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Fossil benthic assemblages document Postglacial to Holocene environmental changes at the Laptev Sea continental margin

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Benthic assemblages (bivalves, ostracods, foraminifers) were studied in four AMS^{14}C dated cores from the Laptev Sea continental margin. Core PS51/154-11 from the western upper continental slope (270 m water depth) dates back to >15.8 cal.ka and represents so far the longest age-controlled record of postglacial to Holocene events in the region. Three cores from the outer-middle shelf originate from the submarine river paleovalleys of the Khatanga, Lena and Yana and age back to 12.7, 11.2, and 11.3 cal.ka, respectively. On the upper continental slope, high relative proportions of benthic foraminifer species *Cassidulina teretis*, planktic foraminifers and relatively deep-living ostracods with North Atlantic affinities provide evidence on the past inflows of Atlantic-derived waters, whereas freshwater inputs, downslope sediment movements and ice-rafting are documented by the presence of euryhaline, brackishwater and freshwater ostracods and low planktic/benthic ratio.

Atlantic-derived waters reached the studied site already 15.8 cal.ka, i.e prior to the establishment of the pathway through the Barents Sea shelf further west. From this time on they were constantly bathing the western Laptev Sea continental slope. Cold, low-nutrient marine environments with recurrent coastal open-water polynya are reconstructed for the period 15.8-14.1 cal.ka. Gradually increasing freshwater influence during the subsequent period reached its maximum between 12.7-11.2 cal.ka, when

the outer shelf was flooded. During the earliest stage of shelf flooding, the pioneer brackishwater assemblages of bivalves and ostracods inhabiting the estuarine parts of river paleovalleys were subject to periodical advection of saline offshore waters, as indicated by the presence of deep-living ostracods and planktic foraminifers. Following the pattern of sea-level rise, these strongly fluvially-affected assemblages rapidly transformed into shallow-water marine ones. After 3.5-3 cal.ka, well-pronounced changes in the composition of benthic assemblages from both, the outer shelf and upper continental slope, indicate climate cooling combined with the intensification of surface and bottom water circulation. On the outer shelf, this is manifested by the increase in the number of euryhaline ostracods ice-rafted from the inner-shelf regions, and re-introduction of deep-living species due to the advection of Atlantic-derived water with reversal bottom currents. On the upper continental slope, peak values of planktic foraminifers, *C. teretis*, euryhaline ostracods, and ice-rafted debris, all point to the increase in Atlantic-derived waters inflow, climate cooling and intensification of the wind-driven surface water circulation.