



THE HANDBOOK ON WATER INFORMATION SYSTEMS

ADMINISTRATION, PROCESSING AND EXPLOITATION
OF WATER-RELATED DATA

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Case study 45: Water Information Systems facilitating transboundary management in the Rhine river basin [78]

The International Commission for the Protection of the Rhine (ICPR) develops, manages and uses different types of Water Information Systems (WIS) that are essential tools for the cross-border exchange and compilation of data within the Rhine river basin. However, the prerequisite for all (virtual) water information systems remains a real, well-organized exchange between the working bodies of the ICPR, whose members collect and produce complex data related to water quality and quantity issues. The various stages of the work between the countries within the Rhine basin are supported and accompanied by computer-, model- and GIS-based information systems presented here.

For the purpose of data management related to the implementation of both the European Water Framework Directive and the Floods Directive within the Rhine basin, the ICPR has concluded a cooperation agreement with the German Federal Institute of Hydrology (BfG) comprising the use of the water portal “WasserBLICK” (data exchange and hosting platform) and the production of different maps for the general and specialized public. Rhine Warning and Alarm Plan

After the chemical accident at Sandoz in 1986, the ICPR strengthened its international Warning and Alarm Plan (WAP). If, despite all preventive measures, an accident occurs or great amounts of hazardous substances flow into the Rhine that may detrimentally impact the water quality or drinking water supply along the river, the model-based WAP is activated, which above all warns all users downstream. Apart from warnings, which are only issued by the International Main Alert Centres (IAC) during huge and serious water pollution events, the WAP is increasingly used as an instrument for exchanging reliable information on sudden water pollution measured by monitoring stations along the Rhine, Neckar and Main rivers and smaller tributaries. The warnings and information issued every year are compiled in an annual report available on the ICPR website.

Transboundary Information systems related to flood risk management

The “Rhine Atlas” is a supra-national sensitization tool comprising aggregated flood hazard and risk maps of the countries on the river. For the main stream of the Rhine, flood depth and areas as well as objects at risk are shown for three scenarios (high, medium and low flood probability). Additional information and more detailed national maps are available by clicking on any area of the atlas. The Rhine Atlas, which is available on the ICPR website, raises risk awareness, supports the implementation of preventive measures in flood-prone areas, and represents a database for risk calculations (see below, the tool ICPR FloRiAn).

Flood forecasting and flood announcement contribute to reducing damage in case of a flood event. Therefore, the Rhine countries – through national centres along the river - cooperate at international level when exchanging data on discharge and precipitation and using them for flood forecasting. The quality of information and forecasting is continuously being improved. Today, national mobile applications like “Meine Pegel” (my gauges) disseminate information and warnings on water levels.

Instrument for assessing the impact of flood risk management measures on risk evolution: The ICPR, supported by the engineering consultant HKV, developed the GIS instrument “ICPR FloRiAn (Flood Risk Analysis)”. Its purpose is to evaluate the effect of measures to reduce flood risk and estimate the future evolution of flood risk. Flood maps (e.g. developed under the FD) are the basis for the tool. In addition to the quantification of economic flood risk, modules are developed for quantifying the consequences of risks for human health, the environment and cultural heritage. In short, the main instrument consists of three interacting calculation modules resulting in an overall damage or risk assessment. The ICPR uses this tool to assess risk reduction and evolution along the Rhine taking into account the impacts of measures. The instrument is available on demand from the ICPR and is applicable to other river basins.



Figure 61: The International Main Alert Centres (IAC) and information flow



Figure 62: Rhine Atlas (flood hazard and flood risk maps)