INTEGRATIVE SCIENCE PROJECTS

The goals of the integrative science projects (ISP) are to: 1) link project components to fully integrate into a truly interdisciplinary project; 2) attain both project-wide and component science goals; and 3) attain sustainability of key infrastructure components of the project. In addition, and key to the success of the project, is that we soon transition from infrastructure building to conducting the science enabled by the new infrastructure.

Two Projects were initiated in 2011:

Great Basin Climeecology

The overarching goal of this Integrative Science Project is to demonstrate the quality and utility of the data from the instrumented transects (NevCAN) via analysis of multiple datasets from network instruments and observations in a collaborative interdisciplinary environment, and communication of these results to the scientific and land management communities.

The project will seek to understand how climate variability and climate change impact ecosystems and water in the Great Basin (including the northern Mojave Desert)

This project will

1. Determine temporal and spatial relationships between key climate and ecohydrological variables
2. Assess causal linkages among climatic, hydrologic, and ecologic processes
3. Assess the extent to which NevCAN data are representative of a wider spatial and temporal framework and develop methods to extrapolate NevCAN observations to larger temporal and spatial scales
4. Publish initial results from the NevCAN, including documentation of transect instrumentation and datasets
5. Conduct outreach to scientific community and land management agencies to attract additional projects that use NevCAN infrastructure and data.

Project components

- **Task 1:** Determine the fate of precipitation in the Snake Range
- **Task 2:** Characterize spatio-temporal variation in temperature in mountain-valley systems of the Great Basin
- **Task 3:** Determine the hydroclimatic factors that control tree-ring formation in Great Basin conifers along an elevation gradient
- **Task 4:** Quantifying environmental controls on tree growth in montane and sub-alpine zones
Project Leaders
Scott Mensing, UNR; Nick Lancaster (DRI)

Project Participants
UNR: Franco Biondi; Scotty Strachan, Tom Albright, Laurel Saito, Kerensa Kruse
UNLV: Dale Devitt, Brian Bird, Lorenzo Apodaca
DRI: Lynn Fenstermaker, Jay Arnone, John Mejia, Guping Tang, Dan McEvoy, Britt Johnson, Anna Lue
Urban Water Vulnerability

This project focuses on the impact of climate change on water systems in urban areas of Las Vegas Valley and Reno as critical case studies for understanding water management in arid regions. The emphasis of the research will be on linking climate models with water supply (e.g., hydrologic scenarios) and demand, and how water managers use information within the decision-making process. This includes the quantification of uncertainty associated with climate change projections and impacts. The research will look at the intersection of water infrastructure, information and current institutional arrangements to determine how modeling information is used in decision-making and what factors improve the utilization of modeling information for improving the capacity of water managers to adapt to potential climate scenarios. This includes the intersection climate modeling information with water management decisions (short and long term) and the influence on decision-making structures. Where possible, existing hydrologic scenarios will be used and supplemented with new ones from the project. Downscaled GCMs will be used to create these climate/hydrologic scenarios along with evaluating the change in urban water demand under changing climates. Water managers will be involved in creating the scenarios that are meaningful for their systems and in post processing of model output through enhanced visualization. Water demand scenarios will be used in combination with alternative hydrologic scenarios (and possibly water quality scenarios) to evaluate system vulnerability. The vulnerability will be determined using a framework that examines supply and demand, water delivery infrastructure, organizational capacity, and institutional arrangements.

Project Leader
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