



## **REACH-ER: a tool to evaluate river basin remediation measures for contaminants at the catchment scale**

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The European Union (EU) adopted the Water Framework Directive (WFD) in 2000 ensuring that all aquatic ecosystems meet 'good status' by 2015. However, it is a major challenge for river basin managers to meet this requirement in river basins with a high population density as well as intensive agricultural and industrial activities. The EU financed SQUAREHAB project (FP7) specifically examines the ecological and economic impact of innovative rehabilitation technologies for multi-pressured degraded water bodies.

For this purpose, a generic collaborative management tool 'REACH-ER' is being developed that can be used by stakeholders, citizens and water managers to evaluate the ecological and economical effects of different remedial actions on waterbodies. The tool is built using databases from large scale models simulating the hydrological dynamics of the river basins and sub-basins, the costs of the measures and the effectiveness of the measures in terms of ecological impact. Knowledge rules are used to describe the relationships between these data in order to compute the flux concentrations or to compute the effectiveness of measures. The management tool specifically addresses nitrate pollution and pollution by organic micropollutants.

Detailed models are also used to predict the effectiveness of site remedial technologies using readily available global data. Rules describing ecological impacts are derived from ecotoxicological data for (mixtures of) specific contaminants (msPAF) and ecological indices relating effects to the presence of certain contaminants. Rules describing the cost-effectiveness of measures are derived from linear programming models identifying the least-cost combination of abatement measures to satisfy multi-pollutant reduction targets and from multi-criteria analysis.