



Increase in the potential predictability of the Arctic Oscillation via intensified teleconnection with ENSO after the mid-1990s

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This study examines the increase in seasonal prediction skill and potential predictability of the Arctic Oscillation (AO) by current dynamical ensemble prediction systems. The seasonal prediction skill of the AO shows significant skill increase after the mid-1990s, particularly in the North Atlantic section of the AO variability, which is contributed by enhanced teleconnection by El Niño and Southern Oscillation (ENSO). The observational ENSO teleconnection to the North Atlantic depends on low-frequency variability in the North Pacific driven by the North Pacific Gyre Oscillation, as represented by the Hawaiian sea level pressure (SLPHI) index. The out-of-phase (in-phase) relationship between NINO_{3.4} index and SLPHI shows shifted ENSO variability to the central Pacific (eastern Pacific) and stronger (weaker) ENSO-AO teleconnection. The linear barotropic model experiments with prescribed ENSO forcing and differing SLPHI phase suggest that enhanced ENSO teleconnection to the North Atlantic is related to the positive phase of SLPHI. This is consistent to frequent La Nina and positive SLPHI since the mid-1990s, which supports an idea of intensified observational teleconnection by upper tropospheric barotropic process. This study also suggests that the ENSO-SLPHI relationship in early winter (November-December) can be used as a predictor in forecasting strong AO in late winter (January-February).