Variability and Change in Our Water: Some Results From Climate Model Ensembles

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Understanding the future evolution of water needs, availability and adaptation challenges due to factors including human development, population, and climate change requires an understanding not only of average climate changes, but also of their interannual and decadal variability and associated uncertainties. In recent years, two different types of large ensemble runs of climate projections have become available, those from more than twenty different climate models, and those from repeated runs of several individual models. These have provided new approaches to the probabilistic evaluation of climate changes and uncertainties, including the key questions of where and how trends and variability in rainfall, runoff, storms and other water-related parameters may change. Using a range of available climate model ensembles, changes as well as quantified uncertainties in mean river flows, their variability, and the time of emergence of anthropogenic signals will be discussed. Preliminary quantification of future climate-related agricultural water stresses across a range of crops and locations will also be presented.