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Managing Water in the West

Reclamation Research and Partners:

Pursuing Innovative Solutions for Water in the West Through Collaborative R&D

July, 2011

U.S. Department of the Interior
Bureau of Reclamation

The Science and Technology (S&T) Program is the primary Research and Development (R&D) arm of Reclamation.

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The S&T Program is Reclamation-wide (17 Western States) for employees only. It is:

1. Competitive.

2. Merit-based applied R&D program.

3. Focused on innovative solutions for Reclamation water and facility Managers, and our western water stakeholders.

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Bureau of Reclamation

Top 3 Water Resources R&D Initiatives

1. **Climate Change and Water Working Group (USBR-USACE-USGS-NOAA-EPA-FEMA)**
   http://www.usbr.gov/research/clomate/

2. **Advanced Water Treatment programs**
   http://www.usbr.gov/pmts/water/publications/reports.html

3. **Mitigation of Invasive Aquatic Mussels**
   http://www.usbr.gov/mussels/

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What do you know About Reclamation?

Established in 1902, the Bureau of Reclamation is best known for the dams, powerplants, and canals it constructed in the 17 western states.

These water projects led to homesteading and promoted the economic development of the West.

Reclamation has constructed more than 600 dams and reservoirs including Hoover Dam on the Colorado River and Grand Coulee on the Columbia River.

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What do you know About Reclamation?

Today, we are the largest wholesaler of water in the country bringing water to more than 31 million people, and provide one out of five Western farmers (140,000) with irrigation water for 10 million acres of farmland that produce 60% of the nation's vegetables and 25% of its fruits and nuts.

Reclamation is also the second largest producer of hydroelectric power in the western United States. Our 58 powerplants annually provide more than 40 billion kilowatt hours generating nearly a billion dollars in power revenues and produce enough electricity to serve 6 million homes.

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Reclamation today

Reclamation is a contemporary watermanagement agency that helps the Western States, Native American Tribes, and others meet new water needs and balance the multitude of competing uses of water in the West.

Our mission is to assist in meeting the increasing water demands of the West while protecting the environment and the public's investment in these structures.

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Science and Technology in Utah

Back to the Future:

Innovative tree ring analysis to reconstruct paleo-climate and stream flows for urban water planning.

Principal Researcher: Fred Liljegren

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Objective:

1. Study under controlled conditions physiological water stress response strategies and impact on ring increment growth of dendrochronologically conventional and unconventional climate proxy tree species found in northern Utah.

2. Develop the capacity to apply different water stress response strategies of these conventional and unconventional species in high and low watershed positions to develop tree ring chronologies to extract idiosyncratic climate responses and reconstruct paleo drought, temperature, and evaporative demand cycles to assist in urban water planning

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Procedures:

1. Set up load cell-datalogger system to control water deficit levels in container grown species common to northern Utah but uncommon in dendrochronology to measure how these species allocate carbon to ring increment under season long water stress.

2. Set up lab with equipment and procedures to process and analyze increment cores to develop tree ring chronologies from uncommonly used climate proxy tree species, such as Rocky Mountain juniper (*Juniperus scopularum*) and bigtooth maple (*Acer grandidentatum*) as well as conventionally used species available in the Wasatch Mountain (Douglas fir, *Pseudotsuga mensiesii*; limber pine, *Pinus flexilis*) at high and low elevation dry sites in the Bear River watershed.

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Sophisticated load cell-datalogger system at the Utah State University research farm with 32 hanging load cells recording instantaneous plant weights and every 24 hours. At midnight either fully replaces plant water loss, or deficit irrigates by replacing only a percentage of the water loss.

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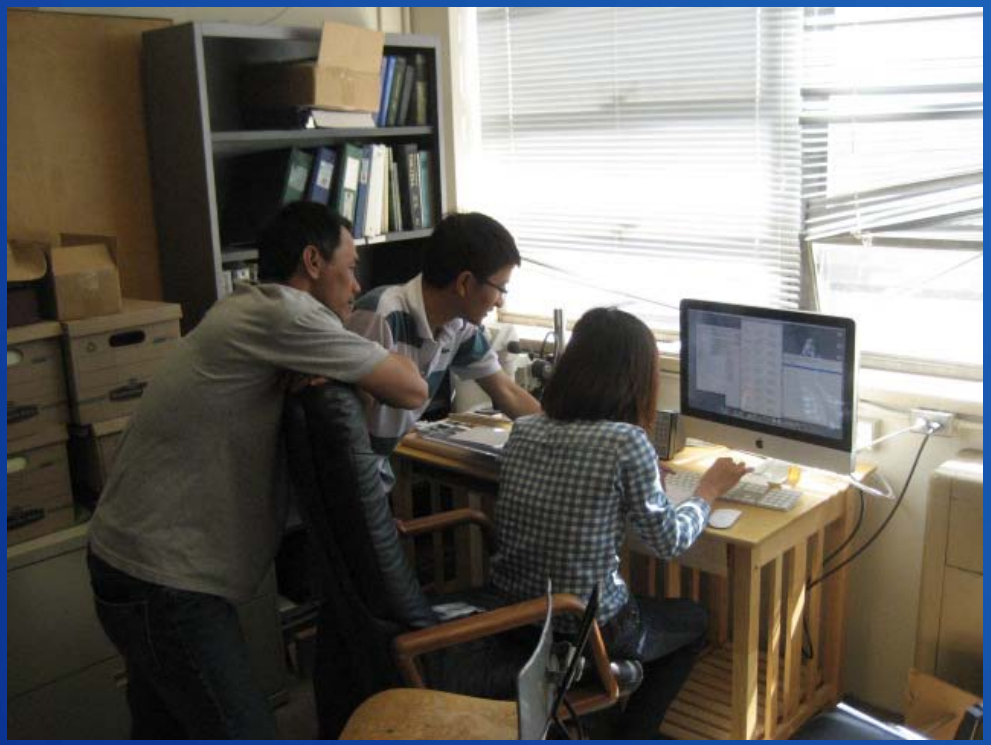

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900 year old Rocky mountain juniper. The core is approximately eight inches in length.

Coring old Utah Juniper.

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WaterSMART Research *Grants*

1.Grants to Develop Climate Analysis Tools are financial assistance opportunities to universities, non-profits and other organizations with water or power delivery authority.

2. Proposals will be invited to leverage non-federal money in a 50/50 cost-share manner with Reclamation on projects designed to enhance the management of water resources, including developing tools to assess the impacts of climate change on water resources and inform management decisions with respect to those impacts.

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WaterSMART Research *Grants*

3. Projects will focus on the information gaps outlined in the joint Reclamation and United States Army Corps of Engineers Report titled Addressing Climate Change in Long-Term Water Resources Planning and Management: User Needs for Improving Tools and

4. Projects will support ongoing efforts under the SECURE Water Act (Subtitle F of Title IX of the Omnibus Public Land Management Act of 2009, P.L. 111-11 (42 USC 10364), including efforts within DOI Landscape Conservation Cooperative (LCCs), Basin Studies and West-Wide Climate Risk Assessments

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WaterSMART Research *Grants*

A Partnership in Utah that has submitted for a WaterSMART Research Grant:

Utah State University
Brigham Young University
Central Utah Water Conservancy District
Metropolitan Water Conservancy Districts
Jordan Valley Water Conservancy District
Weber Basin Water Conservancy District
Salt Lake City Public Utilities
Sandy City Public Utilities

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Questions

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The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

THANK YOU!

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