



Variation in the reliability of ensemble predictions of SSTs from seasonal to decadal timescales

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The reliability of ensemble sea surface temperature predictions from the Met Office Decadal Prediction System (DePreSys) is assessed by verifying 46 retrospective forecasts with start dates from 1960 to 2005. The dispersion characteristics are explored by comparing the ratio of the mean intra-ensemble standard deviation to the root mean squared error of ensemble mean forecasts (spread-error ratio) for three nine-member ensembles of the system: an initial condition ensemble for initialised predictions and two perturbed physics ensembles (PPE), one for initialised predictions and one for uninitialised predictions. This combination allows a 3-way comparison of the reliability across different ensemble types.

At lead times less than 2 years, the initialised ensembles tend to be underdispersed, like many other seasonal prediction systems, whereas the uninitialised forecasts are more overdispersed. For longer lead times, all three ensembles are overdispersed in more than 50% of the grid boxes, while underdispersion is found in the tropical Pacific. Such overdispersion is mainly related to excessive internal variability in the climate model used.