

## **Topographic and depositional signature of old anthropic lakes in northern part of the Moldavian Plateau (NE Romania)**

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The role of humans and their social activities in reshaping earth surface is obvious in many places of the world. Anthropogenic fingerprints on Earth's surface morphology are recognizable by their topographic and depositional signatures that can cause considerable changes in geomorphological organization of the landscape, with direct consequences on Earth surface processes. Anthropogenic dams and their associated sediments represent recent archives that record environmental changes. They can provide substantial data to reconstruct general models in geomorphic evolution of hydrologic catchments and the identification of extreme meteorological events and sediment fluxes. Also, geochemical tracers provide us relevant indicators about climatic patterns and local condition of sedimentation processes.

Until quite recently, the identification and counting the old lakes have been carried out mostly by studying different old maps and less by analyzing their fingerprints on the Earth surface. Considered a real revolution in geomorphology, the high-resolution LiDAR data allow us nowadays a more precise recognition of minor landforms, their extent and cross-relationships, as well as to discover surface features that have escaped the attention before. Furthermore, by using Electrical Resistivity Tomography techniques, the 3D extension of the sediments can be revealed.

Anthropogenic lakes are one of the most particular hydrological anthropic features of the landscape in the northern part of the Moldavian Plateau (Eastern Carpathian lowland). The need for water supply, have forced the inhabitants to build dams of various sizes along the entire river network. Over the time, many dams were abandoned, while others have been relocated with an impressive dynamic at historical time scale.

For more than 3000 sq km we have carried out an accurate inventory of abandoned dams using LIDAR imagery. Taking into consideration the last appearance of the lakes on the old maps, they were classified: pre-1895, 1895-1940, 1940-2000 and present active. In this research we have analyzed 2 small old lakes (pre-1895) and their sedimentary archives. Using LIDAR high resolution DEM and ERT scans we have reconstruct the maximum extension of the lake and the deepening of the sediments. The sediments consist of clay and plant remains with some light-coloured horizons. Bioturbation is abundant in the wall of horizontal tunnels with diameter between 3 and 5 cm. Thin sections were prepared from some samples, opaque, octahedral minerals being visible around the size of 10  $\mu\text{m}$ . Their colour in reflected light was bluishgrey which suggests that these could be magnetite grains instead of pyrite. Authigenic magnetite is abundant in lake sediments, close to the oxic-anoxic transition zone, where the sediment is not sulphidic. It is commonly precipitated as a result of bacterial activity, however these minerals usually don't exceed the size of 100 nm therefore the authigenic origin of the magnetite in our samples is not proven yet.

The study of this sedimentary archives, we believe that needs to be extended in order to have an image of the hydrological and climatological evolution of the study area in the last 500 years.