

## California Water Institute

### 2023-2024 Faculty Fellows Accomplishments

The California Water Institute (CWI) Research & Education Department aims to link Fresno State with the San Joaquin Valley's water research needs. Through the Faculty Fellows program, we are making this vision a reality.

During the 2023-24 year, fellows engaged with colleagues from various colleges and external agencies, including the Department of Water Resources and the California Water Data Consortium. They explored current data use, dashboards, and data access. Fellows also heard from guest speakers, such as a director of sustainability for a farm, who highlighted the accessibility of online data and its applications for farmers.

The fellows worked on several team projects, with two achieving notable success. One of these projects received an invitation to submit a formal grant application.

#### Team 1 – Developing a Farm Digital Twin

Team 1 comprised of Jorge Pesantez, Aimee Jacobs, Pei Xu and Xiangxiong Kong. They focused on creating a farm digital twin. Their work included a white paper and grant application.

**White Paper:** A research-based document outlining the Planning Proposal Grant concept for a digital twin project. A digital twin is a digital model of an intended or actual real-world physical product, system, or process that serves as the effectively indistinguishable digital counterpart. The purpose of the digital twin is for practical purposes, such as simulation, integration, testing, monitoring, and maintenance. The National Science Foundation accepted this pre-screening white paper, paving the way for a full grant proposal.

**Grant Application:** A \$200,000 proposal to fund foundational work for the digital twin. The team, supported by CWI staff, submitted the proposal and is awaiting results. If successful, work will commence in Spring 2025.

#### Team 2 – Health Impacts of Water Quality

Team 2 consisted of Christina Macias, Earvin Balderama, Samuel Contreras-Ruiz and Michelle Calvarese. They investigated the health impacts of groundwater quality in Tulare County. They developed a white paper proposing research to assess correlations between groundwater quality and health issues in the county. The paper outlines research goals to determine the correlation between groundwater quality and health impacts, develop educational materials for disadvantaged communities, and create a documentary highlighting these issues. The research aims to document health impacts from groundwater use, educate affected communities, and share their stories through a compelling documentary.



Congratulations to the 2023-24 Faculty Fellows for a remarkable year!

#### About the CWI Faculty Fellows Program

CWI's Faculty Fellows are full-time Fresno State faculty from various colleges. This multidisciplinary approach allows faculty to involve students in research addressing water resource management challenges in the Valley, while enhancing their education in these critical areas.

Learn more about Faculty Fellows at [www.californiawater.org/](http://www.californiawater.org/)