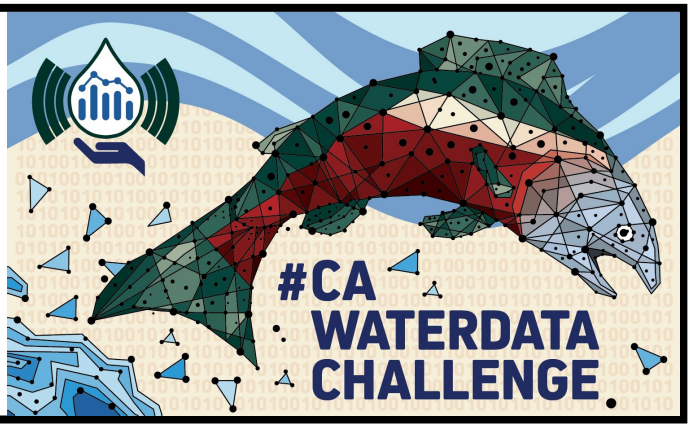
CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

California Water Boards

7th Annual Water Data Science Symposium & California Water Data Challenge

North Yuba River, Photo Credit: Greg Gearheart

Assessing What We Know + Preparing for a More Resilient Future



California Water Boards

7th Annual California Water Data Science Symposium & California Water Data Challenge

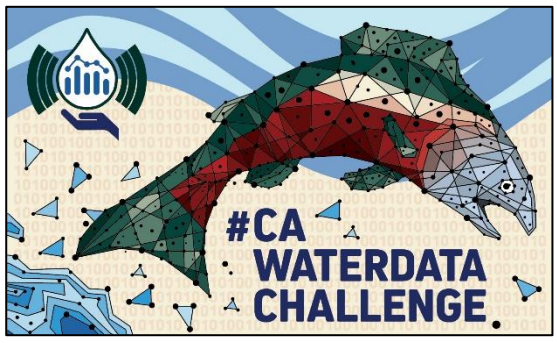
Assessing What We Know + Preparing for a More Resilient Future

June 28 – 30, 2022

Agenda & Resources

Table of Contents

***Link to Symposium Program*, with presentation abstracts and speaker bios and photos**



Science Symposium Presentations – Jun. 28, 2022

Plenary Session Recording

Time	Topic
9:00 - 9:05	Symposium and Webinar Logistics *Greg Gearheart / Anna Holder* *State Water Resources Control Board*
9:05 - 9:20	Welcome *E. Joaquin Esquivel, Chair* *State Water Resources Control Board*
9:20 - 10:00	*Keynote Conversation* *Bidtah Becker, Deputy Secretary for Environmental Justice, Tribal Affairs and Border Relations* *California Environmental Protection Agency (CalEPA)* California Water Board's Safe and Affordable Funding for Equity and Resilience (SAFER) Program SAFER Program's 2022 Tribal Outreach Plan

Session 1: Implementing a Community Equity Lens - Tribal Case Studies Recording

Time	Topic
10:05 - 10:20	Session welcome & California Water Data Challenge framing *Greg Gearheart* *State Water Resources Control Board* Office of Information Management and Analysis (OIMA) • Surface Water Ambient Monitoring Program (SWAMP) • California Water Boards Annual Performance Report • California Water Boards College of Water Informatics California Water Data Science Symposium Website California Water Data Challenge Website

Time	Topic
10:20 - 10:40	Innovation and inclusion: the CARE Principles in publicly funded projects *Andrew Martinez* *Collaboratory for Indigenous Data Governance* Collaboratory for Indigenous Data Governance (Twitter: @IndigiDataLab) United States Indigenous Data Sovereignty Network (Twitter: @USIDSN) CARE Principles for Indigenous Data Governance (Twitter: @GidaGlobal) • 3-page PDF FAIR Guiding Principles for scientific data management and stewardship ENRICH: Equity for Indigenous Research and Innovation Coordinating Hub Local Contexts (Twitter: @LocalContexts) • Notices The University of Arizona Native Nations Institute (Twitter: @NNIarizona) Jennings. 2021. Indigenous data sovereignty: how researchers can empower data governance. California Water Data Science Symposium Presentation Recording Carroll et al. 2019. Indigenous Data Governance: Strategies from United States Native Nations. Data Science Journal Smith. 2016. Governing data and data for governance: the everyday practice of Indigenous sovereignty. In: Kukutai, T and Taylor, J (eds.), Indigenous data sovereignty: Toward an agenda, pp. 253–272. Canberra, Australia: Australian National University Press. Carroll and Martinez. Policy Brief. Indigenous Data Sovereignty in Arizona: Setting an Agenda

Time	Topic
10:40 - 11:00	Implementing a public health based cyanotoxin monitoring program *Sarah Ryan* *Big Valley Band of Pomo Indians* California Environmental Protection Agency Tribal Consultation Protocol. Feb 2020. See Appendix B: List of California Native American Tribes by County California Water Board Tribal Beneficial Uses Freshwater Cyanotoxin Producers Chart California Cyanotoxin Guidelines (2012) Drinking Water Health Advisory Documents for Cyanobacterial Toxins Water filling stations set up for Clear Lake households whose tap water is at risk due to toxic algae, Sep. 18, 2021 Big Valley Band of Pomo Indians Clear Lake Cyanotoxin Issues Webpage
11:00 - 11:20	A qualitative study into California's water data practices *Aaron Dickenson* *Duke University & California Water Data Consortium* AB 1755 The Open and Transparent Water Data Act Legislation Information AB 1755 Open and Transparent Water Data Platform for California

Time	Topic
11:20 - 11:40	Understanding the needs of Native American Tribes in California through Integrated Regional Water Management (IRWM) *Anecita Agustinez, Carmel Brown, Mariko Falke, Pablo Ortiz* *California Department of Water Resources* Integrated Regional Water Management (IRWM) Website Tribal Engagement in Integrated Regional Water Management Sustainable Groundwater Management Act (SGMA) • Statewide Groundwater Management Website • Tribal Advisory Group Registration Contact: Erin.Crandall@water.ca.gov • SGMA Tribal Contact: TribalPolicyAdvisor@water.ca.gov California Water Plan • Next Tribal Water Summit to be held Apr. 11-13, 2023, Natural Resources Building, Sacramento, CA • California Water Plan 2023 Tribal Advisory Committee Contact: Emily.Alejandrino@water.ca.gov • California Water Plan Contact: cwpcom@water.ca.gov • Tribal Contact: TribalPolicyAdvisor@water.ca.gov

Time	Topic
11:40 - 12:20	Panel Discussion with Speakers *Panelists: Andrew Martinez[1], Sarah Ryan[2], Aaron Dickenson[3], Carmel Brown[4], Mariko Falke[4], Pablo Ortiz[4]* *Moderator: Greg Gearheart[5]* *(1) Collaboratory for Indigenous Data Governance, (2) Big Valley Band of Pomo Indians, (3) Duke University & California Water Data Consortium, (4) California Department of Water Resources, (5) State Water Resources Control Board* AB 52 Native Americans: California Environmental Quality Act Legislation Information Tracking California Maps & Data Earth Science Information Partners (ESIP) American Geophysical Union (AGU) Fall Meeting, Dec. 12-16, 2022 • Session: Global community efforts to make Samples, Specimens, and Sampling Features (as well digital information about them) comply with the FAIR and CARE principles (Session IN013) Sustainable Groundwater Management Act (SGMA) Resources • California Department of Water Resources Technical Assistance • California Water Boards SGMA Website Relevant Data Portals • California Environmental Data Exchange Network (CEDEN) • U.A. EPA Water Quality Exchange (WQX) • Other Open Data Portals
12:20 - 12:30	Daily wrap-up and adjourn *Greg Gearheart* *State Water Resources Control Board*

Science Symposium Presentations – Jun. 29, 2022

Plenary Session Recording

Time	Topic
1:30 - 1:35	Symposium and Webinar Logistics *Greg Gearheart / Anna Holder* *State Water Resources Control Board*
1:35 - 1:50	*Keynote Conversation* *Karen Mogus* *State Water Resources Control Board & California Water Quality Monitoring Council* California Water Board's 2020-22 Integrated Report California Water Quality Monitoring Council AB 1755 The Open and Transparent Water Data Act Legislation Information AB 1755 Open and Transparent Water Data Platform for California Internet of Water Coalition California Open Data Portal

Session 2: California Water Data Spotlight Recording

Time	Topic

1:50 - 2:10	California Surface Water Ambient Monitoring Program data overview
	
	Ali Dunn, Tessa Fojut
	
	State Water Resources Control Board - Surface Water Ambient Monitoring Program (SWAMP)
	
	California's Surface Water Ambient Monitoring Program (SWAMP)
	• SWAMP Statewide Bioaccumulation Monitoring Program
	  ○ Bioaccumulation Monitoring Program Realignment
	• SWAMP Statewide Bioassessment Program
	  ○ Perennial Streams Assessment and Reference Condition Monitoring Program
	• SWAMP Statewide Freshwater Harmful Algal Bloom (FHAB) Program
	• SWAMP Statewide Toxicology and Contaminants Program
	• SWAMP Regional Monitoring Programs
	Healthy Watersheds Partnership
	SWAMP Information Management and Quality Assurance Center (SWAMP IQ)
	• SWAMP Quality Assurance Program Plan (QAPP), Jan. 2022
	• QAPPs Made Easy Workbook
	Water Boards Office of Information Management and Analysis (OIMA)
	Water Boards Open Data Resolution
	Water Boards Racial Equity Resolution
	Water Boards Data and Databases
	Water Boards Tribal Water Data Initiatives
	How to access SWAMP Data:
	• California Environmental Data Exchange Network (CEDEN)
	• California Open Data Portal - SWAMP
	• SWAMP Data Dashboard
	• Lahontan Regional Board Data Dashboard
	• Safe to Swim Map
	• SWAMP eDNA Metabarcoding Monitoring and Analysis Project (SeMMAP) Data Resource Hub
	• HAB Incident Reports Map
	SWAMP is Hiring!
	• Environmental Toxicology Position, Final Filing Date: 7/12/2022
	• Environmental Microbiology Position, Final Filing Date: 7/13/2022

Time	Topic
2:10 - 2:30	A rich legacy of interagency collaboration: five decades of ecological monitoring in the San Francisco Estuary *Dr. Sam Bashevkin[1,3], Rosemary Hartman[2,3], The Data Utilization Work Group[3]* *(1) Delta Stewardship Council - Delta Science Program, (2) California Department of Water Resources, (3) The Data Utilization Work Group* Interagency Ecological Program (IEP) IEP GitHub Delta Science Program R Shiny Applications • Bay-Delta Monitoring • Zooplankton Data Synthesizer Data Publications • IEP Data Website • Environmental Data Initiative (EDI) • California Natural Resources Agency (CNRA) Open Data Portal • California Department of Fish and Wildlife (CDFW) Data Website • U.S. Geological Survey (USGS) ScienceBase • U.S. Fish and Wildlife Service (USFWS) Website Scientific Publications • Baerwald et al. 2020. An Open Data Framework for the San Francisco Estuary. San Francisco Estuary and Watershed Science • Bashevkin et al. 2022. Five decades (1972–2020) of zooplankton monitoring in the upper San Francisco Estuary. PLOS ONE Automated Reporting • IEP Seasonal Monitoring Report • Delta Smelt Conditions Report IEP Project Work Teams

Time	Topic
2:30 - 2:50	Trash and microplastic data analysis and sharing tools *Walter Yu[1], Dr. Win Cowger[2]* *(1) California Department of Transportation (CalTrans), (2) Moore Institute for Plastic Pollution Research* Trash AI The Moore Institute for Plastic Pollution Research Code for Sacramento (Part of the Code for America Brigade Network) AI Model • Kaggle TACO Trash Dataset • Example notebook using YOLO v5 model • TACO Trash Dataset Trash Taxonomy
2:50 - 3:10	The Bay-Delta timeline of historical events *Emily Richardson[1], Jeniffer Soto-Perez[1], Sadie Trombley[2], Tamara Kraus[1], Rosemary Hartman[2], Trishelle Tempel[2]* *(1) U.S. Geological Survey - California Water Science Center, (2) California Department of Water Resources* The Bay-Delta Timeline of Historical Events (Tableau dashboard)
3:10 - 3:30	Synthesis science with the Delta Science Program: resources and opportunities *Dr. Laurel Larsen* *Delta Stewardship Council - Delta Science Program* The State of the Bay-Delta Science Delta Science Program's Science Action Agenda Delta Science Program & National Center for Ecological Analysis and Synthesis (NCEAS) Synthesis Working Group Delta Science Program Funding and Fellowships

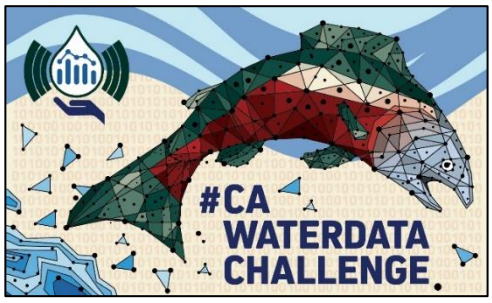
Time	Topic
3:10 - 3:30 Continued	Synthesis science with the Delta Science Program: resources and opportunities - continued R Code • Connectivity synthesis • Food web synthesis • Meta-analysis • Chlorophyll integration (will become an EDI dataset) • Smelt diet integration • Yolo Bypass temperature integration (will become an EDI dataset) R package • Clark & Bashevkin. (2022). deltafish: an R package to access an integrated dataset of fish counts and lengths from the San Francisco Estuary v0.2.0 (v0.2.0). Zenodo. • Clark & Goertler. (2022). inundation. Zenodo. For latest version go to goertler.github.io/inundation/ Data • Benthic invertebrate monitoring in the Sacramento-San Joaquin Bay-Delta • The Sacramento-San Joaquin Delta genus and community level classification maps derived from airborne spectroscopy data • Fish abundance in the San Francisco Estuary (1959-2021), an integration of 9 monitoring surveys Delta Science Program R Shiny Applications • Zooplankton Data Synthesizer • Social Vulnerability Indicators Bay-Delta Social Science Community of Practice Case-study: Synthesis of Delta Temperature Dynamics • Bashevkin et al. 2022. Warming in the upper San Francisco Estuary: Patterns of water temperature change from five decades of data. Limnology and Oceanography • Bashevkin and Mahardja. 2022. Seasonally variable relationships between surface water temperature and inflow in the upper San Francisco Estuary. Limnology and Oceanography • Mahardja et al. 2022. Escape from the heat: thermal stratification in a well-mixed estuary and implications for fish species facing a changing climate. Hydrobiologia

Time	Topic
3:30 - 3:50	CalEnviroScreen 4.0: what's new and an introduction to the drinking water contaminants indicator *Komal Bangia* *California Office of Environmental Health Hazard Assessment (OEHHA)* CalEnviroScreen Website • CalEnviroScreen Hub • CalEnviroScreen 4.0 • What's new in CalEnviroScreen 4.0 • Drinking Water Indicator Information • Drinking Water Indicator Map • Contact: CalEnviroScreen@oehha.ca.gov Human Right to Water Website • Data Tool • Report, Jan. 2021 • Bangia et al. 2019. Assessment of contaminants in California drinking waterby region and system size. AWWA Water Science • Contact: HR2.Water@oehha.ca.gov
3:50 - 4:00	Symposium wrap-up and upcoming events *Greg Gearheart* *State Water Resources Control Board* See the Upcoming Events section below for more details.

California Water Data Challenge Workshops – Jun. 28-30, 2022

Workshops were held on:

- Tue, Jun. 28, 2022 - 1:30 pm - 4:30 pm
- Wed, Jun. 29, 2022 - 9:30 am - 12:30 pm
- Thu, Jun. 30, 2022 - 9:30 am - 12:30 pm



Workshop participants met other potential California Water Data Challenge participants, begin to brainstorm project ideas, and form teams. Breakout groups were created during the Workshops, and participants used this Jamboard to capture some of their initial questions and ideas!

Breakout Groups

- Trash & Microplastics
  - Trash AI Project Website | GitHub Repository
    - YOLO Computer Vision Framework GitHub Repository | Documentation
    - TACO Litter Image Dataset
    - For more information or to join the team, join the Code for Sacramento Brigade and attend their Weekly Virtual Meetings
  - Microplastics Data Portal GitHub Repository
    - For more information or to join the team, contact: Dr. Win Cowger
- Equity & Government Representation
  - For more information or to join the team, contact: Megan Fidell
- Open Data Sharing
  - For information about Department of Water Resources datasets, contact: Paul Shipman
  - For information about California Water Boards datasets, contact: OIMA-Helpdesk@waterboards.ca.gov
- Gated access for data sharing
- Fire & protection of water resources
- Regulatory enforcement in disadvantaged communities
- Groundwater
- Data infrastructure & data models

Useful California Water Data Challenge Links

- California Water Data Challenge Website
  - 2022 Challenge Questions
  - Open Data & Resources
  - California Water Data Challenge Project Repository
- 2022 Challenge Slack Workspace | Join the 2022 Challenge Slack Workspace!

Upcoming Events

Salmon Social Hour, Date and Location TBD

Once more details are available, we will share them via the the Water Boards College of Water Informatics Email List (under the General Interests drop down).

California Water Data Challenge, Jul. - Oct. 15, 2022

While this year's California Water Data Science Symposium is over – the California Water Data Challenge has just begun! If you and/or your team has data-related skills to offer, please consider joining the Challenge as an individual or as a team. Community members experiencing water issues should join as mentors or community liaisons to guide the design and development of solutions.

California Data Summit, Aug. 17-18, 2022, UC Irvine | Registration Link

The CA Water Data Summit is back in person this year at UC Irvine in partnership with Water UCI! Join the California Data Collaborative on August 17-18th for two full days of networking and content.

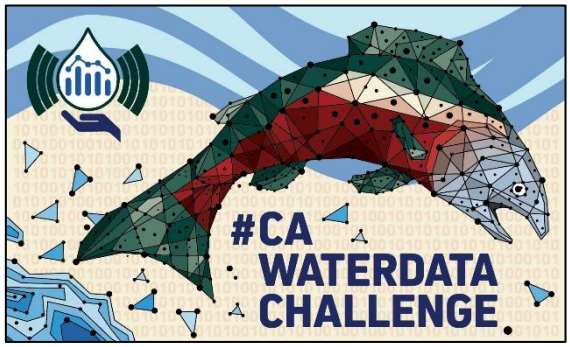
- Day 1 will feature peer training workshops for public and private sector managers and analysts, led by data experts from some of California's leading water agencies.
- Day 2 continues the momentum with sessions highlighting how data is central to the water issues of today.

This is the event of the year for water districts, utilities, companies, non-profits, students, and researchers looking to better use data in the decision-making process in the water sector. The theme for this year's event is "Data 2.0: From Dreams to Discovery" to highlight the progress of water digitization and the value of dreaming big.

California Aquatic Bioassessment Workgroup (CABW) Annual Meeting, Oct. 11-12, 2022, CalEPA Building, Sacramento, CA | Presenter and Poster Interest Form Due Jul. 30, 2022 | Registration Link

The California Aquatic Bioassessment Workgroup (CABW) and the California Chapter of the Society of Freshwater Science (Cal-SFS) are proud to collaborate and host the 29th annual CABW Annual Meeting and 10th annual Cal-SFS meeting! The purpose of this joint meeting is to exchange current and relevant bioassessment and freshwater science information among professionals, resource managers, policymakers, educators, students, and the public; network and build partnerships; and to support science-based policy and natural resource management to protect and restore California's freshwater aquatic ecosystems.

About The 2022 Mascot



Salmon are this year's mascot for the Symposium and Water Data Challenge kickoff. Salmon images bear significant power to convey the importance of caring for our lands and waters. For eons in what is now known as California, Indigenous communities have held – and continue to hold – deeply complex relationships with salmon and their watershed colleagues, including the Steelhead trout, Pacific lamprey, California condor, Pacific giant salamander, and many others. It is with great humility, respect, and reverence that we choose the salmon to guide us forward this year.

Did you know?

1. Four species of salmon can be found in California: Chinook (*Oncorhynchus tshawytscha*), Chum (*Oncorhynchus keta*), Coho (*Oncorhynchus kisutch*), and Pink (*Oncorhynchus gorbuscha*) (caltrout.org).
2. Although Chinook salmon currently spawn in the San Francisco Bay watersheds, they are officially regarded as non-native. A recent environmental DNA (eDNA) analysis of archaeological samples from a Native American midden in the city of Santa Clara dating back more than 200 years has provided evidence that the Chinook range may have in fact extended to the southern end of San Francisco Bay (fishbio.com).
3. Pacific salmon are the great redistributors and transfer large quantities of marine-derived nutrients to “upland” forest ecosystems with profound effects on plant and wildlife production – they feed “downstream” ecosystems, but they don’t extract from inland watersheds. They are an integral part of California's watersheds and their loss would not only impact riparian and ecosystem function, but also river systems where people and salmon coexist (Merz and Moyle, 2006).

Salmon are on the brink of extinction, this is widely known, but we are here to affirm that they are us and we are them. Salmon are changing to be more resilient for our collective future. You may notice that our salmon mascot is morphing, not only for spawning but for a future that is going to challenge what we all know and love. Salmon and how they have the power to organize and energize those around them is an inspiration. So let’s all listen to our ancestors – for they are also our future alevin and smolt – and use our collective power, energy, and data to inform and build a healthy, bright, resiliant, and equitable future for all.

Thank you for joining the 2022 California Water Data Science Symposium!

Stay connected with the water data science community by:

Registering for the [Water Boards College of Water Informatics Email List]
(under the General Interests drop down)

Attending future [water data science events]!

@cawaterdatadive @CaMonitoring @swamp_water_ca
#cawaterdatadive #caswamp #waterdata #cawater