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Phytoplankton community adaptation to changing light levels in the southern Beaufort Sea and the Amundsen Gulf, Canadian Arctic

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The chlorophyll-a (chl_a) specific absorption coefficient of phytoplankton, a^* is an important parameter to know for primary production models and for the estimation of phytoplankton physiological condition. Behavior of this parameter at high latitudes where nutrient rich cold waters submitted to low incident light is a common environment are almost unknown. To address this issue, we investigated the light absorption properties of phytoplankton as a function of irradiance, temperature, and nutrients using a large dataset in the southern Beaufort Sea and the Amundsen Gulf during the open water to ice cover transition. The a^* tended to increase with decreasing light levels resulting from a selection of smaller-size phytoplankton more efficient to absorb light. There were no significant correlation between a^* and irradiance as well as for temperature. However, a^* showed significant positive correlation with NO₃+NO₂. Implications of this parameter for phytoplankton community adaptation to changing light levels are discussed.