

A role of sea ice melt water on iron supply to surface water in the Chukchi Sea, Arctic Ocean

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Nitrate depletion in the surface layer in summer in the Arctic ocean indicating biological utilization and sufficient supply of bioavailable iron into surface water. To reveal iron supply processes in the Arctic ocean in the early stage of biological increase, we investigated a roles of sea ice melt water on iron supply to surface phytoplankton community. We conducted surface towed fish clean sampling from the Bering sea shelf area, through the Bering strait, and around sea ice edge in the Chukchi Sea. Alkalinity was measured as tracer which can be used for classify the sources of fresh water, river discharge or sea ice melting. Judging from the potential alkalinity, sea ice melt water was clearly distributed around edge of the sea ice. Dissolved iron and total dissolvable iron concentration well correlated with a fraction of sea ice melt water, and iron concentration increased with increasing of the fraction. On the other hand, area of Alaskan coastal current (ACC), west coast of Alaska, both of river water and sea ice melt water existed and iron concentrations correlated with fraction of sum of river water and sea ice melt waters. Our estimate from the slope of the correlation indicate that the sea ice melt water have comparable impact on iron supply as river discharge. Additionally, our study indicate that iron supply from sea ice melt water influence to more wide area than river discharge in the Arctic ocean surface.