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Shallow seismic survey of Lake Ohrid, Macedonia and Albania, and initial results from surface sediment investigations

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Only a few lakes exist worldwide, which privide continuous sedimentary records from the Tertiary to the present times. Lake Ohrid is located at the Macedonian/Albanian border between 40˚54' and 41˚10' N. The lake is 30 km long (N-S extension) and 15 km wide and has a surface area of approximately 360 km^2. Two thirds of the lake belong to Macedonia and one third, the southwestern part, to Albania. The lake is supposed to be of tectonic origin and is highly affected by the karst environment. Bathymetric maps show a maximum water depth of almost 300 m. More than 200 endemic species, mostly invertebrates and algae and some fish, indicate that the lake has been a stable system over a long period. Biological and biogeographical studies suggest that the origin of Lake Ohrid dates back to Pliocene times, about three to five million years ago. Despite the knowledge about the immense age of the lake, investigations of its sedimentary record in order to reconstruct the regional climatic and environmental history are scarce.

In June 2004, an extensive shallow seismic survey was carried out at Lake Ohrid in order to understand spatial differences in sediment structures and sedimentation rates, to test its potential for future coring initiatives, and to choose appropriate future coring sites. The shallow seismic investigations revealed that the sediments of Lake Ohrid are characterised by recent and ancient mass movement processes. Slumps and turbidites

are common, as well as thrusts and folds, likely a result of intense neotectonic activities in the area. At some locations, the upper sediment horizons are eroded, exposing older sediments at the surface. Undisturbed sediments have been observed mainly in the distal parts of the basin. A set of surface sediment cores recovered from different locations in the lake basin indicate that the lake underwent eutrophication in recent times and significant environmental changes during the past 1 - 2 ka.

The first results indicate that Lake Ohrid forms, having regard to the results of the seismic survey and to earlier sedimentological investigations, a reliable archive of climatic and environmental changes in the northeastern Mediterranean region for at least the past 100 ka. Therefore, results obtained from the future investigation of longer sediment sequences can be used for a comparison with other terrestrial and marine archives from the surrounding in order to figure out regional pecularities in dependance on larger scale environmental changes, such as formed by long-term changes in the North Atlantic Oscillation.