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The impact of drift correction and detrending on the skill of ENSEMBLES decadal predictions

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Decadal predictions bridge the gap between seasonal forecasts and climate change projections. The time scale of years to decades is of high relevance for stakeholders and decision makers in many sectors, such as infrastructure planning, water resource management, energy production, insurances, agriculture, and others.

Despite indications of potential predictability on the decadal time scale, and despite recent efforts in establishing a large data-base of decadal hindcasts (e.g. EU FP6 ENSEMBLES project), the quantification of prediction skill remains a challenging task due to a range of conceptual problems, such as the small number of independent samples and the scarcity of ocean observations. Another challenge is related to model drift: With increasing forecast lead-time, some models develop large systematic errors that make them drift away from the observed state. These systematic errors must be accounted for when comparing forecasts to observations. We apply methods of drift-correction and discuss their effects on the predications.

Current hindcast data bases cover the second half of the 20th century. Therefore, it is not possible to differentiate in a pure way the capabilities of the models in predicting natural variability from predicting anthropogenic climate change. In a pragmatic approach, the anthropogenic forcing can be modelled as a trend and be removed from the forecast and observational data. The prediction skill of the remaining natural variability gives insights to the superiority of coupled dynamical models to statistical approaches. We evaluate how a trend removal may influence the quality and skill of decadal predictions.

We address these questions by using the decadal predictions of the ENSEMBLES project. Near-surface temperature predicted by five coupled ocean-atmosphere models is compared to ERA-40/Interim reanalysis data.