## Verification of decadal forecasts: North Atlantic decadal prediction using CCSM4

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We present results from an ensemble of CMIP5 decadal prediction experiments using the Community Climate System Model, version 4 (CCSM4). A full-field initialization approach is taken, with 10member coupled model ensembles integrated forward from each of 10 different start dates spaced at 5-year intervals between 1961 and 2006. The time-varying external forcings in the decadal prediction (DP) experiments are equivalent to those used in standard 20th century simulations spun up from preindustrial conditions, but the ocean and sea ice initial conditions in DP runs are obtained from a forced ocean-ice hindcast (HD) experiment. The HD simulation represents a best-estimate of the states of the ocean and sea ice which are compatible with the historical atmospheric state between 1948 and 2007. We find that observed variations in upper ocean heat content in the North Atlantic in the late 20th century, which are well-represented in the HD run, are also reproduced with significant skill in the DP experiments after correcting for a drift bias. In particular, a large and rapid rise in heat content in the mid 1990s is successfully predicted in ensembles initialized in January of 1991. The mechanisms which explain the skillful predictions and the sensitivity to bias correction technique are explored.