

Maar lakes of Tihany Peninsula - in connection under the surface?

Tímea Havril¹, Ádám Tóth²

¹*Eötvös Loránd University, Department of Physical and Applied Geology*

²*Eötvös Loránd University, Department of Geophysics and Space Science*

The student research thesis deals with just one segment of the complex hydrogeology of the Tihany Peninsula, notably, the possible hydraulic connection between the Lake Külső and seasonally water-covered Rátai-csáva.

These lakes are located in maar structures, which were formed by the phreatomagmatic volcanism of the region (NÉMETH ET AL., 2001). The recharge of the lakes was supposed to originate mainly from precipitation. However based on the studies of WINTER (1976, etc.) and results of former investigations of ELTE Hydrogeology and Geothermics Group, - as a research hypothesis - the interaction between the lakes under the surface, could not be excluded. The purpose of the research was 1) to understand the hydraulics of Rátai-csáva and Lake Külső; 2) to explain the seasonal character of Rátai-csáva; and 3) to check the above mentioned hypothesis.

During the work archive data were processed, grain size distribution analyses from the drilling samples of shallow boreholes were made, and water level and water chemistry measurements were achieved from the potencimeters. These data were used to do hydraulic calculations to evaluate water level fluctuations, and to interpret water chemistry. To clarify the hydrostratigraphic conditions radio-magnetotelluric (RMT) measurements were carried out. The interaction between the two lakes and groundwater was checked by two-dimensional numerical simulation of groundwater flow.

The results of this study have proven that Rátai-csáva is located in a local depression of a recharge area, therefore it is strongly influenced by the seasonality of the precipitation. Its seasonal water-coverage is caused by the rising water level following rainy periods. The infiltrated water flows through the volcanic medium towards the Lake Külső which has lower water level compared to the Rátai-csáva.

These results would be significant considering the water balance and ecology of the lakes, and could influence the management of natural environment of the lakes.