



Preserving water quality, restoring aquatic ecosystems, studying the consequences of climate change as well as elaborating more efficient methods for taking into account environmental issues in development projects were the main areas investigated. The new needs emerging in this field require an open and flexible research policy.

The pollution of the Rhône river by PCBs (PolyChloroBiphenyls) hit the headlines in 2007. As of 2008, a research project was approved by the Axelera research cluster (Rhône-Alpes region) and involved 40 partners over a period of 40 months. Artelia's contribution consisted mainly in modelling the movement of fine sediment in the main channel and secondary branches of the river as well as in modelling the dynamics of the PCBs as they interacted with water flows, taking into account the adsorption/desorption phenomena. An appropriate experimental protocol was also designed in order to analyse the behavior and transfer of PCBs to sediments in the water column.

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In the area of **hydrobiology**, Artelia is developing modelling tools and methods to predict the dynamics of pollution and its consequences on the hydrosystem. Efforts focused mainly on the movement of PCBs with fine sediments (Axelera PCB project), on the fate of hydrocarbons in rivers (MIGR'HYCAR project), on outfall discharges, on eutrophication, and on salt intrusion near a dam in an estuary.

To contribute to the **preservation and restoration of aquatic ecosystems**, Artelia is working on alluvial morphodynamics and ecology, and developing innovative methods for re-establishing ecological continuity in rivers and restoring rivers and riverine/coastal wetlands. The European SPICOSA research project devoted to the sustainable management of coastal ecosystems ended in 2011 after 4 years of work.

More generally, in order to ensure **more effective consideration of environmental issues**, Artelia is developing methods for performing multi-criterion analyses, choosing indicators objectively, and assisting with decision-making so that development scenario sensitivity studies are more relevant and understandable.

Interesting results were also obtained when studying the consequences of **climate change**. These included better

estimates of regional vulnerability and of impacts, the consequences of such changes on the eco-morphology of estuaries (C3E2 project), innovative strategies for adapting hydro-systems to change (European CLIMATEWATER project), and the improvement in methods for estimating costs.

Other research subjects included **environmental risks** related to non-conventional hydrocarbon exploitation, environmental assessment of a carbon storage facility, landfill leachate treatment, polluted site management, wastewater reuse, biodiversity, and furniture recycling.

Lastly, Artelia innovated in **socio-economic areas** such as environmental taxation and the interaction between public development and water management policies (IDEAUX project).