



Holocene centennial to decadal-scale climate fluctuations in the Trondheimsfjord area

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The Trondheimsfjord is an ideal location for studying paleoclimatic fluctuations on centennial timescales because high sedimentation rates of several mm per year provide advanced insight into the mode of Holocene climate variability. This is particularly relevant for assessing future climate development as the Holocene is characterized by natural, recurrent climatic instabilities, which evidently operated independently of the size of high-latitude ice sheets. Here we present results from a 15 m long sediment core drilled in the inner Trondheimsfjord to investigate the Holocene climate variability in central Norway over the past 7000 years using proxy records for deciphering abrupt changes in sea surface and deepwater temperatures and terrestrial organic matter supply into the Trondheimsfjord. The covariation of centennial-scale changes in GISP2 ice core oxygen isotopes and benthic foraminiferal oxygen isotopes suggest that the mid to late Holocene climate in central Norway was closely linked to climate changes of the coupled ocean-atmosphere system of the northern Atlantic. Spectral analysis of the benthic oxygen isotopes reveals periodicities of 87 years (Gleissberg cycle), 220 years (de Vries cycle), 420 years, and 740 years which suggests an influence of solar insolation changes on central Norwegian Holocene climate.