



A statistical-dynamical seasonal prediction of the Summer North Atlantic Oscillation

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The North Atlantic Oscillation (NAO) has a major influence on European weather. The NAO has been shown to be most influential in winter, but effects on meteorological parameters have also been shown during summer. Here, we demonstrate predictability for the Summer Northern Atlantic Oscillation (SNAO) with the Max Planck Institute Earth System Model (MPI-ESM) seasonal prediction system for 3 - 4 months in advance, if the dynamical hindcast ensemble is sub-sampled with the help of a physically based predictors.

For the seasonal hindcasts, we use the global coupled climate model MPI-ESM (MR resolution) with a 30 member hindcast ensemble initialized every May between 1982 - 2015. The full hindcast ensemble mean exhibits no predictive skill for the July-August SNAO. However, when predictors such as Arctic sea-ice volume before the start of the respective prediction are used, we find a high anomaly correlation for the JA-SNAO. The increased hindcast skill for the SNAO results in a moderate increase in hindcast skill for 500 hPa geopotential and minor regional increases in hindcast skill for surface temperature over Europe. Furthermore, the sub-sampling leads to a significant increase in the hindcast skill for precipitation over the British Isles.