"Using RiverWare to analyze the impacts of high Frequency versus Low Frequency climate change hydrology sequences in the Truckee Carson Basin"

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"Water for the Seasons" was a project funded by a grant from the USDA and the NSF to a team of scientists and engineers from the University of Nevada at Reno, the Desert Research Institute, the USGS, and Precision Water Resources Engineering, LLC. The five-year project included development of a state-of-the-art network of linked models to simulate the effects of climate change and explore mitigation strategies for these effects in the Tahoe, Truckee, and Carson River Basins. RiverWare served as the system operations model and was used to answer a variety of "what-if" questions about future supply and demand within the basins.

One effort within the project was to use the models to explore the impact of multi-year hydrologic frequency on water supply within the basin. Hydrologic frequency is a characteristic of basin hydrology describing the general length of time of the cycles of wet and dry years within the basin's hydrology. A low frequency hydrology sequence exhibits "clusters" of dry years and wet years while a high frequency hydrology changes more quickly from dry to wet and vice-versa. It is not well understood whether future climatology (and therefore hydrology) will tend to be higher or lower frequency. This is an area of active study and this effort was able to identify the implications of high vs. low frequency hydrology on water supply features and water users in the basins.

In this presentation it will be shown how the Truckee-Carson RiverWare Planning Model was utilized within the network of linked models to explore the impacts of climate change with a specific focus on hydrologic frequency. The impacts of climate change hydrology, specifically the characteristics of timing and frequency on a variety of water users and system features within the basin will be described as the results of the study are surveyed.