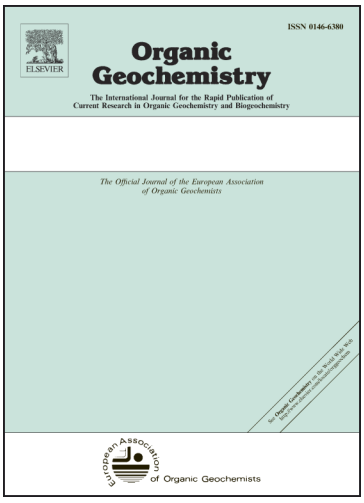

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Holocene variability in sea surface temperature and sea ice extent in the northern Bering Sea: A multiple biomarker study

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ABSTRACT

The Bering Sea, as a transition between the Arctic and the Pacific oceans, plays an important role in global climate change and biogeochemical cycles. Here we examined a variety of biomarkers in a core (BR07) from the northern continental slope of the Bering Sea in order to reconstruct summer sea surface temperature (SST) and sea ice extent during the period 11 to 2 ka (thousands of calendar years ago). The TEX_{86}^{L}-derived SST gradually decreased (ca. 1.6 ^{o}C) from early to mid-Holocene (11.3-8.0 ka), but did not show a cooling or warming trend afterwards. Our SST data do not support the hypothesis of a Holocene seesaw in temperature between the North Atlantic and the North Pacific. Several algal biomarkers, including IP_{25} and its derived indicators for sea ice, brassicasterol for diatoms and dinosterol for dinoflagellates, suggest that the sea ice extent gradually increased from early to late Holocene, interrupted by rapid changes at ca. 2.8-2.6 and 5.5-5.0 ka. The synchronous evolutions between IP_{25} and SST indicates a strong coupling between sea ice cover and climate