UC Cooperative Extension
University of California
Agriculture & Natural Resources

CALIFORNIA WATER COURSE
WATER MANAGEMENT LAB

INDIGENOUS FUTURES SOCIETY

# California Water Course

Samuel Sandoval Solis, Jessie Godfrey, Curt Pierce, Laljeet Sangha, J. Pablo Ortiz Partida, Samantha Ying, Kosana Sovocarev, Austin Stevenot, Brian Wallace, Ivan Senock

May 2nd, 2026

University of California
Agriculture and Natural Resources

UCDAVIS
COLLEGE OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES

# Agenda

1. Introductions of instructors
2. Course Introduction and Expectation
3. Logistics for
   - Guidebook : Reading/Watching Content
   - Water System Self-Assessment: Assignments
4. Your Water System
5. What to Expect for First In-Person Meeting
6. Introduction of participants

## Samuel Sandoval

Water Resources Management

## Kosana Suvoçarev

Biometeorology

## Brian Wallace

Indigenous Futures Society

## Pablo Ortiz

Director Innovation - UCS

## Samantha Ying

Water Quality

## Jessie Godfrey

Env. Horticulture and Wat. Res.

## Curt Pierce

Irrigation and Wat. Resources

## Laljeet Sangha

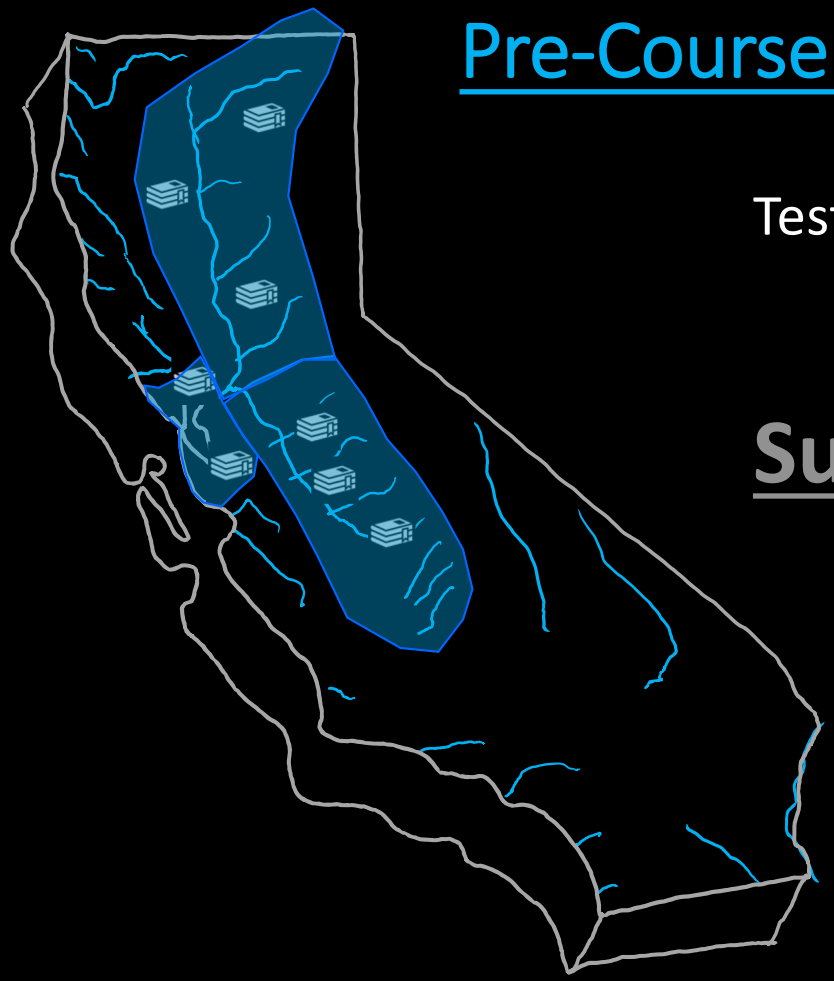
Community Water Systems

## Austin Stevenot

Tribal Engagement & Restoration

## Ivan Senock

Indigenous Ethnography



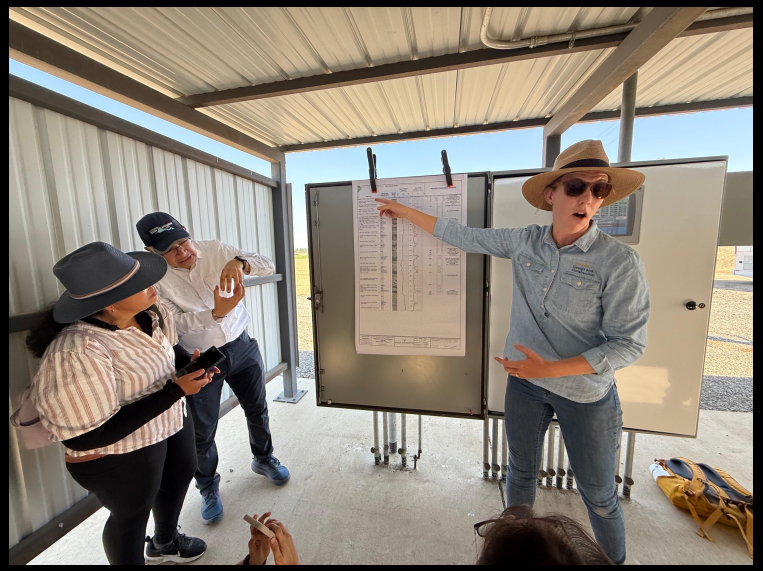
# Pre-Course Survey

Test your knowledge!

## Survey

# Why a California Water Course?

- What would I have taught myself when I started my career at UC ANR
- I want it to be a two-way conversation and a hands-on experience
- I want it to further the conversation about water beyond the basic concepts
- I want it to be tailor made to every person taking the course
- I want it to serve our water community



California Water Course 2025, Putah Creek
August 23rd, 2025

# What is the California Water Course?

Objective: Provide relevant and applied education related to water science, policies and management in California

Audience: People working in the water sector (entry level) or water (self-)advocates

Characteristics:

(a) Self-guided – Materials available at all time

(b) Authenticated – Real world examples

(c) Self-interest driven – Assignments based on the interest of the participants

(d) Flipped Classroom – Theory & HW by themselves, in-person training

California Water Course 2025, Putah Creek
August 23rd, 2025

(e) Bilingual (English and Español)

Outcome: Certificate of Completion

# How is Delivered?

## Basic concepts and applied knowledge

**Guidebook & Videos** (4 hours)

Module 1: Water Systems and hydrology

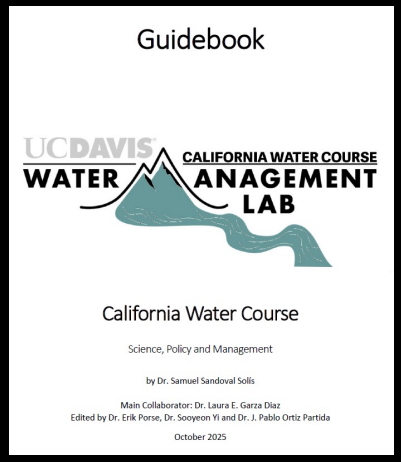
Module 2: Water Policy

Module 3: Water Budgets (In progress)

Module 3: Public Comment Letter

**Water System Self Assessment** (18 hours)

Mod. 1, 2 3 and 4.


Guidebook

UCDAVIS CALIFORNIA WATER COURSE WATER MANAGEMENT LAB

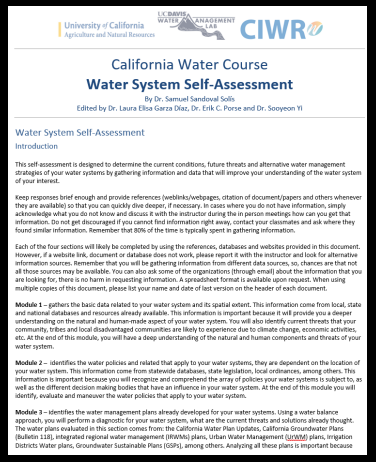
California Water Course

Science, Policy and Management

by Dr. Samuel Sandoval Solís

Main Collaborator: Dr. Laura E. Garza Díaz
Edited by Dr. Erik Porse, Dr. Sooyeon Yi and Dr. J. Pablo Ortiz Partida

October 2025


University of California Agriculture and Natural Resources — UC DAVIS WATER MANAGEMENT LAB — CIWR

California Water Course

**Water System Self-Assessment**

By Dr. Samuel Sandoval Solís

Edited by Dr. Laura Elisa Garza Díaz, Dr. Erik C. Porse and Dr. Sooyeon Yi

Water System Self-Assessment

Introduction

This self-assessment is designed to determine the current conditions, future threats and alternative water management strategies of your water systems by gathering information and data that will improve your understanding of the water system of your interest.

Keep responses brief enough and provide references (weblinks/webpages, citation of document/papers and others whenever they are available) so that you can quickly dive deeper, if necessary. In cases where you do not have information, simply acknowledge what you do not know and discuss it with the instructor during the in person meetings how can you get that information. Do not get discouraged if you cannot find information right away, contact your classmates and ask where they found similar information. Remember that 80% of the time is typically spent in gathering information.

Each of the four sections will likely be completed by using the references, databases and websites provided in this document. However, if a website link, document or database does not work, please report it with the instructor and look for alternative information sources. Remember that you will be gathering information from different data sources, so, chances are that not all those sources may be available. You can also ask some of the organizations (through email) about the information that you are looking for, there is no harm in requesting information. A spreadsheet format is available upon request. When using multiple copies of this document, please list your name and date of last version on the header of each document.

**Module 1** – gathers the basic data related to your water system and its spatial extent. This information come from local, state and national databases and resources already available. This information is important because it will provide you a deeper understanding on the natural and human-made aspect of your water system. You will also identify current threats that your community, tribes and local disadvantaged communities are likely to experience due to climate change, economic activities, etc. At the end of this module, you will have a deep understanding of the natural and human components and threats of your water system.

**Module 2** – identifies the water policies and related that apply to your water systems, they are dependent on the location of your water system. This information come from statewide databases, state legislation, local ordinances, among others. This information is important because you will recognize and comprehend the array of policies your water systems is subject to, as well as the different decision making bodies that have an influence in your water system. At the end of this module you will identify, evaluate and maneuver the water policies that apply to your water system.

**Module 3** – identifies the water management plans already developed for your water systems. Using a water balance approach, you will perform a diagnostic for your water system, what are the current threats and solutions already thought. The water plans evaluated in this section comes from: the California Water Plan Updates, California Groundwater Plans (Bulletin 118), integrated regional water management (IRWMs) plans, Urban Water Management (UrWM) plans, Irrigation Districts Water plans, Groundwater Sustainable Plans (GSPs), among others. Analyzing all these plans is important because

## Hands-on Experience:

**Group Meetings** (18 hours)

#1: Kickoff Meeting (2 hours)

#2: Hydrology and Wat. Policies 101 (8 hours)

#3: Basic Concepts (7hours)

#4: Self Assessment presentation (1 hours)

# Where is the information of the course?

## California Water Course

**Science, Policy and Management**

Deadline to Register: April 30th, 2026. **REGISTRATION CLOSED!**

Registration Description Calendar Content Materials Guidebook Water System Self Assessment Water Policy Map (Español)

### Course Description

**Objective**: Provide relevant and applied education of water science, policies and management to residents, businesses, community water advocates, and entry level professionals in California.

**Audience**: any person interested in water issues and solutions in California, including water advocates, community leaders and entry level professionals.

**Minimum requirements**: Course enrollees should have basic knowledge of arithmetic and algebra

**Student learning objectives**: At the end of the course, the student will be able to
- identify the natural and human-made components of their water system and recognize how they are connected
- distinguish the water policies that apply in their region of interest,
- evaluate the current water management in their region of interest, and
- critique and propose alternative water management alternatives for their region of interest

**Length**: 40 hours total. 2 hours of video content, 14 hours self-guided content, and 24 hours of in person events

**Certificate of Completion**: This is a Pass/Fail course. You have to attend the all the group meetings and submit your Water System Self-Assessment assignments. If completed successfully, you will receive a certificate of completion.

https://watermanagement.ucdavis.edu/californiawatercourse

# Let’s  take a look at an example

# Let's take a look at an example

## Guidebook

UCDAVIS CALIFORNIA WATER COURSE
WATER MANAGEMENT LAB

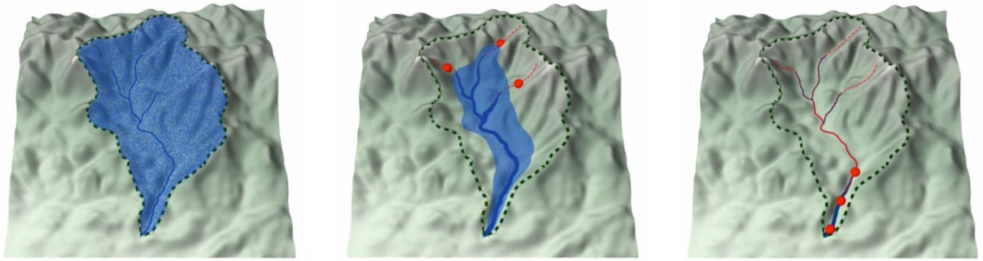
## California Water Course

Science, Policy and Management

by Dr. Samuel Sandoval Solís

### What is a basin?

**A basin** is the area where all the rain is drained at a single point, it is the spatial delimitation of the water cycle in the landscape. Rivers in a basin drain into major river systems, a lake, or ocean. **Basin** and **watershed** sometimes are used interchangeably, when referring to the **drainage area of a point along the stream**. The correct term used in hydrology to refer to the drainage area is watershed; however, the term **basin** is more frequently used than watershed, and in this course, we will use those terms as synonyms. A basin includes all surface water (e.g. rivers, lakes, wetlands) and groundwater (aquifers) resources. Think of it as the area of influence of rainfall, meaning that when it rains all the water is collected and exited at a single point.



a) Basin under a precipitation event
b) Precipitation is been drained as surface runoff
c) Runoff has reached the outlet of the basin

Figure 2 – Description of runoff in a basin

Basin are named using the main river that drains them (e.g. Sacramento River basin or Los Angeles River Basin). Because the main river is fed by tributaries (i.e. smaller rivers), the drainage area of those tributaries is called sub-basin, for instance, the American River is a tributary of the Sacramento River, and thus the American River sub-basin is part of the Sacramento River basin.

# Let’s take a look at an example

| | | |
|---|---|---|
| 4. In which basin is your water system located? | Pajaro River Basin | |
| 5. In which sub-basin is your water system located? (if applicable) | Pajaro River | HUC 8 number(s): 18060002<br>HUC 10 number(s): 1806000208 |

4. Identify the main basin that your water system is located. Here we will use a specialized tool: Online ArcGIS. Go to the following link of Online ArcGIS. We will need to add the following layers, so it will make it clear which rivers are draining each basin: North America Lakes and Rivers. To add this layer, click on the “Add” icon below the layer “California WDB HUC8 Watersheds” and in the “Search” tool type “North America Lakes and Rivers” and then click on “+ Add”. Now, click on the location of your Water System and a window will pop up with the name. This video shows how to do this procedure.
5. Identify the sub-basin that your water system is located. Here you will continue using Online ArcGIS. You will need to add the layer “Watershed Boundary Dataset HUC10s” as you did in the previous question. This video shows how to do this procedure.

# Identify your Water System


- You must identify your water system of interest in California
  - City of Davis
  - Pajaro Valley
  - Upper Russian River
  - Merced Groundwater Sub-basin
  - Los Angeles County
  - Middletown Rancheria
  - A Disadvantaged Community

# Materials are available online

Website: https://watermanagement.ucdavis.edu/californiawatercourse

## Facebook search: californiawatercourse

Facebook: https://www.facebook.com/californiawatercourse/

## Instagram Search: californiawatercourse

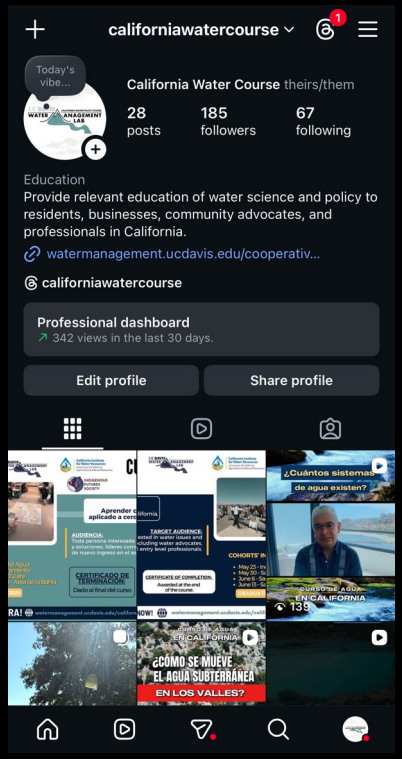
Instagram: https://www.instagram.com/californiawatercourse/

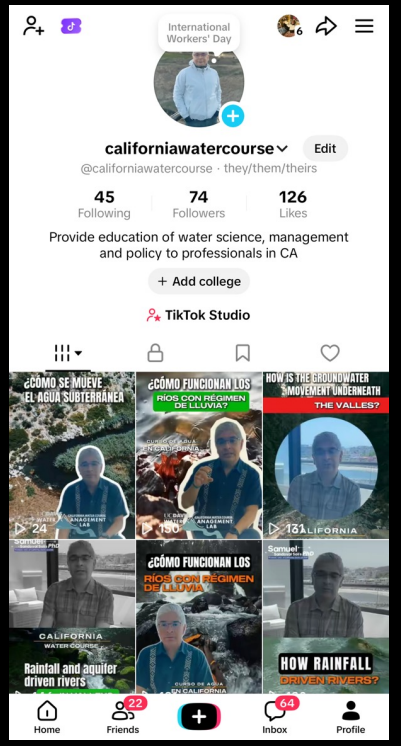
## Tiktok Search: californiawatercourse

TikTok: https://www.tiktok.com/@californiawatercourse

## Youtube Search: Samuel Sandoval Solis

YouTube Chanel: www.youtube.com/@samuelsandovalsolis5329



# Calendar

- Remote Meetings
- In-person Meetings
- Module Submission

## MAY 2026

| SUN | MON | TUE | WED | THU | FRI | SAT |
|---|---|---|---|---|---|---|
| 26 | 27 | 28 | 29 | 30 | 1 | 2 1. Kickoff |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 Wat Guard |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 2.Sac |
| 31 | 1 | 2 | 3 | 4 | 5 | 6 |

## JUNE 2026

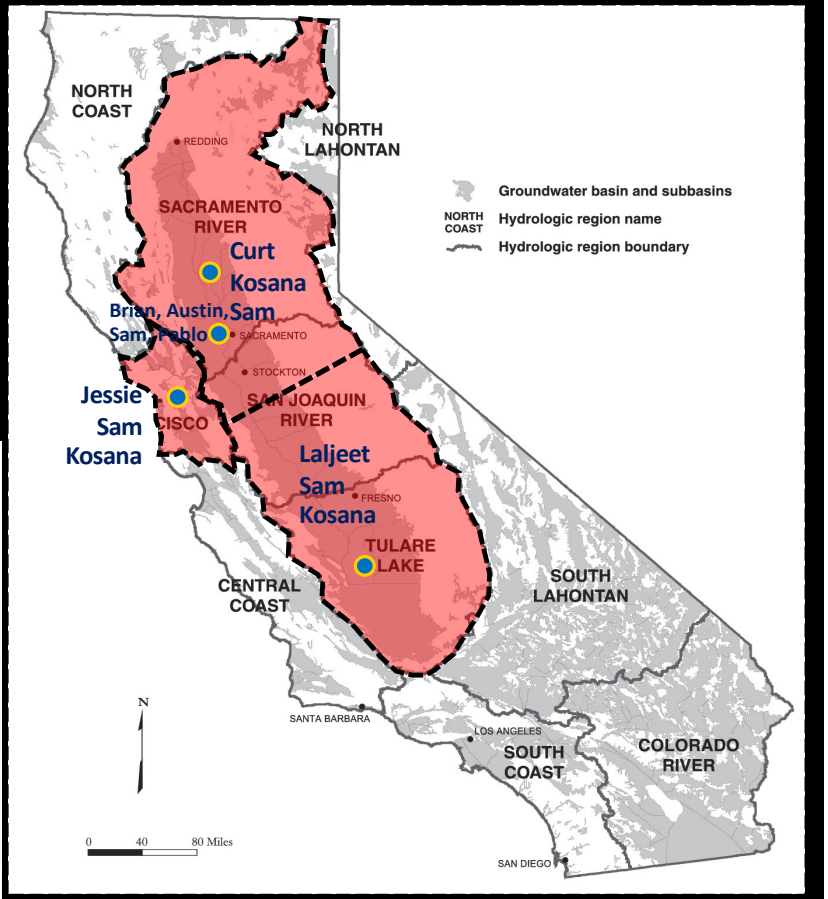
| SUN | MON | TUE | WED | THU | FRI | SAT |
|---|---|---|---|---|---|---|
| 31 | 1 **Mod. 1** | 2 | 3 | 4 | 5 | 6 2.SJ-TL |
| 7 | 8 | 9 | 10 | 11 | 12 | 13 2.SF Bay |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 28 | 29 | 30 | 1 | 2 | 3 | 4 |

## JULY 2026

| SUN | MON | TUE | WED | THU | FRI | SAT |
|---|---|---|---|---|---|---|
| 28 | 29 | 30 | 1 | 2 | 3 | 4 |
| 5 | 6 **Mod. 2** | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 3.Adv. |
| 26 | 27 | 28 | 29 | 30 | 31 | 1 |

## AUGUST 2026

| SUN | MON | TUE | WED | THU | FRI | SAT |
|---|---|---|---|---|---|---|
| 26 | 27 | 28 | 29 | 30 | 31 | 1 |
| 2 | 3 **Mod. 3** | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 4.Slf Ass SJT - Sac |
| 30 | 31 | 1 | 2 | 3 | 4 | 5 |
| 6 | 7 Labor Day | 8 **Mod. 4** | 9 | 10 | 11 | 12 4.Slf Ass SF - IWG |



# What to Expect for the In-Person Meetings

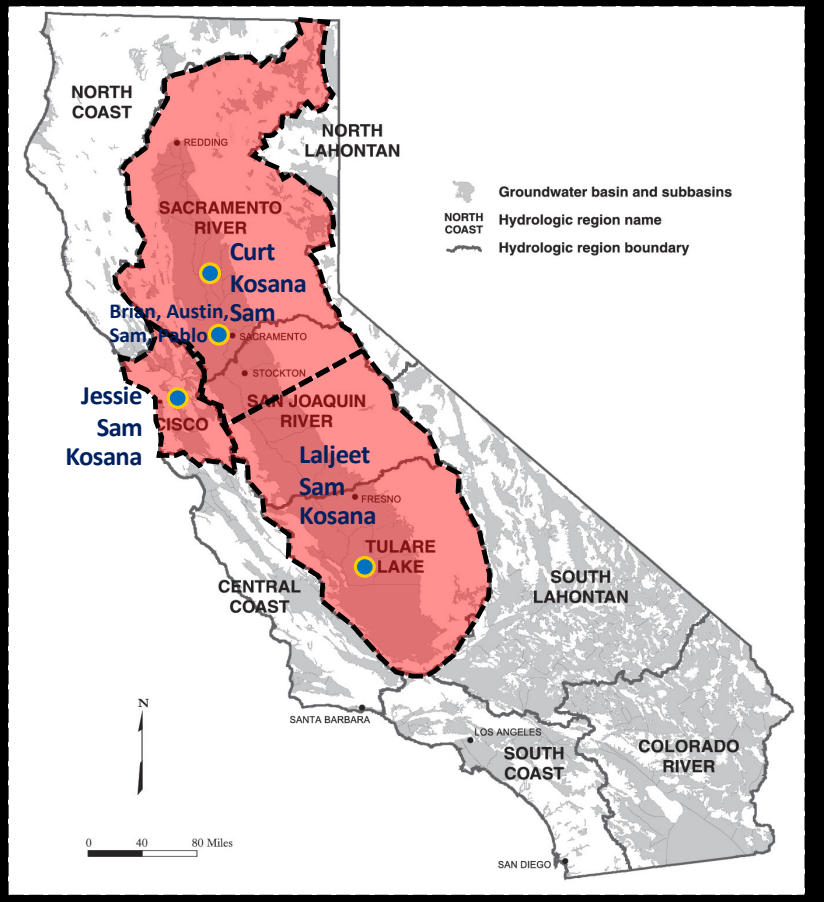
- Backpack, notebook and pen (no need for tablet or laptop)
- **Bring your own lunch** and snacks for the day
- Comfortable shoes
- **Water bottle**
- Long sleeve T-shirt, **sunscreen and sun hat**
- Mosquito repellent
- Long pants (leggings) and sleeves
- **Check the weather**

**See more information in class website**

# Participants Introductions

- Join your Chapter
  - Indigenous Water Guardians
  - Sacramento Basin
  - San Joaquin and Tulare
  - San Francisco Bay Area

- Each participant should share:
  - Name
  - Why you decided to take the course?



# Thank you – Gracias!

samsandoval@ucdavis.edu

watermanagement.ucdavis.edu/californiawatercourse

Facebook & Instagram: californiawatercourse

YouTube and Tiktok: Samuel Sandoval Solis

# Chapter Logistics

## Indigenous Water Guardians

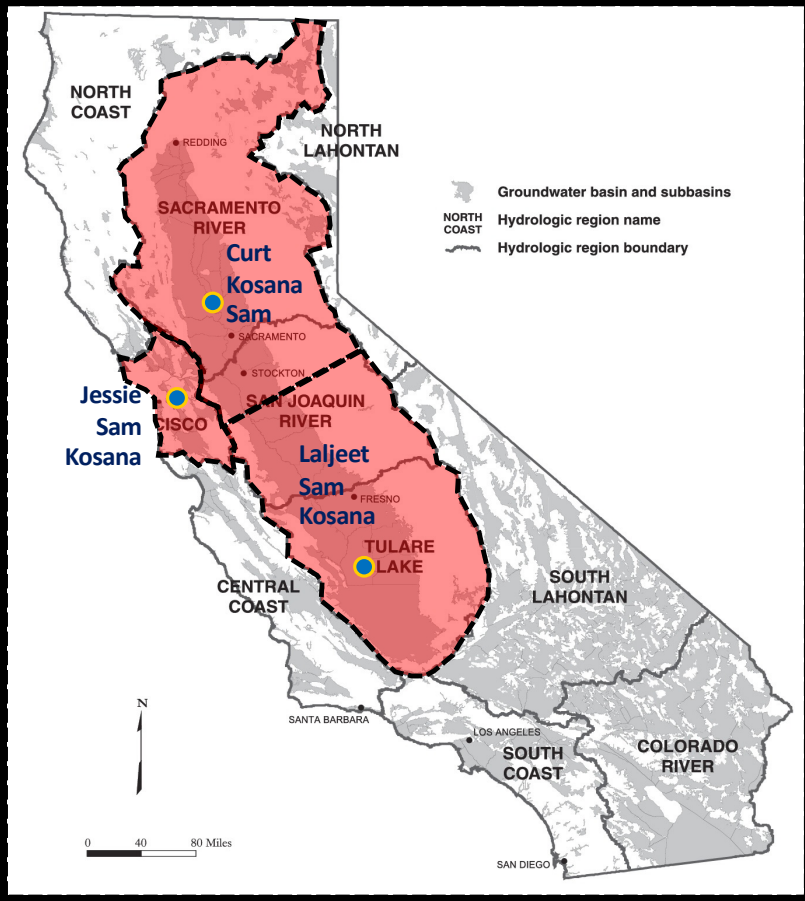
- Coordination: 2 hours (remote)
- Field trip preparation: 6 hours (remote)

## Group Meetings (22 hours)

- Kickoff meeting: 2 hours (remote)
- Hyd. and Water Policies 101: 10 hours (In person)
- Basic Concepts: 6 hours (remote)
- Wat. Syst. Self Assess. 4 hours (remote)

## Evaluation (4 hours)

- Wat. Syst. Self Assess. 4 hours (remote)



# Thank you – Gracias!

samsandoval@ucdavis.edu

watermanagement.ucdavis.edu/californiawatercourse

Facebook & Instagram: californiawatercourse

YouTube and Tiktok: Samuel Sandoval Solis

# Why a California Water Course?

- What would I have taught myself when I started my career in California
- I want it to be a two-way conversation and a hands-on experience
- I want it to further the conversation about water beyond the basic concepts
- I want it to be tailor made to every person taking the course
- I want it to serve our water (advocacy) community

Extension event at Napa
March 1st, 2012

# What is the California Water Course?

Objective: Provide relevant and applied education related to water science, policy and management in California

Audience: People working in the water sector (entry level) or people interested in water

Characteristics:

(a) Self-guided – Materials available at all time

(b) Authenticated – Real world examples

(c) Self-interest driven – Assignments based on the interest of the participants

(d) Flipped Classroom – Theory & HW by themselves, in-person training

Extension event at Sierra Foothills REC
March 1st, 2019

# What is the Content?

Theory:

**Guidebook OR Videos**

Module 1: Water Systems and hydrology

Module 2: Water Policy

Module 3: Water Budgets (*In progress*)

Module 4: Public Comment Letter

~ 90 ninety seconds videos

Total: 4 hours

Practice: **Water Systems Self-Assessment**

Module 1: Water Systems and hydrology

Module 2: Water Policy

Module 3: Water Budgets (*In progress*)

Module 4: Public Comment Letter

12 hours

Total: 16 hours

Hands-on Experience:

**In-person Meetings**

#1: Water Cycle, monitoring and Policy

#2: Basic Concepts and Water advocacy

#3: Self Assessment presentation

1 eight-hour in person meeting
1 eight-hour Remote
1 one-hour Remote

Total: 20 hours

# The guidebook is also available online:

Website:
https://watermanagement.ucdavis.edu/californiawatercourse

Facebook search: californiawatercourse
Facebook: https://www.facebook.com/californiawatercourse/

Instagram Search: californiawatercourse
Instagram: https://www.instagram.com/californiawatercourse/

Tiktok Search: SamuelSandovalSolis
TikTok: https://www.tiktok.com/@user7868176383407?_t=8pfQloImBWV&_r=1

Youtube Search: Samuel Sandoval Solis
YouTube Chanel: Playlist (English, Español)

# Logistics for the Guidebook and Water System Self Assessment

- See class website for:
  - Instructions: how to access materials
  - Materials: Guidebook OR Videos
  - Assignments: Water System Self-Assessment (Diagnostic)

- Upload your assignments in the google Folder according to the module that you are submitting

# What to Expect for the In-Person Meetings

**See more information in class website**

| Time | | Activity | Location |
|---|---|---|---|
| 9:15 | 9:30 | Arrival and Registration | PES |
| 9:30 | 9:45 | Introductions | PES - 2005 |
| 9:45 | 10:15 | First Nations first - Tribal Water | PES - 2005 |
| 10:15 | 10:30 | Traveling to Campbell Track | |
| 10:30 | 11:00 | Climate Monitoring and Evapotranspiration | Campbell track |
| 11:00 | 11:30 | Well monitoring | Campbell track |
| 11:30 | 12:00 | Field trip - Understanding river hydrology | Putah Creek |
| 12:00 | 12:45 | Lunch | |
| 12:45 | 1:00 | Traveling back to Veihmeyer Hall | |
| 1:00 | 2:00 | Hydrology 101 and Groundwater Hydrology | Veihmeyer Hall |
| 2:00 | 3:00 | History of Water in California | Veihmeyer Hall |
| 3:00 | 4:00 | California Water Policy | Veihmeyer Hall |

**Lunch provided:** Email dsrothberg@ucdavis.edu with any dietary restrictions.

# Instructions for the In-Person Meeting (Aug. 23)

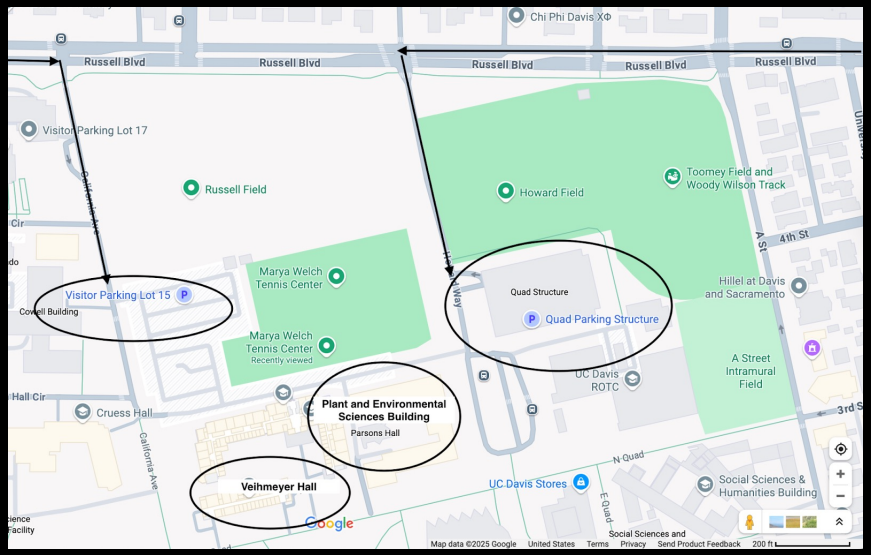
**Where we are meeting:**

Plant and Environmental Science Building

**List of things to bring** for the field:

•Backpack notebook and pen (you can bring your computers or tablets but it is NOT needed)
•Cell phone to take some pictures
•Long pants (leggings) and sleeves (not cotton on any of your clothes if possible)
•Long sleeve T-shirt/blouse to protect your arms from the sun (not cotton preferably), otherwise use plenty of sunscreen.
•Two pairs of shoes:
    •Hiking shoes or running shoes (no converse or open-toe)
    •Shoes to walk in the river: an old pair of shoes, Chacos/Teva, water shoes
•Water bottle
•Sunscreen, sun hat
•Mosquito repellent
•Extra dry clothes/shoes for the ride home (just in case)
•Additional snacks for the day

**Parking Information**




Parking is free on the weekend.