 **Saline water beetles tolerance to salinity and anionic composition in relation to habitat occupancy**

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Physiological adaptations to saline water chemistry constitute an integral part of the ecology, evolution and biogeography of saline water organisms. In this study, we investigated how water salinity and anionic composition tolerances of the Iberian saline aquatic species are related to the habitat occupancy showed by these species. LC_{50} and median individuals survival time were estimated for three pairs of congeneric water beetle species of the *Enochrus*, *Nebrioporus* and *Ochthebius* genera exposed to different salinity and anionic composition treatments. Tolerances were compared between congeneric species with contrasted habitat occupancy (lotic-lentic). In two of the studied genera (*Nebrioporus* and *Ochthebius*) lentic species showed higher tolerances to a wider range of conductivity than lotic species, which could explain their greater geographic distribution range. However, *Enochrus* species did not show this pattern. At salinity tolerance limits for each species, anionic composition had an important effect on individual´s survival; mortality increased in treatments with higher sulphate proportions. Species inhabiting inland saline waters were more tolerant to sulphate than species inhabiting coastal brackish waters. In conclusion, the contrasted physiological tolerances observed between congeneric species seem to be correlated with the different lotic-lentic habitat features and they, could play a relevant role in possible divergences in species´ geographical distribution.

T15-Restoration of aquatic ecosystems and ecological services

T15-P76 **Factores que determinan el éxito de la revegetación con macrófitos: el caso del Tancat de la Pipa (Valencia)**

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Se ha llevado a cabo la reintroducción de macrófitos en El Tancat de la Pipa (humedal dentro del Parque Natural La Albufera de Valencia). El objetivo de esta acción es doble: intentar que la vegetación sumergida se instale de nuevo en las lagunas y averiguar cuáles son (i) los factores bióticos de interacción (peces que remueven los fondos, herbivoría por aves) y (ii) abióticos, que dificultan que tal revegetación sea exitosa. Se replantaron dos lagunas de 5 y 7 ha a mediados de marzo; las especies utilizadas fueron las fanerógamas *Myriophyllum spicatum* y *Ceratophyllum* sp. y las caráceas *Chara hispida* var. *hispida*, *C. hispida* var. *baltica*, *C. vulgaris* y *Nitella hyalina*, todas ellas recolectadas de humedales de la zona y reproducidas por esqueje en el laboratorio. En el diseño experimental se consideraron tres comunidades: a) monocultivo de *C. hispida*, b) las otras tres caráceas juntas y c) las dos fanerógamas. Los tratamientos fueron diferentes encerramientos protectores de las plántulas: 1) abierto a todo el entorno, 2) protección frente a peces y 3) como el anterior más cubriendo también su interface agua-aire (sin acceso a aves). Cada tratamiento tenía tres réplicas y cada réplica era un cercado de 1 m^2 que contenía de 10 a 16 plántulas. Cada tres semanas se evaluó la presencia de las plantas y su porte. De modo preliminar se sabe que el aumento de las temperaturas favorece el aumento de algas filamentosas y de aves acuáticas que suponen un deterioro para las praderas sumergidas en crecimiento y que *C. vulgaris* y *M. spicatum* son los macrófitos que, introducidos tempranamente en el año, pueden alcanzar el porte necesario para ser resistentes a las perturbaciones bióticas.

T15-P112 **El ciclo del agua y nosotros. ¡¡¡Cómo hemos cambiado!!!**

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En los últimos 50 años se han alterado o degradado más ríos y riberas españoles que en cualquier otro periodo de tiempo, especialmente para satisfacer la demanda de agua y de territorio provocada por la intensificación agrícola, el proceso urbanizador y la producción de energía. Este modelo de desarrollo ha generado una pérdida

considerable de biodiversidad, una disminución de la capacidad de estos ecosistemas para generar servicios de regulación relacionados con el control de la contaminación difusa, la minimización de los efectos de las perturbaciones naturales y la fertilidad del suelo de vega y la desaparición del conocimiento ecológico-local, las señas de identidad y sentido de pertenencia y el disfrute espiritual y religioso, antaño muy arraigado en el medio rural, y que formaban parte de los elementos que hacían posible el bienestar humano. En esta comunicación se contrasta, con casos de estudio, cómo la interacción del modelo económico actual y el cambio demográfico de la población española en los últimos 50 años, ha modificado o eliminado muchos de los servicios que proporcionaban los ríos y riberas españoles.

T15-P150 **Efeitos bioquímicos de extractos de alfazema (*Lavandula* sp.) no crescimento de *Chlorella vulgaris***

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Os sistemas aquáticos podem apresentar um desenvolvimento excessivo de fitoplâncton e de algas filamentosas devido à eutrofização. Para mitigar os problemas ambientais e económicos daí resultantes, tem-se procedido à aplicação de químicos, com o inconveniente da serem persistentes e potencialmente tóxicos, bem como de eficácia discutível. O laboratório de Produção de Fitoplâncton da Escola Agrária de Bragança tem vindo a desenvolver estudos sobre a utilização de plantas e dos seus extractos como algicidas/algistáticos naturais. Os resultados obtidos sugerem que os óleos essenciais testados apresentam um efeito algicida forte para duas espécies de microalgas. O efeito algicida dos óleos essenciais de alfazema no crescimento da *Chlorella vulgaris* CBSC 15-2075 foi avaliado na actividade das fosfatases. As culturas de *C. vulgaris* em fase exponencial foram expostas a óleos essenciais de alfazema na proporção de 1:120 (1 mL de óleos essenciais num total de 120 mL de cultura). Os ensaios decorreram durante 6 dias em câmaras de cultura à temperatura de 22 ºC, intensidade luminosa de 2390 lx com um fotoperíodo de 16 h/8 h luz/escuro, sendo agitados manualmente uma vez por dia. Os parâmetros determinados incluíram: taxa específica de crescimento (μ), tempo de duplicação (td), pigmentos fotossintéticos, proteínas totais e actividade da fosfatase ácida e alcalina. Com este trabalho espera-se contribuir para uma melhor compreensão dos mecanismos de acção tóxica desencadeados pelos óleos essenciais sobre as microalgas.

T15-P231 **Linking land use changes in Doñana to water demand: needs and implication for water planning**

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Land use and land cover play a crucial role in the partition of rainfall and the provision of blue water for downstream users in catchments (1). Conventional approaches to water planning have mostly focus on managing the demand side, securing blue water availability by adopting structural approaches as constructing dams and large infrastructures. Accordingly, the European Water Framework Directive has made a huge effort in order to adopt a broader perspective in relation to water management in-stream services (mainly blue) but it has done poorly to manage green water (land use and off-stream services). The socio-ecological system of Doñana (SW Spain) represents an exciting case of study to explore the interrelations between land use changes and water-related processes. The Doñana protected area, which contains one of the most important wetlands in Europe, is surrounded by a water-demanding agriculture matrix. The goal of this study is to assess how changes in land uses could alter water consumption and consequently blue water availability in aquatic systems. We assessed land use change using GIS analysis, and estimated the green and blue water flows with the model BalanceMED (2). Our results suggest that urban and agricultural uses have increased from 1956 to 2007 (590.8 and 120% respectively) while wetland's area has decreased (40%). This land use changes mainly driven by economy had a greater impact than droughts or runoff reduction.

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(2) Willaarts B *et al.* (2012) *Agricultural Water Management* **doi:10.1016/j.agwat.2011.12.019**.

T15-P254 **Uso de biofilme como bioremediador ambiental na remoção de nutrientes e aumento da transparência da água**

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Os ecossistemas aquáticos aumentam gradativamente o estado trófico, em função de causas naturais e da ação antropogênica. Dessa forma, medidas corretivas devem ser aplicadas, para que não ocorra a degradação da qualidade da água, essencial ao uso humano e à biota aquática. Trabalhos de biomanipulação têm sido propostos para a melhoria da qualidade da água. Crispim et al. (2010) realizaram experimentos de bioremediação em mesocosmos, verificando que o biofilme era mais eficiente que a macrófita *Eichornnia crassipes*, na remoção de nitrogênio e fósforo da água. Este trabalho objetivou testar o uso de biofilme em mesocosmos, com a finalidade de analisar a sua eficiência na remoção de compostos orgânicos e no aumento da transparência da água. Para isso foram utilizados tambores de 50 L que foram mergulhados em um tanque, contendo tilápias, no Departamento de Sistemática e Ecologia, na Universidade Federal da Paraíba. Tambores continham substratos de plástico para a aderência do biofilme, enquanto outros foram usados como controle, sem a presença do plástico. Amostras do tanque também foram analisadas. A água foi coletada a cada 15 dias, as amostras foram acondicionadas em garrafas e levadas ao Laboratório de Ecologia Aquática onde foram analisadas as concentrações de nitrito via o método colorímetro, nitrato pelo método redução na coluna de cádmio, amônia pelo método fenol, e o ortofosfato pelo método de ácido ascórbico. Os resultados demonstraram que a presença do biofilme fez os valores de ortofosfato e de clorofila diminuírem no final do experimento, o que torna esta metodologia eficiente para ser usada como forma de bioremediação ambiental, em casos de necessidade de remoção de nutrientes da água e diminuição da produção primária via fitoplâncton.

Reference:
(1) Crispim M.C. *et al.* (2009) *Acta Limnologica Brasiliensia* **21**:387-391.

T15-P275 **DeltaNet: an European network for sustainable management of deltas and estuaries**

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Deltas and estuaries are among the most productive and diverse aquatic ecosystems. At the same time, they are intensively exploited and impacted by human activities that strongly modify habitats and fluxes of water, sediments and nutrients. Increasing alteration of river basins together with threats of climate change, energy scarcity and biological invasions put these systems at risk. Deltas are excellent areas to study future impacts of global change because most are experiencing rapid rates of relative water level rise predicted for the near future eustatic sea-level rise. DeltaNet is a network of European deltas and estuaries (http://www.deltanet-project.eu) funded by Interreg IVC (2010-2013). The principal objective of DeltaNet is to set up a learning and policy network of European regions with deltas and estuaries. The European delta regions are geographically sensitive areas sharing many similar characteristics, problems and challenges. The many spatial and economic demands often threaten sustainable development. The planned exchange of best practices activities are organised around 5 successive sub-themes: (1) Integrated delta approach, (2) Flood and sediment management, (3) Environmental healthy deltas, and (4) Delta awareness. The 5th phase of activities will gather the results of the sub-themes and integrate them into Sustainable Coordinated Delta Policy (5). The main practical outcomes of the network will be the organization of workshops and conferences, the elaboration of documents on good practices and management recommendations, and the design of work plans for each area and for each sub-theme. DeltaNet also aims to be consolidated as a permanent network on European Deltas and Estuaries.

T15-P304 **Effects of the anesthetic eugenol (clove oil) on mosquitofish (*Gambusia* sp.): a tool for restoration?**

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A number of studies have demonstrated that substantial reduction in fish densities shifts the dominance of phytoplankton to submerged vegetation in ponds or lakes, thus improving water quality and reducing the risk of cyanobacterial blooms. This is especially relevant when fish species are invaders. Removal of these is usually carried by either electric and mechanical procedures (small and shallow systems) or with the use of toxicants, as rotenone. We designed an experiment in laboratory to test the efficacy of a natural anesthetic (eugenol, clove oil) on an invasive fish species, the mosquitofish (*Gambusia* sp.). We chose eugenol because it is considered a safe substance (US Food and Drugs Administration), traditionally elected for the anesthesia of fishes in aquaculture, and it is also used as a food additive and as a component of several deontological products in dentistry. The aim of the study was to determine the optimum concentration of the anesthetic (clove oil) for *Gambusia* sp. under controlled temperature and oxygen conditions. We also wanted to know if the product was toxic for other aquatic organisms, as tadpoles, on the selected doses. Results showed that eugenol is effective as anesthetic for the fish, and that the minimum effective dose seems not to be dangerous for tadpoles. These results are preliminary and were obtained under-controlled conditions; any action of restoration of natural aquatic system requires a series of previous tests depending on the characteristics of the area, aquatic system type and species present.

T15-P327 **Do oxbow wetlands recover their biological structure and functions after restoration?**

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In recent years restoration and creation of wetlands has become an important conservation strategy to offset their continuous loss and degradation. However, little is known about the recovery of the biological structure and functionality of floodplain wetlands. Therefore, we studied the macroinvertebrate assemblage taxonomic and life-history characteristics of four created oxbow wetlands, with different age, and compared them to three natural reference oxbow wetlands, located in the Middle Ebro River floodplain (NE Spain). Analysis of variance showed that macroinvertebrate richness (S) and abundance (N) were significantly higher in created (S=5.29±2.73; N=1194±1808) than natural oxbow wetlands (S=4.33±2.13; N=244±234), with differences being greater in the youngest created oxbow wetlands; while diversity indices were similar. Functional groups (FG, combining feeding and locomotion traits) were, in general, more diverse in created (up to 7 FG) than in natural (up to 5 FG) wetlands. Correspondence analysis showed that created oxbow wetlands were dominated by gatherers and predators such as Ephemeroptera and Odonata; while shredders and gatherers, as Decapoda and overall Oligochaeta, dominated natural wetlands. Furthermore, the macroinvertebrate community structure and functionality were influenced by local factors, especially those related to the low nutrient concentration, high oxygen concentration and habitat heterogeneity. Our results suggest that the biological structure of restored habitats recovers more efficiently over time than their biological functionality. This comparative study increases our understanding of the mechanisms by which ecological restoration support the recovery of vital ecosystem services.

T15-P378 **Prioritizing river connectivity rehabilitation actions: a graph-based approach**

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River connectivity can be defined as a functional "exchange pathway of matter, energy and organisms" and is considered to be one of the primary factors influencing the distribution of species. For this reason, longitudinal connectivity has often been recognised as a key issue in river management. Recently, it was shown that network analysis based on spatial graphs has promising applications as a tool for the assessment of connectivity in riverine systems. A potential application is the quantitative examination of cumulative effects of barriers at the scale of river networks, an issue that has seldom been addressed. In this study we used a graph theory approach to identify which barriers impacted most the structural connectivity of a river basin and which connections should preferably be restored or enhanced in order to effectively improve the overall connectivity. The River Tagus basin (Portugal) was

used as a case study. The impact of each barrier on overall connectivity was assessed either ignoring or considering its joint effect with the remaining barriers. The joint effect was studied using two approaches: (1) an historical approach in which the impact of barriers was assessed sequentially following the historical succession of construction; (2) a "forward" approach in which barriers were sequentially removed according to their impact until the effect on the overall connectivity decreased significantly. Results derived from the first approach can be linked with historical data on the occurrence of fish in order to study the effects of connectivity truncation on migratory fish fauna. The goal of the second approach is to optimize the cost efficiency of management and restoration actions, by prioritizing the targets of connectivity rehabilitation.

T15-P455 **Recolonization patterns by benthic invertebrates after restoration of degraded sediments and waterways**

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Aspects of taxonomic diversity and composition in freshwater communities are widely used to quantify water quality and measure the efficacy of remediation and restoration efforts. Recolonization patterns by benthic invertebrates after the restoration of degraded sediments and waterways in a protected ecosystem (Paul de Arzila, Portugal) were analyzed to determine the effects of these disturbances on benthic community structure. This protected wetland in the left margin of the Mondego River is included in the Natura 2000 network. Since the last decade, it has been subjected to intense human disturbance essentially due to nutrient and chemical discharges. The restoration and preservation of habitats was conducted by restoration of degraded waterways to be effective in the long term. For that, attention was given to issues as erosion control, fencing off streams, replanting indigenous vegetation and removal and long term control of introduced plant species. One of the aims of such work should be the reestablishment as far as practicable of original riparian environments. In-stream work was undertaken, planned and executed to minimize any further disturbance. Results described the spatial and temporal distribution patterns of macroinvertebrate communities and the status of stress factors in the ecosystem that affects these communities. The study tries to understand if disturbance may be an important organizational force in the macroinvertebrate assemblage settlement, and if it appears to play a significant role in community structure and organization. This evaluation pursuits the purpose of the Habitats Directive, implemented in the Portuguese (Decree-Law No.140/99).

T16-Tropical Rivers

T16-P5 **Respostas do fitoplâncton à variação hidrológica em lagoas laterais a um rio tropical**

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A modificação na estrutura da comunidade fitoplanctônica e nas variáveis abióticas da água foram examinadas em lagoas marginais com diferentes níveis de conexão com um rio tropical, submetidas às variações anuais de nível hidrológico. Os ambientes estudados estão situados na região de desembocadura do rio em um reservatório construído para acumulação de água e geração de energia elétrica. A atenuação do pulso hidrológico, devido ao grande volume de água armazenado na represa, determina um comportamento distinto do padrão observado nas áreas úmidas alagáveis. No entanto, flutuações nos níveis de água do rio foram observadas ao longo do ano: vazante, estiagem, enchente e cheia, similares às observadas em planícies de inundação. Padrão similar na flutuação da maioria das variáveis abióticas e dos atributos do fitoplâncton foi encontrado no rio e nas duas lagoas conectadas, evidenciando o elevado grau de associação que ambas mantêm com o curso de água. Na lagoa isolada, padrão de variação diferente dos demais ambientes foi verificado. A espécie *Cryptomonas brasiliensis* foi dominante em todos os ambientes na maioria dos períodos do estudo, fato relacionado com a sua estratégia de sobrevivência oportunista. No ambiente isolado, os maiores valores de riqueza e diversidade de espécies foram registrados no final da enchente e relacionados com a perturbação ocasionada pelo aumento do nível de água que parece ter atuado como um distúrbio intermediário. No rio e nas lagoas conectadas, os maiores valores dos atributos do fitoplâncton foram encontrados na estiagem, indicando que nesses ambientes o pulso hidrológico pode não representar uma perturbação intermediária, por não resultar em diversidade máxima, fato relacionado com o grande volume de água armazenado no reservatório à jusante.

T16-P18 **Variação sazonal da densidade e grupos funcionais fitoplanctônicos de um sistema em cascata - Bahia, Brasil**

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Este trabalho tem como objetivo reconhecer os padrões de distribuição sazonal e espacial da densidade e principais grupos funcionais fitoplanctônicos do rio de Contas, Bahia, Brasil, que é considerado um sistema em cascata devido a presença de dois barramentos ao longo do seu curso, os reservatório de Pedra e Funil. As coletas foram realizadas durante três anos consecutivos (2007 à 2010), compreendendo os períodos seco (dezembro e março) e chuvoso (junho e setembro), em 28 estações. As amostras foram coletadas através de arrastos verticais integrados ao longo da zona eufótica, utilizando rede de plâncton (malha de 25 µm). A densidade foi determinada através do método de Utermöhl, em microscópio invertido. Maior densidade foi registrada durante o período chuvoso, com 630.388 org. L^{-1}, enquanto no seco foi de 233.121 org. L^{-1}. De maneira geral, foi verificado que houve certo padrão longitudinal nos

valores de densidade em ambos os períodos sazonais, com os menores valores registrados nos trechos que correspondem aos reservatórios de Pedra e Funil (densidade máxima de 9.741 org. L^{-1}) e os maiores valores nos trechos a jusante destes reservatórios (densidade máxima de 95.856 org. L^{-1}). As algas verdes coloniais dos grupos F e J foram dominantes na maioria das estações nos dois períodos sazonais, com exceção, das estações localizadas a jusante do reservatório de Pedra, onde o grupo S1 (cianobactéria *Planktothrix agardhii*) passou a ser dominante durante o período chuvoso. As elevadas densidades nos trechos a jusante dos reservatórios de Pedra e Funil deve-se, provavelmente, ao aumento da influência antrópica nestes trechos, o que também explica a dominância do grupo funcional S1, comumente encontrado em ambientes com condições mais eutróficas ou com elevados níveis de trofia.

T16-P23 **A comparative study of Odonata (Insecta) in aquatic ecosystems with distinct characteristics**

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The objective of this study was to compare the taxon richness and density of Odonata larvae in four distinct environments: lotic with high pollutant load, lotic with low pollutant load, lentic disconnected from a river and lentic connected to a river. We identified a total of 1,302 Odonata larvae in the four habitats. The measured environmental variables were dissolved oxygen, pH, conductivity, suspended organic matter, air and water temperature, precipitation, depth, and the biomass of macrophytes. Lentic habitats exhibited greater Odonata larvae density than lotic habitats, except in April and December 2006. The Guareí River had high conductivity, possibly because of greater amounts of pollutants received between June and September 2006, and it showed higher density of Odonata larvae in comparison to the Paranapanema River. The studied lakes had higher temperature in the water surface and lower dissolved oxygen than the rivers. Although Odonata density was higher in lakes than in rivers, taxon richness was not altered during the study period. Nevertheless, the genera composition differed, with some taxa showing preference for certain types of ecosystems. That was the case of Calopterygidae and *Neogomphus*, which were only found in the Paranapanema River.

T16-P319 **Carbon and nitrogen dynamics in first order rivers in Atlantic Forest, São Paulo, Brazil**

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Tropical forests are known for their great storages of carbon (C) and nitrogen (N) in soil and vegetation, and for the intense cycling of these nutrients through atmosphere-plant-soil system, and processes like photosynthesis, decomposition and leaching of carbon, and mineralization, nitrification, denitrification and leaching of nitrogen. The streams that drain these forests are generally rich in dissolved organic (DOC) and inorganic (DIC) carbon, and organic (DON) and inorganic forms of nitrogen as nitrate and ammonium (DIN). The aim of this work was to investigate C and N contents in first order streams that drain the Dense Ombrofilous Montane Atlantic Forest, located in the north coast of São Paulo State, southeast Brazil, with an altitude of 1000 meters above sea level. The importance of this evaluation lies in the fact that the Atlantic Forest is one of the oldest and richest pluvial forests in the world that nowadays covers only 10% of its original area. Although the importance of this biome and our concern on its degradation, our knowledge on the functioning of this system is still poor. All the values of DIN concentration were very close to zero, below detection limits, while the median DON concentrations varied between 4 and 30 µM, approximately. The median DIC and DOC concentrations were also very low. Considering that the total carbon and nitrogen storages in these forests (soil + biomass) are approximately 450 mg ha^{-1} and 20 mg ha^{-1}, respectively, and considering the high carbon and nitrogen contents in streams that drain the same forest at 100 m of altitude, the low contents of carbon and nitrogen in the streams that drain the forest at 1000 m of altitude were surprising. Possible causes for this paradox will be discussed in this presentation.

T16-P340 **Modelagem de variáveis ambientais de uma bacia hidrográfica do litoral sul do estado de São Paulo, Brasil**

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Compreender o comportamento das variáveis ambientais é um fator de grande importância para a caracterização, monitoramento e desenvolvimento de estratégias de manejo e conservação de bacias hidrográficas. A utilização de bancos de dados elaborados em ambiente de Sistemas de Informação Geográfica é um método eficiente para obter, analisar e manipular variáveis ambientais de uma bacia hidrográfica. Nesse sentido, este trabalho teve como objetivo elaborar superfícies contínuas de dados referentes às variáveis físicas, químicas e da paisagem de uma bacia costeira no litoral sul do estado de São Paulo (Brasil) a fim de caracterizar ambientalmente a bacia e fornecer mecanismos para o monitoramento e gerenciamento dessa unidade. Para tanto foram obtidas variáveis referentes à paisagem da área de estudo, da zona ripária e variáveis limnológicas da rede hidrográfica. A partir dessas variáveis foi elaborado o banco de dados em ambiente SIG e então foram criadas as superfícies contínuas de dados denominadas de camadas ambientais. As camadas ambientais foram geradas em ambiente SIG através de protocolos geoestatísticos de interpolação de dados. Para a interpolação dos dados foi utilizado o método do inverso ponderado da distância (IDW – Inverse Distance Weighted). Os dados foram particionados em dados de treino (70%) e teste (30%) e validados através de validação cruzada. Ao todo foram geradas 16 camadas ambientais referentes à elevação do terreno, declividade das margens dos rios, cobertura vegetal na margem, abertura de dossel no canal, radiação incidente na margem, profundidade na margem, profundidade a 4 m da margem, nitrogênio total na água, fósforo total na água, oxigênio dissolvido, condutividade elétrica da água, pH da água, salinidade da água, turbidez e temperatura da água.

T16-P366 **Qualidade da água do rio Tocantins na área de influência direta do UHE Estreito (MA, Brasil)**

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A Usina Hidrelétrica de Estreito (UHE) é a oitava de uma série de hidrelétricas previstas em "cascata" no rio Tocantins, Estreito, Brasil. O presente estudo teve como objetivo conhecer a qualidade, física, química e biológica da água do rio Tocantins, na fase pré-enchimento do reservatório, visando avaliar a influência que a barragem exercerá sobre essa qualidade após a implantação da mesma, visto a escassez de informações sobre o metabolismo do rio no trecho estudado. As coletas foram trimestrais (cinco campanhas de coleta) em 20 estações de amostragem durante três períodos de seca e dois de chuva (setembro/09 a setembro/10). Foram analisados parâmetros físicos, químicos e biológicos usando-se metodologia padrão APHA (2005). Na análise global das variáveis consideradas, trata-se de um ambiente bem oxigenado, com teores relativamente baixos de cor e turbidez, ligeiramente ácido, com um restrito grau de mineralização (baixa alcalinidade, dureza e condutividade elétrica) ereduzidos teores de nutrientes enquadrando-se dentro dos padrões estabelecidos para águas de classe 2 (CONAMA nº 357/05), com exceção de alguns tributários. De fato, o trecho do rio Tocantins e alguns tributários estudados não apresentam níveis críticos de eutrofização, visto que na avaliação do Índice do Estado Trófico Médio (IET m), para as variáveis fósforo total, clorofila *a* e transparência, as águas do rio Tocantins e alguns tributários apresentam características mesotrófica (44< IET<54), no ciclo anual (Setembro/09 a Setembro/10). De acordo com os resultados, o rio Tocantins pode ser classificado como mesotrófico para transparência (índice médio 51,2), oligotrófico para fósforo total (índice médio 41,7) e mesotrófico para clorofila *a* (índice médio 53,6). Com base na análise dos elementos considerados foi possível concluir que, embora a água do rio Tocantins seja de excelente qualidade, chegam descargas poluidoras que mesmo não elevadas, principalmente na confluência de alguns tributários, podem incompatibilizar os usos da água para determinados fins.

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T16-P391 **Perturbação na comunidade fitoplanctônica em uma pequena lagoa marginal a um rio tropical**

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O pulso hidrológico, em ambientes marginais, é considerado uma perturbação que resulta em profundas alterações na comunidade fitoplanctônica. Assim, o presente trabalho teve como objetivo analisar as perturbações na estrutura do fitoplâncton em uma pequena lagoa marginal ao rio Paranapanema na zona de transição com um grande reservatório de Usina Hidrelétrica, durante um período de enchente. As coletas foram realizadas a cada três dias, entre 11 de novembro de 2004 e 10 de fevereiro de 2005, totalizando 27 amostragens. Os resultados evidenciaram a dominância de duas espécies de *Aphanocapsa* spp., por dois períodos. Em um deles a cianobactéria predominou com cerca de 80% da biomassa por mais de quatro semanas, o que pode ser considerado como um estado de equilíbrio no ambiente, que foi interrompido pelo súbito aumento no nível hidrométrico, que desestabilizou a comunidade, favorecendo a espécie oportunista *Cryptomonas brasiliensis*, que predominou com mais de 40% de biomassa por duas coletas, caracterizadas pelo súbito aumento no nível hidrométrico. A seguir houve um pico de elevação de *Botryococcus braunii*, seguido de aumento da diversidade da comunidade. Deste modo, o aumento substancial do volume de água no final de janeiro de 2005, via fluxo subterrâneo (Rio Paranapanema - Lagoa dos Cavalos), pode ser considerado uma perturbação de intensidade intermediária, segundo a Hipótese do Distúrbio Intermediário (IDH), visto os elevados valores de diversidade encontrados na lagoa, após a enchente.

T16-P399 **Valores basais de demanda bioquímica de oxigênio e concentrações de oxigênio dissolvido em rios subtropicais**

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O nível de tratamento de efluentes que são lançados em ecossistemas aquáticos subtropicais se reflete na qualidade da água. As medianas das concentrações (MC) de oxigênio dissolvido (OD) e dos valores de demanda bioquímica de oxigênio (DBO) em rios de São Paulo, Brasil, obtidas através de 10.309 dados da Companhia Ambiental do Estado de São Paulo entre 2005 e 2010, foram utilizadas para avaliar a influência do nível de tratamento de efluentes e do uso e ocupação do solo na qualidade da água. De acordo com as formas predominantes de uso e ocupação, as grandes bacias hidrográficas em que os rios se localizam foram classificadas em UGRHIs (Unidades de Gerenciamento de Recursos Hídricos) de conservação, agropecuárias e industriais. A MC de OD nos rios das UGRHIs industriais (5,2 mg L^{-1}) foi menor que as MC nos demais tipos de UGRHI, o que pode ser explicado pela maior carga de efluentes devido aos processos industriais, pela maior densidade populacional e menor nível de tratamento de esgotos. Foram utilizados dois métodos, descritos por Dodds et al. (2006), para a determinação dos valores basais das variáveis avaliadas nos rios. O Best Professional Judgement (BPJ) assume a MC nas UGRHIs consideradas mais preservadas. O método da Trisecção (MT) admite o valor da mediana da terça parte inferior dos dados de todos os rios analisados. O BPJ apresentou valores de 1,5 mg L^{-1} e 6,9 mg L^{-1} para DBO e OD, respectivamente, enquanto o MT apresentou valores de 1,0 mg L^{-1} e 7,4 mg L^{-1}. A não conformidade dos valores das MC nas diferentes UGRHIs com as concentrações basais calculadas indica a necessidade de aumentar os níveis de tratamento de esgoto antes do lançamento nos rios subtropicais analisados.

Reference:
(1) Dodds W K *et al.* (2006) *Lake and Reservoir Management* **22 (2)**:151-159

T16-P423 **Eutrophication increases CH_4 concentration and flux in a river estuarine region in RJ, Brazil.**

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Methane (CH_4) is an important greenhouse gas due its high power of infrared radiation absorption. It is produced at the final process of anaerobic carbon mineralization. Methanogenic activity depends on many environmental factors, such as supply of organic matter, salinity and presence of sulphate-reducing bacteria which compete for substrate with methanogenics. This study tested the hypothesis that a greater influence of seawater (higher salinity and sulfate concentration) will led to lowest values of CH_4 concentrations in the water column and its diffusive flux to atmosphere. We measured monthly for 2 years CH_4 concentration in water column and diffusive flux to atmosphere in two sites of Macaé River (RJ, Brazil), subjected to human impacts. Site 1 was near a estuarine region and Site 2 was inside a estuarine region, near river outfall. We also measured in water column: temperature, oxygen saturation, pH, alkalinity, salinity, and nitrogen (N) and phosphorus (P) concentrations. Site 2 presented the highest values of CH_4 concentration and diffusive flux (respectively ANOVA $p< 0.0001$ and $p= 0.0002$), which does not corroborate our hypothesis. CH_4 concentration was not significantly correlated with the other measured variables. Total N concentration ($p= 0.0130$), alkalinity ($p= 0.0030$) and salinity ($p= 0.0030$) were significantly higher (*t* test) in Site 2. The availability of substrates to methanogenesis (higher N concentrations) in site 2 was related to the higher CH_4 concentration in water column and consequently with the higher CH_4 flux to atmosphere. Our results demonstrated that organic matter availability through artificial eutrophication has higher importance to stimulate CH_4 production than the influence of seawater has to inhibit CH_4 production.

T16-P425 **Macroinvertebrados bentônicos como biondicadores de qualidade de água do Distrito Federal**

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Bioindicadores são espécies, grupos de espécies ou comunidades biológicas cuja presença, quantidade e distribuição indicam a magnitude de impactos ambientais em um ecossistema aquático e sua bacia de drenagem. O estudo foi realizado com o objetivo de verificar a qualidade da água, levando em consideração um período de seca e um de chuva e analisar as respostas da fauna bentônica à sazonalidade. Foram escolhidos dois pontos de coleta, Ribeirão Bananal, localizado no Parque Nacional de Brasília e Ribeirão Sobradinho, localizado na cidade satélite Sobradinho 1. A coleta foi realizada com o uso de redes de bentos do tipo "D". O material coletado foi separado e conservado em álcool 80%, sendo posteriormente identificado até o nível de gênero. No Ribeirão Bananal foram encontrados, no período chuvoso, 11 táxons do filo Arthopoda, no período de seca foram encontrados seis táxons. No Ribeirão Sobradinho no período chuvoso foram encontradas 2 táxons, no período de seca foi encontrada um taxon. Diante das informações e com auxílio do BMWP (Biological Monitoring Working Party Score System), modificado para o cerrado, concluímos que a qualidade do Ribeirão Bananal vai de boa a excelente, por haver uma diversidade maior tanto de ordens, quanto de número de indivíduos encontrados, enquanto o Ribeirão Sobradinho ficou classificado como muito ruim a ruim, pois não houve uma grande diversidade da fauna bentônica. Analisando os resultados, verifica-se que durante o período de seca há um maior número de indivíduos que durante o período chuvoso devido à vazão de água ser menor. Dessa forma, o trabalho realizado constitui uma ferramenta para o monitoramento e avaliação da saúde de ecossistemas aquáticos.

T16-P436 **Comunidades fitoplanctônicas do rio Sorocaba (SP/Brasil) e seus grupos funcionais: efeito de represas**

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O presente estudo visa caracterizar o rio Sorocaba em seu trecho sob influência da represa Itupararanga. Foram realizadas doze amostragens em três pontos à jusante da represa, durante um ciclo anual, por meio de coleta superficial da água, para obtenção de amostras de fitoplâncton e variáveis ambientais. O fitoplâncton foi composto por 95 espécies, predominando quatro grupos taxonômicos: Chlorophyta (35,8%), Cyanobacteria (16,8%), Bacillariophyta (21,1%), e Euglenophyta (14,7%). As cianobactérias foram mais abundantes nos três pontos de amostragem e durante os meses de maior precipitação pluviométrica, sem diferenças significativas entre os pontos (Kruskal-Wallis, p=0,301). A comparação entre os pontos de amostragem sugere que o OD (r=0,052) e a vazão (r=0,028) foram as variáveis de maior correlação positiva com cianobactérias e os outros grupos taxonômicos. Apenas num afluente não foi detectada correlação significativa entre cianobactérias e outros grupos taxonômicos (p=0,174), sofrendo maior influência da vazão vertida da represa, com maior abundância de clorococales e fitoflagelados (euglenóides e dinoflagelados). As cianobactérias foram utilizadas para caracterizar funcionalmente o sistema rio-represa, especialmente, *Anabaena sphaerica, A. spiroides* (Grupo H1, ambientes mesotróficos), *Cylindrospermopsis raciborskii* (Grupo SN, camadas mornas, mescladas), *Planktothrix* sp. (Grupo S1, camadas turvas, mescladas), *Spirulina princeps* (Grupo S2, ambientes rasos, turvos, camadas mescladas) e *Woronichinia* sp. (Grupo LO, lagos mesotróficos, epilímnio de verão). Sugere-se que os grupos funcionais do fitoplâncton podem ser utilizados no monitoramento, manejo e reabilitação de rios e bacias hidrográficas impactadas.

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