




SCARCE Newsletter III

January 2012



With the end of December 2011, SCARCE has completed the second project year. After a very positive evaluation of the first project year through experts from the former Spanish Ministry of Science and Innovation (today named Ministry of Economy and Competitiveness), SCARCE continues with its scientific activities and public appearance.

The scientific activities that have taken place during the last six months of the project can be summarized as follows:

- Finishing the collection of data coming from water authorities and preliminary checking to evaluate environmental risk due to global change.
 - Ending of the general campaign of hydromorphological characterization and finalization of the biological and chemical analysis of the samples coming from the 1st general sampling campaign.
 - Performance of the 2nd general sampling campaign in the Ebro, Llobregat, Júcar and Guadalquivir rivers under different hydrological conditions if considering the ones of the first sampling campaign, which in general mean less flow in the sampling sites (77 water samples and 75 sediment samples for chemical analysis and 5 sampling sites in each basin for biological sampling of invertebrate community).
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- Starting of specific experiments both in the laboratory and in the selected sampling sections (Instrumentation of seven river control sections, pilot study on the mobility of sediments, evaluation of bed load models, geochemical study of the sediments retained at the Barasona reservoir, effect of dams on nutrient dynamics and river metabolism, effect of WWTP effluents on river ecosystem functioning, effects of irrigation on litter breakdown, use of benthic organic matter, in situ bioassays)
 - Development and adaptation of models (TETIS code improvement and calibration, InVEST model to assess climate change impacts on ecosystem services)
 - Analysis of the present contribution of water related ecosystem services to the human well-being at the water body scale.

All these activities have been coordinated through several meetings of the different work packages and the institutions that are part of the SCARCE consortium. In addition, the results obtained during the second year of the project have been presented during the 2nd SCARCE annual conference. These meetings ensure the collaboration of the different groups that belong to the consortium and help to plan future activities:

- Principal Investigators (PIs) meeting (November) to define the activities to be performed and their progress during 2011.
- WP4 meeting in Barcelona (19th July) to discuss about the data from the first sampling campaign.
- WP3 meeting in Perrarrua (Huesca) (20th July) to develop the final sampling strategy guidelines within this WP.
- WP5-7 meeting in Bilbao (9th November) to discuss about the social perception of ecosystems services and climate change
- WP3-5 meeting in Barcelona (14th November) to coordinate Barasona reservoir's sediment sampling and invertebrate community in Esera and Siurana streams.
- WP6-7-8 meeting in Tarragona (24th November) to establish a common strategy to evaluate the ecosystem services.
- 2nd SCARCE annual conference "Integrated modelling and monitoring at different river basin scale" celebrated in the ETS de Ingenieros de Minas of the Technical University of Madrid (UPM), Madrid (28th-29th November) with 29 oral presentations and 33 poster presentations and with more



than 90 assistants. The conference was divided in five sessions named: Monitoring network programme, Analysis of interactions between surface and groundwater hydrology, Assessment of the multiple effects of changes in the hydrological regime, Modelling developments and Methodological framework development to quantify global change effects. In all these sessions there were invited presentations from experts external to the SCARCE network that complemented the works presented by the SCARCE community, both in the form of oral or poster presentations. We also had the active participation of water managers of the different river basins, which improved the interaction between the project and the water authorities.



- During the conference several WP meeting took place: WP4-5 to

discuss the combination of Chemicals data and stick results and its publication, WP6 to analyse the possibility of modelling emergent pollutants with the catchment-scale eco-hydrological model TETIS, WP3 to coordinate and update modelling tasks and WP3-4 to initiate the project about coupling transport of sediment and particle pollutants.

- Annual Plenary Assembly at the ETS de Ingenieros de Minas of the UPM, Madrid (30th November) with the participation of more than 60 SCARCE members. The main lines of investigation for the following months were stated.



Continuing with the exchange of knowledge in the form of training courses and seminars opened both for participants of the project and the general public, during the last six months two have taken place:

- “Environmental Flows: Recent Developments and Applications at Basin Scale” (5-6 September 2011, Valencia). The seminar was organized by UPV with collaboration of SCARCE consortium and was attended by 24 students coming from Spain, Brazil, Portugal, Austria and Romania. It was taught by professors of UPV (Valencia), UPM (Madrid), Federal Institute of

Hydrology (Hannover), University of Murcia and an independent consultant from New Zealand. The seminar was devoted to recent research lines of ecological flows. New methodologies in this topic applied to Iberian rivers were presented by the UPV team. The seminar was organized in a way that encouraged discussion and interaction between students and teachers, which was considered very positive.

- “Managed artificial recharge for sustainable water management under varying climate conditions: quantitative and qualitative aspects” (15-16 December 2011, Barcelona). The course was attended by 21 persons, 9 of them external to the SCARCE network. The course was taught by UPC personnel, with collaborations of three professionals external to the University who provided insight to real site applications. The course included topics such as: quantitative aspects with emphasis in clogging, qualitative aspects on the evolution of chemistry during the infiltration process, surface pond design and real cases.

The printed version of the SCARCE Who is Who is available since November 2011. It contains a short CV of the almost 120 participants of the project, together with their personal contribution to the project and some related publications. The online version is updated with information about the new members of the project in the SCARCE website (www.idaea.csic.es/scarceconsolider). The website also provides information about the future and past events that take place within the project as well as the new publications of the project participants and the appearances in the media.

The first SCARCE special issue, which includes selected works from the 1st SCARCE annual conference, will be released in the following months. It will be published by Environmental Science and Pollution Research (Springer) with the title: Understanding effects of global change on water quantity and quality in river basins. Some of these publications are already online:

- Brix, R., J. López-Doval, M. Ricart, H. Guasch, M. de Alda, I. Muñoz, C. Orendt, A. Romani, S. Sabater and D. Barceló. "Establishing potential links between the presence of alkylphenolic compounds and the benthic community in a European river basin." DOI 10.1007/s11356-011-0527-z
- Ginebreda, A., A. Jelic, M. Petrovic, M. López de Alda and D. Barceló. "New indexes for compound prioritization and complexity quantification on environmental monitoring inventories." DOI 10.1007/s11356-011-0557-6
- Pérez-Parada, A., M. d. M. Gómez-Ramos, M. Martínez Bueno, S. Uclés, A. Uclés and A. Fernández-Alba. "Analytical improvements of hybrid LC-MS/MS techniques for

the efficient evaluation of emerging contaminants in river waters: a case study of the Henares River (Madrid, Spain)." DOI 10.1007/s11356-011-0585-2

- Picó, Y., C. Blasco, M. Farré and D. Barceló. "Occurrence of perfluorinated compounds in water and sediment of L'Albufera Natural Park (València, Spain)." DOI 10.1007/s11356-011-0560-y
- Rubiano, M.-E., M. Agulló-Barceló, R. Casas-Mangas, J. Jofre and F. Lucena. "Assessing the effects of tertiary treated wastewater reuse on a Mediterranean river (Llobregat, NE Spain), part III: pathogens and indicators." DOI 10.1007/s11356-011-0562-9

The special issue corresponding to the 2nd SCARCE annual conference will be published in Science of the Total Environment (Elsevier). The contributions can be submitted until 1st of May 2012.

A part of the special issues, in the last six months SCARCE has generated 13 publications, which have been published in peer reviewed journals, and 42 communications in conferences. In this newsletter only the most relevant contributions in conferences are listed:

SCARCE Project information

Website: 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: 17th December 2009

Duration: 5 years

PUBLICATIONS

BARAHONA-PALOMO, M., RIVA, M., SANCHEZ-VILA, X., VAZQUEZ-SUNE, E. and GUADAGNINI, A. Quantitative comparison of impeller-flowmeter and particle-size-distribution techniques for the characterization of hydraulic conductivity variability, *Hydrogeology Journal* 19 (2011), 603-612

CARMONA-CATOT, G., BENITO, J. and GARCÍA-BERTHOU, E. Comparing latitudinal and upstream-downstream gradients: life-history traits of invasive mosquitofish, *Diversity and Distributions* 17 (2011), 214-224

DAMASIO, J., BARCELÓ, D., BRIX, R., POSTIGO, C., GROS, M., PETROVIC, M., SABATER, S., GUASC, H. LÓPEZ DE ALDA, M. and BARATA, C. Are pharmaceuticals more harmful than other pollutants to aquatic invertebrate species: A hypothesis tested using multi-biomarker and multi-species responses in field collected and transplanted organisms. *Chemosphere* 85 (2011) 1548-1554

FERNÁNDEZ-GARCIA, D., and SANCHEZ-VILA, X. Optimal reconstruction of concentrations, gradients and reaction rates from particle distributions, *Journal of Contaminant Hydrology*, 120-121 (2011), 99-114

GALLART, F., DELGADO, J., BEATSON, S.J.V., POSNER, H., LLORENS, P. and MARCÉ, R. Analysing the effect of global change on the historical trends of water resources in the headwaters of the Llobregat and Ter river basins (Catalonia, Spain), *Physics and Chemistry of the Earth*, 36 (2011), 655-661

GARCÍA-GALÁN, M.J., DÍAZ-CRUZ, M.S. and BARCELÓ, D. Occurrence of sulfonamide residues along the Ebro river basin. Removal in wastewater treatment plants and environmental risk assessment, *Environment International*, 37 (2011), 462-473

GARCÍA-GALÁN, M.J., GARRIDO, T., FRAILE, J., GINEBREDA, A., DÍAZ-CRUZ, M.S. and BARCELÓ, D. Application of a fully automated on-line solid-phase extraction-liquid chromatography-electrospray -tandem mass spectrometry for the determination of sulfonamides in different groundwater resources. *Analytical and Bioanalytical Chemistry*, 399 (2011) 795-806

GARCIA-GALAN, M.J., RODRÍGUEZ, C.E., VICENT, T., CAMINAL, G., DIAZ-CRUZ, M.S. and BARCELÓ, D. Biodegradation of sulfamethazine by *trametes versicolor*: removal from sewage sludge and identification of intermediate products by UPLC-QqTOF. *Science of the Total Environment*, 409 (2011), 5505-5512

JELIC, A., GROS, M., GINEBREDA, A., CESPEDES-SÁNCHEZ, R., VENTURA, F., PETROVIC, M. and BARCELÓ, D. Occurrence, partition and removal of pharmaceuticals in sewage water and sludge during wastewater treatment, *Water Research*, 45 (2011), 1165-1176

LLORCA, M., FARRÉ, M., PICÓ, Y. and BARCELÓ, D. Analysis of perfluorinated compounds in sewage sludge by pressurized solvent extraction followed by liquid chromatography-mass spectrometry, *Journal of Chromatography A*, 1218 (2011), 4840-4846

VAN NUIJS, A.L.N., CASTIGLIONI, S., TARCOMNICU A, I., POSTIGO, C., LOPEZ DE ALDA, M., NEELS, H., ZUCCATO, E., BARCELO, D. and COVACI, A. Illicit drug consumption estimations derived from wastewater analysis: A critical review. *Science of the Total Environment*, 409 (2011), 3564-3577

RAMOS-JILIBERTO, R., VALDOVINOS, F.S., ARIAS, J., ALCARAZ, C. and GARCÍA-BERTHOU, E. A network-based approach to the analysis of ontogenetic diet shifts: an example with an endangered, small-sized fish, *Ecological Complexity* 8 (2011), 123-129

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

COMMUNICATIONS IN CONFERENCES

11 contributions in 13as Jornadas de Análisis Instrumental. Barcelona (Spain), 14-16 November 2011. Among them:

- ACEÑA, J., FERREIRA DA SILVA, B., GARDINALI, P.R., PÉREZ, S. and BARCELÓ, D. Fate of sildenafil (Viagra) in wastewater treatment plants. Identification of its transformation product with advanced mass spectrometric techniques. Oral presentation.
- BARON, E., RUDOLPH, I., BARRA, R., ELJARRAT, E. and BARCELÓ, D. Biomagnification of polybrominated diphenyl ethers and their methoxylated analogs in a food web from San Vicente Bay, Chile. Oral presentation.

8 contributions in AGU Fall Meeting. San Francisco (US), 5-9 December 2011. Among them:

- BELLIN, A. FIORI, A. and DE BARROS, F. The development of a simple closed-form solution for assessing concentration uncertainty in groundwater risk analysis.
- SANCHEZ-VILA, X., DE BARROS, F., FERNANDEZ-GARCIA, D. and BOLSTER, D. On the impact of spatial heterogeneity in aquifer remediation and risk analysis. Oral presentation (Invited lecture).

2 contributions in 4th International conference on medical geology (GEOMED2011), Bari (Italy), 20-25 September 2011. Among them:

- ANDREU, V., VAZQUEZ-ROIG, P., BLASCO, C. and PICO, Y. Spatial distribution of abuse drugs in humid areas. Poster.

2 contributions in 6th International Meeting on Plant Litter Processing in Freshwaters. Cracow (Poland), 26-30 July 2011. Among them:

- FLORES, L., DÍEZ, J.R., LARRAÑAGA, A., PASCOAL, C. and ELOSEGI, A. Inter-habitat differences in storage, composition, and breakdown of organic matter in a mountain stream. Oral presentation.

2 contributions in 4th RISKCYCLE workshop: Sustainable Waste Management of additives in products: A global Challenger. New Delhi (India), 13 October 2011. Among them:

- BARCELÓ, D. Fate and global risk of nanomaterials in the environment and recycling wasters. Oral presentation.

2 contributions in 31st International Symposium on Halogenated Persistent Organic Pollutants - DIOXIN 2011. Brussels (Belgium), 21-25 August 2011. Among them:

- ELJARRAT, E. Development of analytical method for the determination of dechloranes and related compounds in environmental and biota matrices. Oral presentation.

BARCELÓ, D. Analysis of Emerging Organic Contaminants. Oral presentation. 4^o Congresso BrMass. Sociedade Brasileira de Espectrometria de Massas. Brasil, 10-13 December 2011

ELOSEGI, A. La perspective fonctionnelle a la réhabilitation et restauration des écosystèmes fluviales. Oral presentation (invited lecture). Réhabilitation des Hydrosystèmes Continentaux dans un Contexte de Changements Environnementaux: Enjeux Scientifiques et Nouvelles Perspectives. Montréal (Canada), 3-4 October 2011

GAGO-FERRERO, P., DÍAZ-CRUZ, S. and BARCELÓ, D. Expanding the knowledge on organic UV filters in the environment: occurrence, removal and toxicity. Oral presentation. SETAC North America 32nd meeting, Navigating Environmental challenges: Historical lessons guiding future directions. Boston (USA), 13-17 November 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), 26 June - 1 July 2011