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North Water Polynya Sensitivity to Arctic Warming

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The North Water Polynya (NOW) in northern Baffin Bay contains nutrient-rich waters which are essential to the biodiversity of the region and the native Inuit people. Over the observational period the size and duration of the NOW in spring has varied considerably, and recent studies suggest the NOW may fail to form in the future. Even small changes to the polynya have the potential to impact local ocean circulation and nutrient cycling.

To assess the projected changes to the NOW, we look at CMIP5 large ensembles under multiple forcing scenarios. Initial results from CESM1 LE suggest that global temperatures greater than 2.5ºC above pre-industrial levels shift the peak polynya area from June to May. Work is ongoing to assess biogenic and physical impacts of such changes. Implications for climate change are that to avoid large changes to the NOW, warming should be limited.

Additionally, the Polynya area fluctuates with time but decreases as a whole throughout the 21st century.