

Millennial-scale variability in the Bering Strait inflow during the Holocene

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The Bering Strait inflow is an important carrier of heat and freshwater from the Pacific to the Arctic. Previous studies have suggested that this flow to the Atlantic can change the Atlantic meridional overturning circulation. We investigate a centennial-resolution record of the chlorite/illite ratio in a sediment core from the Chukchi Sea to understand the Holocene evolution of the Bering Strait inflow. The record shows an intense Bering Strait inflow to the Arctic during the middle Holocene, which is attributed to the effect of a weaker Aleutian Low. This intensified inflow during the middle Holocene was synchronized not only with a retreat of summer sea ice in the western Arctic but also with intense subpolar gyre circulation in the North Atlantic. We propose that the Bering Strait inflow is linked with the North Atlantic circulation via an atmospheric teleconnection between the Aleutian and Icelandic Lows. A correspondence between the stronger Bering Strait inflow and stronger North Atlantic Drift in the middle Holocene suggests that this atmospheric connection is involved in a mechanism muting the salinity change in the North Atlantic and thereby stabilizing the Atlantic meridional overturning circulation.