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Mid Holocene climate change and impact on evolution on human settlements in northern central Europe

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The Mid Holocene climate evolution in the North Atlantic was marked by a climate optimum, followed by a transition toward colder conditions, starting at about 6 ka BP. This climate transition was accompanied by a radical change from a hunter-gatherer-fisher society toward a society based on agriculture and the domestication of animals in northern Germany and Denmark.
The aim of this study is to better understand the potential impact of oceanic and terrestrial climate change on such human societies in northern Germany and Denmark. We present paleoclimatic and paleoecological reconstructions from sites surrounding the landscape where these human groups settled during the Mid Holocene. These reconstructions include a high resolution UK'37 Sea Surface Temperature (SST) record from the Skagerrak, an MBT-CBT record for estimating lake temperature from Lake Belau, Northern Germany using the calibration set of Tierney et al. (2010), and a Loss On Ignition (LOI) record representing the anoxic/oxic state from the Gotland Basin, Baltic Sea.
The UK'37 record is interpreted to reflect warm season SSTs, and shows a step-like temperature drop of about 6 °C from 6.5 to 5.0 ka BP, immediately followed by a 2 °C warming at about 5.0 ka BP. The MBT-CBT lake record probably reflects mean annual temperature at our site. The record suggests mild winters and/or warm summers until 5.3 ka BP, followed by 2 °C colder conditions within 500 years. The temperature proxies suggest a positive mode in North Atlantic Oscillation (NAO) until around 5.3 ka BP, followed by conditions typical of a negative NAO mode. Furthermore, the LOI record from the Gotland Basin implies a trend from oxic to more anoxic conditions, starting at ∼5.8 ka BP. More severe anoxic conditions could have led to an ecosystem shift within the Baltic Sea, resulting in a decline of copepods, codfish and seals, thus influencing mesolithic hunting activity. The climatic and ecological changes that affected the Baltic Sea might have facilitated the adaption of human societies, further developing agriculture and the domestication of animals in northern central Europe.