

**PARALLEL SESSION B : FRONTIER DOWNSCALING TOOL
B1: VERY HIGH RESOLUTION MODELLING**

**High Resolution Climate Modeling of the Water Cycle over the Contiguous United States
Including Potential Climate Change Scenarios**

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The NCAR Water System program strives to improve the full representation of the water cycle in both regional and global models. Our previous high-resolution simulations using the WRF model over the Rocky Mountains revealed that proper spatial and temporal depiction of snowfall adequate for water resource and climate change purposes can be achieved with model grid spacings less than 6 km horizontal and appropriate microphysical parametrization. The climate sensitivity experiment consistent with expected climate change showed an altered hydrological cycle with increased fraction of rain versus snow, increased snowfall at high altitudes, earlier melting of snowpack, and decreased total runoff. In order to investigate regional differences between the Rockies and other major mountain barriers and to study climate change impacts over other regions of the contiguous U.S. (CONUS), we have expanded our prior CO Headwaters modeling study to encompass most of North America at a horizontal grid spacing of 4 km. A domain expansion provides the opportunity to assess changes in orographic precipitation across different mountain ranges in the western USA, as well as the very dominant role of convection in the eastern half of the USA. The WRF model has been run for eight years of present climate (2000 - 2008) and eight years in the future. The high resolution WRF-downscaled climate change data is available to the community through an NCAR web site for Universities and other groups interested in studying regional climate changes and impacts but unable to perform such long-duration and high-resolution WRF-based downscaling simulations of their own. The scientific goals and details of the model dataset will be presented including some preliminary results.

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