



Faunal evidence of 20th century Arctic warming.

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Instrumental monitoring of the climate at high northern latitudes has documented the ongoing warming of the last few decades. Climate modelling has also demonstrated that the global warming signal will be amplified in the polar region. Such temperature increases would have important implications on the ecosystem and biota of the Barents Sea. This study therefore aims to reconstruct the climatic changes of the Barents Sea based on benthic foraminifera, over approximately the last 1000 years at the decadal to sub-decadal scale.

Marine sediment from the upper 50 cm of the sea floor (Core JM05-001, 74° 09'49N, 21° 08.71'E), was recovered from 350 m water depth from the western Barents Sea in July 2005. Oxygen and carbon isotope analysis and benthic foraminiferal species counts have been undertaken down core every 5 mm. Statistical analysis of temperature trends and principle components analysis of the temporal variations in the faunal record provide additional evidence of the observed patterns.

Preliminary results indicate an overall warming trend of approximately 2.5 °C through the 1500 year record. In addition, the well-documented cooling period equating to the "Little Ice Age" is evident between ca. 1690-1800. Most notably a series of highly fluctuating temperatures are observed over the last century. An increase of 1.5 °C is shown across this period.

The study provides important information regarding the fluctuations of the bottom water temperature in the Barents Sea. For the first time we are able to demonstrate that the recent Arctic warming is also reflected in the oceanic fauna. We are subsequently able to comment on the changing water masses and the implications for the oceanic micro-organisms.