

Water Information Systems to support water managers and decision-makers

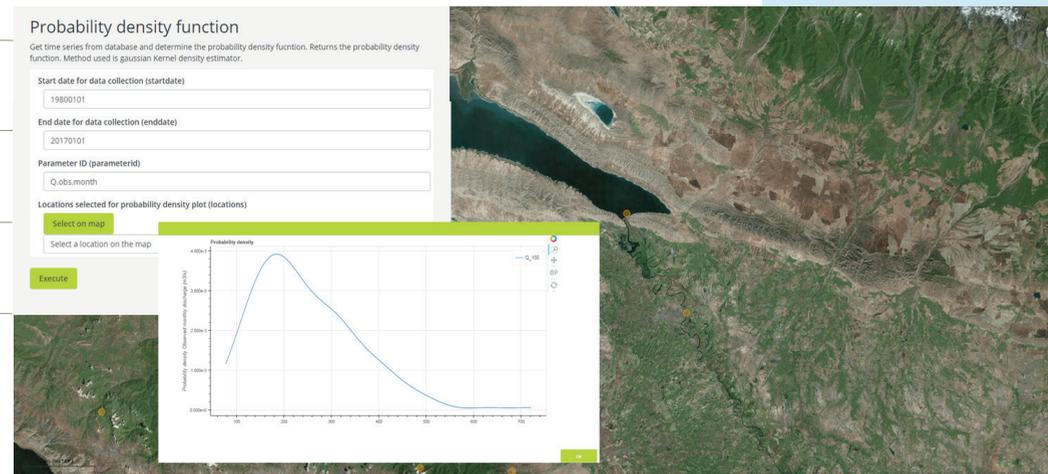
Deltares is developing Water Information Systems in projects in several parts of the world. The aim of the systems is generally to validate, store and retrieve all kinds of water-related data and to provide easy access to the information. Furthermore, some of the systems are used to facilitate working with mathematical simulation models. They are configured for different users, draw on common open source and freeware components, such as PostgreSQL, PostGIS, Geoserver and FEWS, and they work with custom services like WPS. The components and services are loosely coupled and bundled as OpenEarth Water Information Systems. The systems also use common standards for data exchange like WCS, WFS and OPeNDAP.

An example of a Water Information System is the MajiSys system for water management in the Basin of Lake Naivasha, Kenya. It was developed with the University of Twente for the Water Resources Management Authority as part of the Integrated Water Resources Action Programme (IWRAP) executed under the lead of WWF Kenya and sponsored by the Royal Netherlands Embassy in Nairobi. MajiSys focuses on the validation, storage and retrieval of data about lake, river and groundwater levels, river discharges, and the abstraction of surface and groundwater. Combining these validated data in one system is a prerequisite for the sustainable management of the water resource in the basin of Lake Naivasha. The same components of the WIS are being used in Azerbaijan to create AzerWIS for the Azerbaijan Ministry of Emergency Situations. This system focuses on the availability of surface and groundwater resources.

The most ambitious application so far of the components of a Water Information System is now being implemented for the Indian Ministry of Water Resources, River Development & Ganga Rejuvenation and the Indian state-level Departments of Water Resources funded by the World Bank. The aim of the GangaWIS



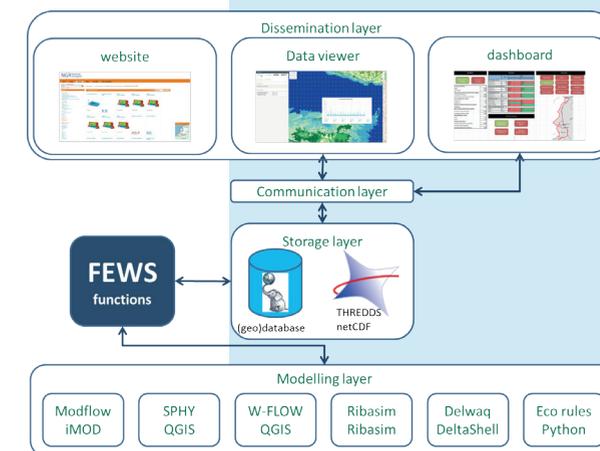
Collaborative modelling session



Map viewer with a probability density function for discharge levels

is to support strategic basin planning for the Ganga Basin. It is being used for the validation, storage, analysis, presentation and retrieval of data about surface and groundwater resources, water use, emission of pollutants, water quality and ecology. A complex linked modelling system is being used here that combines hydrology, geohydrology, water allocation, water quality and ecology. The FEWS component in GangaWIS prepares the input time series for these models and stores the output, with model linkage being facilitated by the GangaWIS. Finally, the dashboard of the GangaWIS enables decision-makers and stakeholders to evaluate the impacts of different scenarios and strategies on selected indicators. The dashboard and a map viewer can be used to disseminate information to target groups through the internet. The development of the mathematical models and the dashboard is a collaborative modelling exercise with the main governmental stakeholders at the central and state levels. The final version of the GangaWIS will be ready at the end of 2017.

Water Information Systems are essential support tools for the management of water resources. The modular setup with reusable components is an integral part of the Deltares approach for information systems, enabling tailor-made solutions that integrate measurements with model input and output to support water managers and decision-makers.



Schematic overview of the GangaWIS for the Ganga River Basin in India

Further reading:
<http://openeearth.eu>