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Decadal prediction of interannual North Atlantic sea surface temperature and its remote influence over land

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The quality of a multimodel of six coupled climate forecast systems initialized with observations, relative to the accompanying uninitialized system, to re-forecast annual-mean North Atlantic Sea Surface Temperature (SST) departures at the decadal time scale is described. The study concludes that, measured by the anomaly correlation skill, the evolution of the leading two Empirical Orthogonal Function (EOF) modes of North Atlantic SSTs are skillfully forecast throughout the nine-year forecast range. The signature of the global mean temperature trend on North Atlantic SSTs contributes to forecast skill of the main North Atlantic modes while the initialization improves forecast quality during the first half of the forecast.
Most systems fail to predict the shift of the first mode in the mid 1990s. EC-Earth 2.3 is the only system that forecasts that shift in forecast year seven.
All models share an intrinsic bias in the North Atlantic. They tend to generate excess annual-mean SST variance at high latitutes which is why the leading two EOF modes show centers of action that are shifted poleward, compared to the observed patterns.
The systems are capable to forecast part of the future nine-year annual-mean influence of the main North Atlantic modes on European temperature only if the global mean temperature trend in North Atlantic SSTs is included. With regard to the prediction of the future annual-mean influence of the main North Atlantic
modes on Sahel precipitation, small but positive anomaly correlation skill is obtained starting in forecast year two.