

DISSOLVED ORGANIC CARBON IN SEA ICE AND SEAWATER
OF SAROMA KO LAGOON AND RESOLUTE
PASSAGE (ABSTRACT)

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As part of the SARES Project, the concentration of dissolved organic carbon (DOC) in ice and seawater at Saroma Ko lagoon and Resolute Passage was measured and compared to the growth of algae in the spring of 1992 to test the hypothesis that algal-derived DOC would lead to a nutrient-rich environment for microheterotrophs. At both sites, DOC concentrations in the ice reached much higher maxima (13 to 32 mg·l⁻¹) than in surface seawater beneath the ice (4.4–5.0 mg·l⁻¹). Physical concentration of DOC was significant, because DOC concentrations in the bottom ice were elevated compared to surface seawater even when algal growth was minimal. Most of the increased DOC in ice was, however, correlated significantly (R² = 44–65%) with algal biomass (chlorophyll *a* or particulate organic carbon). The net accumulation of DOC derived from algae was about 30% of net primary production. A preliminary carbon budget indicated that bacteria used at most 40%, and probably less than 10%, of the DOC that would appear to be made available from the algae. This may imply control of bacterial production by factors other than substrate limitation, and a substantial export of DOC from the ice at break-up.

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