Statistical downscaling of climate forecasts in the Pacific region

Abstract: Statistical downscaling is defined in the climate literature as the use of statistical methods to establish empirical relationships between GCM-resolution climate variables and local climate. In this presentation I describe a multivariate linear, mixed-effect state-space model for statistical downscaling. Hyperparameters in the model are estimated by the EM algorithm. I illustrate how to modify the algorithm to account for missing observations in the climate data. I also discuss some of the issues of applying such a model in practice and illustrate this using data from the Pacific region.