



## **Potential of combined statistical-dynamical sub-sampling approach.**

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The potential of a combined statistical-dynamical sub-sampling approach is analysed in the seasonal forecasts currently contributing to Copernicus Climate Change Service (C3S). For four seasonal forecast systems, we analyse the enhancement of winter North Atlantic Oscillation (NAO) prediction skill. First, teleconnections between the autumn state of sea surface temperature, sea ice, snow depth, and stratospheric temperature and the subsequent winter NAO are established as NAO predictors in the ERA-Interim reanalysis from 1979-2000. Second, these NAO predictors are used to derive a statistical "first guess" for each winter NAO from 2001 to 2017. Third, every "first guess" NAO is used as a reference for the sub-sampling of each dynamical ensemble for every seasonal prediction system. For all used system, NAO prediction skill is considerably improved, while surface properties such as sea level pressure or surface temperature mostly show a regional improvement, also dependent on the forecasts systems ability to simulate NAO teleconnections.