Towards an improved sediment stratigraphy and Better understanding of the Pleistocene glacial history in the western Arctic Ocean

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While evidence for an extensive, Antarctic-style ice shelf covering the Arctic Ocean during some of the Pleistocene glaciations is growing, reliable constrains on chronostratigraphy and geographic distribution of these ice shelves are still very limited. We propose stratigraphic correlation of sediment cores, collected along with geophysical seafloor data from the East Siberian and Chukchi margins, aiming to improve our understanding of the timing and extent of major glacial advances in this part of the Arctic Ocean.

The new data set presented includes a suite of high-quality sediment cores aligned in two transects, from the Siberian margin to the Chukchi Plateau and along the Mendeleev Ridge, which have been analyzed using continuous high-resolution scanning of colour reflectance, sediment density, magnetic susceptibility, and elemental composition. The analyzed cores reveal a coherent stratigraphic pattern that enables a robust correlation across the study area, and thus highlights the potential of such multiproxy approach for improving the stratigraphic framework for the history of glacial advances into the Arctic Ocean. Ultimately, the various lithostratigraphic units identified reflect different sedimentary processes, including glaciogenic erosion and deposition, allowing to reliably reconstruct the Pleistocene Arctic Ocean paleoenvironments.