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Mapping of lacustrine sediment thickness and water depth of the Lake Balaton

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Lake Balaton is the largest lake in Central Europe with a total area of 594 km^2, but its average depth is less than 4 meters. The lake itself is a very young feature: the oldest lacustrine sediments are ca. 15,000 years old. The history of the lake is largely unsolved, the hypotheses are based on borehole data and the morphology of the surrounding landscape. The lake bottom was surveyed and mapped every few decades since 1895 but the last complete survey was done in 1975.

Water seismic measurements have been carried out on Lake Balaton since 1997, providing valuable and very accurate data on the Pannonian (Miocene) strata underlying the Holocene sediment layers. With the help of the ultra high resolution seismic data the water depth and the thickness of the lacustrine sediments can also be evaluated with decimetre accuracy.

We created a new digital terrain model of the lake bottom based on the seismic measurements on the Eastern basin of the lake, and also calculated and mapped the sediment thickness and the topography of the erosion surface underlying the Holocene sediment.

The resulting elevation models were compared to a DEM calculated from the contour lines of the 1975 depth maps and the sediment translocation processes in the past 30 years were measured.

The areas of high sediment accumulation were located based on the sediment thickness map of the Eastern Basin and the actual volume of the sediment was also cal-

culated in these areas. These are presumably the actively sinking parts of the lake bottom.

In addition to providing information on the formation and present day sedimentation processes around Lake Balaton, the resulting accurate elevation model of the lake bottom fills a longtime gap in the research of the lake.