



Computer-based technology for estimation of condition and management of water resources at a catchment scale

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Condition of water resources is result of interference of nature and anthropogenic factors. To estimate condition of water resources at a regional (catchment) scale with aim of optimization in water consumption and water requirement a computer-based water-management technology has been developed. This technology based both on hydrological zoning of river basin and information about water using and water consumption distributed over river basin.

Hydrological zoning is based on elementary watersheds as zoning units. Zoning is realized by using information modeling system ECOMAG, which is version of spatial distributed physically based model of hydrology cycle and pollution transfer in river basin. Space schematization of the river basin (the allocation of river network, sub-catchments of tributaries, elementary watersheds and slope elements) is executed on the basis of digital elevation model using GIS-technology. Automatic catchment fragmentation to elementary watersheds, construction of modeled river network can be made with different levels of details and scale.

Different water-management regional monitoring data were used as characteristics of anthropogenic load on river basin and water resources: water using by agricultural, industry etc., inflow in the river network various types of return water (clean, polluted, waste), pollutant's content and other. This information in GIS-form covers whole river basin including elementary watersheds. Using ECOMAG algorithms information about water using, water management and water pollution in a regional scale was integrated along length of river network.

This technology allows to get series of evaluation maps including maps of distribu-

tion along river network of water resources, various pollutants, water consumption for agricultural, industry and population requirements, water inflow in the river network of polluted and waste waters. These maps display general condition and tendency in water management situation and can be used in planning and rationalization of water consumption processes for sustainable development of regions.