



# RIVER CONSERVATION UNDER WATER SCARCITY

Integration of water quantity and quality in  
Iberian Rivers under global change

20-21 October 2014  
Tarragona, Spain



## ORGANIZERS

TECNATOX

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SCARCE is a multipurpose project that aims to describe and predict the relevance of global change impacts on water availability, water quality and ecosystem services in Mediterranean river basins of the Iberian Peninsula, as well as their impacts on the human society and economy. The project has assembled a multidisciplinary team of leading scientists in the fields of hydrology, geomorphology, chemistry, ecology, ecotoxicology, economy, engineering and modelling, in an unknown effort in the CONSOLIDER framework. The topics of the Final SCARCE International Conference are:

- Integrating the effects of chemical quality with environmental stressors on biodiversity and human risks
- Linking chemical exposure and biological effects
- Integrated assessment of water quantity and quality and Global Change
- Integrating results to predict global change impacts on freshwater ecosystem services
- Global change and adaptation and mitigation measures
- Prediction of future threats and mitigation proposals in the light of the analysis of the economic and social impacts
- Water scarcity, freshwater ecosystem services and integration in RBMPs
- Integrating science and policy

Integration of water quantity and quality in Iberian Rivers under global change is a core element in this Conference. This SCARCE conference will provide a multidisciplinary framework for discussion of integration of basic research, like long-term patterns and mechanisms that operate in the hydrology, water quality, habitat dynamics, ecosystem structure and function of watersheds, and the effects of climate and global change on the ecosystem services they provide, with water management practices.

The Conference is planned in form of oral talks, posters and discussions, where experts from different fields can share their knowledge.

The conference invites to anyone working on water sustainability to share knowledge to face a changing world in water resources management.

The conference will be held at:

*Aula Magna Campus Catalunya*  
Avinguda Catalunya, 35  
43002 Tarragona

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# FINAL PROGRAMME

Monday, 20<sup>th</sup> October 2014

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9.00 - 9.30 Registration

9.30 - 10.15 Welcome

Josep A. Ferré<sup>1</sup>, Josep Poble Tous<sup>2</sup>, Marina Villegas<sup>3</sup>, Marta Schuhmacher<sup>4</sup>  
and Damià Barceló<sup>5,6</sup>

<sup>1</sup>Chancellor of the University Rovira i Virgili

<sup>2</sup>President of the Diputació de Tarragona

<sup>3</sup>Director of Research Projects, Ministry of Economy and Competitiveness, Government of Spain

<sup>4</sup>AGA research group, Departament d'Enginyeria Química, Universitat Rovira i Virgili, Tarragona, Spain

<sup>5</sup>Water and Soil Quality Research Group, IDAEA-CSIC, Barcelona, Spain

<sup>6</sup>Catalan Institute for Water Research (ICRA), Girona, Spain

## Introduction to global change and water scarcity

*Chairperson: Marta Schuhmacher*

10.15 - 10.45 *Opportunities for research in water in H2020. Interactions with JPI Water*

Marina Villegas

*Director of Research Projects, Ministry of Economy and Competitiveness, Government of Spain*

10.45 - 11.30 SCARCE: Executive summary results and achievements Dec2009-Oct 2014

Damià Barceló<sup>1,2</sup>

<sup>1</sup>Water and Soil Quality Research Group, IDAEA-CSIC, Barcelona, Spain

<sup>2</sup>Catalan Institute for Water Research (ICRA), Girona, Spain

11.30 - 12.10 Poster session/Coffee break

## Session I: Integrated assessment of water quantity and quality and Global Change

*Chairperson: Ralf Ludwig*

12.10 - 12.40 *Anthropogenic organic pollutants in riverine and coastal waters as indicators for local and regional scale climate change*

Roland Kallenborn

*Department of Chemistry, Biotechnology and Food Sciences (IKBM), Norwegian University of Life Sciences (NMBU), Aas, Norway*

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**12.40 - 13.10** *Climate change effects on seafood safety and physiology in contaminated environments*

*Ana Luísa Maulvault<sup>1</sup>, Ana Custódio<sup>1</sup>, Patrícia Anacleto<sup>1</sup>, Tiago Repolho<sup>2</sup>, Maria Leonor Nunes<sup>1</sup>, Rui Rosa<sup>2</sup> and António Marques<sup>1</sup>*

<sup>1</sup>*Division of Aquaculture and Seafood Upgrading. Portuguese Institute for the Sea and Atmosphere, I.P. (IPMA), Lisbon, Portugal*

<sup>2</sup>*Guia Marine Laboratory, Center of Oceanography, University of Lisbon (FCUL), Lisbon, Portugal*

13.10 - 15.00 Lunch

**Session II: Ecological stressors and hydrological and morphological changes**

*Chairperson: Teresa Ferreira*

**15.00 - 15.30** *Certainties and uncertainties in river discharge predictions over the Iberian Peninsula in the next decades*

*Matteo Zampieri<sup>1</sup> and Silvio Gualdi<sup>1,2</sup>*

<sup>1</sup>*EuroMediterranean Center for Climate Change (CMCC), Bologna, Italy*

<sup>2</sup>*Istituto Nazionale di Geofisica e Vulcanologia (INGV), Bologna, Italy*

**15.30 - 15.50** *Effects of flow regulation on the Geomorphic Status of rivers in Spain*

*Gemma Lobera<sup>1</sup>, Pedro Besné<sup>2</sup>, Damià Vericat<sup>1,3,4</sup>, José Andrés López-Tarazón<sup>1,5</sup>, Alvaro Tena<sup>1</sup>, Ibon Aristi<sup>6</sup>, José Ramón Díez<sup>7</sup>, Askoa Ibisate<sup>7</sup>, Aitor Larrañaga<sup>6</sup>, Arturo Elosegi<sup>6</sup> and Ramon J. Batalla<sup>1,3,8</sup>*

<sup>1</sup>*Fluvial Dynamics Research Group-RIUS, University of Lleida, Lleida, Spain*

<sup>2</sup>*Department of Geography, Prehistory and Archaeology, University of the Basque Country, Vitoria-Gasteiz, Spain*

<sup>3</sup>*Forest Sciences Centre of Catalonia, Solsona, Spain*

<sup>4</sup>*Institute of Geography and Earth Sciences, Aberystwyth University, Ceredigion, UK*

<sup>5</sup>*School of Natural Sciences and Psychology, Liverpool John Moores University, Liverpool, UK*

<sup>6</sup>*Faculty of Science and Technology, University of the Basque Country, Bilbao, Spain*

<sup>7</sup>*Faculty of Education, University of the Basque Country, Vitoria-Gasteiz, Spain*

<sup>8</sup>*Catalan Institute for Water Research, Girona, Spain*

**15.50 - 16.10** *Impact of dams on biogeochemical processes in Iberian rivers*

*Daniel von Schiller<sup>1</sup>, Lydia Ponsatí<sup>1</sup>, Ibon Aristi<sup>2</sup>, Maite Arroita<sup>2</sup>, Vicenç Acuña<sup>1</sup>, Arturo Elosegi<sup>2</sup> and Sergi Sabater<sup>1,3</sup>*

<sup>1</sup>*Catalan Institute for Water Research, Girona, Spain*

<sup>2</sup>*University of the Basque Country, Bilbao, Spain*

<sup>3</sup>*University of Girona, Girona, Spain*

**16.10 - 16.30** *River channel geomorphological adjustments to global change through the analysis of historical images in Iberian rivers*

*Pedro Besné Torre and Askoa Ibisate González de Matauco*

*Department of Geography, Prehistory and Archaeology. University of the Basque Country, UPV/EHU, Vitoria-Gasteiz, Spain*

16.30 - 17.10 Poster session/Coffee break

## Session II: Ecological stressors and hydrological and morphological changes (cont.)

*Chairperson: Yolanda Picó*

- 17.10 - 17.30** Novel metabolomic responses in fluvial biofilm exposed to drought and pharmaceuticals compounds  
Diana Álvarez-Muñoz<sup>1</sup>, Albert Serra-Compte<sup>1,2</sup>, Natàlia Corcoll<sup>1</sup>, Belinda Huerta<sup>1</sup>, Sara Rodríguez-Mozaz<sup>1</sup>, Sergi Sabater<sup>1,2</sup> and Damià Barceló<sup>1,3</sup>.  
<sup>1</sup>Catalan Institute for Water Research (ICRA), Girona, Spain  
<sup>2</sup>Institute of Aquatic Ecology, University of Girona, Girona, Spain  
<sup>3</sup>Water and Soil Quality Research Group, Department of Environmental Chemistry, IDAEA-CSIC, Barcelona, Spain
- 17.30 - 17.50** Water scarcity in humid-climate streams: a manipulative experiment  
Arturo Elosegi<sup>1</sup>, Ibon Aristi<sup>1</sup>, Maite Arroita<sup>1</sup>, Lorea Flores<sup>1</sup>, José Manuel González<sup>2</sup>, Aitor Larrañaga<sup>1</sup>, Miren Martínez<sup>3</sup>, Aingeru Martínez<sup>1</sup>, Olatz Pereda<sup>1</sup> and Libe Solagaistua<sup>1</sup>  
<sup>1</sup>Department of Science and Technology, University of the Basque Country, Bilbao, Spain  
<sup>2</sup>School of Experimental Science and Technology (ESCET), University Rey Juan Carlos, Móstoles, Spain  
<sup>3</sup>Department of Engineering, University of the Basque Country, Bilbao, Spain
- 17.50 - 18.10** Modelling hydroecological processes in semi-arid riparian areas  
Alicia García-Arias<sup>1</sup> and Félix Francés<sup>1</sup>  
<sup>1</sup>Research Institute of Water Engineering and Environment, Universitat Politècnica de València, Valencia, Spain
- 19.30 - 21.00** Touristic route
- 21:00** Joint Dinner

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**Tuesday, 21<sup>st</sup> October 2014**


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**Session III: Linking chemical exposure and biological effects**
*Chairperson: Isabel Muñoz*

**9.00 - 9.20**     *Atmospheric deposition increases of PCBs and decreases of other organochlorine compounds in remote European areas*  
Joan O. Grimalt

*Department of Environmental Chemistry, IDAEA-CSIC, Barcelona, Spain*

**9.20 - 9.40**     **Wastewater effluents as the principal emission source of pharmaceuticals to Iberian River Basins (Spain)**  
Victoria Osorio<sup>1</sup>, Aitor Larrañaga<sup>2</sup>, Jaume Aceña<sup>1</sup>, Sandra Pérez<sup>1</sup> and Damià Barceló<sup>1,3</sup>

<sup>1</sup>Water and Soil Quality Research Group, Department of Environmental Chemistry, IDAEA-CSIC, Barcelona, Spain

<sup>2</sup>Department of Science and Technology, University of the Basque Country, Bilbao, Spain

<sup>3</sup>Catalan Institute for Water Research (ICRA), Girona, Spain

**9.40 - 10.00**     **Pharmaceuticals fate and effects in WWTP effluent influenced rivers**  
Vicenç Acuña<sup>1</sup>, Ibon Aristi<sup>2</sup>, Ignasi Aymerich<sup>1</sup>, Damià Barceló<sup>1,3</sup>, María Casellas<sup>1</sup>, Natalia Corcoll<sup>1,4</sup>, Lluís Corominas<sup>1</sup>, Belinda Huerta<sup>1</sup>, Mira Petrovic<sup>1,5</sup>, Manel Poch<sup>6</sup>, Lidia Ponsati<sup>1</sup>, Sara Rodríguez-Mozaz<sup>1</sup>, Albert Ruhl<sup>7</sup>, Sergi Sabater<sup>1,8</sup>, Daniel vonSchiller<sup>1</sup> and Arturo Elosegi<sup>2</sup>

<sup>1</sup>Catalan Institute for Water Research (ICRA), Girona, Spain

<sup>2</sup>Faculty of Science and Technology, University of the Basque Country, Bilbao, Spain

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<sup>4</sup>Dept. Biological and Env. Sciences, University of Gothenburg, Gothenburg, Sweden

<sup>5</sup>ICREA, Barcelona, Spain

<sup>6</sup>Laboratory of Chemical and Environmental Engineering, University of Girona, Girona, Spain

<sup>7</sup>School of Life Sciences, Arizona State University, Tempe, U.S.A.

<sup>8</sup>Institute of Aquatic Ecology, University of Girona, Girona, Spain

**10.00 - 10.20**     **Bioaccumulation of emerging pollutants in Mediterranean freshwater fish**  
Yolanda Pico<sup>1</sup>, Vicente Belenguer<sup>1</sup>, Cayo Corcellas<sup>2</sup>, Silvia Díaz-Cruz<sup>2</sup>, Ethel Eljarrat<sup>2</sup>, Marinel.la Farré<sup>2</sup>, Francisca Pérez<sup>2</sup>, Pablo Gago-Ferrero<sup>2</sup>, Belinda Huerta<sup>3</sup>, Alícia Navarro-Ortega<sup>2</sup>, Mira Petrovic<sup>3</sup>, Sara Rodríguez<sup>3</sup>, Laia Sabater<sup>2</sup>, Giselle Santin<sup>2</sup> and Damià Barceló<sup>2,3</sup>

<sup>1</sup>Food and Environmental Safety Research Group, University of Valencia, Burjassot, Spain

<sup>2</sup>Water and Soil Quality Research Group, Department of Environmental Chemistry, IDAEA-CSIC, Barcelona, Spain

<sup>3</sup>Catalan Institute for Water Research (ICRA), Girona, Spain

**10.20 - 10.40**     **Occurrence and distribution of perfluoroalkyl substances in Ebro and Guadalquivir Rivers. Two different study cases**  
Julián Campo<sup>1,2</sup>, Ana Masiá<sup>2</sup>, Yolanda Picó<sup>2</sup>, Marinel.la Farré<sup>3</sup>, Damià Barceló<sup>3,4</sup>

<sup>1</sup>Desertification Research Centre (CIDE-CSIC, GV, UV). Moncada, Valencia, Spain.

<sup>2</sup>Food and Environmental Safety Research Group, University of Valencia, Burjassot, Spain

<sup>3</sup>Department of Environmental Chemistry (IDAEA-CSIC), Barcelona, Spain

<sup>4</sup>Catalan Institute of Water Research (ICRA) Girona, Spain

- 10.40 - 11.00 Occurrence, risk assessment and prioritization of 200 organic contaminants and metals in water and sediment of four Iberian rivers  
Maja Kuzmanović<sup>1</sup>, Núria de Castro-Català<sup>2</sup>, Antoni Ginebreda<sup>1</sup>, Mira Petrović<sup>3,4</sup>, Isabel Muñoz<sup>2</sup> and Damià Barceló<sup>1,3</sup>  
<sup>1</sup>Institute of Environmental Assessment and Water Research (IDAEA-CSIC), Barcelona, Spain  
<sup>2</sup>Department of Ecology, University of Barcelona, Barcelona, Spain.  
<sup>3</sup>Catalan Institute for Water Research (ICRA), Girona, Spain.  
<sup>4</sup>Catalan Institution for Research and Advanced Studies (ICREA), Barcelona, Spain

11.00 - 11.30 Poster session/Coffee break

#### Session IV: Integrating results to predict impacts on freshwater ecosystem services and integration in RBMPs

*Chairperson: Vicenç Acuña*

- 11.30 - 12.00 *Riparian communities as sentinels for global changes and providers of ecosystem services*  
Teresa Ferreira  
*Instituto Superior de Agronomia, Universidade Técnica de Lisboa, Lisboa, Portugal*
- 12.00 - 12.20 Maximization of ecosystem services by the implementation of the River Basin Management Plan (RBMP) in the Llobregat basin  
Marta Terrado<sup>1</sup>, Andrea Momblanch<sup>2</sup>, Vikas Kumar<sup>3</sup>, Laurie Boithias<sup>1</sup>, Sergi Sabater<sup>1,4</sup>, Marta Schuhmacher<sup>3</sup>, Abel Solera<sup>2</sup> and Vicenç Acuña<sup>1</sup>  
<sup>1</sup>Catalan Institute for Water Research, Girona, Spain  
<sup>2</sup>Research Institute for Water and Environmental Engineering, Universitat Politècnica de València, Spain  
<sup>3</sup>Environmental Analysis and Management Group, Department of Chemical Engineering, Universitat Rovira i Virgili, Tarragona, Spain  
<sup>4</sup>Institute of Aquatic Ecology, Universitat de Girona, Spain
- 12.20 - 12.40 Exploring the future of ecosystem services through a participatory approach in Isla Mayor, Andalusia, Spain  
Sherman Farhad<sup>1</sup>, Miquel A. Gual<sup>1</sup> and Francesc La Roca<sup>2</sup>  
<sup>1</sup>Departamento de Economía, Mét. Cuantitativos e Hª Económica, Universidad Pablo de Olavide, Spain  
<sup>2</sup>Departamento de Economía Aplicada, Universitat de València, Spain
- 12.40 - 13.00 In-stream processes in the nutrient retention ecosystem services: the importance of river networks at the watershed scale  
María Sánchez-Canales<sup>1</sup>, Rafa Marce<sup>2</sup>, Vicenç Acuña<sup>2</sup>, F. Javier Eloza<sup>1</sup>  
<sup>1</sup>Universidad Politécnica de Madrid, Escuela Técnica Superior de Ingenieros de Minas, Madrid, Spain  
<sup>2</sup>Institut Català de Recerca de l'Aigua (ICRA), Girona, Spain
- 13.00 - 14.40 Lunch

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## Session V: Global change and adaptation and mitigation measures

*Chairperson: Sebastian Birk*

**14.40 - 15.10** *Climate induced changes on the hydrology of Mediterranean basins: Lessons learned from the CLIMB project - Now what?*

Ralf Ludwig and the CLIMB consortium

Department of Geography, Ludwig-Maximilian-Universitaet Muenchen, Munich, Germany

**15.10 - 15.30** **Assessment of Global change impacts on groundwater resources in Souss-Massa basin**

Redouane Choukr-Allah<sup>1</sup>, Abdelaziz Hirich<sup>1</sup> and Abdessadek Nrhira<sup>2</sup>

<sup>1</sup>Agronomic and Veterinary Medicine Hassan II Institute, Agadir, Morocco

<sup>2</sup>Watershed Basin Agency (ABH) of Souss Massa Daraa, Agadir, Morocco

**15.30 - 15.50** **Detection and attribution of global change effects on river nutrient concentration dynamics in SCARCE basins**

Rosana Aguilera<sup>1</sup>, Rafael Marcé<sup>1</sup> and Sergi Sabater<sup>1,2</sup>

<sup>1</sup>Catalan Institute for Water Research (ICRA), Girona, Spain

<sup>2</sup>Institute of Aquatic Ecology, Faculty of Sciences, University of Girona, Girona, Spain

**15.50 - 16.10** **Water availability variation at the Ésera River Basin (Spain) due to climate change and its influence on water management**

Abel Solera<sup>1</sup>, María Pedro-Monzonis<sup>1</sup>, Gianbattista Bussi<sup>2</sup>, Andrea Momblanch<sup>1</sup> and Félix Francés<sup>1</sup>

<sup>1</sup>Research Institute of Water and Environmental Engineering, Technical University of Valencia, Spain

<sup>2</sup>School of Geography and the Environment, University of Oxford, United Kingdom

**16.10 - 16.50** **Poster session/Coffee break**

## Session VI: Integrating science, economic and social impacts and policy

*Chairperson: Sergi Sabater*

**16.50 - 17.20** *Managing multiple stress for multiple benefits: Towards new scientific concepts, methods and tools in river basin management*

Sebastian Birk and Daniel Hering

Department of Aquatic Ecology, University of Duisburg-Essen, Essen, Germany

**17.20 - 17.40** **Application of outranking method to adaptation strategies for water supply management**

Vikas Kumar<sup>1</sup>, Luis Del Vasto-Terrientes<sup>2</sup>, Tzu Chi Chao<sup>2</sup>, Aida Valls<sup>2</sup> and Marta Schuhmacher<sup>1</sup>

<sup>1</sup>AGA research group, Departament d'Enginyeria Química, Universitat Rovira i Virgili, Tarragona, Spain

<sup>2</sup>ITAKA research group, Departament d'Enginyeria Informàtica i Matemàtiques, Universitat Rovira i Virgili, Tarragona, Spain



## Final programme

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17.40 - 18.00 How can an ES approach linked to deliberative scenarios contribute to the WFD implementation?

Francesc La-Roca<sup>1</sup>, Graciela Ferrer<sup>1</sup> and José Ramón Díez<sup>2</sup>

<sup>1</sup>Department for Applied Economics, University of Valencia, Valencia, Spain

<sup>2</sup>Department of Mathematics and Experimental Sciences Didactics, University of the Basque Country, Vitoria-Gasteiz, Spain

18.00 - 18.20 Evaluation of economic impacts of drought events: evidences from some areas in Europe

Dario Musolino and Alessandro de Carli

CERTeT (Centre for Research on Regional Economics, Transport and Tourism), Bocconi University, Milan, Italy

## Final remarks and closure of the meeting

18.20 - 18.30 Final remarks and closure of the meeting

18.30 End of meeting

*In italics, invited presentations*

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**Posters**


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**Session I: Integrated assessment of water quantity and quality and Global Change**

- 1.- **Problems arising from industrial, urban and agricultural activities on the aquifers of the lower reaches of the river Francolí**  
Diana Puigserver, José M<sup>a</sup> Carmona, Xavier Font and Manuel Viladevall  
 Departament of geochemical, geological survey and petrology, University of Barcelona, Barcelona, Spain
  
- 2.- **Is reclaimed water for agricultural irrigation a source of contaminants in vegetables?**  
 Carme Biel<sup>1</sup>, Robert Savé<sup>1</sup>, Pere Muñoz<sup>1</sup>, Diana Calderón<sup>2</sup>, Víctor Matamoros<sup>2</sup> and Josep M. Bayona  
<sup>1</sup>Environmental horticulture, IRTA  
<sup>2</sup>Environmental Biogeochemistry, IDAEA-CSIC, Barcelona, Spain
  
- 3.- **Water resources stochastic modeling and prediction -a comparison between box-jenkins and kalman filtering methods**  
Khadidja Boukharouba and Ahmed Kettab  
 Laboratoire de Recherche des Sciences de l'Eau-LRS-EAU Ecole Nationale Polytechnique (E.N.P), Alger
  
- 4.- **Assessment of the potential of the Wastewater Treatment and Reuse in Morocco under climate and global changes**  
Redouane Choukr-Allah<sup>1</sup> and Abdessadek Nrhira<sup>2</sup>  
<sup>1</sup>Agronomic and Veterinary Medicine Hassan II Institute, Complex of Horticulture, Agadir, Morocco  
<sup>2</sup>Watershed Basin Agency (ABH) of Souss Massa Daraa, Agadir, Morocco
  
- 5.- **Characterizing the importance of regional groundwater systems in the base flow of a Mediterranean stream using hydrochemistry, Ra isotopes and Rn**  
Albert Folch<sup>1</sup>, Anna Menció<sup>2</sup>, Jordi Garcia-Orellana<sup>3</sup>, Joan Bach<sup>4</sup>, Vanessa Galán<sup>1</sup>, Valentí Rodellas<sup>3</sup>, Marc Cerdà<sup>3</sup> and Josep Mas-Pla<sup>5</sup>  
<sup>1</sup>Hydrogeology Group (UPC-CSIC), University Politècnica de Catalunya-BarcelonaTech, Barcelona, Spain  
<sup>2</sup>Department of Environmental Science, University of Girona, Girona, Spain  
<sup>3</sup>Department of Physics-ICTA, University Autònoma de Barcelona, Bellaterra, Spain  
<sup>4</sup>Unit of External Geodynamics and Hydrogeology, University Autònoma de Barcelona, Bellaterra, Spain  
<sup>5</sup>Catalan Institute for Water Research, Girona, Spain

**Session II: Ecological stressors and hydrological and morphological changes**

- 6.- **Assessment of the sediment ecotoxicological status in four Iberian rivers**  
 Núria de Castro-Català<sup>1</sup>, Maja Kuzmanovic<sup>2</sup>, Neus Roig<sup>3,4</sup>, Jordi Sierra<sup>3,5</sup>, Damià Barceló<sup>2,6</sup>, Antoni Ginebreda<sup>2</sup>, Sandra Pérez<sup>2</sup>, Mira Petrovic<sup>6</sup>, Yolanda Picó<sup>7</sup>, Marta Schumacher<sup>3,4</sup> and Isabel Muñoz<sup>1</sup>  
<sup>1</sup>Department of Ecology, University of Barcelona, Barcelona, Spain  
<sup>2</sup>Water and Soil Quality Research Group, IDAEA-CSIC, Barcelona, Spain  
<sup>3</sup>Environmental Engineering Laboratory, Universitat Rovira i Virgili, Tarragona, Spain  
<sup>4</sup>Laboratory of Toxicology and Environmental Health, Universitat Rovira i Virgili, Reus, Spain  
<sup>5</sup>Laboratori d'Edafologia, Faculty of Pharmacy, University of Barcelona, Barcelona, Spain  
<sup>6</sup>Catalan Institute for Water Research (ICRA), Girona, Spain  
<sup>7</sup>Food and Environmental Safety Research Group, University of Valencia, Burjassot, Spain

- 7.- Application of Wavelet spectral analysis method to interpretation rivers mebolism  
Jonatan Val, M<sup>a</sup> Rosa Pino and David Chinarro  
San Jorge University, Zaragoza, Spain
- 8.- Evaluation of habitat suitability for redfin barbel under climate change scenarios in the Siurana River  
Rafael Muñoz-Mas<sup>1</sup>, Francisco Martínez-Capel<sup>1</sup>, Pedro Millán-Romero<sup>2</sup>, Francisco J. Vallés Morán<sup>2</sup>, Ignacio Andrés-Doménech<sup>2</sup>, Gianbattista Bussi<sup>2,3</sup> and Félix Francés<sup>2</sup>  
<sup>1</sup>Institut d'Investigació per a la Gestió Integrada de Zones Costaneres (IGIC), Universitat Politècnica de València, Gandia, Spain  
<sup>2</sup>Research Institute of Water and Environmental Engineering (IIAMA), Universitat Politècnica de València, València, Spain  
<sup>3</sup>School of Geography and the Environment, University of Oxford, Oxford, UK
- 9.- Effects of aeration and sediment grain size on invertebrate interactions and litter breakdown  
Olatz Pereda, Aitor Larrañaga, Ibon Aristi, Maite Arroita, Lorea Flores, Libe Solagaistua and Arturo Elosegi  
Faculty of Science and Technology, University of the Basque Country UPV/EHU, Bilbao, Spain
- 10.- Changes in stream discharge affect more benthic than hyporheic breakdown  
Libe Solagaistua, Aitor Larrañaga, Ibon Aristi, Maite Arroita, Lorea Flores, Olatz Pereda and Arturo Elosegi  
Faculty of Science and Technology, University of the Basque Country, Bilbao, Spain
- 11.- Effects of river regulation in bed mobility and invertebrate communities  
Gemma Lobera Galan<sup>1,2</sup>, José A. López-Tarazón<sup>1,2,3</sup>, Isabel Muñoz<sup>4</sup>, Damià Vericat<sup>1,2,5,6</sup> and Ramon J. Batalla<sup>1,2,5,7</sup>  
<sup>1</sup>Fluvial Dynamics Research Group -RIUS  
<sup>2</sup>Department of Environment and Soil Sciences, University of Lleida, Lleida, Spain  
<sup>3</sup>School of Natural Sciences and Psychology, Liverpool John Moores University, Liverpool, UK  
<sup>4</sup>Department of Ecology, Faculty of Biology, University of Barcelona, Barcelona, Spain  
<sup>5</sup>Forest Sciences Centre of Catalonia, Solsona, Spain  
<sup>6</sup>Institute of Geography and Earth Sciences, Aberystwyth University, Wales, UK  
<sup>7</sup>Catalan Institute for Water Research (ICRA), Girona, Spain

### Session III: Linking chemical exposure and biological effects

- 12.- Environmental Concentrations of Metals in the Catalan Stretch of the Ebro River, Spain: Assessment of Temporal Trends  
Lolita Vilavert<sup>1</sup>, Clara Sisteré<sup>1</sup>, Marta Schuhmacher<sup>1,2</sup>, Martí Nadal<sup>1</sup> and José L. Domingo<sup>1</sup>  
<sup>1</sup>Laboratory of Toxicology and Environmental Health, University Rovira i Virgili, Reus, Spain  
<sup>2</sup>Environmental Engineering Laboratory, Department of Chemical Engineering, University Rovira i Virgili, Tarragona, Spain
- 13.- Incidence and distribution of heavy metals and pharmaceutical products in waters of the Turia River basin  
Vicente Andreu<sup>1</sup>, Eugenia Gimeno<sup>2</sup>, Juan Antonio Pascual<sup>1</sup> and Yolanda Picó<sup>3</sup>  
<sup>1</sup>Desertification Research Centre-CIDE (CSIC-UV-GV), Moncada, Spain  
<sup>2</sup>Foundation University of Valencia-CIDE, Moncada, Spain  
<sup>3</sup>Faculty of Pharmacy, University of Valencia, Burjassot, Spain

- 14.- Analysis of pharmaceuticals and their metabolites in fish from Llobregat river  
Jaume Aceña<sup>1</sup>, Pilar Campos<sup>1</sup>, Lluís Benejam<sup>2</sup>, Laia Sabater<sup>1</sup>, Sandra Pérez<sup>1</sup> and Damià Barceló<sup>1,3</sup>  
<sup>1</sup>Water and Soil Quality Research Group, IDAEA-CSIC, c/Jordi Girona 18-26, Barcelona, Spain  
<sup>2</sup>Department of Environmental Sciences, University of Vic, Vic, Spain  
<sup>3</sup>Catalan Institute of Water Research (ICRA), Girona, Spain
- 15.- Individual and mixture effects of selected pharmaceuticals on larval development of two shrimp species: an experiment on *Palaemon longirostris* and *Palaemon varians*  
Enrique González-Ortegón<sup>1</sup>, Luis Giménez<sup>1</sup>, Lewis LeVay<sup>1</sup> and Julián Blasco<sup>2</sup>  
<sup>1</sup>School of Ocean Sciences, Bangor University, Menai Bridge, UK  
<sup>2</sup>Institute de Ciencias Marinas de Andalucía, CSIC, Puerto Real, Spain
- 16.- Effect of oxytetracycline (OTC) on growth of marine and freshwater microalgae  
Ignacio Moreno-Garrido, Luis M. Lubián and Julián Blasco  
 Institute of Marine Sciences of Andalusia (CSIC), Puerto Real, Cádiz, Spain
- 17.- Determination of pharmaceuticals in soil samples. Evaluation of QuEChERS advantages and disadvantages  
Eric Carmona<sup>1</sup>, Vicente Andreu<sup>2</sup> and Yolanda Picó<sup>1</sup>  
<sup>1</sup>Environmental and Food Safety Research Group, Department of Medicine Preventive, University of Valencia, Burjassot, Spain  
<sup>2</sup>Desertification Research Centre – CIDE (CSIC-UV-GV), Moncada, Spain
- 18.- Assessment of occurrence of 8 pharmaceuticals in the Llobregat river and sensitivity analysis of several parameters using Monte Carlo methods  
Zoran Banjac<sup>1</sup>, Antoni Ginebreda<sup>1</sup>, Laurie Boithias<sup>2</sup>, Rafael Marcé<sup>2</sup> and Damià Barceló<sup>1,2</sup>  
<sup>1</sup>Water and Soil Quality Research Group, Department of Environmental Chemistry, IDAEA-CSIC, Barcelona, Spain  
<sup>2</sup>Catalan Institute for Water Research (ICRA), Girona, Spain
- 19.- Estimation of emission factors of 200 emerging organic microcontaminants by inverse modeling in a Mediterranean river basin (Llobregat, NE Spain)  
Zoran Banjac<sup>1</sup>, Antoni Ginebreda<sup>1</sup>, Maja Kuzmanovic<sup>1</sup>, Rafa Marcé<sup>2</sup>, Martí Nadal<sup>3</sup>, Josep M. Riera<sup>4</sup> and Damià Barceló<sup>1,2</sup>  
<sup>1</sup>Water and Soil Quality Research Group, Dep. of Environmental Chemistry, IDAEA-CSIC, Barcelona, Spain  
<sup>2</sup>Catalan Institute for Water Research (ICRA), Girona, Spain  
<sup>3</sup>Laboratory of Toxicology and Environmental Health, IISPV, Universitat Rovira i Virgili, Reus, Spain  
<sup>4</sup>Organización, Calidad y Proyectos, S.L., Barcelona, Spain
- 20.- Evaluation of four extraction procedures in the analysis of 23 perfluoroalkyl substances in soil and sediment  
Julián Campo<sup>1,2</sup>, María Lorenzo<sup>2</sup> and Yolanda Picó<sup>2</sup>  
<sup>1</sup>Desertification Research Centre, Moncada, Valencia, Spain  
<sup>2</sup>Food and Environmental Safety Research Group, University of Valencia, Burjassot, Valencia, Spain
- 21.- Assessment of pesticide occurrence in the Túria and Júcar Rivers  
Ana Masiá<sup>1</sup>, Alexander Ccancapa<sup>1</sup>, Vicente Andreu<sup>2</sup> and Yolanda Picó<sup>1</sup>  
<sup>1</sup>Environmental and Food Safety Research Group, University of València, Burjassot, Spain  
<sup>2</sup>Research Centre of Desertification-CIDE (CSIC-UV-GV), Moncada, Spain

- 22.- **On the presence of pesticides in waters and sediments of the river Júcar, Spain**  
Juan Antonio Pascual Aguilar<sup>1,2</sup>, Vicente Andreu<sup>1</sup>, Julián Campo<sup>2,3</sup>, Ana Masiá<sup>3</sup> and Yolanda Picó<sup>3</sup>  
<sup>1</sup>Environmental forensic and Landscape Chemistry Group, Centro de Investigaciones sobre Desertificación-CIDE (CSIC-UV-GV), Moncada, Spain  
<sup>2</sup>Centro para el Conocimiento del Paisaje, Matet, Spain  
<sup>3</sup>Food and Environmental Safety Research Group, Department of Medicine Preventive, University of Valencia, Burjassot, Spain
- 23.- **Analysis of polar triazines and degradation products in waters by in-tube solid-phase microextraction and capillary chromatography: an environmentally friendly method**  
Javier Pla-Tolós, Pascual Serra-Mora, Yolanda Moliner-Martínez, Jorge Verdú-Andrés, Rosa Herráez-Hernández and Pilar Campíns-Falcó  
 Department of Analytical Chemistry, University of Valencia, Burjassot, Valencia, Spain
- 24.- **Determination of Irgarol in coastal waters of the Region of Valencia by in-tube solid phase microextraction coupled to capillary liquid chromatography**  
Ana I. Argente-García, Stéphanie Aparicio-Antón, Yolanda Moliner-Martínez, Carmen Molins-Legua, Jorge Verdú-Andrés and Pilar Campíns-Falcó  
 Department of Analytical Chemistry, University of Valencia, Burjassot, Valencia, Spain
- 25.- **Polymer characterization and preliminary studies on their degradation**  
Daniel Rivas<sup>1</sup>, Antoni Ginebreda<sup>1</sup>, Carmen Quero<sup>2</sup>, Sandra Perez<sup>1</sup> and Damià Barcelo<sup>1,3</sup>  
<sup>1</sup>Department of Environmental Chemistry, IDAEA-CSIC, Barcelona, Spain  
<sup>2</sup>Department of Biological Chemistry and Molecular Modelling, IQAC-CSIC, Barcelona, Spain  
<sup>3</sup>Catalan Institute for Water Research (ICRA), Girona, Spain
- 26.- **UHPLC-MS/MS in combination with microextraction techniques for sensitive assay of amphetamines in river water**  
Diego Airado-Rodríguez, Ana M. García-Campaña and Carmen Cruces-Blanco  
 Department of Analytical Chemistry, Faculty of Sciences, University of Granada, Granada, Spain
- 27.- **Fast methodology for detection of LSD, ketamine and their metabolites in environmental water**  
Diego Airado-Rodríguez, Ana M. García-Campaña and Carmen Cruces-Blanco  
 Department of Analytical Chemistry, Faculty of Sciences, University of Granada, Granada, Spain
- 28.- **An approach to the environmental scoring of siloxanes**  
Nuno Ratola<sup>1,2</sup>, José Avelino Silva<sup>1</sup>, Vera Homem<sup>1</sup>, Alessandra Cincinelli<sup>3</sup>, Pedro Jiménez-Guerrero<sup>2</sup>, Lúcia Santos<sup>1</sup> and Arminda Alves<sup>3</sup>  
<sup>1</sup>LEPABE-DEQ, Faculty of Engineering, University of Porto, Rua Dr. Roberto Frias, Porto, Portugal  
<sup>2</sup>Physics of the Earth, Regional Campus of International Excellence "Campus Mare Nostrum", University of Murcia, Edificio CIOyN, Campus de Espinardo, 30100 Murcia, Spain  
<sup>3</sup>Department of Chemistry, University of Florence, Sesto Fiorentino, Florence, Italy
- 29.- **Control and modelization of fouling on a spiral wound reverse osmosis membrane in the treatment of olives washing and olive mill wastewater**  
Javier M. Ochando-Pulido, María D. Víctor-Ortega and Antonio Martínez-Férez  
 Chemical Engineering Department, University of Granada, Granada, Spain

- 30.- Comparison of Fenton-like oxidation and UV/TiO<sub>2</sub> photocatalysis as pretreatments for final purification of olive mill wastewater by membrane technology  
Javier M. Ochando-Pulido, María D. Víctor-Ortega and Antonio Martínez-Férez  
 Chemical Engineering Department, University of Granada, Granada, Spain
- 31.- Study of ion exchange equilibrium for saline toxicity removal from pretreated olive mill wastewater by using Dowex Marthon C and Amberlite IRA-67 resins  
María Dolores Víctor-Ortega, Javier Miguel Ochando-Pulido and Antonio Martínez-Férez  
 Department of Chemical Engineering, Granada, Spain
- 32.- Study of resin disposition and temperature in an Ion Exchange semi-batch system as pretreatment for effective reduction of membrane fouling  
María Dolores Víctor-Ortega, Javier Miguel Ochando-Pulido and Antonio Martínez-Férez  
 Department of Chemical Engineering, Granada, Spain

#### Session IV: Integrating results to predict impacts on freshwater ecosystem services and integration in RBMPs

- 33.- Analysis of the uncertainty in ecosystem services monetary valuation - a case study at the river basin scale  
 Laurie Boithias<sup>1</sup>, Marta Terrado<sup>1</sup>, Lluís Corominas<sup>1</sup>, Guy Ziv<sup>4</sup>, Sergi Sabater<sup>1,2</sup>, Vikas Kumar<sup>3</sup>, Montse Marqués<sup>3</sup>, Marta Schuhmacher<sup>3</sup> and Vicenç Acuña<sup>1</sup>  
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<sup>4</sup>School of Geography, University of Leeds, Leeds, United Kingdom

#### Session V: Global change and adaptation and mitigation measures

- 34.- Present and future variation of drought patterns over Europe under several climate change scenarios  
 Andrés Olmedo, Pedro Jiménez-Guerrero, Juan Pedro Montávez and Nuno Ratola  
 Physics of the Earth, Regional Campus of International Excellence "Campus Mare Nostrum", University of Murcia, Edificio CIOyN, Campus de Espinardo, 30100 Murcia, Spain

#### Session VI: Integrating science, economic and social impacts and policy

- 35.- Ecotoxicological status of sediments as a complementary tool for the surface water quality assessment under WFD  
Neus Roig<sup>1,2</sup>, Jordi Sierra<sup>1,3</sup>, Martí Nadal<sup>2</sup>, Ignacio Moreno-Garrido<sup>4</sup>, Elena Nieto<sup>4</sup>, Miriam Hampel<sup>4</sup>, Elena Perez Gallego<sup>5</sup>, Marta Schuhmacher<sup>1,2</sup> and Julián Blasco<sup>4</sup>  
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<sup>2</sup>Laboratory of Toxicology and Environmental Health, IISPV, University Rovira i Virgili, Reus, Spain  
<sup>3</sup>Laboratory of Edaphology, University of Barcelona, Barcelona, Spain  
<sup>4</sup>Department Ecology Coastal Management, ICMAN-CSIC, Puerto Real, Spain  
<sup>5</sup>Hydrographical Confederation of Ebro (CHE), Zaragoza, Spain

- 36.- **Analyzing the sensitivity of a USLE based model applied in a Mediterranean river basin under global change and management implications**  
María Sánchez-Canales<sup>1</sup>, Alfredo López-Benito<sup>1</sup>, Vicenç Acuña<sup>2</sup>, Guy Ziv<sup>3</sup>, Perrine Hamel<sup>4</sup>, Rebecca Chaplin-Kramer<sup>4</sup> and Francisco J. Elorza<sup>1</sup>  
<sup>1</sup>Universidad Politécnica de Madrid, Escuela Técn. Sup. Ingenieros de Minas y Energía, Madrid, Spain  
<sup>2</sup>Catalan Institute for Water Research (ICRA), Girona, Spain  
<sup>3</sup>University of Leeds, School of Geography, Leeds, United Kingdom  
<sup>4</sup>The Natural Capital Project. Woods Institute for the Environment, Stanford, U.S.A.
- 37.- **Development of integrated land use and water management scenarios based on climatic and socio-economic forcing - GLOBAQUA Project WP2-SCENARIOS**  
Verena Huber García, Ralf Ludwig, Swen Meyer and David Gampe  
Department of Geography, Ludwig-Maximilians-Universität, Munich, Germany