Sustainable water strategy by means of tight-knit approach to water cycle in river catchment

CRIS project is a demonstration of an information system that supports rational management of water resources in river catchment areas.

It will be tested in the part of the Mała Wisła River basin starting from its spring, through the Goczałkowicki Dam Reservoir to the Biała River estuary. The Mała Wisła River catchment area is situated in the south of Poland (Śląskie and Małopolskie Voivodeships).

The developed information system will take into account the needs of potential users as well as information obtained from institutions responsible for management and monitoring of the environment in the investigated area. The system will consist of a database and an on-line user interface combining: 1) operational monitoring data, 2) spatial data from the case study area (GIS layers), 3) meteorological data, 4) satellite observations, 5) results of simulations performed using complex and already evaluated modelling tools, 6) tools for visualisation and interpretation of the monitoring and modelling results (reports, tables, graphs, maps).

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CRIS INFORMATION SERVICE will provide data on the current status and quality of water and allow to predict changes in the circulation of water in a river basin.

The service will support units responsible for water management by providing them with real-time and short-term forecast information as well as archive data concerning:

- distribution of precipitation, including flow rate and water level in rivers and the reservoir;
- surface water quality;
- water resources depletion and water quality degradation;
- groundwater resources;
- influence of variable conditions within the river catchment on water balance and water quality.

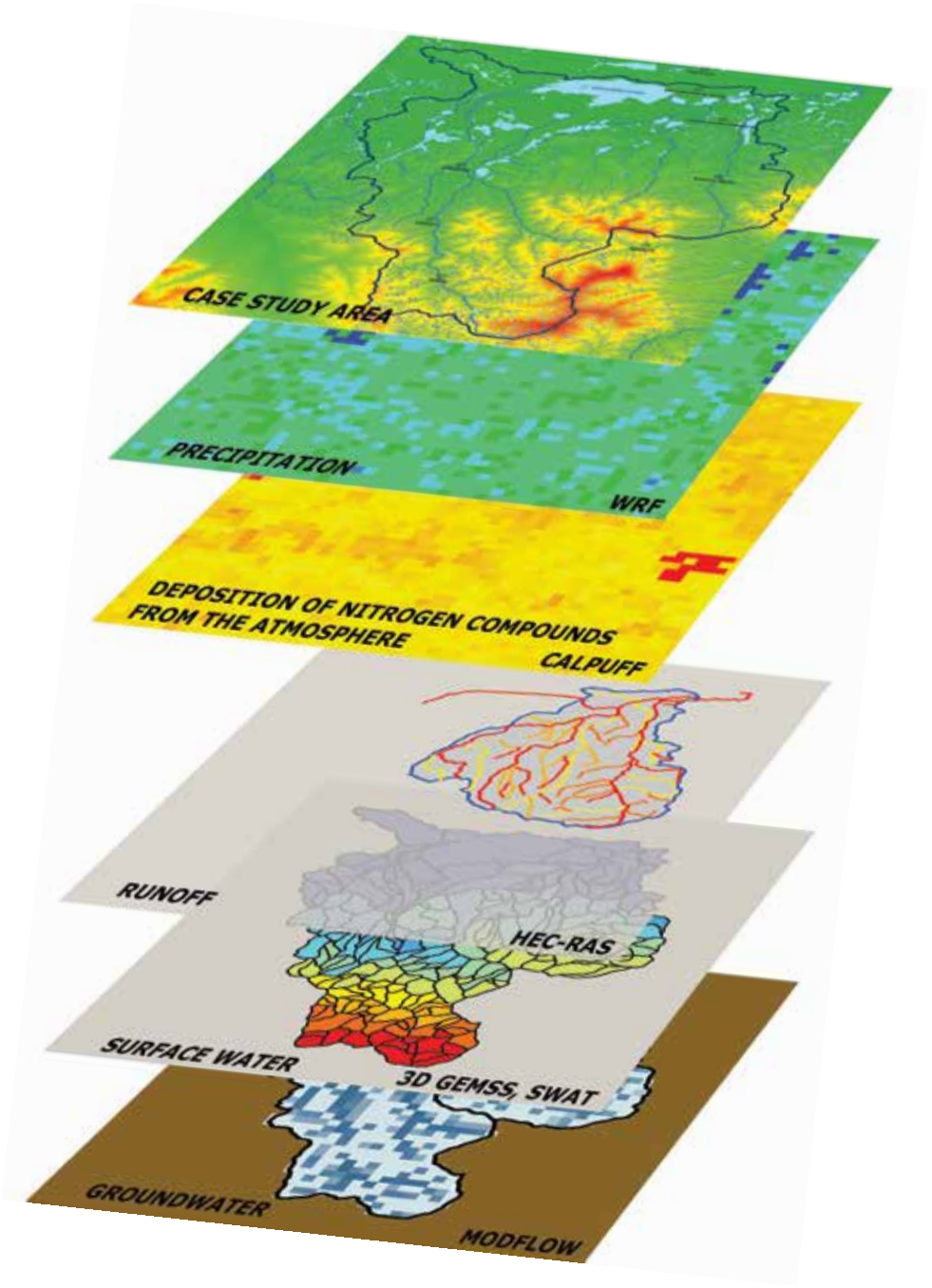
The service will help identify the impact of anthropogenic factors such as: land use, water consumption, wastewater discharge and atmospheric deposition of pollutants on the balance and quality of water in the catchment area, as well as determine the impact of changing weather conditions on circulation of water in the catchment.

MODELLING TOOLS

A set of modelling tools will be used to simulate (or forecast):

- spatial rainfall distribution and meteorological radar data - Weather Research & Forecasting Model (WRF);
- air pollution transport and deposition - CALPUFF Model;
- water balance and surface water quality in the river basin - Soil and Water Assessment Tool Model (SWAT);
- flow rate and water level in watercourses - Hydrologic Engineering Centres River Analysis System (HEC-RAS);
- 3D reservoir hydrodynamics including water quality parameters - Generalised Environmental Modelling System for Surface Waters (3D GEMSS);
- groundwater balance and hydrodynamic field - USGS Modular Three-Dimensional Groundwater Flow Model (MODFLOW).

Mała Wisła catchment area information service



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