



Middle to Late Holocene changes in the deep convection in the Greenland Sea

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Under modern conditions, open-ocean deep convection occurs in the central Greenland Sea, making it an important location for the studies of the Atlantic Meridional Overturning Circulation (AMOC) and deep water formation. Our core from the foot of the Vesterisbanken Seamount (73°N, 9°W) offers an unprecedented multicentennial record of the deep-sea Middle to Late Holocene paleoceanography of the Greenland Sea. The planktic and benthic carbon isotope ratios reached their maximum around 7 ka indicating intensive water mass ventilation. This suggests that deep convection, probably even more intense than at present, took place in the proximity of our study site. Around 3 ka the planktic carbon isotope ratios show a relatively sudden and rapid decrease which seems to represent a basinwide feature. Thickening of the cold, low salinity surface layer (as confirmed by our foraminiferal record) probably led to stronger stratification of the water column. This, in turn, resulted in the subsequent amplification of the Late Holocene warming connected with the increased Atlantic Water inflow into the Nordic Seas. Our benthic carbon isotope record also shows a decrease at 3 ka which may indicate a slow-down of deep water renewal which is unusual compared to other records. Again, the proximity of the convection centre must have played an important role. Our record exhibits generally higher values than the records from more distant areas and was stronger affected by the weakening of the deep convection.