A bellwether of Utah's climate challenges:

Although the Great Salt Lake is unique in the world, its interconnectedness with Utah's ecosystem make it a flashpoint for a number of natural resources issues within the state. The effectiveness of our efforts with GSL-related water conservation and storage, wetland preservation, and air quality management will be reflected far beyond the lake's shores.

USU's commitment to people, landscapes, and life:

As Utah's land-grant institution, USU is uniquely connected to our state's landscapes. We're woven in the fabric of our statewide urban and rural communities. With an unparalleled combination of local expertise and world-renowned discovery, USU provides critical context to Utah's most pressing issues. More than 140 USU Researchers are seeking to solve land, water, and air challenges in Utah, with more than a dozen focused specifically on the Great Salt Lake.

USU's land-grant mission:

Education -
Training the state's professional experts

Research -
Knowledge to address state issues

Extension -
Extending knowledge to people who can use it

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THE GREAT SALT LAKE

Utah State University Research
Addressing Challenges with
the Great Salt Lake

USU researchers creating data and insights on the Great Salt Lake

Wayne Wurtsbaugh
Professor Emeritus
Watershed Sciences
and Ecology Center
Utah State University
wayne.wurtsbaugh@usu.edu

Creating a scientific big picture of the Great Salt Lake

Dr. Wurtsbaugh has worked on Great Salt Lake research questions since 1985 and has authored many of the key findings now driving action on the lake, including elevation studies. Wurtsbaugh has examined brine shrimp, birds, eutrophication of Farmington Bay, metal contamination, and most recently, the factors causing the desiccation of the lake.

Joanna Endter-Wada
Professor
Environment
and Society
Utah State University
joanna.endter-wada@usu.edu

Public policy strategies for providing water to the Great Salt Lake

Dr. Endter-Wada's current project is designed to determine the public's willingness to employ different strategies, including significant conservation efforts, to provide water for the Great Salt Lake ecosystem. The public survey tool will be sent out within the next two months, with data collection and analysis occurring later in the year.

Karin Kettenring
Professor
Watershed Sciences
and Ecology Center
Utah State University
karin.kettenring@usu.edu

Restoring wetlands and native plant species

Common reeds, or phragmites, are an aggressive, tall, dense, wetland grass that crowd out native vegetation around the Great Salt Lake and surrounding wetlands, resulting in a loss of habitat for wildlife and access for people. Erradication and native vegetation reseeding programs can help preserve lake ecosystem health.

Janice Brahney
Associate Professor
Watershed Sciences
Utah State University
janice.brahney@usu.edu

Particle research and the Great Salt Lake

Dr. Brahney studies small things, including dust emissions from the Great Salt Lake. Coming from a terminal basin, Great Salt Lake dust contains higher levels of toxins—arsenic, cadmium, lead, copper, and mercury—than other dust sources. Brahney's research also encompasses phosphorous, cyanotoxins, microplastics, and smoke particles that impact the Great Salt Lake and broader Utah watersheds.

Sarah Null
Associate Professor
Watershed Sciences
Utah State University
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Voluntary water banking for the Great Salt Lake

Dr. Null focuses on the potential of water banking to sustain agriculture and the Great Salt Lake with anticipated drought intensification. Her team's study areas are Utah, California, and New Mexico. Null estimates that about 2 feet of water could be delivered to Great Salt Lake over the course of about 20 years with voluntary water banking in wet years. This might cost in the ballpark of $24–32 million, which is a good deal for saline lake restoration.

Som Dutta
Assistant Professor
Mechanical and
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Utah State University
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Modeling water flows between north and south sides of the lake

The causeway dividing the lake significantly increases salt concentrations in the northern section. To address environmental and economic concerns caused by changing saltwater densities, a new breach was added in the causeway. Super computer modeling helps determine the effectiveness of this breach and whether modifications or additions to the breach are needed.

Great Salt Lake researchers - cont'd

Trisha Atwood	- Mapping GSL wetland habitats
Phaedra Budy	- Microplastic Transfer to Fish Comm.
Michale Conover	- Bird movement and habitat
Kim Hageman	- GSL dust emissions
Ed Hammill	- Heavy metals in wetland plants
Bethany Nielson	- Waterflow models in the GSL
Doug Ramsey	- Mapping GSL algal growth
Erin Rivers	- Water qualtiy and GSL
Ron Sims	- Using GSL algae for water recycling
David Tarboton	- Water management strategies

USU Researchers in collaboration with

- Audubon Society of Utah
- Friends of Great Salt Lake
- Great Salt Lake Advisory Council
- Great Salt Lake Brine Shrimp Cooperative
- Great Salt Lake Technical Team
- Intermountain West Joint Venture
- Marriner Eccles Foundation
- National Science Foundation
- Property and Environment Research Center
- Salt Institute
- USDA National Institute of Food and Agriculture
- U.S. Environmental Protection Agency
- U.S. Forest Service
- U.S. Geological Survey
- Utah Department of Commerce and Economic Development
- Utah Department of Environmental Quality
- Utah Department of Natural Resources
- Utah Division of Forestry, Fire, and State Lands
- Utah Division of Water Quality
- Utah Division of Water Resources
- Utah Division of Wildlife Resources
- Utah Water Banking Strategy Management

Bodies of Water USU researchers are studying for GSL insights

- Laguna de Aculeo (Chile)
- Lake Urmia (Iran)
- Mono Lake (California)
- Owens Lake (California)
- Salton Sea (California)

Tip of the iceberg: *GLS issues are Utah issues*

Dozens of USU researchers are working to understand broader issues that can positively impact the Great Salt Lake:

Understanding Utah's drought patterns, Tracking water availability in the state, Managing Utah's watershed, Creating residential and agricultural water conservation strategies, Measuring water quality and usability, Measuring air quality, Determining outdoor recreation impacts, Understanding ecological impacts, Outlining economic benefits of natural resources.

Great Salt Lake Action: *A sea change for the state*

Attention and commitment to the Great Salt Lake is not only saving the lake, but it is laying foundation for solutions to other critical issues on the horizon:

Changing snowpack and snowmelt trends, Reservoir capacity and water storage, Northern Utah river and stream health, Agricultural irrigation technology development, Utah Lake water quality and management challenges, Salt Lake Valley air quality, Understanding viable change strategies.

RESEARCHLANDSCAPES
UtahStateUniversity

USU Research Landscapes connects community decision makers across the Wasatch Front with researchers who are investigating critical issues facing Utah's shared resources. Each event features a brief research presentation, Q&A, and a networking reception.

researchlandscapes.usu.edu

Janet Quinney Lawson
Institute for Land, Water & Air
UtahStateUniversity

This new USU institute is the state's designated entity for land, water, and air outreach and connections. The institute brings together USU land, water, and air researchers and connects them with Utah problem solvers. These efforts include an annual Report to the Governor on Utah's Land, Water, and Air, which was shared at an event with the Governor and other key stakeholders late last year. An advisory board of key external partners will continue to guide the growth of institute activities over the coming years.

usu.edu/ilwa

Extension
UtahStateUniversity

As Utah's land-grant institution, USU Extension has a statewide presence in every county in the state. Extension specialists promote health and resiliency in a wide variety of areas, including water quality and conservation. Two key resources provided by Extension that outline programs and events include:

water quality: **extension.usu.edu/waterquality**
drought: **extension.usu.edu/drought**

08.04.2022

Agriculture and water use

Thur. Aug. 04
4:00 - 5:30 p.m.

O.C. Tanner Headquarters
1930 South State Street, SLC

Lead presenter: Dr. Matt Yost

11.03.2022

Stewardship of the Great Salt Lake

Thur. Nov. 03
4:00 - 5:30 p.m.

O.C. Tanner Headquarters
1930 South State Street, SLC

Lead presenter: Dr. Joanna Endter-Wada

MARCH.2023

Spring Run-off Conference

Eccles Conference Center
Utah State University
Logan Main Campus

The USU Spring Runoff Conference, managed by USU's Interdisciplinary Water Science & Education team, is held annually to provide a forum for sharing and exchange of ideas on water-related issues in Utah and the Intermountain Region, extending to all aspects of water science, ecology, policy, engineering, and management. The conference is a one-day event, usually held in late March.

usu.edu/water/conference/2022-conference