



Comparing sediment load and deposit thickness values in the eastern embayment of shallow Lake Balaton, Hungary

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Recent high-resolution lake seismic measurements in the eastern embayment of Lake Balaton have enabled the calculation of the present water bottom and the lacustrine sediment layer thickness. The seismic lines provided some three million data points for the 230 km² area of the water body (corresponding to a point density of 0.013 points/m²). Bathymetric DEMs edited from archive water depth maps of the lake were compared to present-day water depth data, providing estimations of the sediment accumulation rate for the last 25 years. This accumulation rate was compared to the recent sediment load of the rivers and streams flowing into the lake and corrected for the precipitation of dissolved matter (ca. 50%). Archive maps were used for the estimation of changes in land use (which has significant impact on the sediment load). Although the total sediment load is climate-dependent, the amount of clastic and solved (primarily calcareous) material accumulated during the lifetime of the basin fits to the calculated cumulative sediment load. Compaction and shore erosion may have influence on the calculated rate in a limited extent. The primary source of sediment is the Zala river flowing into the western subbasin, but its sediment load is intensively redistributed by currents and seiche throughout the lake.

A further complication in the calculation is the yet unknown contribution of the products of the mass movements of the elevated shoreline on the east. For the time being

(ca. for the last century) the slumping of the ca. 40-50 m high walls consisting of Pannonian loose sediments has largely been stopped by mechanical countermeasures, but material of the tongues of the mass movements distributed by lake currents and the seiche could have played an important role in the past as well in the sedimentation balance.

This is a contribution of projects NKFP 3B022_04 (BALÖKO) and OTKA T47104 and TS44765.