Geophysical Research Abstracts
Vol. 12, EGU2010-10455-1, 2010
EGU General Assembly 2010

Quaternary evolution of the delta systems and the coast line of Lake Ohrid (FYROM/Albania) revealed by shallow geophysical and drilling data

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The Lake Ohrid Basin (40°54´ - 41°10‘N, 20°38‘- 20°48‘E) is a cross boundary lake (FYROM/Albania) stretching over a length of c. 30 km and a width of c. 15 km. It is situated in a karstic environment in the Balkanides, an active tectonic region. The general geodynamic setting of the Lake Ohrid area can be described as a “basin and range” situation which is influenced by the northern part of the Hellenic trench and is underlain by ongonig extension so that the Ohrid basin is still actively subsiding. Typical sedimentation patterns supported by the topography give evidence for a tectonically controlled regime. Inactive, Pleistocene lobe-shaped fans are cut off relatively linear by the lake. Drowned alluvial fans along the west coast give evidence for lake-level fluctuations or tectonic subsidence along the western basin margin. In contrast the Struga plain in the North is a vast dried up area, which acts either as a sedimentary catchment for a fan system or as a tectonic basement which is subject to subsidence. Thus, the investigation areas concentrated close to the shorelines including extensive parts at the west coast, in the Struga Plain to the North, the deltas of the inflowing rivers and mass movement bodies at the east coast. Ground Penetrating Radar and Electric Resistivity have been applied, as a non-invasive shallow subsurface mapping methods, to image the sedimentary and tectonic structures. Sediment cores were taken and grain size and sediment composition were analysed.
In the aggradation and deltaic plains of the Dajan river in the north and of the Cerava river in the south sets of channels cutting into horizontal layers were identified close to the shoreline. Several S-ward dipping foreset-like structures were found in the north near Struga. The cores show sequences of grain sizes varying between clay and gravel intersected by intervals that are fining upward, and are interpreted as fluvial sediments. No evidences for a higher lake-level were found, such as fine-grained limnic sediments, organic material or shells in the cores.
In conclusion, during the Pleistocene higher erosion rates are observed around Lake Ohrid, but no evidence for higher lake-level was found in the plains north and south of the lake. Thus the Pleistocene sediments are affected by erosion and by fault activity, mainly along N-S striking normal faults. Flooding of the Struga plain is only subject to a lower ground level presuming that the old shorelines where limited by the deposits of the fans.