

# **Physical modeling of hydrogeologic parameters effecting meander migration of Gezel-Uzan river in central Iran**

Esfandiari, Mehrdad, The Tehran University, Tehran, Iran

The catchment basin of Gezel-Uzan river covers major parts of north and central Iran and with another major river, Shahrud, join together and discharges into a large lake behind Sefid Roud Dam. This dam and its catchment areas play a major role in hydrogeologic cycle, water supplies, morphology, erosion, and sediment transport of the region.

Gezel-Uzan river supplies more than 84% of sediments of the reservoir lake. To understand its various mechanisms a physical modeling of various hydrogeologic parameters with unit stream power, low gradient of 0.003%, high gradient of 0.007, with varying flow rates and channel morphology, sediments transport, erosion, and meander migration was carried out. The designed model had an optimum horizontal scale of 1:400 and 1:40 vertically. Discharge and gradients of the constructed flume model was considered as varying parameters, affecting directly meandering migration, erosion, and sediments; while channel geometry and bed load was considered as non-variables in certain phase of the study. Collection of field data from a 6 Km. of selected length of the river where geomorphic features warranted change of meandering, was made for bed and suspended load determination at various depths of channel. A "distorted physical model" was chosen to study 9 types of meandering, energy and velocity distribution.

It is concluded that an increase in discharge results in lateral expansion of channel width which is comparatively more than meander migration. The downstream meander migration is more than its lateral extension in vertical section of the channel. On the basis of this similitude and modeling, erosion, sediment load transport, rate of meander migration and their effects can be obtained for the unknown hydrogeologic parameters.