Forecast quality assessment of seasonal-to-decadal predictions
A posteriori verification of how skillful was a climate prediction or a set of predictions – here we focus on monthly to decadal timescales - is essential to estimate the quality of climate forecast system and its potential usefulness in the future.

Summary

A climate model at any level of complexity is an approximation of the climate system that also employs approximate methods for describing how different parts of the system interact. These methods are designed to simplify complex processes and improve our understanding of how the climate system works. The ultimate goal is to develop forecast systems that can provide reliable predictions for years to decades ahead.

At the most basic level, climate forecast verification is investigation of the properties of joint distribution of predictions and observations. The verification involves comparing the forecasted values with the observed values to assess the accuracy and reliability of the forecast. To separate the training and test OBS (cross-validation to avoid artificial skill) must be taken into account.

Climate forecasts of categorical and continuous predictands can be deterministic or probabilistic. There is expanding emphasis on using probabilistic forecasts because they provide more information about the uncertainty in the forecast and can be used to make more robust decisions.

Users can also require measures of utility to examine added economic value of comprehensive climate predictions instead of relative improvements as well as socio-economic benefits achievable through such forecast-assisted decision-making.

Objectives

The objectives of this research line are the development and application of:

1. skill scores and other metrics for forecast verification
2. statistical prediction methods for reference forecasts
3. post-processing drift and bias correction, and calibration methods
4. techniques to assess prediction skill based on multiple OBS and forecast sources
5. user-oriented measures that address specific aspects of forecast quality or utility

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