



Challenges of regional climate modeling and validation

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As attention shifts from broad global summaries of climate change to more specific regional results there is a need for statistics to analyze observations and model output that have significant variability and also to quantify the uncertainty in regional projections. This talk will survey some work on interpreting regional climate experiments. In large multi-model studies one challenge is to understand the contributions of different global and regional model combinations to the simulated climate. This is difficult because the runs tend to be short in length and with a limited number of ensemble members. We suggest some spatial models for the climate fields based on sparse approximations to the covariance matrix and derive an ANOVA like decomposition for the fields. The decomposition into main effects and interactions helps to isolate the effects of different models. The spatial models provide a rigorous framework for assessing statistical significance and comparing simulations to observed climate. This approach is illustrated for output from the PRUDENCE program and we also discuss the newer NARCCAP experiments for regional climate of North America.