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Decision support system for drinking water management

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The problems in drinking water management are complex and often solutions must be reached under strict time constrains. This is especially distinct in case of environmental accidents in the catchment areas of the wells that are used for drinking water supply. The beneficial tools that can help decision makers and make program of activities more efficient are decision support systems (DSS). In general they are defined as computer-based support systems that help decision makers utilize data and models to solve unstructured problems.
The presented DSS was developed in the frame of INCOME project which is focused on the long-term stable and safe drinking water supply in Ljubljana. The two main water resources Ljubljana polje and Barje alluvial aquifers are characterized by a strong interconnection of surface and groundwater, high vulnerability, high velocities of groundwater flow and pollutant transport. In case of sudden pollution, reactions should be very fast to avoid serious impact to the water supply. In the area high pressures arising from urbanization, industry, traffic, agriculture and old environmental burdens.
The aim of the developed DSS is to optimize the activities in cases of emergency water management and to optimize the administrative work regarding the activities that can improve groundwater quality status. The DSS is an interactive computer system that utilizes data base, hydrological modelling, and experts' and stakeholders' knowledge. It consists of three components, tackling the different abovementioned issues in water management. The first one utilizes the work on identification, cleaning up and restoration of illegal dumpsites that are a serious threat to the qualitative status of groundwater. The other two components utilize the predictive capability of the hydrological model and scenario analysis. The user interacts with the system by a graphical interface that guides the user step-by-step to the recommended remedial measures. Consequently, the acquisition of information to support the water management's decisions is simplified and faster, thus contributing to more efficient water management and a safer supply of drinking water.