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High-resolution geochemical investigations on a long record from ancient Lake Ohrid Macedonia/Albania.

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Lake Ohrid, a transboundary lake between Macedonia and Albania in the central-northern Mediterranean, is with an age of approximately 3-5 Ma considered to be the oldest and one of the largest lakes in Europe. With a sediment fill of more than 500 m it provides a unique record in a region responding sensitively to climate change.

Here we present first results from a sediment record (Co1202) recovered from Lake Ohrid in autumn 2007. The c. 15 m long sediment sequence was taken from 145 m water depth in the north-eastern part of the lake, where the sediment succession is widely undisturbed according to a shallow seismic pre-site survey. Core Co1202 likely covers the period from the last interstadial to the present and comprises several cm thick tephra layers, which in combination with radiocarbon dating and paleomagnetic investigations will lead to a good age control of the record.

High-resolution x-ray fluorescence (XRF) and magnetic susceptibility measurements were performed at 1 mm intervals after opening of the core. Analysis of biogeochemical properties such as TOC, TIC, TN, and TS were conducted at lower resolution (10 cm).

The sediment composition varies strongly throughout core Co1202 showing two clearly distinguishable units in terms of lithology, magnetic susceptibility, inorganic and organic element composition. A comparison with another core (Lz1120), taken already in 2005 from the south-eastern part of the lake at 105 m water depth, reveals

different sedimentation rates, but similar sediment characteristics likely triggered by environmental changes.

Massive sediment units with high amounts of Ca, TOC, TIC, low amounts of Fe and low magnetic susceptibility values are indicative for warm stages, whereas laminated sediments, with high amounts of Fe, high magnetic susceptibility values, low Ca, TOC, and TIC concentrations, and the sporadic occurrence of dropstones are indicative for cold stages. In addition to these large-scale shifts in sediment composition, small-scale variations of the element composition, especially during stages 4, 3, and 2, seem to reflect cyclic responses of Lake Ohrid to past short-term climate fluctuations, and thus indicate that Lake Ohrid has reacted sensitively to past climate change.