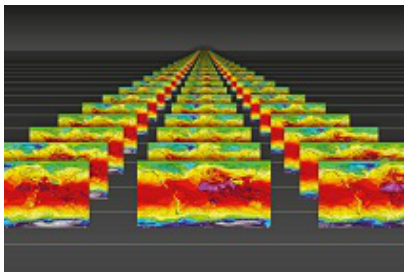

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Subseasonal Forecast Skill over the Northern Polar Region in Three Operational S2S Systems

Tuesday, 2 April 2019 17:00 (15 minutes)

Pentad forecast skill over the Northern polar region in boreal winter is evaluated for the subseasonal to seasonal prediction (S2S) systems from three operational centers: the European Centre for Medium-Range Weather Forecasts (ECMWF), the U.S. National Centers for Environmental Prediction (NCEP) and Environment and Climate Change Canada (ECCC). The former two systems are running with air-sea coupled models, whereas the latter with an atmospheric-only model. One objective of this study is to assess the impact of air-sea coupling on polar subseasonal forecast skill. Previous studies have reported that the ECMWF system has a better Madden-Julian Oscillation (MJO) forecast skill than the other systems. Whether the MJO skill translates to polar forecast skill is of great interest.

The results indicate that for a lead time longer than about 10 days the forecast skill of 2-meter air temperature and 500-hPa geopotential height in the polar area is low comparing to the tropical and middle latitude regions. The three S2S systems have comparable forecast skill in the northern polar region. Relatively high skill is observed in the Arctic sector north of the Bering Strait in pentads 4-6. The polar temperature forecast skill is found to be dependent on the tropical MJO phase in the initial condition. Forecasts starting from MJO phases 3 and 6, which correspond to enhanced (suppressed) convection in the equatorial eastern Indian Ocean and suppressed (enhanced) convection in the tropical western Pacific, tend to be more skillful than those initialized from other MJO phases. To improve the polar prediction on the subseasonal time scale, it is important to have well represented tropical MJO and its associated teleconnections in the model.

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