

Increase of the Predictability of the Arctic Oscillation by Enhanced ENSO Teleconnection after the Mid-1990s

Myong-In Lee¹ and Daehyun Kang¹

¹*Climate-Environment Modeling Laboratory, Ulsan National Institute of Science and Technology, Ulsan, South Korea*

This study examines enhanced seasonal prediction skill of the Arctic Oscillation (AO) after the mid-1990s with different characteristics of ENSO teleconnection. Skill enhancements are represented in 4 of 5 dynamical ensemble prediction systems (Kang et al., 2014), which are affirmed in the North American Multimodel Ensemble (NMME). The skill increase is primarily contributed by the variability over the North Atlantic with an enhanced teleconnection of El Niño and Southern Oscillation (ENSO). This ENSO teleconnection to the North Atlantic is associated with the low-frequency variability in the North Pacific driven by the North Pacific Gyre Oscillation (NPGO), which is also represented as the Hawaiian sea level pressure (SLP_{HI}). The SLP_{HI} is also associated with the type of ENSO. When the sign of the SLP_{HI} index and the NINO3.4 index are out-of-phase (in-phase), which has shifted variability to the central Pacific (eastern Pacific) of ENSO, it shows more intense (weak) ENSO-AO teleconnection. This relationship is more apparent in El Niño rather than La Niña. These relationship is also represented in the linear barotropic model experiments with prescribed El Niño forcing. This implies an important and independent role of the SLP_{HI} variability that modulates El Niño teleconnection through barotropic process in upper troposphere.

Key words: Arctic Oscillation, seasonal prediction, ENSO teleconnection

References

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