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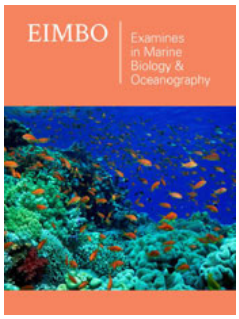

Loss of Perennial Polar Sea Ice May Initiate Major Climate Change

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Opinion

Removal of near-surface stratification of Baffin Bay initiated the Last Ice age at 120ka BP by allowing winter-cooled deep-water to form in the north end of the Bay, with a resulting order of magnitude increase of snowfall associated with a strong Labrador Low atmospheric low-pressure system [1]. A similar Labrador Low system may occur soon, although its underlying cause would be somewhat different.

During the year 2016, daily images of the movement of large clumps of sea ice in the Nares Strait were published on-line by the Technical University of Denmark. The sea ice movement was highly correlated with differences in atmospheric pressure between north and south ends of the Strait. The difference is the driving force for flow in the Strait. Today, the dominant flow is from north to south and it carries lower density polar water into Baffin Bay and stratifies the Bay. But the loss of thick polar sea ice, possibly in future decades, will warm the polar atmosphere and lower its pressure, with a likely reversal of average flow in the Strait. The reversal would drain off the lower density water in Baffin Bay and allow deep-water to form with a resulting Labrador Low and extremely heavy snowfall.

If atmospheric CO2 then does not ensure melting, the next ice age would begin. Even if it does ensure melting, the added precipitation would lower the salinity of the Labrador Current and greatly reduce deep-water formation in the Greenland Sea, with the loss of replacement water and the warm Gulf Stream water that gives Europe its mild climate. Extremely heavy annual snowfall in Canada and a major cooling of Europe would be expected.

References

1. Robert Glenn Johnson (2021) Strong deep-water formation in Baffin Bay ensured the heavy snowfall that initiated the Last Ice Age in the Northern Hemisphere. Journal of Advances in Natural Science 8: 39-45.