



# SCARCE Newsletter II



July 2011

During the last months, the 1<sup>st</sup> SCARCE annual report has been produced. It has to be evaluated by experts from the Spanish Ministry of Science and Innovation (MICINN). Besides of this assessment, the External Scientific Committee has evaluated the first project year, resulting in a positive valuation and some recommendations to improve the development of SCARCE project.

At the end of June 2011, SCARCE has completed the first 18 months of the project. During these months the collection of historical data has taken place simultaneously to the obtaining of experimental data from the field. Both processes are almost finished and the first results will appear by the end of the year.

As a result of a very successful 1<sup>st</sup> SCARCE annual conference, the most interesting contributions were selected for their publication in the journal Environmental Science and Pollution Research under the edition of Philippe Garrigues. Most of these contributions have been accepted or published online, including a descriptive paper about the project and its main objectives:

- Occurrence of perfluorinated compounds in water and sediment of L'Albufera Natural Park (València, Spain) - Yolanda Pico
- New indexes to quantify complexity of environmental chemical monitoring inventories: background and case study - Antoni Ginebreda
- Assessing the effects of tertiary treated wastewater reuse on a Mediterranean river (Llobregat, NE

Spain). Part III: Pathogens and indicators - M. E. Rubiano

- Establishing causal relationships between the presence of endocrine disrupting compounds and the benthic community in a European river basin - Rikke Brix
- Assessing and forecasting the impacts of global change on Mediterranean rivers. The SCARCE Consolider project on Iberian basins - Alícia Navarro-Ortega

The Environmental Science and Pollution Research special issue will probably be available before the end of the year, in coincidence with the 2<sup>nd</sup> edition of the SCARCE annual conference that will be held in Madrid during 28-29 November 2011.

During the first six months of 2011, several meetings have taken place to ensure collaboration of the different groups that belong to the consortium and plan the future activities after the 1<sup>st</sup> SCARCE sampling campaign:

- WP3-WP5 visit to different Ebro watersheds for in-situ selection of monitoring reaches (February). Two



coupled sample points (or reaches) were selected in the same river system in order to determine: i) the impact of regulation caused by dams, and ii) the added impact of regulation and degree of *Mediterraneity* in the physical habitat, hydrology, biological communities and metabolic processes.

- WP6 meetings in Valencia (March) and Madrid (May) to establish how and in which sub-basins the different models included in the project will be applied.
- Principal Investigators meeting in Madrid (June). The leaders of all the groups belonging to the consortium and the leaders of all Work Packages assisted to a meeting in which the first year of the project was evaluated and the basis for the following months were stated.

To ensure transfer of knowledge one training course for students and scientists has taken place and two more will be held during the following months:

- "Economics for water services management" (19-21 May 2011, Seville): with the participation of 11 lecturers, 5 participants in the round table "Water economics in selected sectors" and 21 students. The goal of this 20-hours advanced

course was to analyze the role of Economics in the decision making, in order to promote a sustainable management of ecosystem services, in a framework of change, uncertainty and complexity.

- A seminar on "Environmental Flows: Recent Developments and Applications at Basin Scale" will be held in the Technical University of Valencia on 5-6 September 2011. More details in the following Newsletter.
- A course on "Managed artificial recharge for sustainable water management under varying climate conditions: quantitative and qualitative aspects" will be held at the end of the year. More details in the following Newsletter.

In the last six months the number of SCARCE participants has increased from 80 to 120. A short CV of each of them is included in the "SCARCE who is who" available in the SCARCE website ([www.idaea.csic.es/scarceconsolider](http://www.idaea.csic.es/scarceconsolider)). A printed version will be published by the end of 2011.

SCARCE has generated several **publications**, which have been published in peer reviewed journals, and communications in conferences.

#### SCARCE Project information

Website: [www.idaea.csic.es/scarceconsolider](http://www.idaea.csic.es/scarceconsolider)  
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Assessing and predicting effects on water quantity and quality in Iberian rivers caused by global change (SCARCE)

CONSOLIDER-INGENIO 2010  
(CSD2009-00065)

Start date of the project: 17<sup>th</sup> December 2009

Duration: 5 years

## PUBLICATIONS

ARTIGAS, J., GAUDES, A., MUÑOZ, I., ROMANI, A.M., and SABATER, S. Fungal and Bacterial Colonization of Submerged Leaf Litter in a Mediterranean Stream. *International Review of Hydrobiology*, 96 (2011), 221-234

APARICIO, E., CARMONA-CATOT, G., MOYLE, P.B. and GARCÍA-BERTHOU, E. Development and evaluation of a fish-based index to assess biological integrity of Mediterranean streams. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 21 (2011) 324-337

DE BARROS, F.P.J., BOLSTER, D., SANCHEZ-VILA, X., and NOWAK, W. A divide and conquer approach to cope with uncertainty, human health risk, and decision making in contaminant hydrology. *Water Resources Research*, 47 (2011), W05508

BATALLA, R.J., VERICAT, D. (2011): A appraisal of the contemporary sediment yield in the Ebro basin. *Journal of Soils and Sediments*. DOI 10.1007/s11368-011-0378-8

BLASCO, C., MASIA, A., MORILLAS, F., PICO, Y. Comparison of the Effectiveness of Recent Extraction Procedures for Antibiotic Residues in Bovine Muscle Tissues, *Journal of the AOAC International*, 94 (2011) 991-1301

BRIX, R., LÓPEZ-DOVAL, J., RICART, M., GUASCH, H., LOPEZ DE ALDA, M., MUÑOZ, I., ORENDT, C., ROMANÍ, A.M., SABATER, S. and BARCELO, D. Establishing potential links between the presence of alkylphenolic compounds and the benthic community in a European river basin. *Environmental Science and Pollution Research* (2011) ([doi:10.1007/s11356-011-0527-z](https://doi.org/10.1007/s11356-011-0527-z))

ELJARRAT, E., FEO, M.L. and BARCELÓ, D. Degradation of brominated flame retardants. In: E. Eljarrat and D. Barceló (eds.). *The Handbook of Environmental Chemistry, Vol. 16: Brominated flame retardants* (2011), (pp 187-202) Springer-Verlag Berlin Heidelberg

FEO, M.L., ELJARRAT, E. and BARCELÓ, D. Performance of gas chromatography/tandem mass spectrometry in the analysis of pyrethroid insecticides in environmental and food samples, *Rapid Communications in Mass Spectrometry* 25 (2011), 869-876

FERREIRA DA SILVA, B., PÉREZ, S., GARDINALLI, P., SINGHAL, R.K., MOZETO, A.A. and BARCELÓ, D. Analytical chemistry of Metallica nanoparticles in natural environments. *Trends in Analytical Chemistry*, 30 (2011), 528-540

GAGO-FERRERO, P., DÍAZ-CRUZ, S. and BARCELÓ, D. Fast pressurized liquid extraction with in-cell purification and analysis by liquid chromatography tandem mass spectrometry for the determination UV filters and their degradation products in sediments. *Analytical and Bioanalytical Chemistry*, 400 (2011), 2195-2204

GAGO-FERRERO, P., DÍAZ-CRUZ, S. and BARCELÓ, D. Occurrence of multiclass UV filters in treated sewage sludge from wastewater treatment plants. *Chemosphere*, (2011) doi:10.1016/j.chemosphere.2011.04.003

GONÇALVES, C., PÉREZ, S., OSORIO, V., PETROVIC, M., ALPENDURADA, M.F. and BARCELÓ, D. Photofate of Oseltamivir (Tamiflu) and Oseltamivir Carboxylate under Natural and Simulated Solar Irradiation: Kinetics, Identification of the Transformation Products, and Environmental Occurrence. *Environmental Science and Technology*, 45 (2011) 4307-4314

GUERRA, P., ELJARRAT, E. and BARCELÓ, D. Determination of halogenated flame retardants by liquid chromatography coupled to mass spectrometry. *Trends in Analytical Chemistry*, 30 (2011), 842-855

GUERRA, P., ALAEE, M., ELJARRAT, E. and BARCELÓ, D. Chapter 1: Introduction to brominated flame retardants: commercially products, applications and physicochemical properties. In: E. Eljarrat and D. Barceló (eds.). *The Handbook of Environmental Chemistry, Vol. 16: Brominated flame retardants* (2011), (pp 1-18) Springer-Verlag Berlin Heidelberg

GUERRA, P., COVACI, A., ELJARRAT, E. and BARCELÓ, D. Recent methodologies for brominated flame retardants determinations by means of liquid chromatography-mass spectrometry. In: E. Eljarrat and D. Barceló (eds.). *The Handbook of Environmental Chemistry*, Vol. 16: Brominated flame retardants (2011), (pp 95-122) Springer-Verlag Berlin Heidelberg

KÖCK-SCHULMEYER, M., LÓPEZ DE ALDA, M., MARTÍNEZ, E. FARRÉ, M., NAVARRO, A. GINEBRED, A. and BARCELÓ, D. Pesticides at the Ebro River Delta: Occurrence and toxicity in water and biota. In: D. Barceló and M. Petrovic (eds.). *The Handbook of Environmental Chemistry*, Vol. 13: The Ebro River Basin (2011), pp 259-274, Springer-Verlag Berlin Heidelberg.

LÓPEZ, P., MARCÉ, R. and ARMENGOL, J. Net heterotrophy and CO<sub>2</sub> evasion from a productive calcareous reservoir: Adding complexity to the metabolism-CO<sub>2</sub> evasion issue. *Journal of Geophysical Research*, 116 (2011), G02021

NAVARRO-ORTEGA, A. and BARCELÓ, D. Persistent Organic Pollutants in Water, Sediments, and Biota in the Ebro River Basin. In: D. Barceló and M. Petrovic (eds.). *The Handbook of Environmental Chemistry*, Vol. 13: The Ebro River Basin (2011), pp 139-166, Springer-Verlag Berlin Heidelberg

DE OLIVEIRA PEREIRA, R., LOPEZ DE ALDA, M., JOGLAR, J., ANTONIO DANIEL, L., and BARCELÓ, D. Identification of new ozonation disinfection byproducts of 17 $\beta$ -estradiol and estrone in water. *Chemosphere* (2011) doi:10.1016/j.chemosphere.2011.05.058

DE OLIVEIRA PEREIRA, R., POSTIGO, C. LOPEZ DE ALDA, M., ANTONIO DANIEL, L., and BARCELÓ, D. Removal of estrogens through water disinfection processes and formation of by-products. *Chemosphere*, 82 (2011), 789-799

PEDRETTI, D., FERNÁNDEZ-GARCIA, D., SANCHEZ-VILA, X., BARAHONA-PALOMO, M. and BOLSTER, D. Combining physical-based models and satellite images for the spatio-temporal assessment of soil infiltration capacity. *Stochastic Environmental Research and Risk Assessment*. doi: 10.1007/s00477-011-0486-4, (2011)

PÉREZ, S., KÖCK-SCHULMEYER, M., TONG, L., GINEBRED, A. LÓPEZ-SERNA, R., POSTIGO, C., BRIX, R., LÓPEZ DE ALDA, M., PETROVIC, M., WANG, Y. and BARCELÓ, D. Wastewater reuse in the Mediterranean area of Catalonia, Spain. Case study of reuse of tertiary effluent from a wastewater treatment plant at El Prat de Llobregat (Barcelona). In: D. Barceló and M. Petrovic (eds.). *The Handbook of Environmental Chemistry*, Vol. 14: Waste Water Treatment and Reuse in the Mediterranean Region, (2011), pp. 249-294, Springer-Verlag Berlin Heidelberg

PETROVIC, M., GINEBRED, A., ACUÑA, V., BATALLA, R.J., ELOSEGI, A., GUASCH, H., LÓPEZ DE ALDA, M., MARCÉ, R., MUÑOZ, I., NAVARRO-ORTEGA, A., NAVARRO, E., VERICAT, D., SABATER, S., and BARCELÓ D. Combined scenarios of Chemicals and ecological quality under water scarcity in Mediterranean Rivers. *Trends in Analytical Chemistry* (2011) doi:10.1016/j.trac.2011.04.012

PICÓ, Y., BLACO, C., FARRÉ, M. and BARCELÓ, D. Occurrence of perfluorinated compounds in water and sediment of L'Albufera Natural Park (València, Spain). *Environmental Science and Pollution Research*, DOI 10.1007/s11356-011-0560-y

PICO, Y., FARRÉ, M., LLORCA, M., BARCELÓ, D. Perfluorinated Compounds in Food: A Global Perspective. *Critical Reviews in Food Science and Nutrition*, DOI:10.1080/10408391003721727

POSTIGO, C., SIRTORI, C., OLLER, I., MALATO, S., MALDONADO, M.I., LÓPEZ DE ALDA, M. and BARCELÓ, D. Solar degradation and photocatalytic treatment of cocaine in water: kinetics, characterization of major intermediate products and toxicity evaluation. *Applied Catalysis B: Environmental*, 104 (2011), 37-48

POSTIGO, C., LÓPEZ DE ALDA, M. and BARCELÓ, D. Illicit drugs along the Ebro River Basin: Occurrence in surface and wastewater and derived consumption estimations. In: D. Barceló and M. Petrovic (eds.). *The Handbook of Environmental Chemistry*, Vol. 13: The Ebro River Basin (2011), pp 189-208, Springer-Verlag Berlin Heidelberg

POSTIGO, C., LÓPEZ DE ALDA, M. and BARCELÓ, D. Occurrence of illicit drugs in wastewater in Spain. In: Castiglioni, S. Zuccato, E. and Fanelli R. (eds.). *Illicit Drugs in the Environment: Occurrence, Analysis, and Fate, using Mass Spectrometry* (2011), pp 117-136, John Wiley & Sons, Inc., Hoboken, New Jersey.

ROMANÍ, A. M., SABATER, S. and MUÑOZ, I. 2011. The physical framework and historic human influences in the Ebro River. In: D. Barceló and M. Petrovic (eds.). *The Handbook of Environmental Chemistry, Vol. 13: The Ebro River Basin* (2011), pp 1-20, Springer-Verlag Berlin Heidelberg.

SABATER, S., MUÑOZ, I. ARTIGAS J, ROMANI, AM., PEREZ M and DURAN, C. Aquatic and riparian biodiversity in the Ebro watershed: prospects and threats. In: D. Barceló and M. Petrovic (eds.). *The Handbook of Environmental Chemistry, Vol. 13: The Ebro River Basin* (2011), pp 1-20, Springer-Verlag Berlin Heidelberg

SABATER, S., ARTIGAS, J., GAUDES, A., MUÑOZ, I. URREA, G. and ROMANÍ, A.M. Long-term moderate nutrient inputs enhance autotrophy in a forested Mediterranean stream. *Freshwater Biology*, 56 (2011), 1266-1280

SABATER, S., NAVARRO-ORTEGA, A. and BARCELÓ, D. Oferta y demanda de agua: implicaciones para los sistemas fluviales mediterráneos. *Lychnos*, 4 (2011), 28-33

SILVA, B. F., PÉREZ, S., GARDINALI, P., MOCETO, A.A., SINGHAL, R.K. and BARCELÓ D. Analytical chemistry of metallic nanoparticles in natural environments. *Trends in Analytical Chemistry*, 30 (2011), 528-540

TONG, L., PÉREZ, S., GONÇALVES, C., ALPENDURADA, F., WANG, Y. and BARCELÓ, D. Kinetic and mechanistic studies of the photolysis of metronidazole in simulated aqueous environmental matrices using a mass spectrometric approach. *Analytical and Bioanalytical Chemistry*, 399 (2011), 421-428

TONG, L., EICHHORN, P., PÉREZ, S., WANG, Y. and BARCELÓ, D. Photodegradation of azithromycin in various aqueous systems under simulated and natural solar radiation: Kinetics and identification of photoproducts. *Chemosphere*, 83 (2011), 340-348

VAZQUEZ-ROIG, P., ANDREU, V., ONGHENA, M., BLASCO, C.; PICO, Y. Assessment of the occurrence and distribution of pharmaceuticals in a Mediterranean wetland (L'Albufera, Valencia, Spain) by LC-MS/MS, *Analytical and Bioanalytical Chemistry*, 400 (2011), 1287-1301

YLLA, I., SANPERA-CALBET, I., MUÑOZ, I., ROMANÍ, A.M. and SABATER, S. Organic matter characteristics in a Mediterranean stream through amino acid composition: changes driven by intermittency. *Aquatic Sciences*, DOI 10.1007/s00027-011-0211-x

#### COMMUNICATIONS IN CONFERENCES

##### Presentation of the project

NAVARRO-ORTEGA, A., BATALLA, R., PETROVIC M. and BARCELÓ, D. The SCARCE Consolider project on iberian river basins: study of sediments. Oral presentation. 7th International Sednet: Sediments and biodiversity: bridging the gap between science and policy. Venecia, Italy, 6-9 April 2011

NAVARRO-ORTEGA, A., MUÑOZ, I., SABATER, S., PETROVIC M. and BARCELÓ, D. El proyecto SCARCE Consolider en las cuencas fluviales ibéricas: La calidad del agua. Oral presentation. Agricultura, agua y energía, Madrid (Spain), 12th May 2011

##### Presentations related with the project

ACUÑA, V., DÍEZ, J.R., FLORES, L. and ELOSEGI, A. Stream restoration by wood addition - connecting reach and basin scales by ecosystem services. Oral presentation. 7<sup>th</sup> Symposium for European Freshwater Sciences. Girona (Spain), 27 June-1 July 2011

BADIA, M., GAGO, P., OLIVARES, A., PIÑA, B., DÍAZ-CRUZ, M.S., BLANQUEZ, P., CAMINAL, G., BARCELÓ, D. and VICENT, T. Comparison of fungal biodegradation and photodegradation treatments for the elimination of UV filter benzophenone-3. Oral presentation. Water and Industry 2011. IWA Specialist International Conference. Valladolid (Spain), May 2011

ELOSEGI, A. Channel form, water flow, and river ecosystem functioning. Oral presentation (invited lecture). 7<sup>th</sup> Symposium for European Freshwater Sciences. Girona (Spain), 27 June 2011

FÀBREGA, F., MARI, M., NADAL, M., SCHUHMACHER, M. and DOMINGO, J.L. Health risk assessment of a PFOS and PFOA mixture by using a whole body pharmacokinetic model. Oral presentation. 21st Annual Meeting - SETAC Europe. Milano (Italy), May 2011

FLORES, L., LARRAÑAGA, A. and ELOSEGI, A. Effects of food type and availability on consumption and growth of larval *Sericostoma vittatum* Rambur (Trichoptera). Oral presentation. 7<sup>th</sup> Symposium for European Freshwater Sciences. Girona (Spain), 27 June 2011

GARCÍA-ARIAS, A. AND FRANCÉS, F. 2011. Climate change scenarios effects analyses over the riparian vegetation dynamics in a Mediterranean reach (Mijares River, Spain). Oral presentation. 7<sup>th</sup> Symposium for European Freshwater Sciences: Freshwater ecosystems - Challenges between conservation and management under global change. Girona (Spain), 27 June-1 July 2011

GARCÍA-ARIAS, A., FRANCÉS, F., ANDRÉS-DOMÉNECH, I., VALLÉS, F., GARÓFANO-GÓMEZ, V. and MARTÍNEZ-CAPEL, F. Modelling the spatial distribution and temporal dynamics of Mediterranean riparian vegetation in a reach of the Mijares River (Spain). Euromech Colloquium. Ecohydraulics : linkages between hydraulics, morphodynamics & ecological processes in Rivers. Oral presentation. Clermont-Ferrand (France), 15-17 June 2011

MEDICI, C. Progressive development of a hydrologic and inorganic nitrogen conceptual model to improve the understanding of small Mediterranean catchments behaviour. Oral Communication. REFRESH Project Meeting. Aberdeen (Scotland). 3rd - 7th April 2011

OSÓRIO, V., PÉREZ, S. and BARCELÓ, D. Biodegradation of non-steroidal antiinflammatory drugs (NSAIDs) and their non-halogenated analogs in nitrifying batch reactors. Oral presentation. SETAC, Europe 21st Annual Meeting Ecosystem Protection in a Sustainable World: a Challenge for Science and Regulation. Milan (Italy), 2011

PASQUATO, M., MEDICI, M. and FRANCÉS, F. Application of a conceptual distributed dynamic vegetation model to a semi-arid basin, SE of Spain. Oral presentation. EGU General Assembly. Vienna (Austria). April 2011

PÉREZ, S., OSÓRIO, V. and BARCELÓ, D. Investigating the formation of nitrated and nitrosated transformation products in activated sludge batch reactors: comparison of diclofenac with its non-halogenated analogs. Oral presentation. SETAC, 7<sup>th</sup> Annual LC/MS/MS workshop on environmental applications and food safety. Buffalo (USA), 2011

PÉREZ, S. and BARCELÓ, D. Transformation and removal of Pharmaceuticals and their human metabolites in Wastewater Treatment Plants: evaluation of secondary and tertiary treatments. Oral presentation (invited lecture). Sepwater. Barcelona (Spain), 2011

PICO, Y., BLASCO, C., FARRE, M. and BARCELO, D. Determination of organic contaminants in food by liquid chromatography-mass spectrometry. Keynote-lecture. Mass spectrometry in food and feed, Merelbeke (Belgium) 2011

SANCHEZ-VILA, X. Dealing with complex transport problems in groundwater: when one is expected to provide exact solutions with little to none information. Oral presentation (invited lecture). 34th IAHR Congress Brisbane (Australia), 2011

SANCHEZ-VILA, X., FERNÁNDEZ-GARCIA, D., DE BARROS, F.P.J., NOWAK, W. AND BOLSTER, D. An Approach to Cope with Uncertainty, Health Risk and Decision Making of Remediation Efforts in Polluted Sites. Oral presentation (invited lecture). AGU Fall Meeting. San Francisco (US), 2010