

Changes in biogeochemical properties of the Canada Basin, Arctic Ocean

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In the Canada Basin of the Arctic Ocean, summer sea ice retreat and enhanced Beaufort Gyre have resulted in major changes in water column in the last two decades. In this presentation, I will summarize findings from time-series observations in the Canada Basin from 2003 to 2017, regarding interannual and seasonal changes in freshwater content, ocean acidification status, and distributions of nutrients and chlorophyll *a*.

Melting of sea ice freshened surface layer by 2008, and then meltwater content has decreased to ~0 after 2012. After 2013, meteoric water content increased and caused second freshening. These freshening has resulted in changes in nutrient availability, biological productivity, and ocean acidification. Stronger stratification due to freshening decreased accessibility for phytoplankton to nutrients in deeper layer. Increased sea ice melt in the mid-2000s has accelerated ocean acidification. With less meltwater content, state of ocean acidification has stabilized after 2007. Recent freshening due to increased meteoric water should have smaller effect on acidification as river runoff has higher alkalinity than sea ice meltwater. Consequences of continued ocean acidification on zooplankton in the Canada Basin will be also presented.

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