Geophysical Research Abstracts
Vol. 21, EGU2019-16407, 2019
EGU General Assembly 2019

Three million year climate history of the terrestrial Arctic inferred from biomarkers at Lake El'gygytgyn

William Daniels, Isla Castañeda, and Julie Brigham-Grette
University of Massachusetts, Geosciences, Amherst, United States (wcdaniels@geo.umass.edu)

The mid-Pleistocene Transition is characterized by crucial changes in the frequency, amplitude, and symmetry of glacial-interglacial climate changes. Sediments of Lake El'gygytgyn in Far East Russia offer unique insights into the continental climate dynamics across the MPT and can provide constraints on the evolution of Arctic polar climate. Here we reconstruct climate variability from 3 Ma to present at El'gygytgyn, resolved at approximately 2000 year sample spacing, using glycerol dialkyl glycerol tetrather biomarkers (GDGTs). Utilization of a new HPLC method that separates GDGT isomers improves the paleoclimate interpretation and provides new insights on the MPT in the terrestrial Arctic. The distributions of branched GDGTs reflect changes in growing season temperature. Isoprenoid GDGT distributions likely record past occurrences of perennial ice cover and associated lake anoxia and are in general agreement with other sedimentary indicators of lake anoxia. We discuss changes in the amplitude and frequency of orbital-scale temperature changes from before and after the MPT, as well as changes in the occurrence of super-interglacial events.