기후 분과 [P-026]

Increased seasonal predictability of the North Atlantic Oscillation from the Central Pacific El Niño in boreal winter

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The winter North Atlantic Oscillation (NAO) is an important interannual variability mode that affects the abnormal climate in the Atlantic region. The seasonal forecasting skill of the sea level pressure (SLP) in the Atlantic region in the boreal winter is lower than that in the Pacific, so the main causes and analysis are needed to improve the prediction skill of the NAO. In this study, we analyzed the prediction performance of the NAO and its teleconnection with the Pacific using the hindcast of the C3S seasonal forecasting models and reanalysis data. By comparing the Central Pacific El Niño-Southern Oscillation (CP-ENSO) during winter, we show a significant statistical increase in the prediction of the NAO and the potential predictability during the CP-El Niño season. This suggests that the northward shift of the storm track in the northeastern Pacific due to the asymmetric CP-ENSO variability of the Aleutian SST (ALS) and the enhanced wave activity in the Atlantic are dynamical origins of the teleconnections describing the NAO-like pattern, through observational analysis and model experiments using nudging. Furthermore, the CESM2-LENS model shows that the enhanced ALS-NAO teleconnections in the current CP-El Niño period cause strong NAO variability above the 75th percentile and an increase in frequency in the future climate. The understanding of the Pacific-Atlantic dynamical teleconnections due to CP-ENSO is expected to be an important study that can suggest potential elements for the seasonal prediction of the NAO in climate models such as the signal to noise paradox (SNP), and suggest improvements in predictions.

Key words: Seasonal prediction, NAO, CP-ENSO, Teleconnection