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Title: *Multi-proxy analysis of sediment record from Kharbei lakes (northeastern European Russia)*

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High-latitude regions are subjected to the threats of global warming. The Arctic is showing some of the most dramatic effects of global warming. During the last decade the depth of seasonal melting of permafrost in Northern Russia, significantly increased. Investigation of lake sediments from polar regions has an extreme importance for understanding of the modern environmental processes and their influence on northern ecosystems and biological diversity of these regions.). Climate change is emerging as the most far reaching and significant stressor on Arctic biodiversity (Arctic biodiversity 2010). Invertebrate communities are used for diagnostic of lake ecosystems because they have a great sensitivity to climatic changes (Andronnikova, 1996; Lazareva, 2008; O'Brien et al., 2005). The data can be used as well as a basis for inference models for reconstruction of the paleoclimatic conditions. Chironomid-based, Cladocera-based and diatom models have successfully been developed (Nazarova et al., 2008, 2011; Self et al., 2011) and can be used for precise paleotemperature reconstructions (Kienast et al., 2011).

In summer 2012, we investigated complex of Kharbei lakes, located in the interfluve of Korotaiha and Bolshaya Rogovaya rivers in the east side of Bolshezemelskaya tundra, Russia. Six different lakes were investigated using modern geophysical and palaeoecological methods. In total 9 cores were obtained, cut, dated and further investigated. In order to reconstruct the changes occurring in the lakes, we conducted analyses of published data sets, and lake sediment (sedimenthological, geochemical and paleobiological proxies: diatoms, pollen, chironomids and cladocerans) that allow for tracking changes both in the terrestrial and water parts of the lake's catchment.

Paleolimnological investigation has shown that the major compositional changes in diatom, cladoceran and chironomid communities are synchronous. The chironomid-inferred summer temperature show an increase during the last 100 years, which can be related to the end of LIA in the region and support previous investigations (Solovieva et al., 2005).