



## **A Multi-proxy approach for the investigation of climate changes over the last 3.5 ka in the Nam Co area (Xining, China) using lake sediments.**

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The presented project, as a part of the DFG funded Priority Programme 1372 “Tibetan Plateau: Formation – Climate – Ecosystems (TiP)”, is aimed to reconstruct processes within the lake Nam Co (southeastern part of the Tibetan Plateau; 4718 m asl.), its environment and the climatic conditions within the last 3.5 ka. During a field work campaign in September 2008 five gravity cores (70 cm to 115 cm length) were recovered in addition to one piston core with a total length of 11 m (water depth: 93 m). This study is focused on data of the sediments from two gravity cores (NC08/01 Pilot 3 & NC08/01 Pilot 4), whereby a wide spectrum of sedimentological, geochemical, mineralogical as well as biological investigations was carried out. Results are presented for XRD- and XRF measurements, for microfossil investigations (ostracodes & diatoms), for the analysis of thin sections and at least for SEM-imaging analyses. The data are completed by an age-depth model using  $^{210}\text{Pb}$  and  $^{137}\text{Cs}$  data as well as at least five  $^{14}\text{C}$  AMS ages.

The sediments show homogeneous sediment color as well as grain size distribution. Equally the XRD-measurements screen that the main components of the sediment, such as quartz, calcite, feldspars (albite & orthoclase) and muscovite do not vary with notable fluctuations over the time-depth scale. In addition monohydrocalcite ( $\text{CaCO}_3 \cdot \text{H}_2\text{O}$ ), a metastable form of  $\text{CaCO}_3$  was found within the sediments, while this component is meant to be an indicator for intervals of cold climate or for evaporative settings. The results of the high resolution XRF-scan as well as the results of the microfossil investigations show clear variability. Hereby Al, Ti, Rb, K and Fe, which are indicators for allochthonous input into the lake, reach their maximum values between app. 3400 a cal. BP and 2500 a cal. BP as well as between 1800 a cal. BP and 1600 a cal BP. These elements show also notable fluctuations within the last 500 a. The ostracoda assemblages as well as the spectra of the diatoms show occasionally enormous differences over the time dependant course, which indicates fluctuations of the lake level and the biological productivity. With the help of thin sections it was possible to define parts within the sediment cores that are characterized by mostly angular mineral particles ( $> 63 \mu\text{m}$ ) which can be interpreted as a signal for a temporarily confined enhanced aeolian input. Finally the derived high resolution data lead to the demarcation of variable sedimentation processes due to climatic events like the Little Ice Age (LIA) and the Medieval Warm Period (MWP) as well as climatic impacts within the time period before.