

# High-latitude vegetation and climate changes during the Mid-Pleistocene Transition inferred from a palynological record from Lake El'gygytgyn, NE Russian Arctic

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## Abstract

© 2017 Collegium Boreas. A continuous pollen record from Lake El'gygytgyn (northeastern Russian Arctic) provides detailed information concerning the regional vegetation and climate history during the Mid-Pleistocene Transition (MPT), between 1091 ka (end of Marine Isotope Stage (MIS) 32) and 715 ka (end of MIS 18). Pollen-based qualitative vegetation reconstruction along with biome reconstruction indicate that the interglacial regional vegetation history during the MPT is characterized by a gradual replacement of forest and shrub vegetation by open herbaceous communities (i.e. tundra/cold steppe). The pollen spectra reveal seven vegetation successions that have clearly distinguishable glacial-interglacial cycles. These successions are represented by the intervals of cold deciduous forest (CLDE) biome scores changing from high to low, which are basically in phase with the variations of obliquity from maxima to minima. The dominating influence of obliquity forcing on vegetation successions contradicts with the stronger power of eccentricity, as demonstrated by the result of wavelet analysis based on landscape openness reconstruction. This discrepancy shows that a single index is insufficient for catching signals of all the impacting factors. Comparisons with vegetation and environmental changes in the Asian interior suggest that global cooling during the MPT was probably the key force driving long-term aridification in the Arctic region. The accelerated aridification after MIS 24-22 was probably caused by the additional effect of the Tibetan Plateau uplift, which played an important role on intensification of the Siberian High and westerly jet systems.

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