

Characteristics of lake sediment from southern part of Mongolia and comparison to meteorological data

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Mongolia is located in center of the Central Asia and it provides an important key archive for the research of climate characteristics inside continents. Lake sediments are an excellent archive to study long-term fluctuations of environmental conditions (Gunten et al. 2009). Lake is the subject to a variety of extrinsic and intrinsic forcing variables that regulate the subsequent history of the lake, such as climate, watershed bedrock composition, tectonic and volcanic activity, vegetation, aquatic biota, and human activities (Gierlowski-Kordesch, 2004). To understand how climate system works in Mongolia and how we can extract information from the lake sediments, sediment cores of about 30 cm long from Boontsagaan, Orog and Olgoy lakes are analyzed and compared to the meteorological data (air temperature, precipitation and wind) of Galuut and Baatsagaan stations, Bayanhongor Province. The sedimentary features include whole and mineral grain size, grain density, water, organic matter, carbonate, and amorphous silica contents. Sedimentary ages were estimated by excess ^{210}Pb measurement. According to the comparison between sediment characteristics and climate condition, temperature is correlated to whole grain size in three of lakes.

Further comparison reveals that calcium carbonate concentration, amorphous silica concentration, and mineral grain size correlate to temperature in Boontsagaan and Olgoy lakes. In Orog lake, wetter years with high wind and much rainfall result in fine grain size, while the high amount of CaCO_3 and organic flux is found during the low precipitation. Some of the major fluctuations may indicate indirect consequence of climate change, for instance, some events such as the earthquake or a permafrost degradation.

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