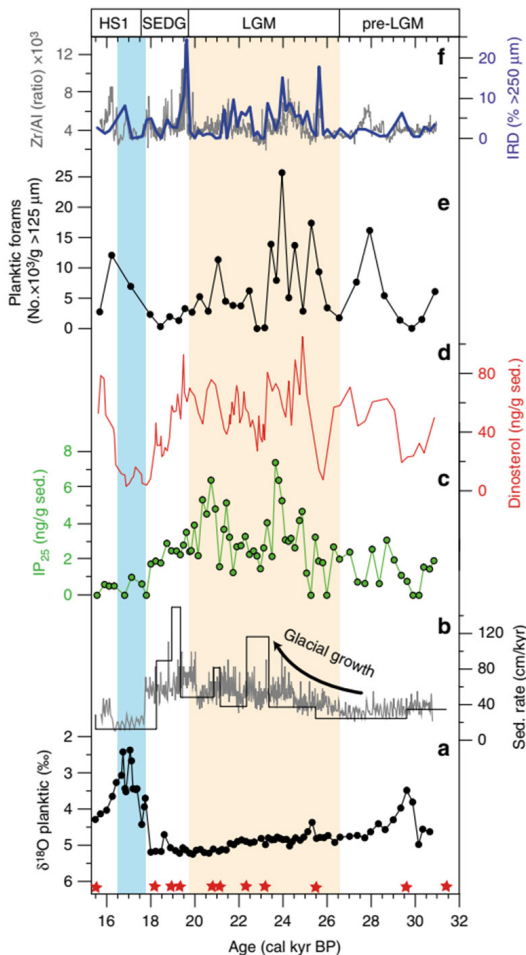


Sea ice marginal conditions in the Eurasian sector of the Arctic over the last ~800000 years



From Knies et al. (2018)
Nature Communications.

We revisited ODP Site 910 from the Yermak Plateau and analysed highly branched isoprenoids (HBI) with 25 carbons including the C25 HBI monoene (IP25) for semi-quantitative sea ice reconstruction during the past ca. 800 000 years. The motivation was to test the hypothesis whether the central part of Yermak Plateau was covered by a marine-based, grounded ice sheet sometimes during the middle to late Pleistocene. The stratigraphic framework is derived from a continuous stable isotope record on planktonic foraminifera combined with paleomagnetic vectors including inclination and declination as well as biostratigraphic datums. The sea ice proxy IP25 was present in all samples with the lowest abundance during the Last Glacial Maximum (LGM). High and low IP25 concentrations corroborate the open-water biomarker HBI III (z-isomere) suggesting a common organic carbon source. However, compound-specific $\delta^{13}\text{C}$ isotopes clearly indicate a sea ice diatom and open ocean phytoplankton derived precursor for both biomarkers. This implies the prevalence of a marginal sea ice conditions independent from glacial-interglacial cycles rather than the episodic coverage of grounded ice sheets/icebergs on Yermak Plateau during the past 800.000 years. Support is provided by the novel HBI T25 biomarker for identifying the phytoplankton spring bloom in the study area. A T25 ratio >1 throughout the record suggest regular phytoplankton spring bloom events analogous to contemporary Barents Sea and does not support the model of a pan-Arctic glaciation during the late Pleistocene.

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