

## FY 2017 Applied Science Grants

### **Mountain Studies Institute, Prioritized Drought Resilience Framework Applied Science for Flows, Livelihoods, and Fisheries**

**Reclamation Funding: \$99,939**

**Total Project Cost: \$217,531**

The Mountain Studies Institute in Silverton, Colorado will combine scenario planning with the development of a decision support tool to develop a drought resilience framework for the Mancos Conservation District, a Reclamation project located in western Colorado. The Institute will provide a decision support tool that will incorporate existing vulnerability assessments and other data for the Four Corners region and scenario planning options using resource manager and community contributions to define and map drought-related stresses. The resulting tool will provide guidance to resource managers for identifying, locating, and prioritizing regional conservation actions, including actions to mitigate impacts to Endangered Species Act listed warm water fish.

### **Museum of Northern Arizona, Inc., Database and Decision-Support for Springs and Springs-Dependent Species Management**

**Reclamation: \$100,000**

**Total Project Cost: \$200,066**

The Museum of Northern Arizona in Flagstaff, Arizona will improve and expand the decision-support functions of a database describing springs across a broad geographic area, including parts of Utah, Colorado, southern California, Arizona, New Mexico and Texas. The Museum will improve and expand decision-support and reporting tools, develop templates and instructions that will allow managers to more efficiently submit compatible data for upload to their database, develop tools for prioritization of restoration and monitoring activities, develop additional modules to document restoration activities, and address data gaps. The project will also include the development of user tools, such as the ability to export landscape-wide or land unit geodatabases, as well as smartphone apps to support citizen-science data collection. The existing database, Springs Online, has grown rapidly and now has over 500 users from state and federal agencies, Tribes, non-governmental organizations, researchers, and members of the public. Springs provide an important source of water in Reclamation basins, including water for endangered species and plant species with cultural importance to Tribes.

### **Southern Nevada Water Authority, Modeling of Drought Conditions in Lake Mead to inform future Drinking Water Treatment Process Needs, Habitat Conditions for Critical Species, and LCR Water Quality**

**Reclamation: \$88,599**

**Total Project Cost: \$224,814**

The Southern Nevada Water Authority, located in Las Vegas, Nevada, will perform water quality modeling to assess how changes in lake elevations due to drought affect critical water quality parameters, and to determine if and when water treatment plant modifications may be required. SNWA will conduct three-dimensional water quality modeling, and model output will then be incorporated into a new simulation model of SNWA's drinking water treatment processes. The project will address gaps in knowledge regarding the effects of drought on lake and reservoir water quality, including impacts to water temperature, turbidity, and algal growth. The modeling will inform future planning efforts for treatment plant upgrades and expansions, as well as planning efforts related to aquatic species, including endangered Razorback Suckers and Humpback Chub.

**Utah State University, Drought Synthesis to Inform Drought Resiliency Planning**

**Reclamation: \$99,998**

**Total Project Cost: \$199,995**

Utah State University, in collaboration with the Jordan Valley Water Conservancy District, the Provo River Water Users Association, the Weber Basin Water Conservancy District, and the Salt Lake City Department of Public Utilities will synthesize drought characteristics to inform drought resiliency decisions. The project includes a synthesis of key water cycle processes of snowpack, streamflow, evapotranspiration, and soil moisture in the Wasatch Range that will enhance the decadal prediction of drought for water users dependent on Wasatch Range watersheds. The project will create a synthesized drought information platform available through the Utah Climate Center webpage and, to reach broader audiences, will also be hosted on the National Integrated Drought Information System and the Western Water Assessment Dashboard.

**The Nature Conservancy, Freshwater Implementation Network & Decision Support Tool (The FIN Tool)**

**Reclamation: \$98,058**

**Total Project Cost: \$226,053**

The Nature Conservancy ("TNC"), in partnership with the Open Water Foundation, Colorado Natural Heritage Program, River Network, and the Colorado Water Trust, will create an interactive web-based tool that synthesizes water datasets through a geospatial interface that will provide baseline information about the condition of riverine ecosystems to enhance water management activities. This tool, the Freshwater Implementation Network and Decision Support Tool ("FIN Tool"), will help resource managers, planners, conservation entities, and local communities develop an initial understanding of the complex relationships between hydrology, geomorphology, water rights administration, riparian habitat condition, and aquatic habitat availability, and provide decision-support information for flow enhancement and habitat restoration activities.

**Weber Basin Water Conservancy District, Weber Basin Water Resources Dashboard**

**Reclamation: \$100,000**

**Total Project Cost: \$206,467**

The Weber Basin Water Conservancy District will develop a web-based water resources "dashboard" for the Weber Basin in Utah, to provide access to water management data and analytic tools to help inform water managers and streamline the data acquisition process. The dashboard will provide daily average values for a suite of hydrologic data, including for example, precipitation, snowfall, streamflow and discharge within canals, water rights, soil moisture, evaporation, and drought indices, among other information. The "dashboard" will build from research performed in the Klamath Basin on a web-based data harvesting tool and conceptual design that can be tailored to each user's data needs and expertise. This "dashboard" will provide consistent up-to-date data in one location, facilitating stakeholder collaboration through the sharing of information and data, while promoting a better understanding of resource decisions basin-wide. There are three Reclamation projects within the Weber Basin which will benefit from the improved access to water resources data.

**Sky Island Alliance, Sky Island Waters: Adapting the Way Spring Ecosystems are Monitored, Managed, and Restored**

**Reclamation: \$95,255**

**Total Project Cost: \$249,215**

The Sky Island Alliance, located in Tucson, Arizona, will synthesize the state of knowledge and approaches for monitoring springs, and develop tools and guidance to support stewardship of springs and stream resources within the Sky Island Region of Arizona. The project will support conservation of spring

and stream ecosystems in the arid southwest by: 1) developing tools and analysis to support managers in determining where to focus limited resources to conserve spring ecosystems and the biodiversity they support; 2) synthesizing the state of the knowledge and approaches for springs monitoring; 3) enhancing springs monitoring approaches, capacity and coordination in the region; and 4) developing new guidance on adapting restoration efforts at springs to drought conditions. As a part of the project, the Alliance will disseminate training and technical guidance for resource managers and volunteers at select spring sites for restoration and provide best practices for conducting restoration actions, and work with managers to utilize, revise and enhance the Arizona Springs Restoration Handbook. This project can inform water resources management by generating information on the springs and streams that are optimal for contributing to groundwater recharge within the Lower Santa Cruz basin.