WATER For The SEASONS

Sustaining Water Resources in a Changing Climate

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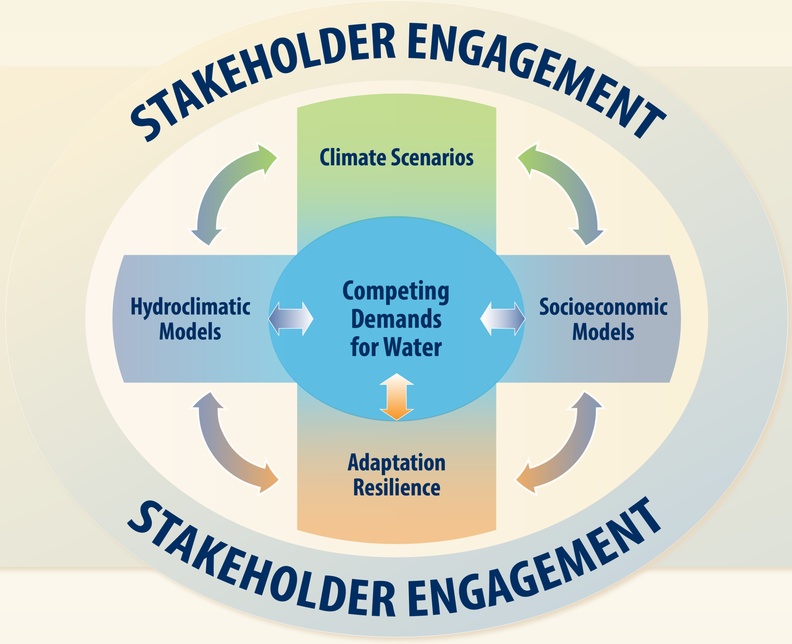
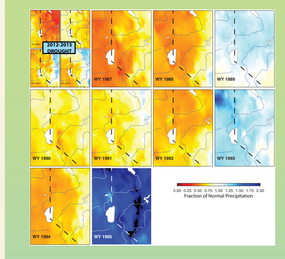


Water for the Seasons (WftS) partners scientists with farmers, ranchers and water and ecosystem managers in the Truckee-Carson River System (TCRS) to assess the impacts of climate stressors including warming temperatures, extended droughts and variable precipitation on water supply and demand. Adaptation and resilience by diverse stakeholder communities to these stresses are assessed through integrated hydroclimatic and collaborative modeling. The TCRS serves as a model for snow-fed arid land river systems, globally.

Climate Scenarios

First stakeholder-informed scenario



Recent-history PLUS

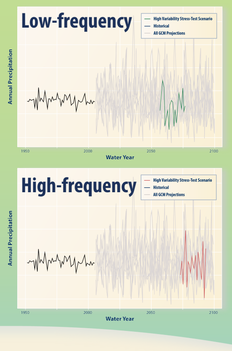
Putting current drought into a realistic plausible (if somewhat pessimistic) perspective

Storyline=2012-2015 followed by 1987-1995

NB: 1987 was moderate El Nino year

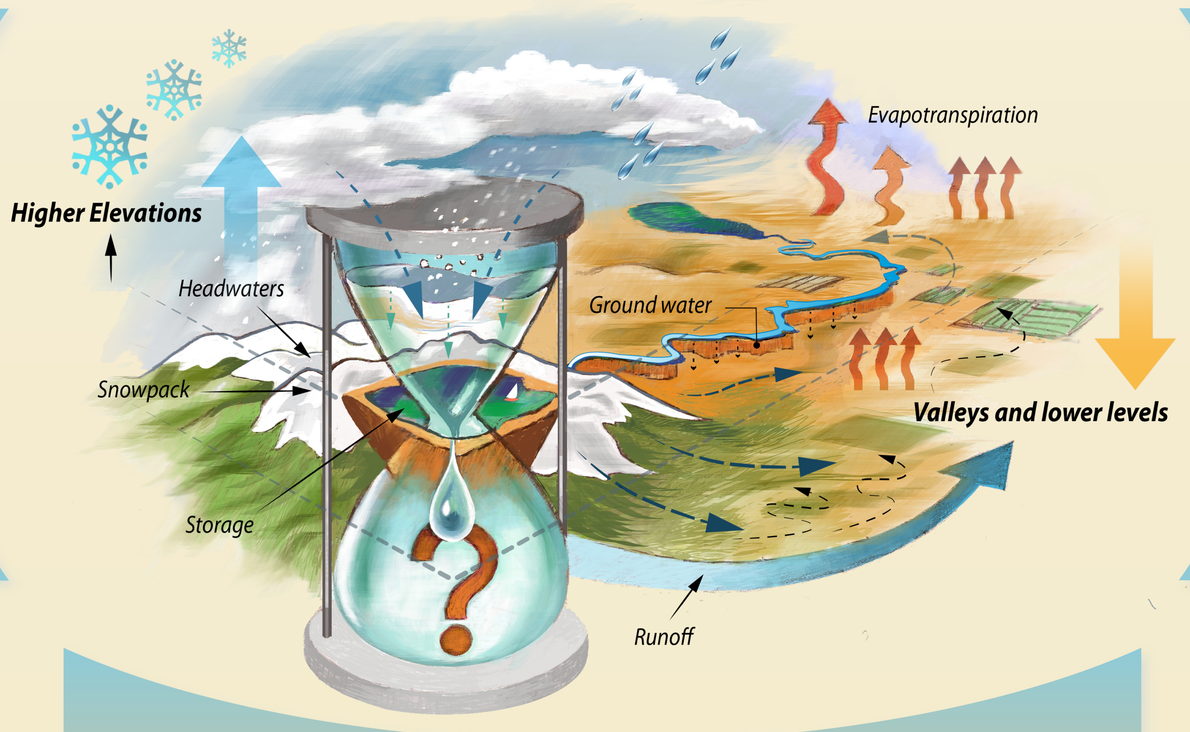
Research by Christine Albano, Michael Dettinger and Maureen McCarthy

GCM Variability



Stakeholders identified high precipitation variability as stressful to the system. Scenarios representing these conditions were selected by screening the ensemble of global climate model (GCM) projections to identify two 20-year periods representing late-century warming with low- and high- frequency precipitation variability.

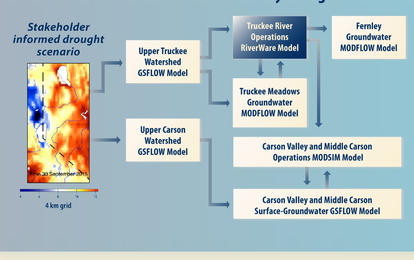
Water Cycle for Snow-fed Arid Lands: Working with Nature's Clock



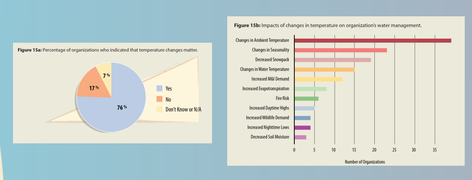
Hydroclimatic Models

Daily temperature and precipitation data extracted from gridded climate scenarios are promulgated through an integrated suite of surface, groundwater and water management models for the TCRS. (Research conducted by Greg Pohll, Shey Rajagopal, Justin Huntington, Rich Niswonger, Eric Morway, Wes Kitlasten, Murphy Gardner, Shane Coors and Linnet Jose)

How does a climate scenario feed into hydrologic models?

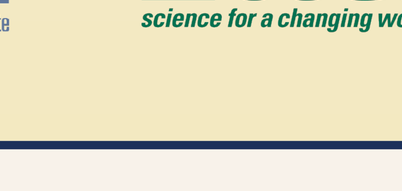


Socioeconomic Models

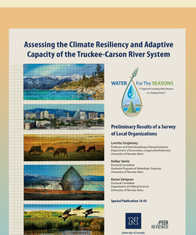


To assess potential impacts to organizations in the TCRS from changes in the climate, researchers conducted survey interviews with water management organizations from the headwaters to terminus. Collaborative modeling research was designed to evaluate system vulnerability to warming temperatures, changes in precipitation, and adaptation capacity. (Research conducted by Kelley Sterle, Karen Simpson and Loretta Singletary)

Adaptation & Resilience

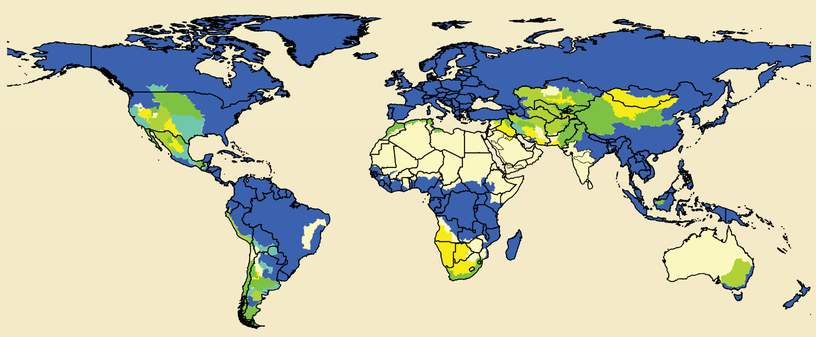


Understanding Ecosystem Services through Organizational Analysis: Organizational network analysis was used to assess the adaptation resilience of ecosystem services in the TCRS by developing networks of organizations for each of the TCRS ecosystem services. Highly networked, lower-level polycentric systems, with more redundancy have been shown to be more adaptive and resilient. (Research by Azmat Pashev and Derek Kauneckis, Ohio University)



Featured Products

- Suite of Climate Scenarios
- Integrated Hydroclimatic Models
- Transferability Assessment for Snow-fed Arid Lands Globally



Featured Impacts

- Truckee Meadows Water Authority Drought Contingency Plan
- Stimulate Adaptation Planning Among Stakeholders

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