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A method for statistical downscaling of seasonal ensemble predictions

H Feddersen

Danish Meteorological Institute

A model output statistics based method for downscaling seasonal ensemble predictions is outlined, and examples of ensemble predictions of precipitation and 2-m temperature are verified against observing stations in Europe. The downscaling from seasonal DEMETER hindcasts to daily precipitation time series for individual observing stations is performed in three steps: (i) a spatial downscaling of ensemble mean seasonal means from dynamical model output to station level by means of patterns derived from a singular value decomposition analysis of model output and observations; (ii) application of the downscaling transformation to the model output ensemble and subsequent calibration of the downscaled ensemble; (iii) a stochastic generation of daily precipitation conditioned on predictions of the probability of a wet day in the season and daily persistence. In the majority of the examples, the downscaling is found to provide more skilful predictions than the raw dynamical model output.

Reference: H Feddersen and U Andersen 2005, Tellus 57A, 398-408.