PI44C-2577 - Effects of Atmospheric Forcing on Interannual Variability of Chlorophyll Concentration in the Antarctic Coastal Polynyas

Thursday, 20 February 2020
16:00 - 18:00
SDCC - Poster Hall C-D

Abstract

Antarctic coastal polynyas are the most productive regions in the Southern Ocean, playing a significant role in a polar ecosystem. We investigate the effects of atmospheric factors such as winds and cloud cover on phytoplankton variability in the Antarctic coastal polynyas based on satellite ocean color and atmospheric reanalysis data for 1998–2016. Interannual variability of chlorophyll-*a* (chl-*a*) in the west Antarctic polynyas is highly related with that of winds because winds induce entrainment of nutrient-rich subsurface water. On the other hand, there is a weakly negative relationship in the east Antarctic polynyas where mean wind speed is stronger than that in the west Antarctic polynyas. A cloud cover as one factor of controlling light condition also contributes to chl-*a* variability with an inverse correlation in the Weddell Sea and the Amundsen Sea. The results indicate that the interannual variability of chl-*a* differs notably from region to region in the coastal polynyas, showing wind-induced strong variability of chl-*a* in the west Antarctic marginal seas.

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