



The role of sea ice in abrupt climate changes following the last glacial maximum

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Climate changes following the last glacial maximum (~ 21 -10ka BP) are considered some of the most dramatic and wide reaching abrupt events of the geological past. On Greenland the transition from the last glacial maximum to the Bølling-Allerød (BA) warm period was extremely abrupt, as is the transitions in and out of the Younger Dryas (YD) cold period. In terms of ocean changes, there are indications from proxy records that the large scale Atlantic Meridional Overturning Circulation (AMOC) was significantly reduced a few thousand years before the BA and again at the start of the YD. However, the link between changes in AMOC and climate in the Northern Hemisphere and in particular on Greenland is unclear.

Here, we study changes to climate and circulation in the North Atlantic across these key climate transitions based on a sediment core from the Nordic Seas as well as sensitivity studies with a global climate model. Preliminary results suggest that changes in sea ice and stratification of the Nordic Seas played a key role in the observed climate changes during and preceding the deglaciation of the large land based ice sheets. In particular the cold period following Heinrich Event 1 (H1) and ending at the BA as well as the cold YD are associated with expansions of Arctic sea ice into the Nordic Seas region.