PAMIP Webinar Series

Pacific circulation responses to eastern Arctic sea ice loss

Anne Seidenglanz

Date: February 24th, 2022
Time: 9 am (GMT)

Join the PAMIP group:
https://groups.google.com/u/1/g/pamip?hl=en

Or contact Lantao Sun: lantao.sun@colostate.edu.

Abstract

This study assesses the impact of realistic late autumn Arctic sea ice anomalies in the Barents-Kara Seas on atmospheric wintertime circulation at mid-latitudes, pointing to a hidden potential for seasonal predictability. Using a dynamical seasonal prediction system, an ensemble of seasonal forecast simulations of 23 historical winter seasons is run with reduced November sea ice cover, and is compared to the respective control seasonal hindcast simulations. A non energy-conserving approach is adopted for achieving the desired sea ice loss, with artificial heat being added to the ocean surface heat fluxes during November.

The results point to a robust atmospheric circulation response in the North Pacific, featuring an anticyclonic anomaly at upper and lower levels. This ridging leads to dry conditions over the North American southwest coast and can be ascribed to a re-organization (weakening) of west-Pacific tropical convection and interactions with the tropical Hadley circulation. The circulation response in the Atlantic sector is intermittent and is statistically significant during January only.

These results aid our understanding of the seasonal impacts of reduced eastern Arctic sea ice on the midlatitude atmospheric circulation with implications for seasonal predictability during wintertime.