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A multisystem view of NAO seasonal predictability in wintertime

Panos Athanasiadis (1), Alessio Bellucci (1), Adam Scaife (2), Leon Hermanson (2), Stefano Materia (1), Antonella Sanna (1), Andrea Borrelli (1), Craig MacLachlan (2), Silvio Gualdi (1,3)

(1) Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC), Bologna, Italy (panos.athanasiadis@cmcc.it), (2) Met Office Hadley Centre, Exeter, UK, (3) Istituto Nazionale di Geofisica e Vulcanologia (INGV), Bologna, Italy

Significant predictive skill for the mean winter North Atlantic Oscillation (NAO) and Arctic Oscillation (AO) has been reported for a number of independent seasonal forecasting systems. These findings are important from a socio-economic point of view, since the ability to predict the wintertime atmospheric circulation anomalies over the North Atlantic ahead in time will have significant benefits for North American and European countries, but they are also important for pursuing better seasonal forecasts in the mid-latitudes. As indicated by recent results, such forecasts are possible provided that key components of the climate system are initialized realistically and the coupled models are able to simulate adequately the dominant processes and teleconnections associated with low-frequency variability. The reported predictability originates from the initial state of the ocean, snow cover, sea ice, soil moisture and the stratosphere, and is the subject of a number of ongoing studies. It is shown that a multi-system approach has unprecedented high predictive skill for the NAO and AO, probably largely due to increasing the ensemble size and partly due to increasing model diversity. Though, predicting successfully the winter mean NAO does not guarantee that the respective climate anomalies are also well predicted. The NAO has a strong impact on Europe and North America, yet it only explains part of the interannual and low-frequency variability over these areas. Here it is shown with a number of different diagnostics that the high predictive skill for the NAO/AO indeed translates to more accurate predictions of temperature, surface pressure, and precipitation in the areas of influence of this teleconnection.