# An intercomparison of skill and over/underconfidence of the wintertime North Atlantic Oscillation in multi-model seasonal forecasts

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The wintertime North Atlantic Ocean (NAO) is the main driver of variability in winter sea level pressure, temperature and precipitation over much of Europe and the North Atlantic. The NAO is a measure of the difference in surface pressure between the Icelandic Low and the Azores High. Positive values of the NAO indicate that this pressure difference is larger than normal, resulting in a stronger North Atlantic jet, often associated with mild, wet winters across Northern Europe. Recent studies of individual seasonal forecast systems have shown that the wintertime North Atlantic Oscillation (NAO) can be skilfully forecast. However, it has also been suggested that these skilful forecasts tend to be underconfident, meaning that there is too high a proportion of unpredictable noise in the model.

We assess the skill and over/underconfidence of the seasonal forecast systems contributing to the EU-ROSIP multi-model ensemble system. Five of the seven systems studied have significant skill in forecasting the wintertime NAO at 2–4 month lead-times. A simple multi-model ensemble mean forecast is produced from the five significantly skillful forecast systems. The ensemble mean forecast has a correlation skill of 0.73, which is higher than for any individual forecast systems. The MME mean forecasts the correct sign of NAO anomaly in 18 of the 20 years. Three of the systems are underconfident for forecasting the NAO, while two systems are skilful but not underconfident. Underconfidence becomes more pronounced as the ensemble size increases. Certain years in the hindcast period are well forecast by all or most models. This implies that common teleconnections and drivers of the NAO are being captured by the EUROSIP seasonal forecasts.