Geophysical Research Abstracts
Vol. 13, EGU2011-4588-1, 2011
EGU General Assembly 2011

Late Eemian warming in the Nordic Seas delayed glacial inception in Scandinavia

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We analyze a transient simulation of the last glacial inception in a climate model of intermediate complexity, focusing on sea ice-ocean circulation dynamics in the North Atlantic and Nordic Seas. As northern high latitude summer insolation decreases towards the end of the Eemian interglacial, Arctic sea ice export to the North Atlantic increases. This surface fresh water transport weakens deep water formation in the North Atlantic and the near surface circulation of the subpolar gyre. As a consequence, the relative contribution of subpolar gyre waters to the Atlantic inflow into the Nordic Seas is reduced, giving way to more warm and saline subtropical waters from the North Atlantic Current. We thus find an episode of relatively high heat and salt transport into the Nordic Seas during the last glacial inception between 119,000 and 115,000 years before present. This stabilizes deep ocean convection in the region and warms Scandinavia during a phase of low insolation. These findings are in good agreement with proxy data from the Nordic Seas and North Atlantic. At the end of the warm interval, sea surface temperature drops by about 3 degC, marking the onset of large scale glacier growth over Scandinavia.