

SYMPOSIUM ON INTEGRATED APPLICATIONS (B5)  
Tools and Technology in Support of Integrated Applications (1)

Author: Dr. Sevda R. Ibrahimova  
Azerbaijan National Aerospace Agency, Azerbaijan, s\_ibrahimova@yahoo.com

REMOTE SENSING AND GIS BASED TECHNOLOGY FOR CREATION 3D GROUNDWATER  
MODELS IN AZERBAIJAN

**Abstract**

Proposed work is to creation of 3D Groundwater maps of Azerbaijan and information tool using high resolution space information and GIS based hydro-geological databases. This involves large spectrum information related to hydrogeology, geology, hydrology, meteorology, water engineering, land management, and environment.

In order to gain an impression of the amount of river water which may infiltrate into the river bed of the Kura, a small theoretical groundwater model in MODFLOW is constructed simulating a general setting of the meandering Kura river. In a number of scenarios some plausible hydrogeological settings are defined to determine the bandwidth of the infiltrating fluxes of water. The models feature both steady- and unsteady-state versions. The unsteady-state version is the most important model as it simulates the varying Kura river stages over the year and the sudden rise of the Kura river during flooding.

The other important component is the estimation of the direct abstractions from the rivers by pumping for irrigation practices. As the information on these, often illegal, pumping practices is scarce the option was selected of using LANDSAT7 satellite imagery to determine the actual irrigated areas by processing the images in a GIS system and attempting to detect the areas with high green reflections in summer time when soil moisture from the previous rainfall period is depleted and can be maintained by irrigation only. In addition to this approach from satellite imagery, data from Azerbaijan Ministry of Emergency Situation and Melioration is used to estimate water losses from irrigation from official data, albeit fragmentary.

As the information on these, often illegal, pumping practices is scarce the option was selected of using LANDSAT7 satellite imagery to determine the actual irrigated areas by processing the images in a GIS system and attempting to detect the areas with high green reflections in summer time when soil moisture from the previous rainfall period is depleted and can be maintained by irrigation only. In addition to this approach from satellite imagery, data from MES (Azerbaijan Ministry of Emergency Situation) and Melioration is used to estimate water losses from irrigation from official data, albeit fragmentary.