



## **Variability in the sea ice cover of the Arctic and subarctic seas during the present interglacial: Contrasted responses of the eastern vs western Arctic**

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Organic walled dinoflagellates (dinocysts), which occur in a wide range of environmental conditions including polar areas, were used to reconstruct sea ice cover based on the application of the modern analogue technique (MAT). Sea ice cover is expressed in terms of seasonal extent of sea ice cover (months per year with more than 50% of concentration) or mean annual sea ice concentration (in tenths). The updated dinocyst database comprises 1492 sites and 64 taxa from the northern Hemisphere. It permits reconstruction with an error of prediction better than  $\pm 15\%$ . Sea ice cover variations during the Holocene were reconstructed using cores raised from 34 sites of the northern North Atlantic and Arctic seas. The results show important regional differences. Dense sea ice cover and low amplitude variations characterize the Canadian Arctic Archipelago. In contrast, the Chukchi Sea and Barents Sea recorded large amplitude variations with a millennial pacing, pointing to high sensitivity of sea ice extent in these areas. Moreover, the trends and variation of sea ice throughout the Holocene show opposite features in the Barents Sea vs either the western Arctic or the Fram Strait area, indicating a strong regionalism in the dynamics of sea ice. Hence, one may be tempted to make comparison with the dipole anomaly used to describe the Arctic sea ice in response to atmospheric circulation or with changes in the predominance of AO/NAO modes of circulation that play a role on sea ice formation in the Siberian Sea, Atlantic water inflow into the Arctic and sea ice-freshwater export from the Arctic to the North Atlantic. The regional differences in the sea ice cover throughout the Holocene also suggest that the conditions and mechanisms controlling its extent are not necessarily the same in the western and eastern parts of the Arctic Ocean. In any case, the regionalism of the paleo-sea ice records hampers extrapolations from a few sites to the hemispheric scale. Finally, it should be stressed that the Holocene sea ice reconstructions suggest more differences between the late Holocene and the second half of the 20th Century, than throughout the whole Holocene.