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Paleoceanographic reconstruction in the western and northern Barents Sea during and after the last deglaciation

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During the last glacial maximum the Barents Sea shelf area was covered by the Svalbard-Barents Sea Ice Sheet (SBIS). After the retreat of the SBIS the Barents Sea gradually became one of the main gate ways for Atlantic Water transport towards the Arctic Ocean. At present, the south-western Barents Sea is influenced by warm and saline Atlantic Water, while the northern part is dominated by cold and less saline Arctic water masses. The sharp temperature and salinity gradients between the two water masses form an oceanic front. The front area is associated with high benthic biological production and approximately defines the winter sea ice extend.
Two gravity cores from the western (JM09-KA11, Kveithola Trough, ∼74°N, 16°E) and northern (NP05-11-70, Olga Basin, ∼78°N, 32°E) Barents Sea were investigated in regards to benthic foraminiferal fauna, stable isotopes and sedimentology. Moreover transfer function reconstructions of bottom water temperature and salinity were performed. The age models set minimum ages of deglaciation at 15.500 and 11.000 cal yr B.P. in the Kveithola Trough and the Olga Basin, respectively. Following the deglaciation of the Kveithola Trough bottom water temperature and salinity fluctuated in response to inputs of melt water and changing influx of Atlantic Water. Sea ice cover and presence of icebergs varied during this period. The area experienced near perennial sea ice cover conditions during the Younger Dryas. Conditions stabilized after ca. 10.000 cal yr B.P. with Atlantic Water dominating the bottom waters until present while sea ice/iceberg presence was reduced to a minimum. In the Olga Basin cold conditions, probably with abundant sea ice, characterized the early Holocene. This period was followed by warmer and more saline bottom water conditions due to an increased input of water of Atlantic origin after ca. 6.000 cal yr B.P. The last 2000 years conditions became colder and more unstable.