

Blending Ensembles from Multiple Models

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Introduction

The most accurate seasonal weather forecasts combines multiple models developed by different countries using equal weights. A methodology to blend each model's forecasts using weights determined by the skill of each model is examined. As there is only a small forecast-outcome archive available for seasonal forecasts we look at combining multiple imperfect models from a non-linear system using a proper skill score to determine the weights.

DEMETER

The DEMETER data set is a multi-model ensemble of seasonal forecasts for atmospheric variables which is modeled in 10^6 dimensions. Each hindcast has been integrated for six months and has nine members in its forecast ensemble. The dataset contains 22 seasonal forecasts.

Moran Ricker

The low dimensional chaotic system used in this experiment is the Moran Ricker Map:

$$x_{i+1} = x_i e^{\alpha(1-x_i)} \quad (1)$$

Where α is set to 2.9. The experiment uses three imperfect models of the Moran Ricker Map and a climatology model. The climatology model was gen(c)0.2023(f)0.41429(f)0.4166(m)0.11933(a)0.5471(f)-3716(f)-371)0.2023(f)0.41429(f)0.4166(m)0.11933(a)0.5471(f)log