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Comparing Planktonic Foraminiferal Climate Records during the Holocene on the Norwegian-Svalbard Continental Margin

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We compare six high-resolution Holocene, planktonic foraminiferal proxy records along a N-S transect on the Norwegian –Svalbard continental margin from c. 60^{o}N to 77 ^{o}N. The records are located under the axis of the Norwegian Current and the Spitsbergen Current. These currents are main responsible for the heat flux of warm Atlantic Water into the Polar Ocean today. Atlantic water dominates the water column above 400m in the south, deepening to 800 m in the north. Sea surface temperatures cool from 13-14 ^{o}C in the south to 3-4 ^{o}C off western Svalbard. The records from 72 ^{o}N and further north are situated close to the Arctic Oceanic Front separating warm Atlantic Water from cold Arctic Water. Each proxy record has an individual age model based on a large number of ^{14}C dates that were calibrated to calendar years. Sediment accumulation rates are in general high allowing for a time resolution from 10 -10^{2} years.

The dominating foraminiferal planktonic species in the records south of 70 ^{o}N, *N. pachyderma* sin and *N. pachyderma* dex, show fairly stable values throughout most of the Holocene. However, the high latitude records from the western Barents Sea and Svalbard continental margin show relatively high faunal variability on 10^{2}-10^{3} year time scales. An apparent time-transgressive peak in *T. quinqueloba* may indicate the northward displacement of the Arctic Ocean Front (AOF) during the early Holocene. Quantitative estimations of sea surface temperatures are based on the Modern Ana-

logue Technique in the data analysis program C 1.3 (Juggins 2002) using the modern planktonic foraminiferal training set of Pflaumann et al. (2003). All cores show a rapid warming at the Younger Dryas/Holocene transition. The southernmost cores show slightly increasing temperatures throughout the Holocene that may be linked to a gradual relaxation of atmospheric forcing implying an increased distance to the AOF. The northern cores show larger temperature variations indicating rapid shifts in the position of the AOF in the Western Barents Sea and Svalbard margin.

References

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