



Determination of potential ICDP Sites and Reconstruction of Lake Level Changes at Lake Van, Turkey, based on high resolution seismic Surveying

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In the first two weeks of June 2004, a reflection seismic survey was carried out at Lake Van in Turkey (the fourth largest of all terminal lakes in the world). In total, 50 profiles with a length of ~850 km were collected by means of a high resolution multi channel seismic system and a GeoChirp system. The main goal of this survey is the interpretation of the seismic data in order to locate the best possible locations for potential ICDP-sites and to analyze the evolution of Lake Van. The seismic data were an important basis for the ICDP workshop proposal 'Lake Van Drilling Project-PALEOVAN'. The workshop will take place in Van in spring 2006. Due to its location in Eastern Turkey and the occurrence of non-floating varve records, Lake Van might act as a key site for the investigation of the Quaternary climatic evolution of the Near East. A second major goal will be to study the paleo-seismicity of this tectonic active region.

A major part of the survey was concentrated on the northern edge of the largest basin (Tatvan Basin), where a prominent sedimentary ridge and a secondary basin can be identified. The sedimentary ridge clearly shows a condensed sediment succession, while the secondary basin shows relatively undisturbed sediments. As these two features present promising potential locations for ICDP-sites, we crossed this area with a number of profiles in order to locate the best location for an ICDP Site. In addition, a 942cm long sediment core was taken on the sedimentary ridge in ~375m water depth,

which shows undisturbed and continuous sediments back to glacial times. The Chirp data in this area shows two prominent reflectors, which were found in the entire survey area and can be used as marker horizons. The correlation with dated sediment cores gives a sedimentation rate of about 75cm/1000a for the secondary basin during the Holocene and 50cm for the sedimentary ridge. The condensed sediments on the sedimentary ridge cause a slight reduction of the resolution of the sedimentary archive, but will cover a larger period of time. The seismic data of the secondary basin and its surrounding show, that a prograding sequence underlies undisturbed sediments. We propose, that the prograding sequence has been deposited directly after the development of the lava dam (in the west of the lake), which block the outflow of the lake and thus represents the initial phase of Lake Van as terminal lake. Assuming sedimentation rates of 50-75cm/1000a, the thickness of 120m of undisturbed sediments on top of the prograding sequence indicates that Lake Van is clearly older than the previously postulated 100,000 years.

The most prominent features on the lacustrine slopes mainly identified in water depths between 100m and 200m are deltaic sequences, submerged channels, and closely spaced U- and/or V-shaped depressions. Three stacked buried prograding deltaic sequences in the eastern part of the lake indicate low-water levels in several periods.