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**A COMBINED FORECAST AND OPERATIONS MODEL OF THE
UPPER RIO GRANDE BASIN USING RIVERWARE**

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ABSTRACT: The Bureau of Reclamation and the U.S. Army Corps of Engineers share a suite of models used for operating the Upper Rio Grande. The Upper Rio Grande Water Operations Model (URGWOM) is a suite of models used for planning, forecasting, operations and water accounting. A new model in this suite is a decision support system in itself - combining several complex processes to complete forecasting and operations planning. It develops an annual operating plan using a forecasted inflow volume, analyzes operations for risk and confidence by running with a set of probabilistic forecast volumes, performs stochastic analysis by running with historical traces, and optionally runs for a two to three year run range to include inter-annual effects of carryover storage. The model consists of a data module that takes input NRCS/NWS forecast volumes and optionally selects the year(s) of history that have a similar volume. Algorithms scale the chosen years' data to the forecast volume and distribute it to inflow locations. The operations module then operates the reservoirs, applies diversions, and routes flows through the basin. The result is the reservoir storage, flows in the river, and diversion shortages for that forecasted inflow. Utilities export desired results, summarize important information, and automatically start the next run with another forecast volume. This paper describes how this combined model works using the flexibility of the RiverWare modeling tool such as initialization rules and iterative multiple run management, the various modes of use, and the types of results and analyses that can be performed using the model.

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