

SACRAMENTO STATE



ANNUAL REPORT
2017 – 2018



WATER PROGRAMS
SACRAMENTO STATE



ABOUT US

Office of Water Programs (OWP) publishes the industry standard in drinking water and wastewater training materials and test track provides valuable, science-based applied research services for water management in California and elsewhere.

Our team of nearly 50 professionals, trained in a variety of academic disciplines, collaborates to produce high caliber work that furthers OWP's mission and values. These two pages highlight the local, national, and international universities, colleges, and degree programs from which OWP staff made their start.

University of California, Davis

- 2 – Ph.D., Civil & Environmental Engineering
- 2 – BS, Civil & Environmental Engineering
- MS, Civil & Environmental Engineering
- MS, Hydrologic Sciences
- BS, Environmental Biology and Management
- BS, Geology

California State University, Sacramento

- MS, Civil Engineering
- MS, Civil & Environmental Engineering
- MS, Environmental Engineering
- 2 – BS, Civil Engineering
- BA, Mathematics
- BA, Communication Studies
- 2 – BS, Graphic Design
- BA, Economics

University of California, Berkeley

- Ph.D., Civil & Environmental Engineering
- MS, Civil & Environmental Engineering
- Professional Technical Editing Certificate

University of California, Santa Cruz

- BA, Biology

Stanford University

- 2 – MS, Environmental Engineering
- MS, Civil & Environmental Engineering
- 2 – BS, Civil Engineering with Honors
- BA, Human Biology

Humboldt State University

- MS, Environmental Resources Engineering

California State University, Chico

- BS, Civil Engineering

California Polytechnic State University, San Luis Obispo

- BS, Animal Science

California State Polytechnic University, Pomona

- BS, Civil Engineering (Environmental Focus)

University of Tennessee, Memphis

Ph.D., Biological Sciences
MS, Biological Sciences
BS, Biology Sciences

Utah State University

Ph.D., Environmental Engineering
MS, Mathematics
MS, Environmental Engineering

University of Wisconsin, Madison

BS, Civil & Environmental Engineering

California State University, Fresno

BA, Mass Communication & Journalism

Queen Mary University of London

Ph.D., Water Quality Management

Imperial College London

MS, Engineering Hydrology

University of Surrey

BS, Chemical Engineering

St. John's College

BA, Liberal Arts

George Mason University

M.P.P., Science & Technology Public Policy

University of Oregon

BS, Journalism

Oregon State University

MS, Civil & Environmental Engineering

Colorado Technical University

Ph.D., Environmental Sustainability

Colorado State University

BS, Business Management

Capella University

Ph.D., Biological Sciences

University of Maryland, College Park

MS, Environmental Management

Washington State University

MS, Geology

University of Georgia

Ph.D., Water Resources & Remote Sensing

University of Leeds

MS, Engineering Geology

American University of Beirut

BS, Geology

University of Baghdad

BS, Civil Engineering (Structures Division)

El Camino College

AA, Zoology

Spokane Community College

AA, Legal Secretarial Science

Folsom Lake College

AS, General Studies

Sierra College

AA, Liberal Arts

AA, Humanities

Yuba College

AA, Accounting



TRAINING SERVICES

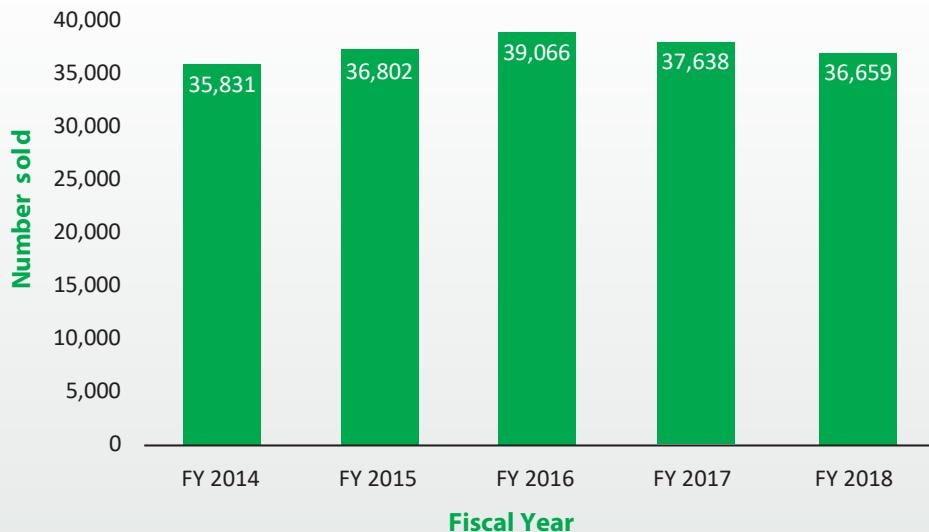
Offering nearly 50 print, online, and video courses for water and wastewater industry professionals, OWP delivers affordable training materials that help operators, managers, and inspectors do their jobs better.

2017-2018 Highlights

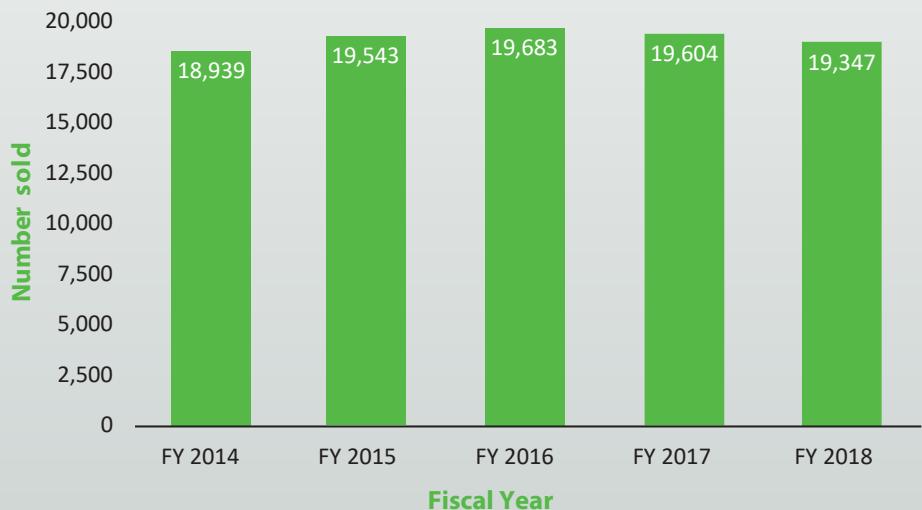
- **Sold** nearly **37,000** training manuals, with **82.5%** of sales **outside of California**
- **Enrolled** almost **19,400** adult learners in courses for continuing education units, contact hours, or academic credit
- With **70%** of our US students residing **outside of California**, OWP continues to be a leading national training provider
- Training materials and **courses sold internationally** in the UK, Cayman Islands, Belize, and Jamaica, among others, represents **9%** of sales



Training Manual Sales



Course Enrollment Sales





POPULAR TRAINING TITLES

Inside a Training Manual

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Chapter 4

Sedimentation

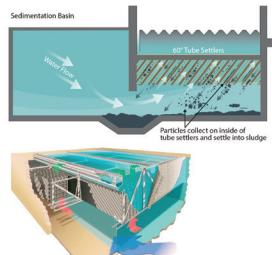


Figure 4.17 Cutaway view of tube settler in rectangular basin (Bottom figure: Courtesy of Fluence Research Inc.)

Solids-contact units generally have provisions for controlled removal of sludge so that the concentration of solids retained in the basin can be maintained at some desired level.

Solids-contact units are popular in older treatment plants and in older treatment plants and in cold climates where the units have to be installed in basins. Careful control must be exercised in the operation of these units to ensure that a uniform sludge blanket is formed and is subsequently maintained throughout the solids removal process. The sludge blanket must be thick enough to provide sufficient resistance to sediment density currents tend to upset the sludge blanket. Loss of the sludge blanket will affect the performance of the filters. Other important aspects of solids-contact clarifiers include the addition and mixing of chemicals.

Unmixed coagulation sedimentation units remove particulate pollutants for both turbidity removal and softening processes requiring the precipitation of hardness. With softening processes, chemical requirements are usually lower also. In the case of turbidity removal, coagulant requirements are often higher. In either case, solids-contact units are very sensitive to changes in influent flow or temperature. In these facilities, changes in the rate of flow should be made infrequently, slowly, and with great care.

Sedimentation Basin | Section 4.3 | 217

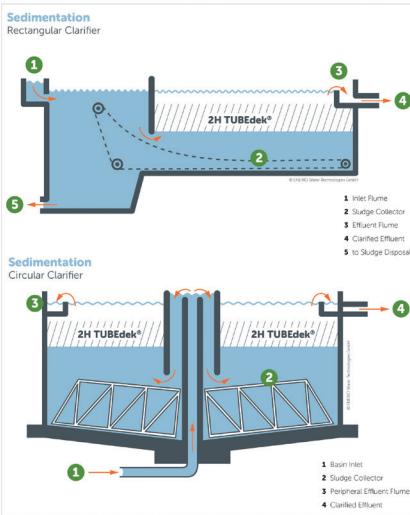
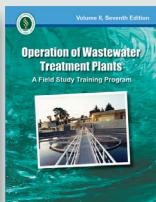
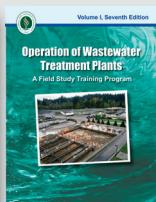
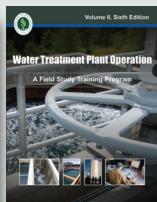
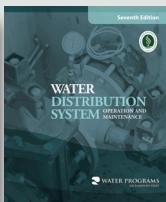
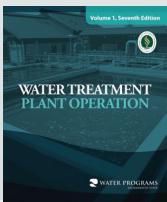


Figure 4.18 Tube settlers in rectangular and circular clarifiers (Courtesy of ENEXIO Water Technologies)

Top-selling Titles



1. Water Treatment Plant Operation, Volume 1
2. Water Distribution System Operation and Maintenance
3. Water Treatment Plant Operation, Volume 2
4. Operation of Wastewater Treatment Plants, Volume 1
5. Operation of Wastewater Treatment Plants, Volume 2

Selected Training Products

Advanced Waste Treatment (training manual, course enrollment)

Basic Small Water System Operations (training manual)

Collection Systems: Methods for Evaluating and Improving Performance
(training manual, course enrollment)

Industrial Waste Treatment, 2 volumes (training manual, course enrollment)

Manage for Success (training manual, course enrollment)

Membrane Bioreactors (training manual, course enrollment)

Operation and Maintenance of Wastewater Collection Systems, 2 volumes
(training manual, DVD, course enrollment)

Operation of Wastewater Treatment Plants, 2 volumes
(training manual, CD, course enrollment, online)

Pretreatment Facility Inspection (training manual, DVD, course enrollment)

Small Wastewater System Operation and Maintenance, 2 volumes
(training manual, course enrollment)

Small Water System Operation and Maintenance
(training manual, DVD, course enrollment, online)

Treatment of Metal Wastestreams (training manual, course enrollment)

Utility Management (training manual, course enrollment)

Water Distribution System Operation and Maintenance
(training manual, course enrollment, online)

Water Systems Operation and Maintenance Video Training Series
(training manual, DVD, course enrollment)

Water Treatment Plant Operation, 2 volumes (training manual, course enrollment)



Graduate Research Fellowship Connects OWP, University with Neighbor

To complete OWP's Graduate Research Fellowship Program, Sac State master's degree candidate Eric Uppal investigated the potential for using urban stormwater runoff as a source for a drinking water treatment plant. This first successful fellowship grew out of OWP projects on statewide stormwater capture and use strategies. In the resulting paper, "Capture and Reuse of Urban Runoff Conveyed Directly to a Drinking Water Treatment Facility as an Alternative Stormwater Management Strategy: A Sacramento Case Study," Eric describes how much stormwater Sacramento's Fairbairn Water Treatment Plant could accommodate, what levels of treatment would be needed, and how large the watershed would need to be to provide the flows.

Eric also determined that the costs of stormwater storage and treatment are about ½ the cost of installing stormwater BMPs in urban neighborhoods. He worked with Rod Frizzell, chief operator at the treatment plant (a neighbor to OWP and Sac State located on College Town Drive), and was advised by Dr. John Johnston, Sac State professor of civil engineering and OWP technical advisor.



For more information about our connection with Sac State, visit us online at www.owp.csus.edu/university-connection

Education Program Development Supports Industry Workforce



Recognizing the increasing need for new, well-trained drinking water and wastewater treatment operators, OWP took on a new strategic initiative in 2017 to promote OWP training programs by assisting in the creation of standardized educational programs related to water industry workforce development.

As part of this initiative, OWP is now a partner organization in Sacramento Region Water Works—a group formed to promote and maintain regional water sustainability through education and workforce development. The group is collaborating with the Division of Apprenticeship Standards (part of the State of California's Department of Industrial Relations) to formalize an apprenticeship program for the drinking water and wastewater sector.

OWP also has a partnership agreement in place for the 2018–19 academic year with the City of Sacramento and Sacramento New Technology High School to provide educational, work-based learning and internship opportunities for high school students.

With this strategic initiative, OWP helps employers attract and train new operators and ensures that our nationally recognized training programs—approved by state certification offices in all 50 states and Canada—are part of the water industry's workforce development core curriculum.

Water Seminar Series Flows with Industry Insight

In its fourth year, the Water Seminar Series continues to attract water management experts interested in sharing their knowledge and collaborating with others in the field. Presentation topics have included:

- California Climate and Weather
- American River Temperature Management
- American River Salmon Restoration
- US Army Corps of Engineers Emergency Response
- Folsom Dam: Flood Operations Update



Information about upcoming and past seminars is available at
www.owp.csus.edu/water-seminars

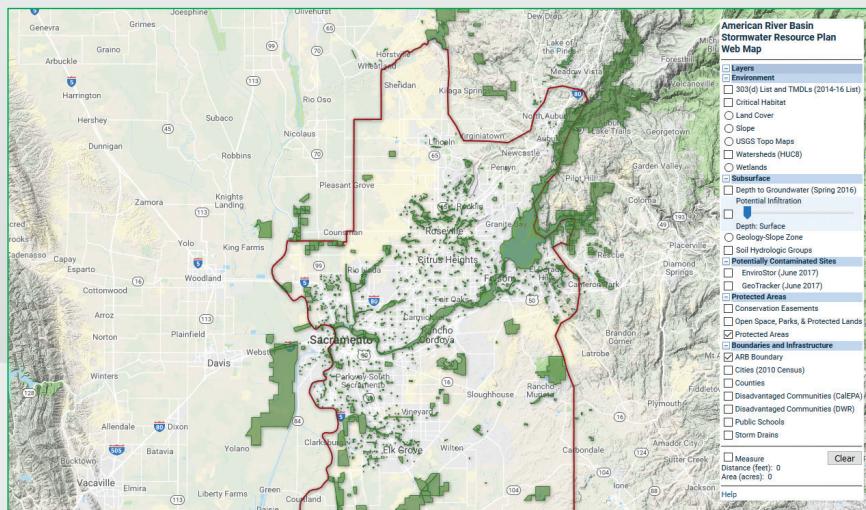


TECHNICAL TOOLS AND SERVICES

Numerical modeling, permit compliance, and stormwater design software tools are among those developed by OWP's research engineers to provide robust, science-based, and customizable resources for stormwater practitioners focused on research, design, and planning.

American River Basin Stormwater Resource Plan— Web Map

This web-based GIS map assists users in identifying and evaluating stormwater capture and use project opportunities for the American River Basin Stormwater Resource Plan. The interactive map provides multiple layers of surface, subsurface, environmental, and community characteristics for eastern Sacramento County, western Placer County, and surrounding regions. OWP developed the tool with funding awarded from the California State Water Board's Proposition 1 Storm Water Planning Grant Program.



For more information about software tools, visit us online at
www.owp.csus.edu/research/software-tools.php

BasinSizer

Assisting stormwater practitioners in sizing stormwater basins anywhere in California, Basin Sizer is a software tool that calculates water quality volumes and water quality flows using various methods and data obtained from rainfall stations throughout the state. Users can easily select project locations using the interactive map.

California Phase II Low Impact Development Sizing Tool

The LID Sizing Tool assists stormwater practitioners with selecting and sizing LID best management practices that meet sizing requirements in California's National Pollutant Discharge Elimination System permit for stormwater discharges from small municipal separate storm sewer systems. OWP developed the tool with funding awarded from the State Water Board's Proposition 84 Stormwater Grant Program.

Hydrologic Analysis Tool

Originally developed to prepare hydrographs for stormwater-related studies conducted by OWP, the Hydrologic Analysis Tool (HAT) standardizes complex calculations required for event-based stormwater monitoring. HAT is made freely available to the public for NPDES permit monitoring and stormwater studies.

Stormwater Practitioner Training and Exam Administration

In partnership with the California Stormwater Quality Association and the State Water Board, OWP developed and continues to coordinate training and exam administration programs for Construction and Industrial Permit compliance. Over 9,000 professionals have become Qualified Stormwater Developers, Qualified Stormwater Practitioners, and Qualified Industrial Stormwater Practitioners since the program's inception in 2011.

Struvite Tool

The Struvite Tool makes struvite control planning easier by calculating the struvite precipitation potential for a facility based on user-input water quality parameters. The user can vary input parameters to examine "what-if" scenarios when conditions are changed to control struvite precipitation.

Water Quality Planning Tool

This tool provides planners with an easy-to-use website that makes available the watershed information required to create and comply with stormwater permits. A feature of the website enables the user to find a watershed through interactive maps or by entering the postmile number of a project location.



Our experienced and well-trained staff of research engineers and scientists provide technical expertise and project consulting on data analysis, cost assessment, watershed planning, modeling, and water policy issues to public and private sector clients and partners. Water quality, management, and reuse are the focus of these sought-after services.

2017-2018 Highlights

- \$2M, four-year extension to Department of Water Resources contract to assist Division of Safety of Dams with dam break flood analysis and emergency action plan development
- \$380K, four-month contract with California Governor's Office of Emergency Services to prepare dam break flood inundation maps
- \$150K, ten-month contract with State Water Board to develop low impact development and green infrastructure implementation guidance for public schools
- \$4M, three-year stormwater technical assistance contract with State Parks

Funded Grants & Contracts

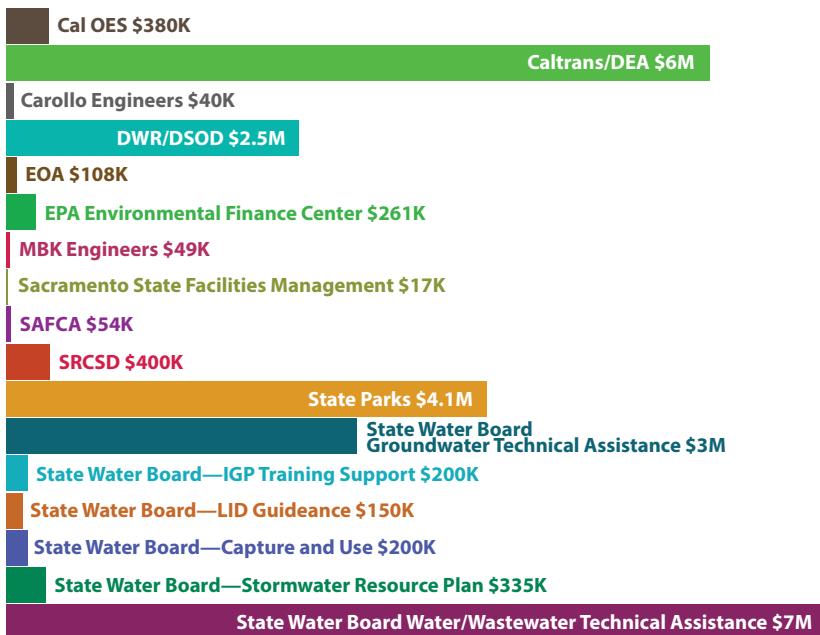
Stormwater Program Technical Assistance

The California Department of Parks and Recreation (State Parks) contracted \$4,092,888 with OWP (05/01/18–05/01/21) to provide technical assistance for its stormwater program.

LID Guidance for Public Schools

The State Water Resources Control Board (State Water Board) contracted \$150,000 with OWP (05/22/18–03/31/19) to develop guidance for public schools in the implementation of low impact development (LID)/green infrastructure stormwater and dry weather runoff capture best management practices.

\$24.8M in multi-year grants and contracts



Capture and Use White Paper

The State Water Resources Control Board (State Water Board) contracted \$200,000 with OWP (06/09/16–03/31/18) to prepare a capture and use white paper and perform a literature search on reasonable assurance analysis.

Stormwater Program Technical Assistance

The California Department of Transportation (Caltrans), Division of Environmental Analysis (DEA) contracted \$6,000,000 with OWP (09/01/16–11/30/19) to provide technical assistance with stormwater research focusing on discharge characterization, source identification and control, and treatment control studies.

Stormwater Resource Plan

The State Water Resources Control Board (State Water Board) contracted \$355,463 with OWP (01/01/17–05/31/18) to develop a stormwater resources control plan.



Division of Safety of Dams Mapping Project

The California Department of Water Resources (DWR) contracted \$2,500,000 with OWP (01/01/13–06/30/22) to assist the Division of Safety of Dams (DSOD) with dam break flood analysis and emergency action plan development.

Office of Emergency Services Mapping Project

The California Governor's Office of Emergency Services (Cal OES) contracted \$380,000 with OWP (09/01/17–01/30/18) to assist with preparing dam break flood inundation maps.

Environmental Compliance Support

Sacramento State Facilities Management contracted \$17,000 with OWP to review its Spill Prevention Control and Countermeasure Plan and other related tasks.

Levee Scour Hole and Vegetative Wind/Wave Buffer Research

Sacramento Area Flood Control Agency (SAFCA) contracted \$54,500 with OWP (10/03/16–12/31/18) to research and provide recommendations on levee scour holes and vegetative wind/wave buffers.

BASMAA Pollutant of Concern Monitoring for Source Identification and Management Action Effectiveness Project

EOA, Inc. contracted \$108,197 with OWP (02/02/17–03/31/19) to assist with study design for source identification and best management practice effectiveness.

Wastewater Technical Expertise

The Sacramento Regional County Sanitation District (SRCSD) contracted \$400,000 with OWP (06/11/03–12/31/20) to provide technical assistance, with a focus on wastewater characterization and treatment.

Wastewater Generation Rates Study

Carollo Engineers contracted \$40,181 with OWP (05/15/18–06/30/20) to assist with a project designed to determine wastewater generation rates from different sources.

Qualified SWPPP Developer and Qualified SWPPP Practitioner Testing and Certification

California Stormwater Quality Association (CASQA) contracted with OWP (executed on 01/21/11) to develop and implement an online training delivery system to administer and grade tests and issue certifications for Qualified SWPPP Developers and Qualified SWPPP Practitioners.

Qualified Industrial Stormwater Practitioners Training and Testing

California Stormwater Quality Association (CASQA) contracted with OWP (executed on 05/23/16) to develop and implement an online system to train and test Qualified Industrial Stormwater Practitioner certificate candidates.



Environmental Finance Center (Region 9)

US Environmental Protection Agency (USEPA) contracted \$261,000 with OWP (10/16–09/18) to develop, operate, and maintain an Environmental Finance Center for Region 9.

The screenshot shows the homepage of the Environmental Finance Center (Region 9) at www.efc.ca.gov. The header includes the Sacramento State logo and navigation links for About, Colleges & Majors, Student Life, Admissions, Athletics, and Make a Gift. The main banner features a night view of a city skyline with the text "Assistance for Stormwater Financing Programs" and a subtext about assisting West Covina and City of Pico Rivera. Below the banner are logos for the City of West Covina and the City of Pico Rivera. A green bar at the bottom announces an "Upcoming Event: Transformative Issues Symposium on Affordability — August 6-7, 2018, Washington DC". The symposium logo features the text "transformative issues" and "symposium" with a yellow triangle graphic. A small note at the bottom left explains that water sector professionals from across North America will discuss affordability issues associated with water rate increases. The bottom right corner contains the event date "august 6-7 2018".

At the Transformative Issues Symposium on Affordability, water sector professionals from across North America will discuss the most important and challenging issues associated with the affordability of water rates that ultimately fund infrastructure projects. Rate increases can burden utility customers, particularly low-income customers, with the most highly impacted customers dedicating a significant portion of their household income toward water/wastewater utility bills. To reduce the impact, many utilities implemented programs to assist low-income customers within legislative frameworks at local, regional, and federal levels. This event will feature presentations by affordability thought leaders and engage attendees in facilitated discussions to help foster the exchange of ideas on this evolving topic.

For more information and to register, visit <https://www.awwa.org/conferences/education/conference/affordability.aspx>.

Sponsored by the American Water Works Association and Water Environment Foundation.



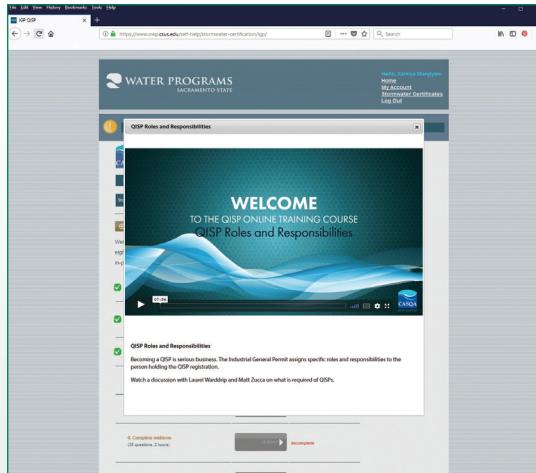
APPLIED RESEARCH SERVICES

California Industrial General Permit Training Program Support

The State Water Resources Control Board (State Water Board) contracted \$200,000 with OWP (02/28/18–03/31/20) to assist with enhancing the Industrial General Permit training program.

Yuba County Water Agency Project Priority Optimization

MBK Engineers contracted \$48,971 with OWP (executed on 12/11/17) to assist with developing a project prioritization methodology for the Yuba County Water Agency. Jonathan Kaplan (Sacramento State Economics professor) is performing the majority of the work.



Drinking Water and Wastewater Technical Assistance and Outreach

The State Water Resources Control Board (State Water Board), under a Proposition 1 grant, contracted \$7,000,000 with OWP (09/01/16–08/31/19) to provide water and wastewater technical assistance to disadvantaged communities in California.

Groundwater Technical Assistance and Outreach

The State Water Resources Control Board (State Water Board), under a Proposition 1 grant, contracted \$3,000,000 with OWP (09/01/16–08/31/19) to provide groundwater technical assistance to disadvantaged communities in California.

PROFESSIONAL ACTIVITIES

Conferences

July 2017

Department of Water Resources Science Quarterly Meeting, Sacramento, CA
(tour facilitator for Sac State campus LID devices tour)

September 2017

California Stormwater Quality Association 2017 Conference, Sacramento, CA
(tour facilitator for Sac State campus LID devices, abstract reviewers for seven technical subject areas)

Lower American River Task Force Meeting, Sacramento, CA (presenter)

National Rural Water Conference, Reno, NV (participant)

October 2017

New Frontier Water Summit, Seaside, CA (presenter)

Oakmont High School Career Fair (exhibitor)

Water Environment Federation Annual Technical Exhibition and Conference, Chicago, IL (participant)

UC Davis Groundwater Land Use Symposium, Davis, CA (discussion lead on groundwater recharge)

American River Integrated Regional Water Management Plan Meeting, Sacramento, CA (presenter)

November 2017

CalTap Fair for Water Systems, Napa, CA (presenter, exhibitor)

Career and Technical Education Leadership Conference, Woodland, CA (participant)

EWRI ASCE Operation & Maintenance of Stormwater Control Measures Conference, Denver, CO (participant)

Regional Occupational Programs Conference, Rancho Mirage, CA (presenter)

UCLA Grand Challenges Water Research Symposium, Los Angeles, CA (presenter, panelist)



PROFESSIONAL ACTIVITIES

December 2017

Association for Career and Technical Education National Conference, Nashville, TN
(participant)

January 2018

Accreditation Board of Certification Annual Conference, San Antonio, TX (multiple presenters, exhibitor)

Rocklin High School Career Fair, Rocklin, CA (presenter, exhibitor)

February 2018

2018 International Erosion Control Association (IECA) Annual Conference and Expo, Long Beach, CA (participant)

California Water Environment Association P3S Conference, Riverside, CA (presenter)

Environmental Protection Agency Environmental Financial Advisory Board Semi-Annual Meeting, Washington, DC (participant)

March 2018

Baywork Career Fair, San Francisco, CA (exhibitor)

California Career Pathways Consortia and California Partnership Academies "Educating for Careers" Annual Conference, Sacramento, CA (presenter)

California State Water Resources Control Board Data Fair, Sacramento, CA (participant)

CalTap Fair, Long Beach, CA (presenter, exhibitor)

Sixth American River Basin LID Conference, Sacramento, CA (conference planning participant, multiple presenters)

April 2018

California Rural Water Association Conference, Lake Tahoe, NV (participant, exhibitor)

California Water Environment Association Conference, Sacramento, CA (multiple presenters)

California Water Environmental Modeling Forum Annual Workshop, Folsom, CA (presenter)

Sacramento Floodplain Management Association Luncheon, Sacramento, CA
(presenter)

Trash Full Capture Equivalency and On-Land Visual Trash Assessment Training, Santa Rosa, CA (participant)

Water Resources and Policy Initiatives Annual Conference, Palm Desert, CA
(participant)

May 2018

USEPA/RCAC Tribal Symposium, Reno, NV (exhibitor)

June 2018

American Water Works Association Annual Conference, Las Vegas, NV
(presenter)

EWRI Congress, Minneapolis, MN (multiple presenters)

Floodplains Ecology Institute for Teachers Career Panel, Sacramento, CA (panelist)

International Environmental Modeling Software Symposium, Fort Collins, CO
(multiple presenters)





PROFESSIONAL ACTIVITIES

Committees and Meetings

Align Capital Region, Sacramento Region Water Works

- Alignment Team (Chair)
- Baywork Candidate Development and Outreach Committee

American Basin Council of Watersheds

American River Basin Integrated Regional Water Management Committee

American Water Works Association

- AWWA California-Nevada Section, Advanced Water Treatment Committee
- National Wastewater Collection Systems Committee

California Stormwater Quality Association

- Board of Directors (Member)
- BMP Subcommittee
- Training Subcommittee (Co-Chair)
- Conference Planning Subcommittee
- Construction Subcommittee
- Effectiveness Assessment Subcommittee
- Impaired Watershed Subcommittee
- Monitoring Subcommittee
- Phase II Non-Traditional Subcommittee
- Phase II Subcommittee
- Policy and Permitting Subcommittee

California Water Environment Association, Regional Board of Directors

Delta Tributaries Mercury Council

Environmental Finance Advisory Board (industry meeting participant)

Folsom Lake College Water/Wastewater Advisory Board

Lower American River Task Force—Bank Protection Working Group

Placer County Wastewater Advisory Committee

Sacramento Region Water Works

State Water Resources Control Board (State Water Board)

- Construction General Permit Training Team and Testing and Evaluation Subcommittee
- Data Visualization Group
- Drinking Water Operator Advisory Committee
- Industrial General Permit Training Team and Evaluation and Examination Subcommittee
- Northern CA Water Quality Monitoring Group
- Southern CA Beach Water Quality Work Group
- Wastewater Advisory Committee

Transportation Research Board—Stormwater Committee

Washington State TAPE External Board of Reviewers

Water Environment Federation

- National Collection Systems Committee
- Stormwater Committee



PROFESSIONAL ACTIVITIES

Publications

Porse, E., Mika, K. B., Williams, R., Gold, M., Blomquist, W., and Pincetl, S. 2018. "Groundwater Exchange Pools and Urban Water Supply Sustainability: Modeling Directed and Undirected Networks". *Journal of Water Resources Planning and Management*, 144(8), 04018040.

Porse, Erik. 2018. "Open Data and Stormwater Infrastructure in Los Angeles: Implications for Green Infrastructure and Sustainability". *Local Environment*. 1-13.

Porse, E., Mika, K. B., Litvak, E., Manago, K. F., Hogue, T. S., Gold, M., Pataki, D. E., and Pincetl, S. 2018. "The Economic Value of Local Water Supplies in Los Angeles." *Nature Sustainability*, May. doi:10.1038/s41893-018-0068-2.

Porse, Erik. "Improving Urban Water Conservation in California." *California Water Blog*. May 6, 2018.

Porse, Erik. "Los Angeles and the Future of Urban Water in California." *California Water Blog*. January 22, 2018.





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