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Deglacial Timing and Dynamics of Paleoclimate Variations in the Bering Sea and Subarctic Pacific

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One characteristic of the last glacial termination is the widespread decrease of mid-depth oxygen concentrations in the world ocean in intermediate water depth (i.e. above c. 2000 m). The resulting expansion of oxygen minimum zones is connected with the deposition of high-resolution, laminated sediments throughout the subarctic North Pacific, providing the potential to study marine archives with a high temporal resolution, combined with the possibility to establish relatively precise chronostratigraphic frameworks. From a comprehensive collection of sediment cores retrieved during R/V Sonne cruise $SO_2$02 INOPEX, we investigated sites in the Bering Sea that featured laminated deglacial facies. Sedimentary layer countings of laminated sections, AMS 14C measurements of foraminifera and correlation to the NGRIP Greenland oxygen isotope ice core record, aided by high-resolution micro-XRF data, X-ray images and supplementary geochemical data gave detailed information about the processes that led to laminae formation and provided the basis for establishing paleoceanographic reconstructions with exceptional temporal resolution, possibly on sub-decadal timescales. We selected one partly laminated, mid-depth key site from 1100 m water depth on the northeastern Bering Shelf slope to further investigate the timing, and surface – intermediate water development during the Termination I. A correlation between the NGRIP oxygen isotope reference record and our layer countings revealed that the laminations represent annual layered sediments (varves) and the presence of these laminations is tightly coupled to submillennial, short-term warm phases, especially during the Bølling-Allerød. The latter point strongly argues for a close atmospheric teleconnection between the North Atlantic and the North Pacific. As a result of our correlation approach we created an age model that is partly independent from radiocarbon dates in the varved time intervals. We used our resulting chronstratigraphy to directly calculate planktic reservoir ages. Reservoir ages at our core location vary between 730 –1100 years during the Bølling-Allerød to Preboreal.