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GloSea5: The new Met office high resolution seasonal prediction system

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An improved operational Global Seasonal Forecast System (GloSea5) was introduced by the Met Office in Spring 2013. The new system has an atmospheric resolution of approximately 40km in mid latitudes and 0.25 degree in the ocean. Hindcast simulations of past years show GloSea5 possesses unprecedented skill in predicting the winter North Atlantic Oscillation (NAO), with an anomaly correlation of 0.6 for the hindcast period. This represents a dramatic improvement over the current generation of seasonal prediction systems, which lack any significant skill in predicting the NAO (anomaly correlations less than 0.2). It suggests that slowly changing components in the climate system (e.g. ocean heat content anomalies) do indeed play an important role in the variability of extratropical atmospheric circulation in winter, as opposed to being predominantly unpredictable weather noise. Importantly, NAO predictability provides predictability of surface winter climate in Europe and the United States. In addition, the system improves the representation of the El Nino-Southern Oscillation (ENSO) by reducing the spurious westward extension of the SST patterns in the tropical Pacific seen in its predecessor, GloSea4. This gives increased correlations and reduced mean errors, while maintaining the good ENSO teleconnection patterns seen in GloSea4. The introduction of GloSea5 heralds a possible new chapter in the skill and utility of seasonal predictions.