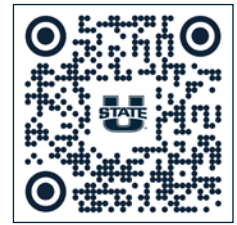




# Graduate Research Opportunities

## Utah State University

Department of Civil and Environmental Engineering and  
Utah Water Research Laboratory



### Come Discover with US!

GROUND and AERIAL SENSOR REAL-TIME ANALYTICS • ADVANCED DRONE  
AVIONICS and SENSING • EDGE and HIGH-PERFORMANCE COMPUTING

We are engaged in exciting, cutting-edge research and applications in agriculture, natural systems and urban environments. We invite you to contact the faculty below for specifics on the different research topics and starting dates.

#### SPECIFIC STUDY TOPICS:



**ALFONSO TORRES-RUA:** I work in applications of satellite and drone imagery for mapping vegetation water use and stress, soil moisture in agriculture, natural systems, and urban environments.

email: [alfonso.torres@usu.edu](mailto:alfonso.torres@usu.edu)

website: <https://uwrl.usu.edu/people/faculty/torres-alfonso>



**SIERRA YOUNG:** My lab aims to advance our understanding of the natural environment by developing new use cases for mobile and optical sensor systems to monitor environmental and agricultural processes.

email: [sierra.young@usu.edu](mailto:sierra.young@usu.edu)

website: <https://www.thedaisylab.com>



**CALVIN COOPMANS:** I work in the development of advanced drone aircraft (systems avionics, remote sensing) and as the Director of the USU AggieAir UAS Research Program.

email: [cal.coopmans@usu.edu](mailto:cal.coopmans@usu.edu)

website: <https://uwrl.usu.edu/people/faculty/coopmans-calvin>



**STEVE PETRUZZA:** My core research is in high-performance computing and scientific visualization. We develop solutions for real-time analysis and streaming visualization of large-scale drone data.

email: [steve.petruzza@usu.edu](mailto:steve.petruzza@usu.edu)

website: <https://stevepetruzza.io>



**BURDETTE BARKER:** I work in quantifying irrigation water use and movement using ground-based sensors and the accessibility of information to a broad range of users.

email: [burdette.barker@usu.edu](mailto:burdette.barker@usu.edu)

website: <https://extension.usu.edu/directory/barker-burdette>



**OTHER OPPORTUNITIES:** See additional environmental and water processes graduate opportunities connecting vegetation, soil, and water to environmental and civil applications at—

website: <https://uwrl.usu.edu/opportunities>

#### QUALIFICATIONS:

Positions vary, so contact the appropriate faculty contact to discuss your specific qualifications. We encourage experience in programming, GIS, crop production and water balance.

#### ABOUT USU:

Utah State University is a premier land- and space-grant institution committed to excellence, access, and inclusion. We empower all people to lead successful lives of involvement, innovation, and impact.

In its programs and activities, including in admissions and employment, Utah State University does not discriminate or tolerate discrimination, including harassment, based on race, color, religion, sex, national origin, age, genetic information, sexual orientation, gender identity or expression, disability, status as a protected veteran, or any other status protected by University policy, Title IX, or any other federal, state, or local law.

**UtahStateUniversity**



## The UTAH WATER RESEARCH LABORATORY

### Mission

The Utah Water Research Laboratory conducts collaborative water and environmental research in Utah and throughout the world to advance innovative solutions, promote scientifically informed policy and management decisions, and train tomorrow's leaders.

### Vision

We envision a sustainable water and environmental future for Utah and the world.

### Overview

- ▶ Multi-disciplinary research on a wide range of local to global water challenges
- ▶ 61,000 ft<sup>2</sup> Hydraulics Laboratory
- ▶ 11,000 ft<sup>2</sup> Environmental Quality Laboratory
- ▶ 24 interdisciplinary faculty experts
- ▶ 12 research staff
- ▶ ~40 graduate students
- ▶ ~60 undergraduate students
- ▶ ~200 projects ongoing at any given time

### Research Areas

**ENVIRONMENTAL ENGINEERING:** Basic and applied research to understand and develop sustainable solutions to water challenges that occur in the innumerable interactions between humans and water, including evaluating, assessing and modeling the presence and occurrence of various risk factors in water and water systems (e.g., microplastics, PPCP, ozone, PM2.5 air pollution), and a wide range of other environmental applications.

**WATER RESOURCES MANAGEMENT:** Advancing innovative solutions and promoting scientifically informed policy and management decisions; addressing water resources and water quality challenges in instream ecosystems and other water bodies; collecting ongoing data within the [Logan River Observatory](#); researching management options for the Great Salt Lake and the Colorado River, among others.

**HYDRAULIC MODELING AND TESTING:** Scale modeling of design options for dams, spillways, pumping stations, etc.; hydraulic research; valve and meter testing; and Computational Fluid Dynamics (CFD) numerical modeling of hydraulic processes and structures, among others.

**IRRIGATION AND REMOTE SENSING:** Research in precision irrigation management, remote sensing, crop water use, irrigation system performance, water use optimization, including advancing use of satellites and unmanned aerial/ground vehicle systems (drones) for agricultural, urban and environmental applications (e.g., evapotranspiration, precision agriculture, water-related monitoring). Home to the [AggieAir UAV Research Program](#).

**DATA MANAGEMENT AND HYDROINFORMATICS:** Developing cyberinfrastructure and hydrologic information systems to support open data management for research reproducibility and evidence-based policy and decision making; utilizing big data to address local to global water-related challenges; and smart metering to manage urban water supplies and promote sustainable customer behavior, among others.