SEDIMENTOLOGICAL, GEOCHEMICAL AND MICROPALEONTOLOGICAL INVESTIGATIONS OF LAKE SEDIMENTS TO RECONSTRUCT LATE GLACIAL/HOLOCENE LANDSCAPE EVOLUTION AT LAGO BUDI (CHILE)

Stefan Doberschütz, Dirk Nowacki, Gerhard Daut, Brunhilde Dressler,
Steffi Faber, Peter Frenzel, Theresia Klötzing, Roland Mäusbacher, Mario Pino, and Johannes Wallner

Department of Geography, University of Jena, Löbdergraben 32, D-07737 Jena
Corresponding address: S. Doberschütz; stefan.doberschuetz@uni-jena.de, Fax: +49 (0) 3641 948812, Phone: +49 (0) 3641 6986850

The coastal lagoon Lago Budi, located in southern Chile (38.9° S) can be characterized through elevated ranges of salinity (7– ~20 ppm), which arise from a spatial connection to the Pacific Ocean. Due to its location, Lago Budi serves as a sediment trap, indicating Holocene landscape evolution.

During a field campaign (German Research Founding Project "Late Glacial/Holocene Landscape Evolution at Lago Budi, Chile (38.9° S) - Paleoseismic Investigations on Lake Sediments") several piston cores were taken to obtain detailed information on intra-lagoon sedimentation processes. Furthermore, the compilation and dating of tsunamigenic sediments should allow a deeper understanding of seismic events and associated tsunami waves on a temporal and regional scale. The influence of such singular events on lake chemistry and the corresponding microfauna also has to be taken into account.

Thus, the aim of the current study was to develop a multi-proxy approch providing the possibility to reconstruct Late Glacial / Holocene landscape evolution with simultaneous consideration of ecosystem modifications mainly caused by the input of allochtonous tsunamigenic sediments.

Based on the analysis of one piston core with a total length of 6 meters a wide range of sedimentological, geochemical and microfaunistical methods was carried out in reconstructing marine, brackish and freshwater conditions, reflecting a weakening respectivly strengthening of the marine impact. To distinguish event-associated disturbances and long-term modifications of the ecosystem grain-size analysis were performed by using laser diffraction technology. In combination with measurements of the magnetic susceptibility several sandy layers could be detected, indicating the existence of tsunamigenic deposits within the lake. In addition, X-ray diffractometry measurements enabled us to determine the origin and structural composition of these layers.

The results of geochemical analysis primarily based on atomic absorption spectrometry and CNS were used to deviate a chronological sequence of different types of paleoenvironments in terms of salinity and nutrient content. Furthermore C_{org}/N-ratios were calculated to identify the influence of terrigenous input.

One of the main focuses of our study was the use of micropaleontological indicators. By applying a paleoecological approach, several taxa of foraminifera, ostracods and molluscs representing brackish respectivly marine environments were identified and analysed quantitatively to reconstruct past habitat characteristics.