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**URGSIM ANALYSIS OF CLIMATE RISK IN THE UPPER RIO GRANDE BASIN**

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**ABSTRACT:** A basin-scale climate risk assessment authorized under the Secure Water Act is underway for the Upper Rio Grande basin, defined as the Rio Grande Basin from its headwaters in Colorado to Elephant Butte and Caballo Reservoirs in south-central New Mexico. Led by the U.S. Bureau of Reclamation (Reclamation), the impact assessment for the upper Rio Grande basin will quantitatively evaluate the impacts associated with climate change including changes to water supplies and demands. Three steps are being linked to accomplish this assessment: a) Transformation of General Circulation Model (GCM) information into a spatial and temporal scale relevant to a regional planning context. b) Utilization of the spatially and temporally relevant climate information to project future changes in water supply and evapotranspirative demand that can be expected as a result of climate change alone. c) Simulation of future operations of Reclamation projects and other Reclamation activities with the available water supplies and anticipated demands developed in b. The overall context of these activities, and details on steps a-b will be provided in other presentations at the AWRA 2011 conference (see Llewellyn et al and Subhrendu et al respectively). This presentation will focus on the methods and available results associated with the third piece of this analysis, namely driving the Upper Rio Grande Simulation Model (URGSiM) with output from the first two activities. URGSiM is a monthly timestep decision support simulation tool developed at Sandia National Labs based on surface water dynamics and reservoir operations from the Upper Rio Grande Water Operations Model (URGWOM), and groundwater dynamics from three MODFLOW regional groundwater flow models (Española Basin, Albuquerque Basin, and Socorro Basin). URGSiM runs quickly enough to efficiently evaluate the hundreds of GCM scenarios considered in the climate risk assessment. Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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