

ACTIVITIES REPORT 2018 - 2020



ENVIRONMENT

Panelists: Pablo Garza, Environmental Defense Fund
Sandi Matsumoto, The Nature Conservancy;
Zach Smith, Colorado Water Trust;
Phillip Womble, Stanford University



2018 - 2020 has been full of exciting projects and events.

**We are pleased to share this inaugural biennial activity report of
the California Water Institute.**

WELCOME TO THE CALIFORNIA WATER INSTITUTE

California Water Institute (CWI) has accomplished so much in 2018 - 2020. Our mission – to lead the way in sustainable water management strategies and practices – is increasingly relevant as water remains a critical challenge in the San Joaquin Valley, as well as our state, the nation, and the world at large. And, with your support, CWI remains a major forum for unbiased and collaborative discussion, research, and education on water-related issues.

Today, the Institute’s experts provide service to not-for-profit organizations, as well as private, state, federal, and local agencies. Located on the Fresno State campus, the Institute also engages the academic community in the pursuit of sustainable water resource management solutions for agriculture, disadvantaged, environmental, and urban interests.

As we enter our third decade of service we will continue to count on many of you as partners in this significant work as we increase our impact in managing ever-increasing demands on the Earth’s most precious resource. When people come together for a purpose, amazing things can happen.

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History & Mission

2000 – 2020:
Twenty years of CWI meeting one of California’s biggest challenges:
WATER

CWI was created in 2000 after voters approved Proposition 13, a \$2 billion water bond measure. Not long after, representatives from government agencies, public organizations, and private industries – all with a vested interest in water use for agriculture, urban needs and the environment – helped outline CWI’s future and its scope of goals:

- To carry out concise, comprehensive studies that will provide the direction for better future use and conservation of the State’s water
- To promote practices that will enhance and preserve the State’s water resources and its quality
- To serve as a center for research, education, planning, policy evaluation, and information transfer
- To communicate the results of its research and studies with California residents
- To collaborate with State-based agencies and institutions to seek a positive resolution to the State’s complex water problems
- To present workshops and symposia.
- To maintain a collection of pertinent information
- To provide objective, third-party reviews of water issues

Now, our mission is evolving. In fact, today’s water decisions will help determine California’s potential as one of the largest economies in the world. Please take a look at who we are, and what we do, and how we can be of assistance.

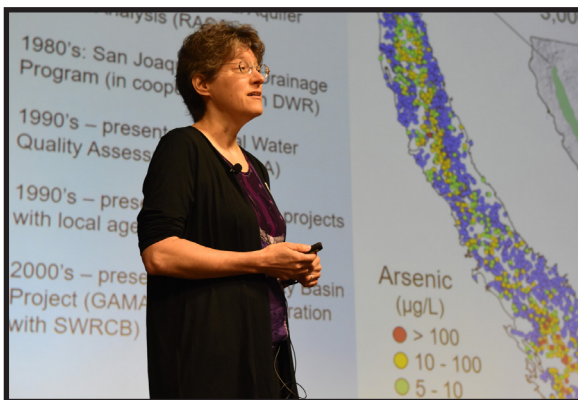
Education and Outreach

Arsenic Symposium (October 2018)

This symposium outlined the effects of arsenic in San Joaquin Valley groundwater, with insights from Fresno State faculty, local hydrogeologists and well drillers, the United States Geological Survey, the State Water Resource Control Board, and Stanford University researchers. Attendees also participated in breakout sessions to brainstorm on the next steps in addressing arsenic in San Joaquin Valley groundwater. To read the event proceedings please visit: bit.ly/ArsenicSymposium



Top Image: Panel discussing key regulatory challenges for Arsenic in drinking water.



Left Image: USGS Geochemist presents on USGS National Water Quality Assessment Program and Groundwater Ambient Monitoring.

Conference Presentations (2018 - 2020)

Over the last two years, CWI staff presented at multiple conferences ranging from water sustainability to next generation of water managers. Presentations were also given in Spanish on general water issues by CWI staff at a variety of community events.



Top Image: CWI staff presenting on a panel at the Annual California Irrigation Institute Conference.



Left Image: CWI staff interviewing on Bringing Water to Life Podcast.



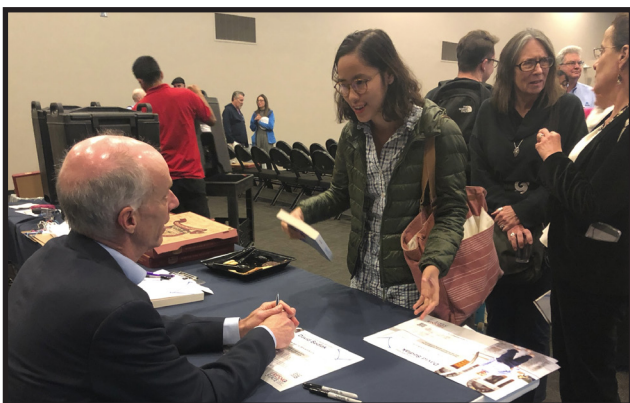
The participants from Spring 2020 Water Book Club during their last Zoom get together.

Water Book Club (Spring 2019 and 2020)

The CWI Water Book Club encourages Fresno State students, staff, and faculty to expand their knowledge on all aspects of water. The book club started with the Water Cohort's annual campus-wide Common Read Initiative, with hundreds of students reading a water-related book as part of their curriculum.

Club members are supported with reading guides and a space to discuss their thoughts while allowing for different perspectives and a better understanding on water issues. Highlights include:

1. Spring 2019: *Chasing Water: A Guide for Moving from Scarcity to Sustainability*, by Brian Richter, who visited campus to talk about how communities must collectively work together for more successful, sustainable and enduring water management programs.
2. Spring 2020: *The Dreamt Land: Chasing Water and Dust Across California*, by Mark Arax. The author joined our virtual Zoom meeting to answer questions about topics such as water rights, conveyance, groundwater quality and more. A replay of the event can be viewed on California Water Institute's YouTube channel.



Author visit with Brian Richter on campus.

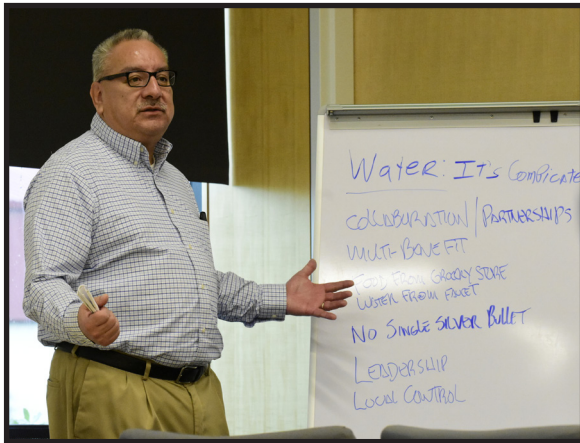
Water Boot Camp for Journalists (January 2020)

In partnership with the Fresno State Institute for Media and Public Trust, CWI hosted an event for journalists who cover issues related to California's water.

This one-day seminar offered an intense look into the many facets of water law in the state, including important updates on major changes in rules and regulations. The event began with an overview of water conveyance, policy and history in California and included key speakers from all over California as well as Fresno State Faculty and Staff.

Following the presentations, there was a moderated panel discussion on key areas water effects: the environment, disadvantaged communities, urban settings as well as agriculture.

The boot camp taught journalists what questions they needed to ask to inform their readers, viewers, and listeners about California's vast water issues.



Politics in Water panel at Fresno State's Jordan Agricultural Research Center.

Water Exchange Market Symposium (January 2019)

This symposium focused on how water exchange markets work and how markets may or may not be a good fit for specific water supply management plans.

Attendees -- such as growers, irrigation/water districts, regional water agencies, groundwater sustainability agencies, and other stakeholder groups -- participated in discussions linked to the creation of California's water exchange markets in response to Sustainable Groundwater Management Act requirements. For more information, please visit the event web page: bit.ly/WEMSymposium

Top and Right Image: Environmental Resources panel at Fresno State's Satellite Student Union.



Water Resilience Portfolio Stakeholder Meetings (August and September 2019)

Under Executive Order N-10-19, issued by California Governor Gavin Newsom in April 2019, major stakeholders were directed to prepare a water resilience portfolio. Lead agencies -- the California Natural Resources Agency, California Environmental Protection Agency, and the California Department of Food and Agriculture -- directed the work to meet the needs of the state's communities, economy, and environment through the 21st Century.

CWI convened stakeholder groups from across the San Joaquin Valley to generate water resiliency recommendations for this region.

Final conclusions were:

1. If water resilience for the San Joaquin Valley was easy, it would have already been accomplished. No individual stakeholder group can accomplish water resilience independently. It must be accomplished collaboratively.
2. Water policy is difficult in California due to four issues:
 - i. The diversity of demands placed on the State's water system (agriculture, urban, disadvantaged communities, and the environment).

- ii. The geographic extent of demands placed on the State's water system (from the Oregon border to the Mexico border, from the Sierra Nevadas to the Pacific Ocean).
- iii. The scarcity of water supplies to fully satisfy all system demands during certain hydrologic conditions (below normal precipitation).
- iv. The inability of the existing water system infrastructure to store, convey, and distribute available water supplies during certain hydrologic conditions (above normal precipitation).

3. The State should avoid adopting a water resilience portfolio that results in: water supply restrictions on San Joaquin Valley residents; one water user profiteering at the expense of another water user; the loss of ethnically-diverse and small family farms; and California becoming food-dependent on other nations.

The complete summary and recommendations report submitted to the California Natural Resources Agency is available at bit.ly/CWIpublications.



The Kings River provides fresh water to communities and irrigates cropland in the Central Valley. The river flows southeast of Fresno and ends at the Tulare Lake Basin.

Publications

The California Water Institute collaborated with faculty from University of California, Berkeley and Fresno State to develop the following publications. The publications from the past two year can be accessed by visiting bit.ly/CWIpublications.

Central California Business Review

This report, published by the Fresno State Craig School of Business, features valuable insights into the regional economy such as consumer and real estate sentiments, the labor market, and business interests including agriculture, water, manufacturing, banking, and global issues.

The following authors contributed to the “Water & Agriculture in the San Joaquin Valley” section of the Business Review report.

- 2019 - Thomas Esqueda and Helle Peterson.
- 2020 - Thomas Esqueda, Amber R. Crowell, and Thomas Holyoke.

Water infrastructure in the San Joaquin Valley – A Series of Publications

CWI published findings developed by working with researchers to assess how a reduction in water availability will affect the growth of the regional economy, as well as possible solutions.

Socioeconomic and Demographic Trends of the California San Joaquin Valley, 1970 - 2017

This report provides historical data about socioeconomic and demographic trends as observed in the area between 1970 - 2017, such as:

- Age and sex
- Race and ethnicity
- Educational attainment
- Poverty
- Unemployment
- Industry of occupation

Top Image: 2020 Central California Business Review Cover

Bottom Image: 2019 Central California Business Review Cover



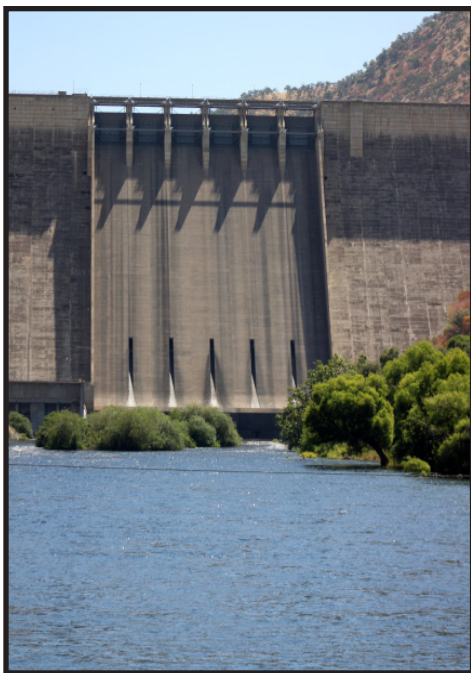
Analysis: Economic Impact of Water Reduction to the Valley

CWI was asked to identify potential experts to conduct this analysis. In cooperation with the Blueprint Group, CWI worked directly with Dr. David Sunding from University of California, Berkeley to develop the scope of work, analytical methods, compensation and schedule, and contract execution.

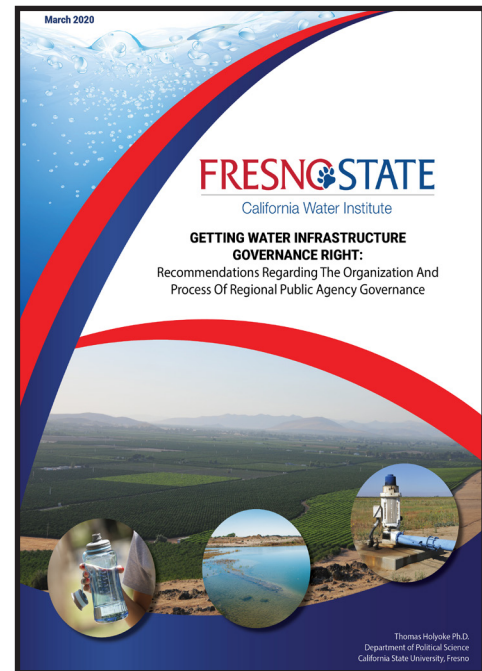
Dr. Sunding's research estimates that the economic losses associated with the forecasted water supply shortage conditions will be \$7 billion annually.

Funding a Future for Water in the San Joaquin Valley: A Literature Review of Public Funding for Water Infrastructure

Published in November 2019, this report summarizes past financing strategies for water infrastructure and the reasons they have or have not worked. It provides detailed examples of financing strategies that can work in the future, as well as a summary of recommendations for funding a future for water in the San Joaquin Valley.



Pine Flat Dam in Fresno County, California on the Kings River.



Publication cover of *Getting Water Infrastructure Governance Right*.

Getting Water Infrastructure Governance Right: Recommendations Regarding the Organization and Process of Regional Public Agency Governance

Published in March 2020, this report illustrates how water infrastructure in the San Joaquin Valley can be managed with Joint Power of Authorities, Enhanced Infrastructure Financing Districts, and Public Finance Authorities. It summarizes how a board might be strategically composed with members, how votes might be allocated, and a possible model for such governance. The publication concludes with a recommendation of a possible model.

San Joaquin Valley Water System Investment Program

The final publication in this series brings together the CWI research and analysis of the past two years, identifying new projects, as well as improvements to decaying water infrastructure, including funding costs and strategies.

Research and Projects

Drinking Water Treatment Strategies for Point-of-Entry Systems

In December 2017, the State Water Resources Control Board adopted a regulation determining the maximum contaminant level for 1,2,3 - Trichloropropane (TCP). TCP is an emerging drinking water contaminant affecting water systems in the City of Fresno and surrounding areas.

In an effort to provide individuals with a cost-efficient way to treat water entering their home, Fresno State conducted research and water quality tests to analyze the effectiveness of different treatment methods on the reduction of TCP in drinking water. The report will be available by December 2020.



Top Image: Pouring contaminated water samples into test tubes for laboratory testing.

Left Image: Students used ozone test kits to gain accurate ozone level readings.

Environmental Management System Plan

An environmental management systems plan was developed to be part of an application for a local farming business to achieve B Corporation certification status. It includes a description of verifiable policies, practices, procedures, and technologies that result in measurable improvements for employees, communities, and the environment while still fulfilling the corporate mission of profitability.

The project included data collection and analysis in four key areas -- water, energy, fertilizer, and pesticide -- as well as identified industry baselines and recommendations for future goals.

Next, CWI will work with faculty and students to assist the farmer in developing a more automated system for collecting data.

Implementing a National Phytosanitary Capacity for the Country of Georgia

Funded by the Foreign Agricultural Service of USDA, this project's goal is to implement a national phytosanitary program for Georgia, a country at the intersection of Europe and Asia. The project's first phase includes the design of a National Integrated Pest Management Roadmap. Phase 2 involves training and technical support to the Georgian National Food Agency on plant health, pest management, and water sustainability/irrigation

management. Collaborators on the project include the United States Agency for International Development and the Georgian-based non-governmental organization Farmers of the Future.



The team visiting the Republic of Georgia to educate about pests.



Water System Consolidations Feasibility Study

CWI worked with the State Water Resources Control Board, Division of Drinking Water, CSU San Bernardino, and the City of Fresno on a feasibility study to assess the operational, technical, institutional, and financial effects of consolidating 12 public water systems with the City of Fresno water system.

Assisted by faculty and students, CWI completed the feasibility study on March 27, 2020, and is now working with Self Help Enterprises, Water Board staff, and the City of Fresno to move these projects to construction for delivery of safe drinking water to these communities.



Top Image: The City of Fresno, State Water Board, and CWI meeting to discuss the feasibility study of potentially consolidating specific small water systems to the City of Fresno for reliable water sources.

Bottom Image: Fresno State students working with CWI to put together a Regional Consolidation Feasibility Study for the City of Fresno.

Training on Post-Harvest Handling and Marketing for the Country of Georgia

CWI hosted a group of six Cochran Fellows from Georgia in October 2019. This training program was focused on post-harvest handling, marketing, and the use of water in fruit and vegetable processing. The visiting Fellows were either from the private sector or government employees (Georgian Ministry of Agriculture) engaged in agricultural production and agribusiness marketing.



Fresno State faculty and staff met with the Republic of Georgia's officials.

Flow Measurement Device Study

CWI collaborated with Fresno State faculty and a research team of five graduate students, to work with a local irrigation district to conduct research and testing of a variety of flow measurement devices.

The group of students conducted a literature search of flow measuring devices, prepared a list of potentially suitable devices, and conduct pilot testing of them in the lab.

The team of research students were able to use the experience as part of their graduate projects and have since graduated with their Master's degree.

Following the lab testing, a unit will be tested in the field. The project is still in progress and CWI is looking forward to providing other students with the opportunity to learn from this experience.



The laboratory hydraulic experiment included the construction of a physical scale-model that was used to accurately calculate flow through a turnout with known head conditions and known hydraulic structure characteristics.

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Images courtesy of California Water Institute Staff and the Craig School of Business.