



FY 2022 Applied Science Grants

Arizona

The Nature Conservancy, Verde River Basin Integrated Hydrologic Modeling Project
Reclamation Funding: \$64,273 **Total Project Cost: \$128,546**

The Nature Conservancy, in conjunction with the Yavapai-Apache Nation, will collaborate with watershed stakeholders to refine and improve an existing hydrologic modeling tool for the Upper and Middle Verde River Basins in Yavapai County, Arizona. The river faces tremendous threats from groundwater pumping, climate change, water policy, and agricultural water use. Without continued monitoring and management, the Verde River will not be able to sustainably support the biodiversity and people that depend on it. The project partners will develop and run modeling scenarios in the Verde River Watershed to promote comprehensive management and collaboration, simulating the cumulative impacts of land and water management choices and conservation strategies to better understand better the impacts of these management choices and changing conditions in the watershed.

California

Agua Caliente Band of Cahuilla Indians, Geospatial Data Platform to Assess and Manage Tribal Water Resources
Reclamation Funding: \$55,000 **Total Project Cost: \$110,000**

The Agua Caliente Band of Cahuilla Indians (Tribe), located in Riverside County, California, in conjunction with the Agua Caliente Water Authority, will develop an online Geospatial Data Platform (GDP) to store and display geospatial and time-dependent datasets including climate, groundwater, surface water, and water quality data for the Agua Caliente Indian Reservation. The Tribe will use the GDP to integrate the datasets with the Hydrogeologic Conceptual Model (HCM) to support 3-dimensional visualization and assessment based on available well logs, geophysical data, pump tests, and other related hydrogeologic datasets. The GDP tool will allow users to examine changes in the occurrence and movement of groundwater and water quality over time, thereby helping water managers make informed management decisions and promote sustainable groundwater resources.

City of Long Beach, Well Asset and Groundwater Management and Forecasting Tool Project

Reclamation Funding: \$200,000

Total Project Cost: \$579,848

Long Beach Water Department (Department), located in Long Beach, California, will develop and utilize tools and technology to maximize groundwater withdrawal sustainably and reliably. The project includes the development of the tools and procedures necessary to monitor wellfield operations effectively, assess critical factors affecting current and future groundwater production, and provide the foundations for proactive decision-making. Through completion of the project, the Department will improve access and use of water resources data, develop a digital water management tool to help provide short and long-term estimates of groundwater pumping to improve modeling and forecasting capabilities, and perform real-time analytics. Improved knowledge about groundwater will increase and improve the utilization of local water resources, maximizing allowable pumping rates from the aquifer, reducing water imports, and assisting in the sustainable management of groundwater resources.

Coachella Valley Water District, Mission Creek Subbasin Water Quality Model

Reclamation Funding: \$200,000

Total Project Cost: \$402,000

The Coachella Valley Water District (District), located in Palm Desert, California, will partner with seven other agencies in southern California's Mission Creek Subbasin (MCSB) to update the Coachella Valley Salt and Nutrient Management Plan by developing water management tools to model and forecast Nitrate and Total Dissolved Solids (N/TDS). The district's objective is to sustainably manage salt and nutrient loading in the basin to protect its beneficial uses. As part of this project, the district will characterize the N/TDS loading and current groundwater quality, delineate management zones and metrics to characterize beneficial use protection, develop a technical approach and tools to forecast N/TDS concentrations, and establish baseline scenario forecasts of groundwater quality conditions in the future. Upon completion of the project, the model and baseline scenario will be available for use by the partnering agencies to run future scenarios, quantify the relative effectiveness of future mitigation strategies, and ultimately manage water quality in the subbasin to support decision-making and resiliency. Partnering agencies include City of Coachella, City of Palm Springs, Desert Water Agency, Indio Water Authority, Mission Springs Water District, Myoma Dunes Mutual Water Company, and Valley Sanitary District.

Rancho California Water District, Integrated Groundwater Wellfield System

Reclamation Funding: \$200,000

Total Project Cost: \$421,119

Rancho California Water District (District), located in Temecula, California, will create better hydrologic data for the Murrieta-Temecula Groundwater Basin by developing a new water management tool for improving basin management efficiency. Through this project, the district will install new remote sensing equipment on the District's 26 wells within the Pauba Valley in southern California to generate more accurate and frequently available groundwater levels and

well-pumping efficiency data. This information will then be integrated into a new water management tool to assist Rancho Water staff in making decisions on maximizing the efficiency of basin management operations in terms of water production and maintaining the basin's health.

Santa Ana Watershed Project Authority, Cloud Seeding Technology Validation Protocol

Reclamation Funding: \$100,000

Total Project Cost: \$200,000

The Santa Ana Watershed Project Authority (SAWPA), a joint power authority with the support of the Inland Empire Utilities Agency, San Bernardino Valley Municipal Water District, Orange County Water District, and other local public agencies, in collaboration with the Desert Research Institute, will develop a standard protocol for evaluation of cloud seeding benefit to complement a planned pilot-scale program for weather modification (cloud seeding). This effort is expected to provide water agencies standard guidelines and procedures to be undertaken to ensure the benefits of increased precipitation from weather modification programs can be effectively quantified based on the weight of evidence approach. Once the project is complete, water resource agencies across the western United States will be able to use the protocol and validation tool to quantify the benefits of increased precipitation from weather modification, support increased water supply, and enhance stormwater capture.

Nevada

Southern Nevada Water Authority, Robust Updates to Advanced Lake Models to Inform Future Drinking Water Treatment Needs

Reclamation Funding: \$193,085

Total Project Cost: \$540,365

The Southern Nevada Water Authority will expand forecasting functionality in an existing water quality model for Lakes Mead and Mohave. As the drought continues, drinking water intakes may withdraw epilimnetic water, which may be warmer, higher in nutrients, and consequently more difficult to treat, threatening the water supply for over 2.2 million residents and 43 million annual tourists. The model will be used with future planning tools to understand potential changes to water quality before they occur, allowing water managers to take appropriate action to mitigate changes in water quality and maintain treatment and delivery efforts. The project will allow for improved long-term drought resilience in the Lower Colorado River Basin by expanding modeling capabilities leading to more robust projections.

Texas

Post Oak Savannah Groundwater Conservation District, Operations and Management Model to Enhance Sustainability and Climate Resiliency in Central Texas

Reclamation Funding: \$200,000

Total Project Cost: \$550,080

The Post Oak Savannah Groundwater Conservation District, located in central Texas, in collaboration with The Meadows Center for Water and the Environment at Texas State University (Meadows Center), will develop an operations and management model to be used by the district to help establish a comprehensive and consistent set of rules, policies, and strategies to address water resource management challenges in central Texas. Through application of the model, the district expects to enhance its existing capacity to balance conservation of groundwater resources, development of resources to meet growing needs and demands of the State, and protection of private property water rights. The district will generate model simulations to help inform management decisions related to issues including evaluation of permit renewals, long-term aquifer sustainability, improved climate resiliency, development of desired future conditions, curtailment of permits and/or production, and drought management.