

Climate modeling and opportunities for statistical analysis

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Climate models are essential tools for understanding the Earth's climate system and projecting future changes. These models are highly complex, incorporating numerous discretized equations and many parameters. They also generate massive volumes of data exceeding 20 petabytes that support scientific research and inform climate assessments at global and regional scales. The complexity of climate models, along with the sheer data volume, presents both challenges and opportunities for statistical analysis. In this talk, I will give a brief overview of climate models, including the underlying physical principles, numerical approximations, and model structure. I will then highlight several statistical methods in my research, with a focus on quantifying model uncertainty. This talk aims to foster interdisciplinary dialogue and explore potential collaborations between climate science and the field of statistics.