Sea ice in the global biogeochemical cycles: How much do we care?

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Large changes in the state and seasonality of sea ice are expected for this century in both hemispheres. The impact of these changes on marine biogeochemical cycles and ecosystems is difficult to predict. Will the polar oceans be more or less biologically productive? Will they take up more or less carbon? At this stage, the answers to these key questions are not obvious.

Marine biogeochemical cycles in the sea ice zone are characterized by specific processes that have been unravelled over the last 20 years or so. They involve active biological and chemical processes within the sea ice, the modulation of heat and gas exchanges by the ice cover; and the impact of growing and melting sea ice on the water column stratification and vertical exchanges in the water.

To understand how sea ice influences marine biogeochemical cycles, the sea ice biogeochemical community focuses on:

(i) the synthesis of existing data and the interpretation of robust large-scale patterns;

(ii) the introduction of new representations of sea ice processes into large-scale models of the Earth System and the study of their impact;

(iii) the evaluation of existing observation methods and the development of new ones. In this talk, I will review and synthesize recent research activities in these lines of thought.