



## EU-Wide screening for emerging pollutants

### FATE Campaign 1: Selected European rivers

In the context of its support to the Water Framework Directive and related legislation, the JRC Institute for Environment and Sustainability (IES) has organised an EU-wide perspective on the occurrence of polar emerging pollutants, such as pesticides (and their degradation products), pharmaceuticals, hormones, antibiotics, and industrial chemicals (alkylphenolics, and perfluorinated compounds) in European rivers. The screening exercise was carried out in autumn 2007 and involved not less than 71 laboratories from whole Europe.

In total, 126 sampling stations from European streams, rivers and similar water bodies were screened by the participants. All samples were shipped to the facilities of the IES' RWER-Laboratory for analysis by means of SPE-LC-MS/MS. In total 35 chemical compounds were identified and quantified, thus forming a sound data basis for further discussions. The campaign is part of the FATE approach towards integrated monitoring and modeling of pollutants. Additional EU-wide initiatives on other emerging compounds are ongoing.

#### Compounds selected for the exercise

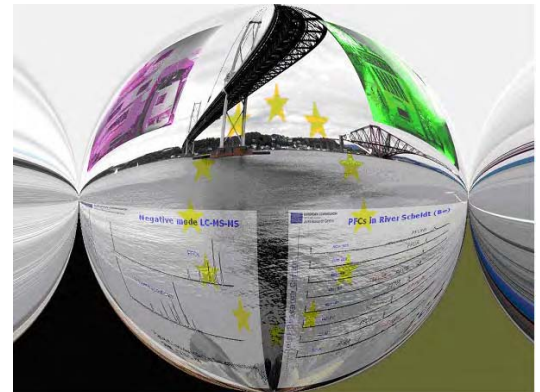
The following compounds were selected for the screening exercise: Nitrophenol, 2,4-Dinitrophenol, Naproxen, Ketoprofen, Mecoprop, Bezafibrate, Ibuprofen, Diclofenac, Gemfibrozil, Bentazone, 2,4-D, PFHxA, PFHpA, PFOA, PFNA, PFOS, PFDA, PUnA, Benzotriazole, Caffeine, Desethyl-Atrazine, Carbama, Sulfamethoxazole, Simazine, Desethylterbutylazine, Methylbenzotriazole, Atrazin, Isoproturon, Diuron, Terbutylazin, NPE1C, Nonylphenol, Bisphenol A, Estrone, tert-OP as well as total mercury content.

#### Logistical organization and sampling

Sampling sites were proposed by selected laboratories engaged in water monitoring according to WFD requirements or research teams. Empty, pre-conditioned and labeled polypropylene bottles were dispatched to the participating labs, which performed the sampling according to the instructions provided. Upon sampling, the filled bottles were dispatched to the JRC under cooled conditions within 48h. All analytical determinations were performed in the premises of the RWER Laboratory. All samples were carefully documented and geo-referenced. All information were registered in the RWER Laboratory Information Management System inaugurated at this occasion.

#### Analytical determinations

All determinations were done using HPLC-MS and AAS (only Hg) using validated and quality-assured in-house standard operation procedures. Due to a lack of appropriate certified reference materials all methods are checked by regular participation in laboratory intercomparisons.



The EU-wide campaigns contribute to the awareness raising in MS for emerging pollutants.



All samples were carefully documented and geo-referenced. Dispatch was done under controlled conditions using specially designed containers



The organic pollutants were analysed by means of HPLC-MS/MS Detection after Solid-Phase Extraction (SPE).



The EU-wide screening exercise succeeded to obtain a good coverage of the European continent, thus allowing a glance on the concentration ranges of the studied compounds. Further campaigns are in progress.

## Outlook and perspectives

This first EU-wide Screening exercise on the emerging pollutants in European rivers are part of the so-called FATE approach. FATE, which stands for **Fate of pollutants in aquatic and terrestrial ecosystems in Europe**, aims at an integrated approach of modeling and monitoring ranging from EU-wide screening to the identification and assessment of hot-spots.

In order to develop additional FATE - layers, further EU-wide campaigns are targeting various lipids as indicators for persistent organic pollutants, sewage sludges, and various water matrices such as groundwater, coastal waters and waste water. In order to cope with the variety of analytical measurement capabilities required, intense networking with other environmental laboratories and competence centres, e.g. the NORMAN-Initiative, is ongoing.