

Downscaled Probabilistic Climate Change Projections, with Application to Hot Days
Adrian Raftery (Dept. of Statistics, Univ. of Washington, USA)

Abstract:

The climate change projections of the Intergovernmental Panel on Climate Change are based on scenarios for future emissions, but these are not statistically based and do not have a full probabilistic interpretation. Instead, Raftery et al. (2017) and Liu and Raftery (2021) developed probabilistic forecasts for global average temperature change to 2100. I will describe a method for downscaling these to yield for probabilistic long-term spatial forecasts of local average annual temperature change, combining the probabilistic global method with a pattern scaling approach. This yields a probability distribution for average temperature in any year and any place in the future. Finally, we ask, how common dangerously hot days are likely to be at any location by the end of the century, and develop a method for assessing its predictive distribution. We find, for example, that exposure to dangerous heat levels is likely to increase by factors of 3-10 in many parts of the midlatitudes. This is joint work with Xin Chen, Peiran Liu, Lucas Zeppetello and David Battisti.