

Summertime CO₂ source in the eastern Bering Sea shelf

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In the summers of the years 1998 to 2002, 2004 and 2006, we conducted shipboard observations of atmospheric and surface seawater pCO₂ in the eastern Bering Sea shelf. At latitudes 57 - 63N, surface seawater pCO₂ was elevated up to about 450 micro atm, meaning that the area acted as a source for atmospheric CO₂. South of 57N, however, surface seawater pCO₂ was reduced to be 150 micro atm, meaning a strong sink for atmospheric CO₂. The reduced surface seawater pCO₂ was associated with depleted nitrate and reduced silicate, suggesting diatom activity. Although the depletion of nitrate and reduction of silicate were observed also at latitudes 57 - 63N, surface seawater pCO₂ (total CO₂ also) was elevated. Since the pCO₂ elevation corresponded with blooms of coccolithophorid *Emiliana huxleyi*, it was expected that the pCO₂ was elevated by the blooms. The fact that the pCO₂ elevation was found also in the years when the bloom did not occur demonstrates that there are no cause-and-effect relationships between the blooms and the pCO₂ elevation. We chiefly attributed the pCO₂ elevation to river discharge.

In the presentation, we intend to discuss carbon budget in the eastern Bering Sea shelf.