



A Proposed Mechanism for how Atlantic Meridional Overturning Circulation and Sea Ice May Drive Observed Climate Changes in the Northern Hemisphere Ice Cores

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From marine proxy records from the North Atlantic and the Nordic Seas, there are growing evidences that the ocean climate in the North Atlantic and the Nordic Seas operated in phase with climate records obtained from ice core records from Greenland on millennial time scales, but also on much shorter time scales (centennial to decadal). The Nordic Seas are probably a crucial area that may trigger rapid climate changes, and which can dynamically operate in such manner that it might potentially be a major driver of observed climate changes as recorded in Greenland ice cores. Transitions into cold stadials are triggered by relatively modest meltwater contributions from the Fennoscandian ice sheet, which cause stratification and establishment of a stable halocline in the Nordic Seas. This situation cause changes in the mechanism of deep overturning, affecting the meridional transport of warm surface water in the Atlantic Ocean. The tropics and subtropics experience an expansion of the thermocline, a warming which is slowly advecting northward at subsurface and gradually felt below the halocline in the Nordic Seas. This warming is gradually eroding the halocline within the Nordic Seas, and at the point when this relatively modest warming reach the sea ice we see a rapid decrease in sea ice cover and temperature overshoots at high latitude for a few decades until more stable overturning circulation again is achieved. I will here present evidences from data and models, supporting this scenario.