

INTEGRATED MODELING OF HORNAD RIVER BASIN IN FRAME OF THE TISZA RIVER PROJECT.

Jana Poórová¹, Emília Kuníková², Lucia Velčická¹

¹Slovak Hydrometeorological Institute, Bratislava, ²Water Resources Research Institute, Bratislava,

Abstract:

The Tisza River Project proposal was submitted as an RTD project proposal to the 5th Framework Programme of the European Commission. The project, had its kick-off on 15 January 2002. A consortium consisting of 11 participants is carrying out the Project, co-ordinated by the Water Resources Research Centre VITUKI, Hungary. The participants are partly national institutions, organisations and universities of the Tisza Basin countries (Slovakia, Romania and Hungary, with an outlook to Ukrainian subcontracting partners) and partly leading research institutes and universities of the Member States of the European Union (Austria, Belgium, Germany and the United Kingdom). The overall objective of the project is to help saving the water resources and ecological values with the help of integrated catchment management tools and to secure the sustainable use of the resources of the Tisza River Basin.

The scientific objective of The Tisza River Project is to develop a “real-life-scale” integrated catchment model system. It means the development of practical application oriented set of tools, (e.g. set of computer models for water flow), that are exactly tailored to the issues to be solved and the availability of data. Inevitable part of the catchment modelling is hydrological model.

Target of integrated water resource management is to provide demand on water to society, namely adaptation water resources distribution in time and space toward water demand distribution in time and space. Present human activities are determining factor of changing environment.

The development of water environmental management strategies, formulated as input scenarios, is a crucial element of the whole integrated catchment management process. Chosen strategies can be translated to the model input scenarios and run them with the model system and see what improvement could be achieved handled by the models and if at the same time are in compliance with national or local water management polices.

The hydrological modelling can be considered as one of major possibilities for the quantification and qualification of hydrological process changes. For application has been chosen the WetSpa (Water and Energy Transfer between Soil, Plant and Atmosphere) model, calibrated for Hornad River Basin. WetSpa simulates the most important hydrological processes in a river basin, such as runoff, actual evapotranspiration, groundwater recharge, and hydrographs at selected locations in the stream network, etc. Next two kinds of scenarios have been applied in the Hornad river basin: 1. supposed of acceleration of the runoff, 2. supposed of reduction of the runoff.