Session: C29 Poster: W156A

A new metric to quantify the added value of regional models

Laurel DeHaan[†]; Masao Kanamitsu
[†] SIO / UCSD, USA
Leading author: ldehaan@ucsd.edu

Dynamical downscaling of large-scale models using regional models in the study of climate is becoming quite common. Regional models have the potential to realistically include small scale features as well as provide more detailed information on the effects of climate change on a local level. However, determining the value added to the original large-scale model by the regional model is non-trivial. Recently there have been several verification methods introduced to look at the skill of fine-scale models (Gilleland et al, 2009). While these methods begin to address the issue, they were all created to address the skill of numerical weather prediction, and in general don't lend themselves to making a seasonal comparison between a large-scale and a fine-scale model. Here we present a new metric, the Added Value Index (AVI), that is specifically designed to make a fair comparison between two models with different resolutions. It is based on the characteristic spatial distribution of skill (temporal correlation) from each model. A normal distribution is fit to each skill distribution, and a comparison of the two curves gives information about the level of skill in each model. The AVI is particularly intended to highlight the situation when one model has small areas of high skill. We will show the AVI for different examples, including a 50 year downscaled AMIP run, and a 22 year downscaled multi-model seasonal forecast. Using these examples, a comparison in results can be made between AVI, the more traditional anomaly correlation, and a newer verification method based on wavelet analysis. When used to consider the value added to the large-scale model by the fine-scale model, all three verification methods often give similar results. However, there are cases when the different methods do not agree. We will take a closer look at those cases to better understand the information that can be gained from each verification method.