

# **User Manual for CA Water Board's Tribal Water Data Map**

CA Water Board's Office of Information Management and Analysis (OIMA)

2023-08-24

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# Welcome!

This is an online User Manual for the [California Water Board's Tribal Water Data Map](#) (Map), written by the California State Water Resources Control Board's ([State Water Board](#)) Office of Information Management and Analysis ([OIMA](#)).

**The purpose of the Map** is to increase awareness of and access to the Water Board's water data resources that intersect with Tribal matters and needs. The interactive Map includes curated data layers that have been requested by tribal partners and that may be useful for California Native American Tribes (tribes) doing environmental or water related work.

**The purpose of this User Manual** is to provide guidance and context so it's easier for all audiences to use the Map. Content in this User Manual includes curated information that has been requested by tribal partners and/or that the development Team thinks may be helpful to reference when using the map.

To view the status of ongoing Map and User Manual development, visit the [Project Management Board](#).

This [Quarto book](#) is an open, living, and continuously iterating resource. If you have suggestions for additions or revisions you think should be incorporated into this book, please follow the guidance provided in the [Contributing](#) chapter.

# 1 About OIMA

## 1.1 Overview

The California State Water Resources Control Board's ([State Water Board](#)) Office of Information Management and Analysis ([OIMA](#)), serves as an advocate for data management, a bridge between data collectors and users, and provides transparency of the Water Board's information management infrastructure.

OIMA's goal is to collaborate monitoring efforts, accurately analyze data, make our data easily accessible, and create visualizations and reports that make data understandable across all audiences.

## 1.2 Tribal Water Data Initiatives

OIMA is committed to [advancing equity](#), inclusion, and belonging in our work, our office, and at the Water Boards. Meaningful engagement and partnership with California Native American Tribes (tribes) is fundamental to this work.

OIMA has begun to work with Tribal partners on a series of water data initiatives – including the [Tribal Water Data Map](#) and this [User Manual](#) – to build relationships and work together to better understand, streamline, and improve the interactions between Water Board data systems and those of our Tribal government partners.

Visit our [Tribal Water Data Initiatives](#) website for information on other initiatives.

## 2 Map Guide

This guide serves to provide greater detail about functions within the Tribal Water Data Map.

### 2.1 Opening the Web Map

The [link](#) will take you to the main Portal of the map where you will find basic information like:

**1. Map viewing options:**

- If you have ArcGIS Desktop installed on the computer you are working on, you can opt to open the map directly on the App, otherwise just **click on “Open Map Viewer”** to open it.

**2. Map description:**

- A description of the map that highlights the purpose and goals.

**3. Layer dictionary:**

- You can click on each of the layers and find out more detailed information, including the source, a description of the source and the data, and the type of layer.
- If you only want to visualize one specific layer, you can click on the layer name in the Layer Dictionary and choose “Visualization” in the top right corner

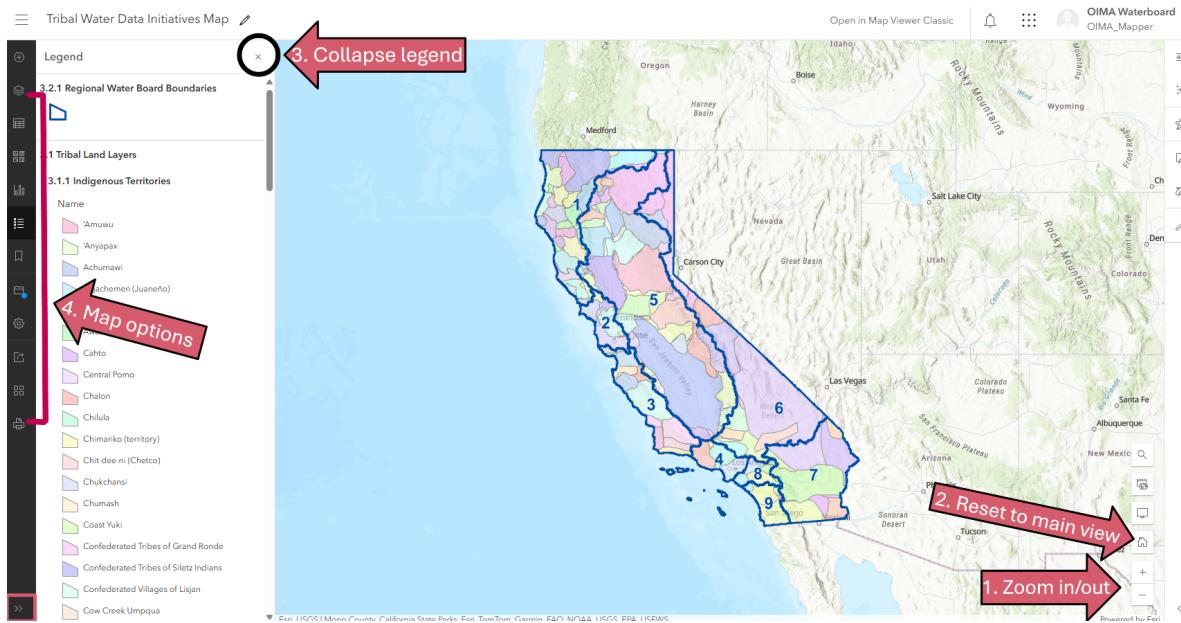
## 2.2 Navigating the Map

After you have clicked on ‘Open in Map Viewer’, the web map will open with two default layers being displayed: Regional Board Boundaries and Indigenous Territories.

To navigate the map:

1. To zoom you can use the **Zoom in** and **Zoom out** buttons on the bottom right of map, the mouse and wheel button, or press Shift + Plus Sign (zoom in) and Shift + Minus Sign (zoom out) on the keyboard. To zoom in, you can also press the Shift key while dragging a box on the map.
2. To go back to the main view, press the **house icon**.
3. **Collapse the legend** pane by clicking on the arrow on the upper-right corner of the menu.
4. Scroll through the **map options** in the sidebar on the left
  - Map options include Layers, Tables and Charts, viewing the BaseMap, Viewing the Map Properties, and more.
  - To expand the map options to see icons and words, click on the ‘»’ arrows in the bottom lefthand corner (see Navigating Legend and Layers section below for picture).

- To pan the map, use the mouse or the arrow keys on your keyboard.
- If you're using a Mac with OS X 10.6 or later, you can use multitouch gestures by dragging two fingers to pan and zoom the map. The default behavior is to pan. To zoom in or out, press Shift while dragging two fingers toward you to zoom in or dragging two fingers away from you to zoom out.



## 2.3 Navigating Legend and Layers

- To see information on the map, click on any of the items in the **menu bar** on the left side of the screen. For example, to view other layers you can click on the **Layers** icon, which is displayed directly to the right of the menu bar.
- Also in the menu bar, is the **legend** (shown in the inset below the pop-up menu). The legend gives more details about each layer that is currently selected. For example, the blue outlines and numbers are the Regional Board Boundaries and Designations, and the different Indigenous Territories are color coded and defined on that menu.
- You can also click on a map area of California to find out what Regional Board, or Indigenous Territory is in a specific location. The information will be shown in a **pop-up menu**.
  - In this example, the right border of California was clicked and a pop-up showed that the area belongs to Region 6 of the Regional Boards.

- Additional map properties for exploration and analysis can be found on the panel on the right side of the screen for map properties and effects, to add a sketch, or to use measurement tools.



## 2.4 Displaying/Removing View of Layers

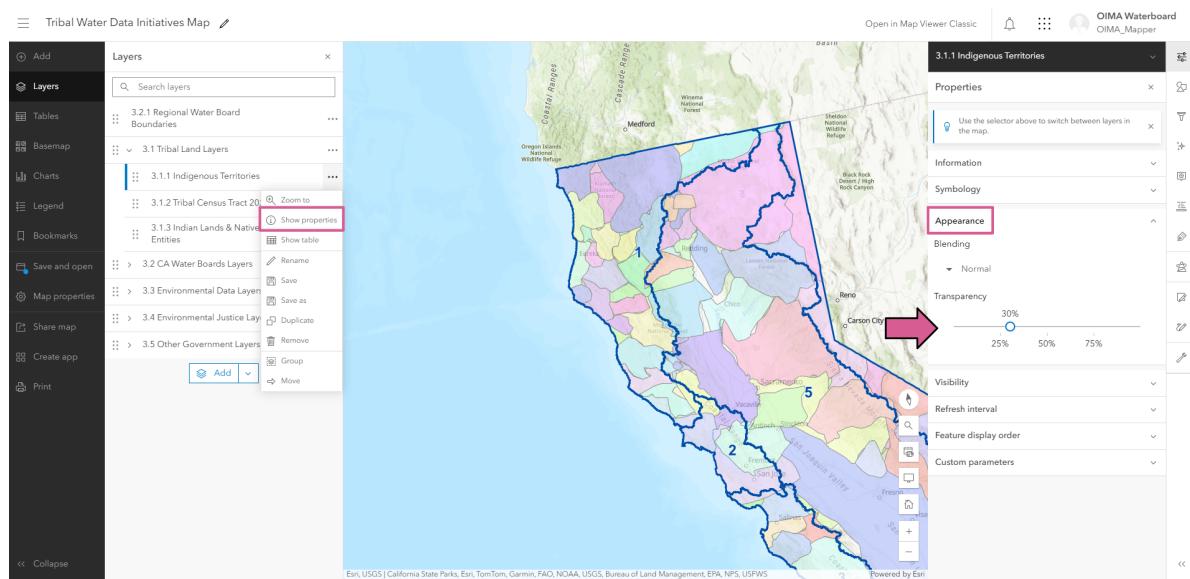
- On the **Menu Bar**, click **Layers**. All the layers of the map will be listed (but not yet displayed). The layer categories (3.1, 3.2, 3.3, 3.4, 3.5, and 3.6) are coordinated with the section in the [Layer Guide](#) that outlines each layer and its important/relevant information.
- Upon opening the map, only Regional Boards Boundaries and Indigenous Territories will be displayed. You can confirm this by looking at the layer name and seeing an eye icon (you may need to hover over the layer to see the eye icon). If the eye icon has a slash through it, that means the layer is not currently visible on the map. You need to click on the eye icon specifically to display/remove the layer.
  - If you just click the layer name and not the eye icon, you will pull up the **properties** information about that layer on the right side of the map (shown on the right hand side for Tribal Census Tract 2021 layer).



## 2.5 Adjusting Layer Transparency

To change the transparency of the layers:

- Select the layer of which you'd like to change the transparency:
  - You can either click on the three dots next to the layer name and select “Show properties” or
  - You can click on the layer name and the properties panel will pop up on the right side of the screen.
- Scroll down to **Appearance**
- Select **Transparency**, and slide the button to the desired transparency
  - The more transparency, the less visible the layer will be.



# 3 Layer Guide

This guide serves to provide greater detail about each layer included in the Tribal Water Data Map.

## Note on default map settings

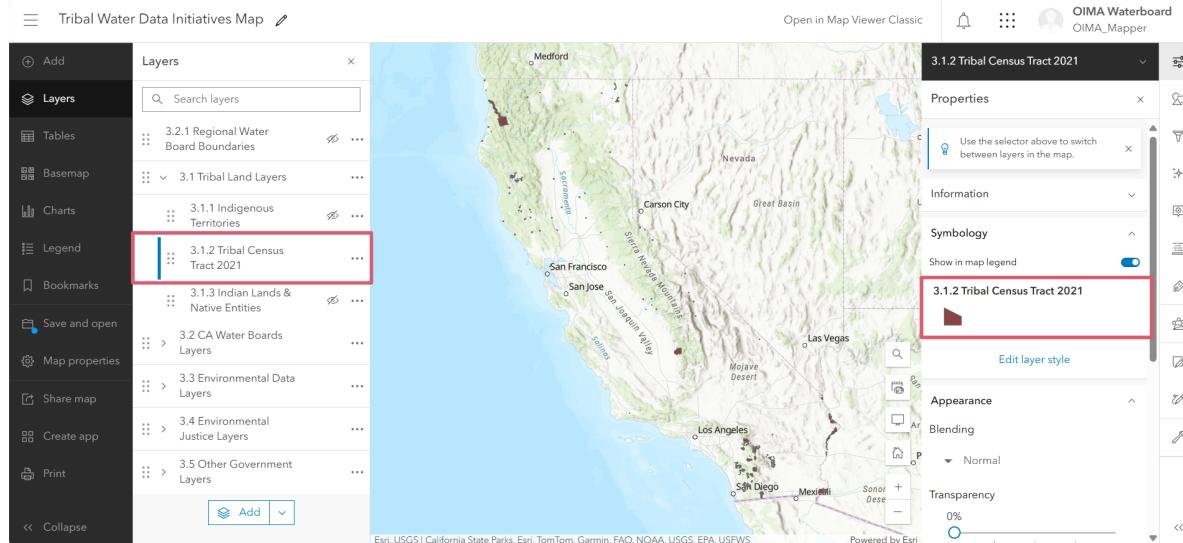
When opening the map in Map Viewer, the **default** layers that will be displayed include the Indigenous Territories layer (at 50% transparency) and the California Regional Boards Boundaries. To see more details about these layers, read below or click on the layer in the [Layer Dictionary](#) (see instructions on [Map Guide](#) page)

## 3.1 Tribal Land Layers

### 3.1.1 Tribal Census Tract 2021

Layer showing Tribal areas identified by the U.S. Census Bureau. Symbology for this layer is shown on the right hand side. You can zoom in further to see specific areas more closely.

#### Note of limitation:



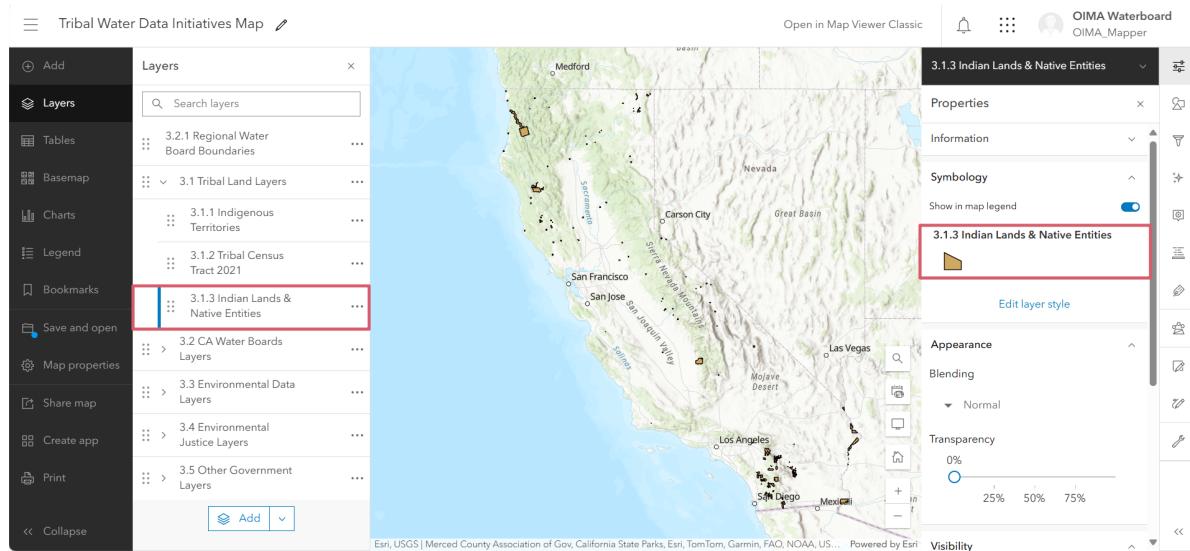
Source: [U.S. Census Bureau](#)

Data Update Frequency: Every 10 years

Contact: [U.S Census Bureau](#)

### 3.1.2 American Indian Lands and Tribal Entities

Layer showing American Indians Reservations/Federally Recognized Tribal Entities.



Source: [California Governor's Office of Emergency Services \(Cal OES\)](#)

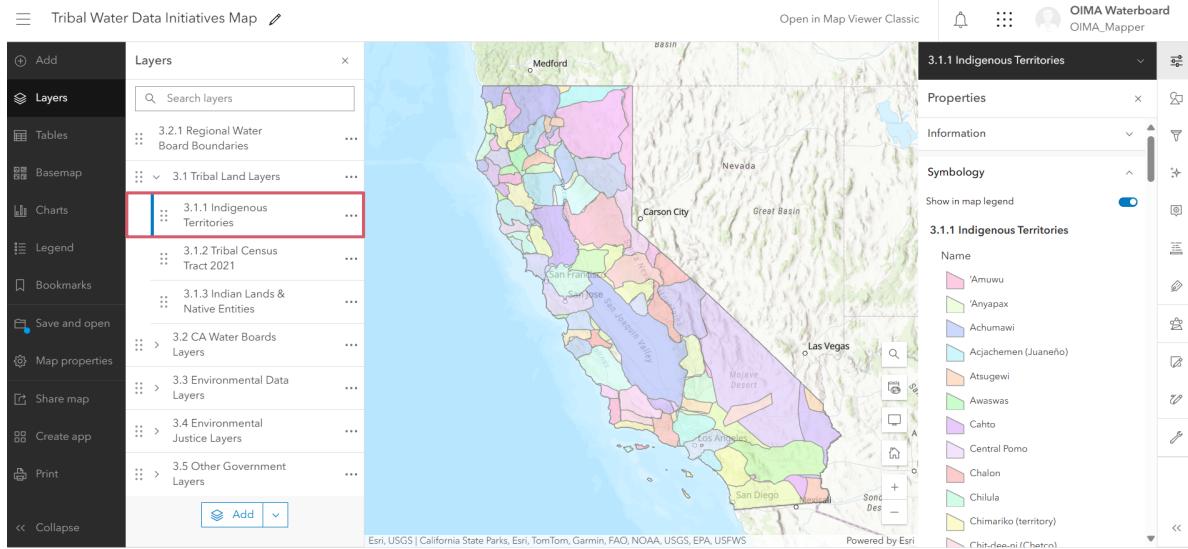
Data Update Frequency: As needed

Contact: [Cal OES](#)

The American Indians Reservations/Federally Recognized Tribal Entities data set depicts feature location, selected demographics and other associated data for the 561 Federally Recognized Tribal entities in the contiguous U.S. and Alaska. Categories included are: American Indian Reservations (AIR), Federally Recognized Tribal Entities (FRTE) and Alaska Native Villages (ANV).

### 3.1.3 Indigenous Territories

Layer displaying historic Indigenous Territories within California.



Source: [native-land.ca](https://native-land.ca)

Data Update Frequency: As needed

Contact: Native Land Digital

Native Land Digital “strives to create and foster conversations about the history of colonialism, Indigenous ways of knowing, and settler-Indigenous relations, through educational resources such as our map and Territory Acknowledgement Guide. We strive to go beyond old ways of talking about Indigenous people and to develop a platform where Indigenous communities can represent themselves and their histories on their own terms. In doing so, Native Land Digital creates spaces where non-Indigenous people can be invited and challenged to learn more about the lands they inhabit, the history of those lands, and how to actively be part of a better future going forward together.”

## 3.2 Integrated Report and Beneficial Use Layers

### 3.2.1 2024 Integrated Report

**!** Important

#### What is the Integrated Report?

Waterbodies assessed in the Integrated Report (IR) include surface waterbodies, such as rivers, lakes, and beaches.

Assessed waterbodies are placed into one of five Integrated Report Condition Categories based on the waterbody's ability to support beneficial use(s).

The 303(d) list consists of the waterbodies in Categories 4a, 4b, and 5. These waterbodies can be referred to as “listed” or “impaired”.

- The 303(d) list is based off of Section 303(d) of the Clean Water Act, which requires each state to identify waters that do not meet water quality standards and to prioritize those waters for development of total maximum daily load (TMDL)
- The Clean Water Act also requires each state to report on the overall condition of its surface waterbodies, which is Section 305(b).

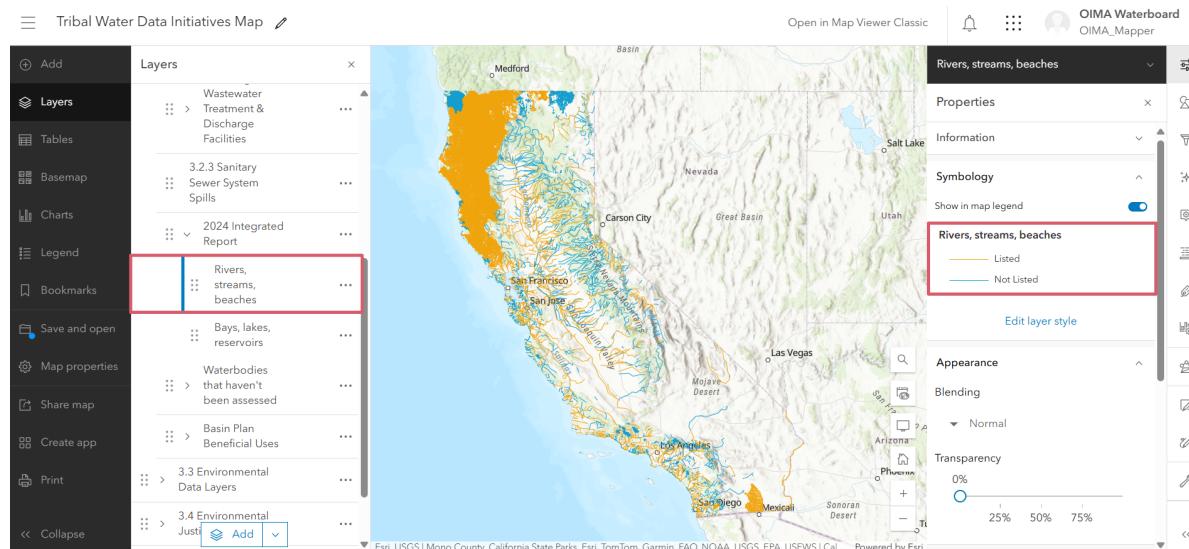
California combines its 303(d) lists and 305(b) reports into a single “California Integrated Report”.

For more information see:

[CEDEN - California Environmental Data Exchange Network](#)  
[2024 Integrated Report | California State Water Resources Control Board](#)

### 3.2.1.1 State Water Bodies (rivers, streams, and beaches)

This layer shows linear waterbodies in California, such as rivers, streams, and beaches, which were assessed for 305(b) in the 2022-2024 California Integrated Report. Blue waterbodies are listed in Category 1, 2, or 3. Orange waterbodies represent those placed on the 303(d) list of impaired waters.



Note, these are not the final assessments.

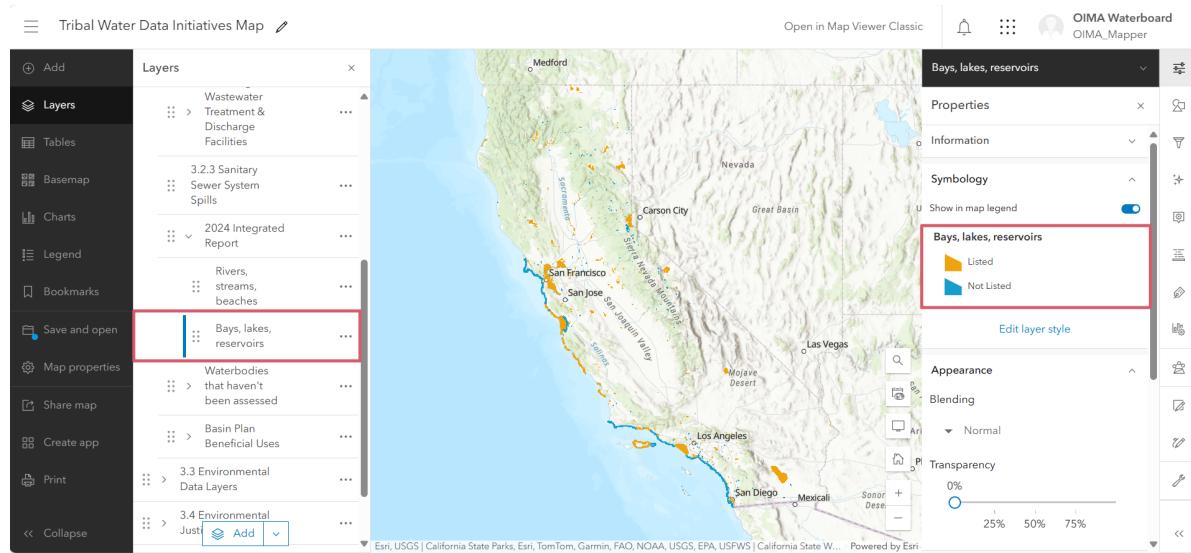
Source: [California State Water Resources Control Board \(SWRCB\)](#)

Data Update Frequency: Every two years

Contact: [SWRCB Water Quality Assessment Program](#)

### 3.2.1.2 State Water Bodies (bays, lakes and reservoirs)

This layer shows non-linear (polygon) waterbodies in California, such as bays, lakes, and reservoirs, which were assessed for 305(b) in the 2020-2022 California Integrated Report. Blue waterbodies are listed in Category 1, 2, or 3. Orange waterbodies represent those placed on the 303(d) list of impaired waters.



Note, these are not the final assessments.

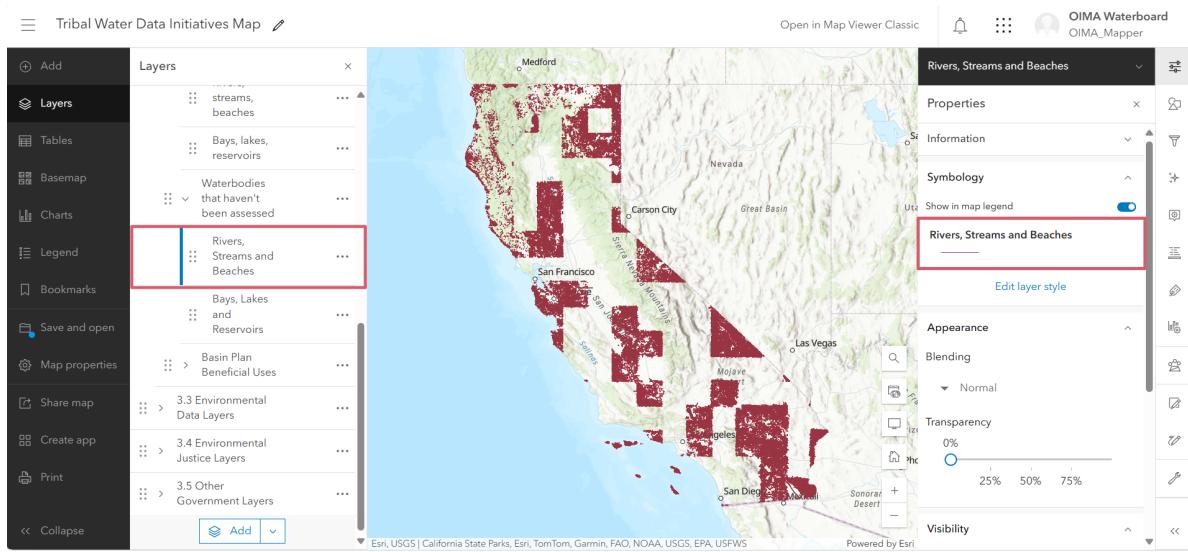
Source: [California State Water Resources Control Board \(SWRCB\)](#)

Data Update Frequency: Every 2 years

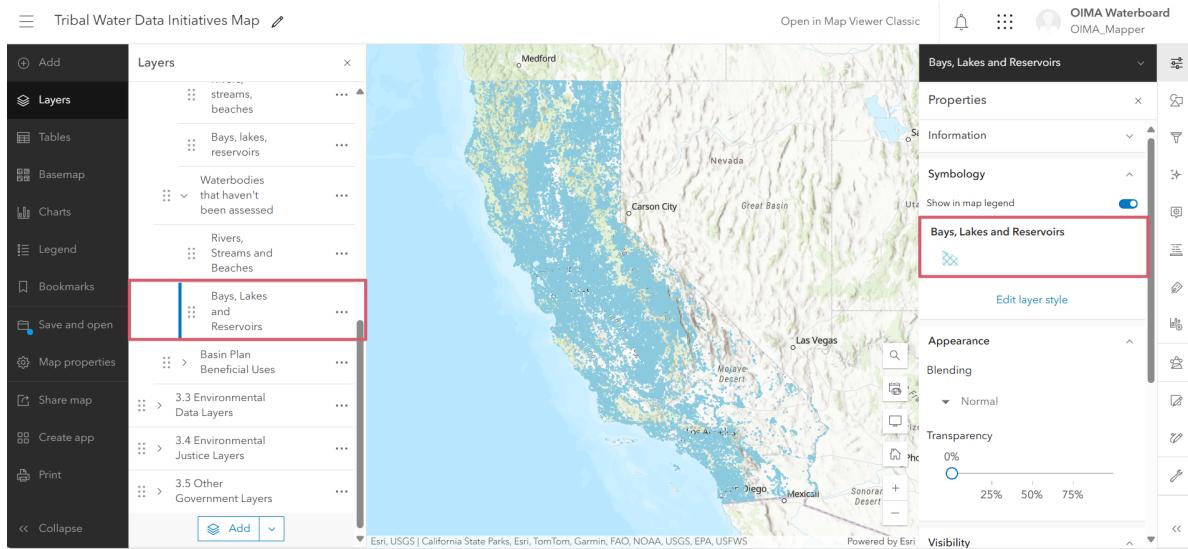
Contact: [SWRCB Water Quality Assessment Program](#)

## 3.2.2 Waterbodies that haven't been assessed

### 3.2.2.1 State Water Bodies (rivers, streams, and beaches)



### 3.2.2.2 State Water Bodies (bays, lakes and reservoirs)

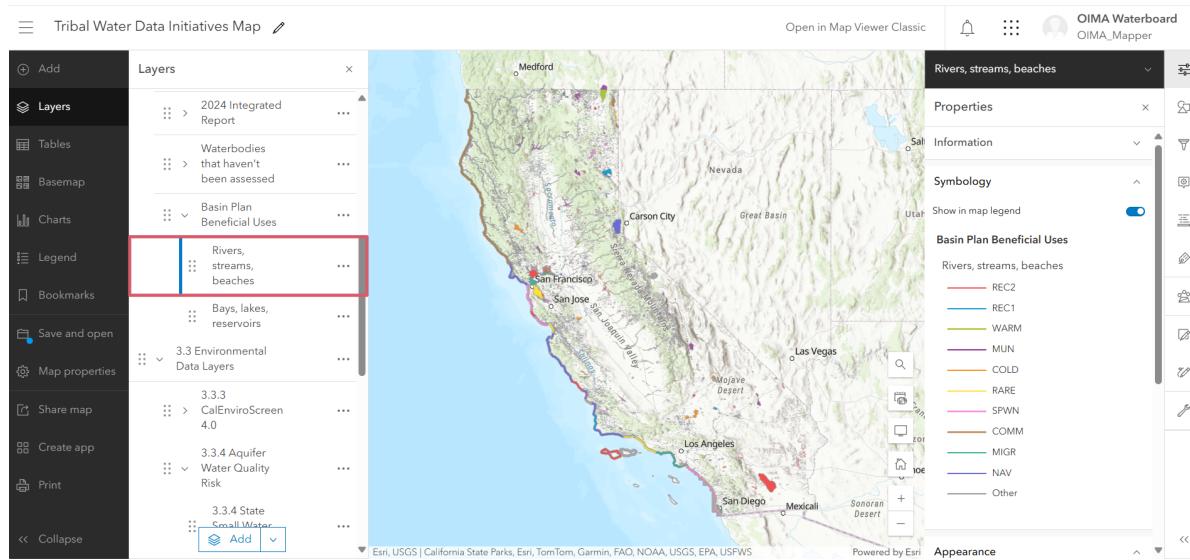


### 3.2.3 Basin Plan Beneficial Uses

! Important

What are Beneficial Uses?

#### 3.2.3.1 State Water Bodies (rivers, streams, and beaches)



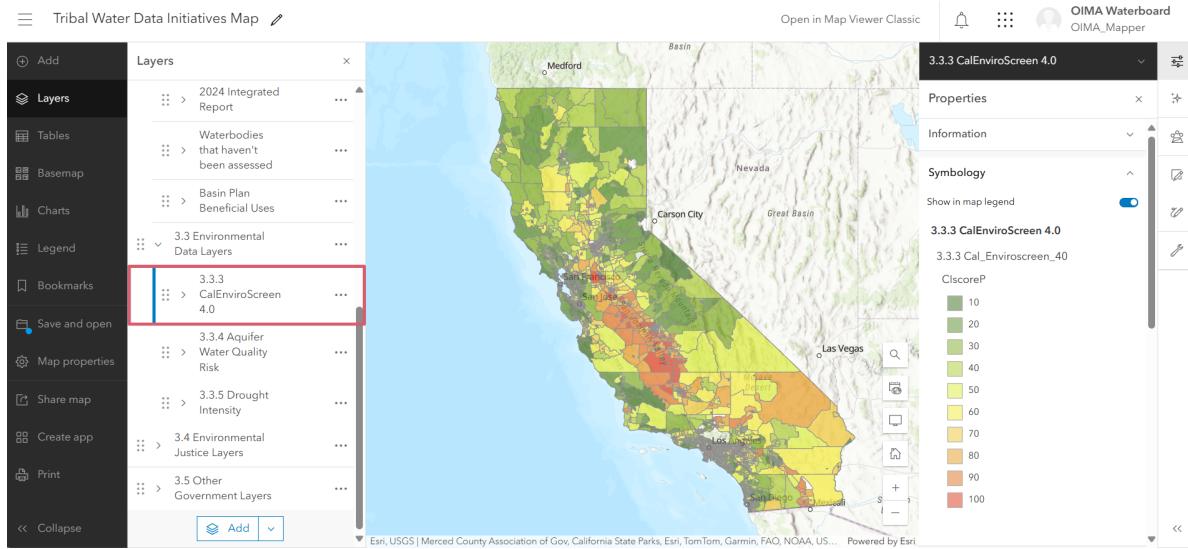
#### 3.2.3.2 State Water Bodies (bays, lakes and reservoirs)

### 3.3 CalEnviroScreen

#### 3.3.1 CalEnviroScreen 4.0

This layer shows the CalEnviroScreen (CES) 4.0 based on the CES Score percentile.

CalEnviroScreen is a screening methodology that can be used to help identify California communities that are disproportionately burdened by multiple sources of pollution. CI score ranges from 10 to 100. For more information on CalEnviroScreen scoring, see Practice Examples page.



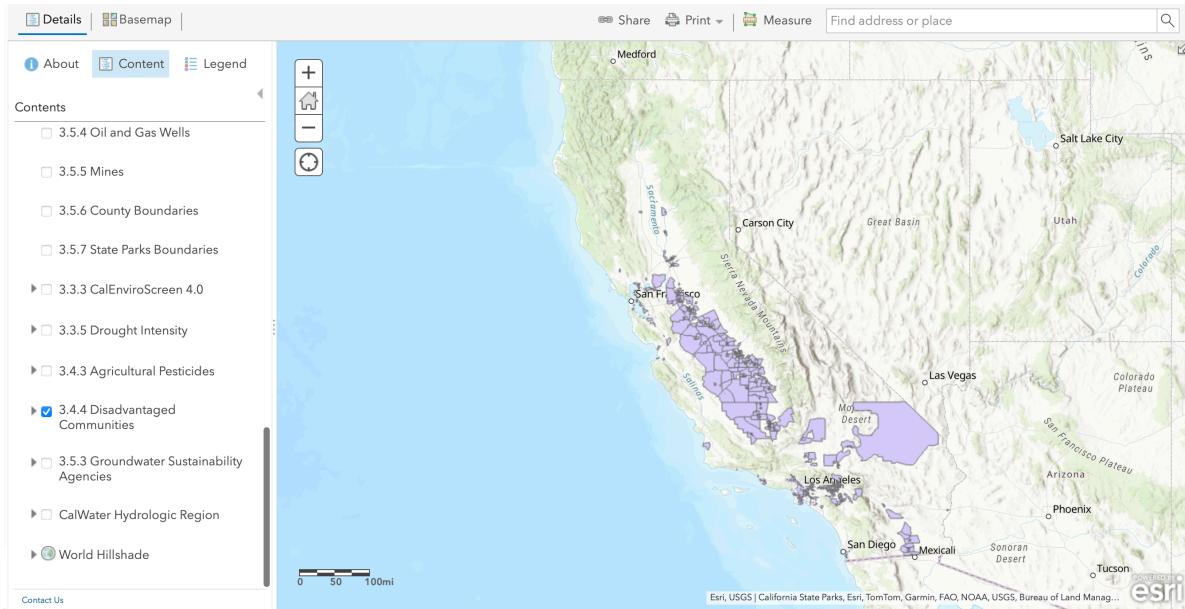
Source: [California Office of Environmental Health Hazard Assessment \(OEHHA\)](#)

Data Update Frequency: As needed

Contact: [CalEnviroScreen](#)

### 3.3.2 Disadvantaged Communities

This map shows the disadvantaged communities designated by CalEPA for the purpose of SB 535. These areas represent the 25% highest scoring census tracts in CalEnviroScreen 4.0, census tracts previously identified in the top 25% in CalEnviroScreen 3.0, census tracts with high amounts of pollution and low populations, and federally recognized tribal areasas identified by the Census in the 2021 American Indian Areas Related National Geodatabase.



Source: [California Office of Environmental Health Hazard Assessment \(OEHHA\)](#)

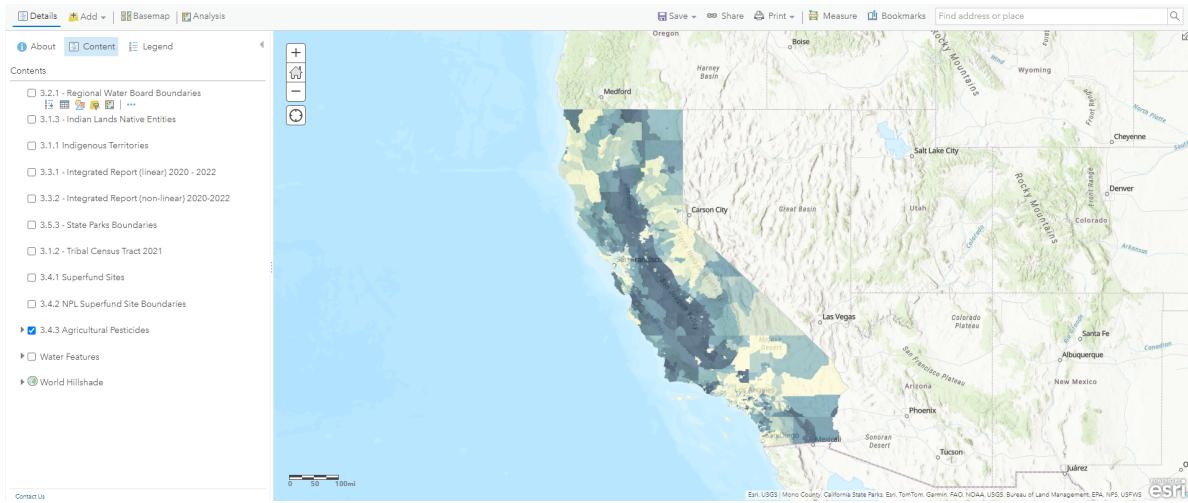
Data Update Frequency: As needed

Contact: [CalEnviroScreen](#)

## 3.4 Pollution Indicators

### 3.4.1 Agricultural Pesticides

This indicator represents the reported use of 132 hazardous and volatile pesticides in 2017-2019. Only pesticides used on agricultural commodities are included in the indicator. The data is averaged over the census tract area, and some application may be adjacent to (instead of within) the census tract.



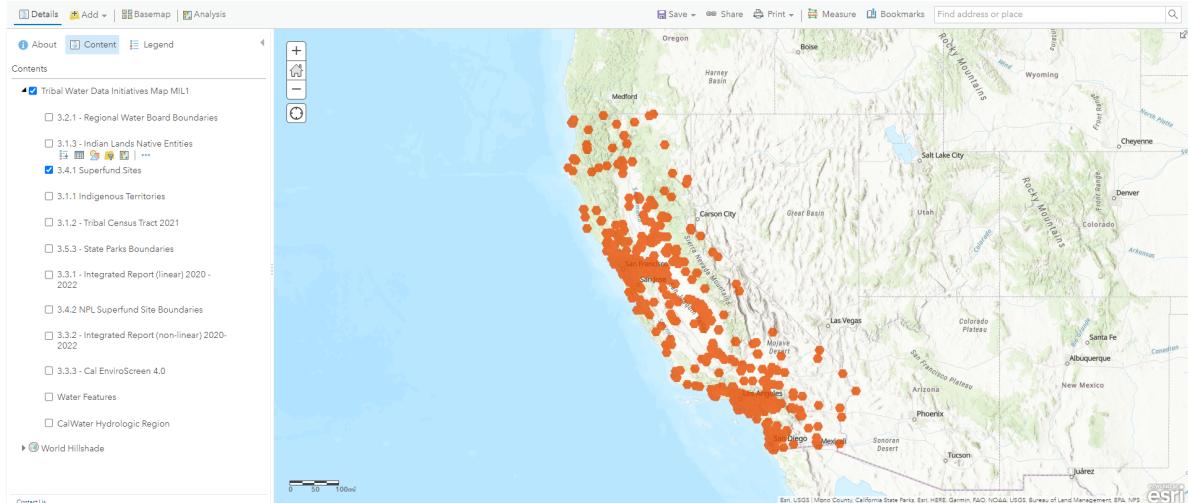
Source: [California Office of Environmental Health Hazard Assessment \(OEHHA\)](#)

Data Update Frequency: As needed

Contact: [CalEnviroScreen](#)

### 3.4.2 Superfund Sites

This layer shows Superfund Site locations and data on the inventory of active and archived hazardous waste sites evaluated by the EPA's Superfund program.



This data provides location and attribute information on Facilities regulated under the Superfund Enterprise Management System (SEMS). It contains sites that are either proposed to

be, or are on, the National Priorities List (NPL) as well as sites that are in the screening and assessment phase for possible inclusion on the NPL.

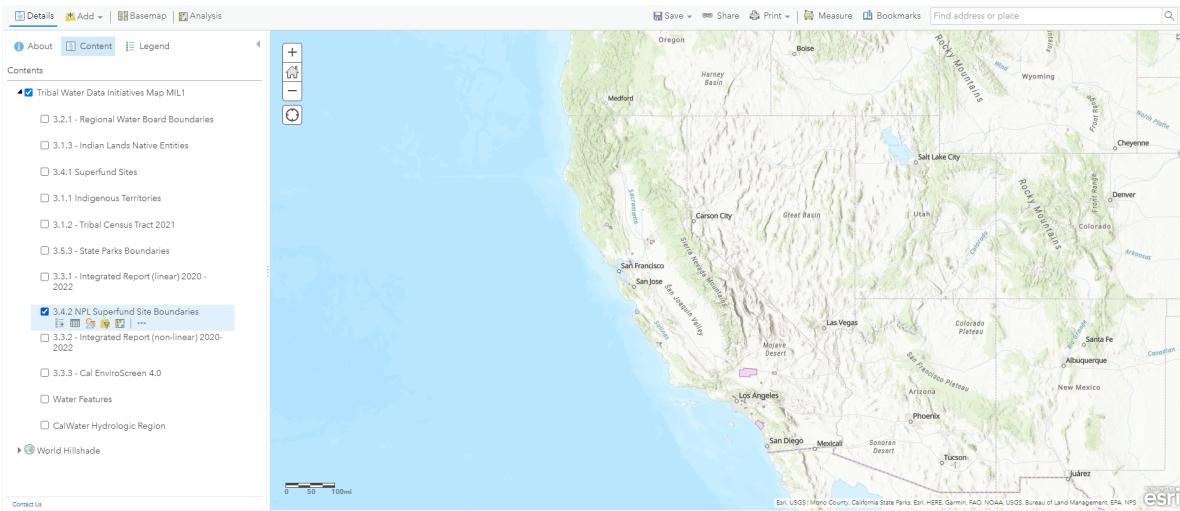
Source: [U.S. Environmental Protection Agency \(EPA\)](#)

Data Update Frequency: As needed

Contact: [U.S Environmental Protection Agency \(EPA\)](#)

### 3.4.3 NPL Superfund Site Boundaries

This layer shows entire Superfund Site boundaries.



U.S. EPA Superfund Site boundaries are polygons representing the footprint of a whole site, defined for purposes of this effort as the sum of all of the Operable Units and the current understanding of the full extent of contamination.

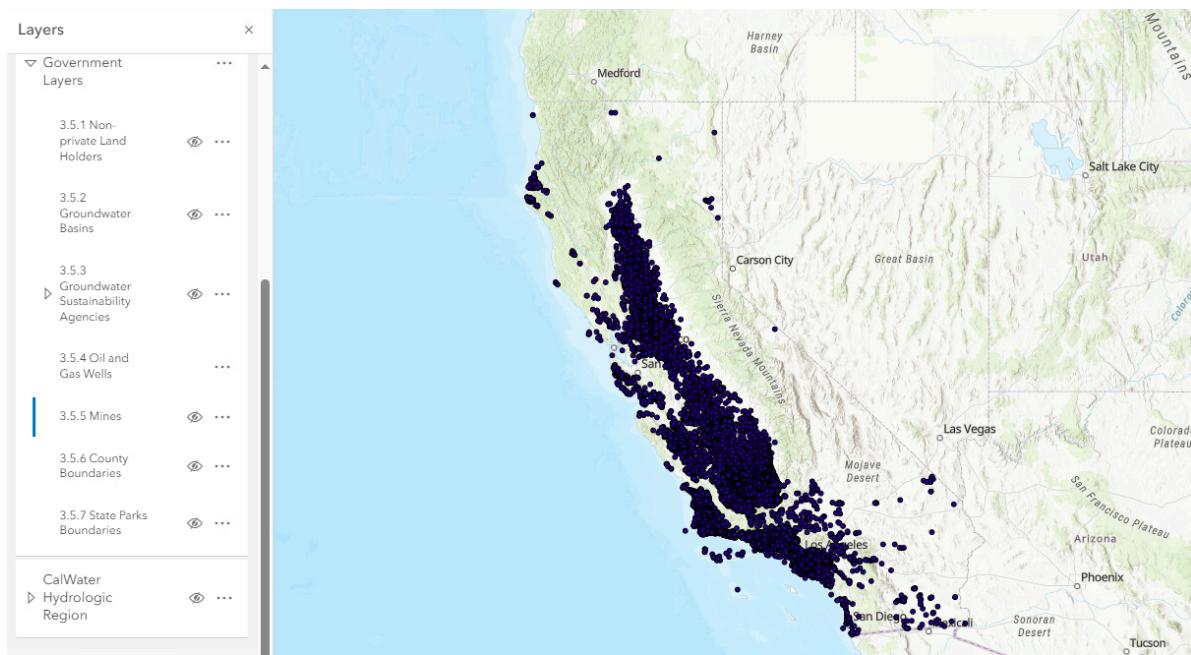
Source: [U.S. Environmental Protection Agency \(EPA\)](#)

Data Update Frequency: As needed

Contact: [U.S Environmental Protection Agency \(EPA\)](#)

### 3.4.4 Oil and Gas Wells

This layer shows oil and gas well locations (and their associated records) across California.

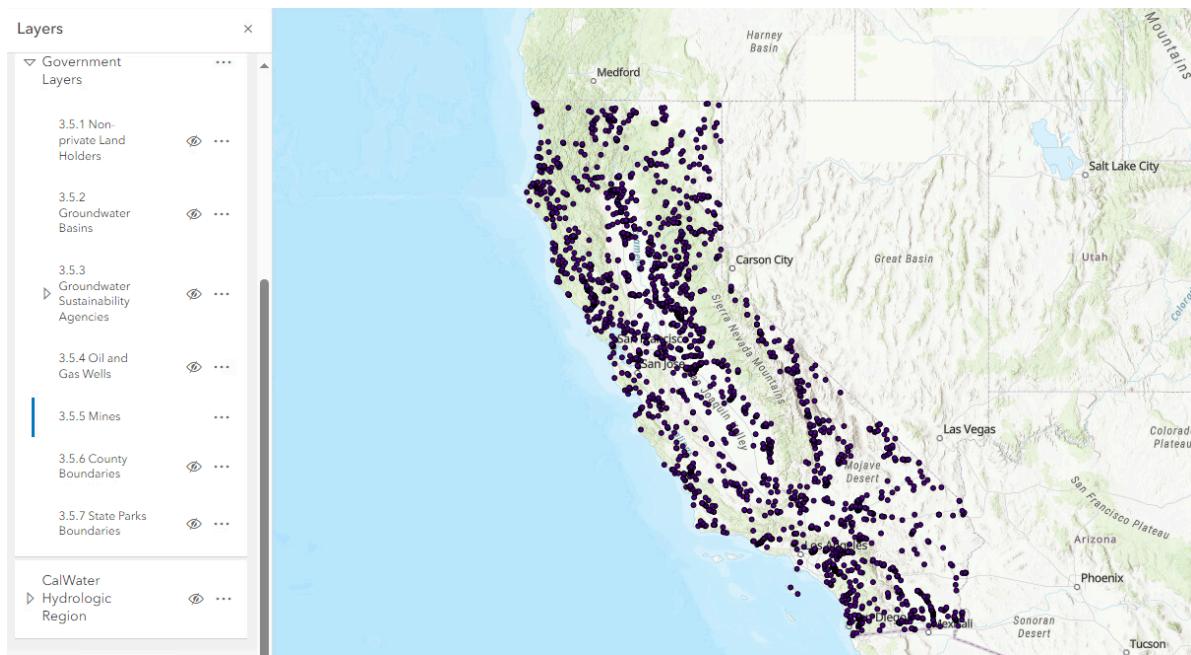


Source: [WellFinder](#), published by the California Department of Conservation and Geologic Energy Management Division

Data Update Frequency: As needed

### 3.4.5 Mines

This layer shows all mines in California.



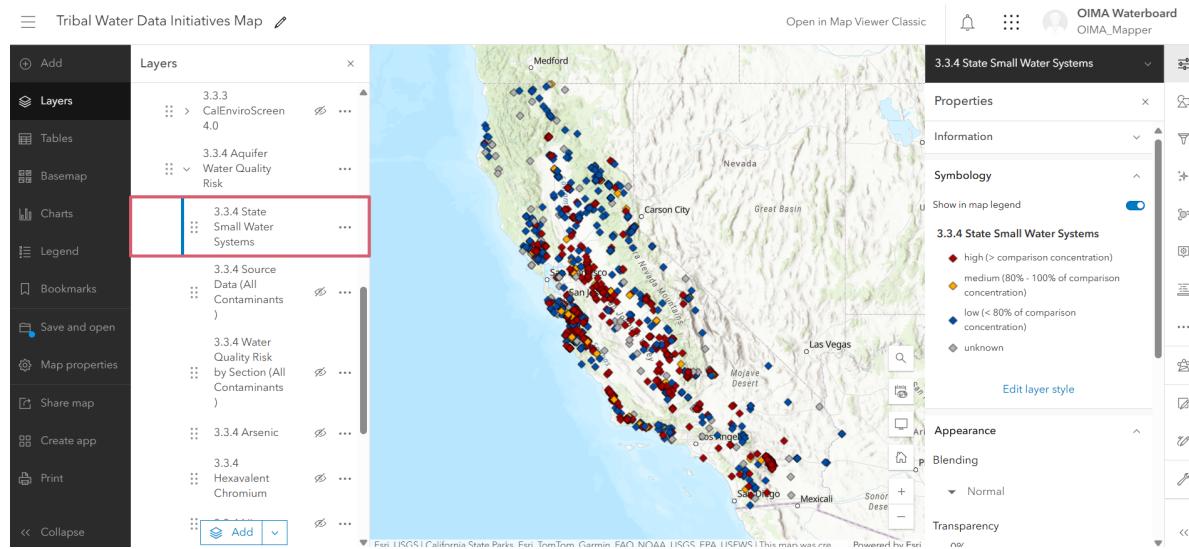
This data is published with the intent to aid mine reclamation and is gathered via annual reports under Public Resources Code section 2207.

Source: California Department of Conservation Division of Mine Reclamation

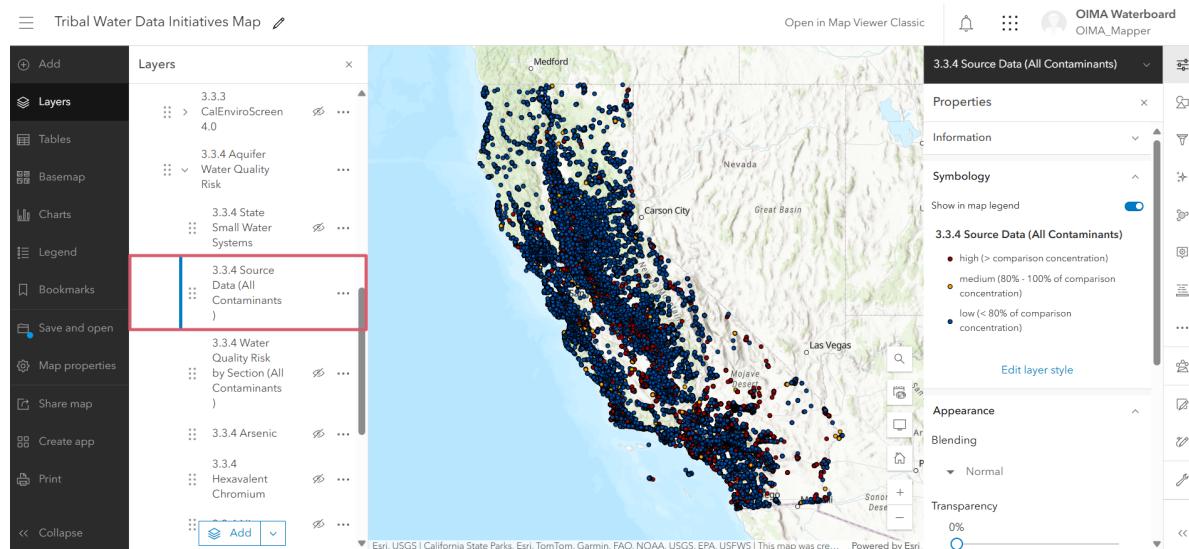
Data Update Frequency: As needed

## 3.4.6 Aquifer Water Quality Risk

### 3.4.6.1 State Small Water Systems

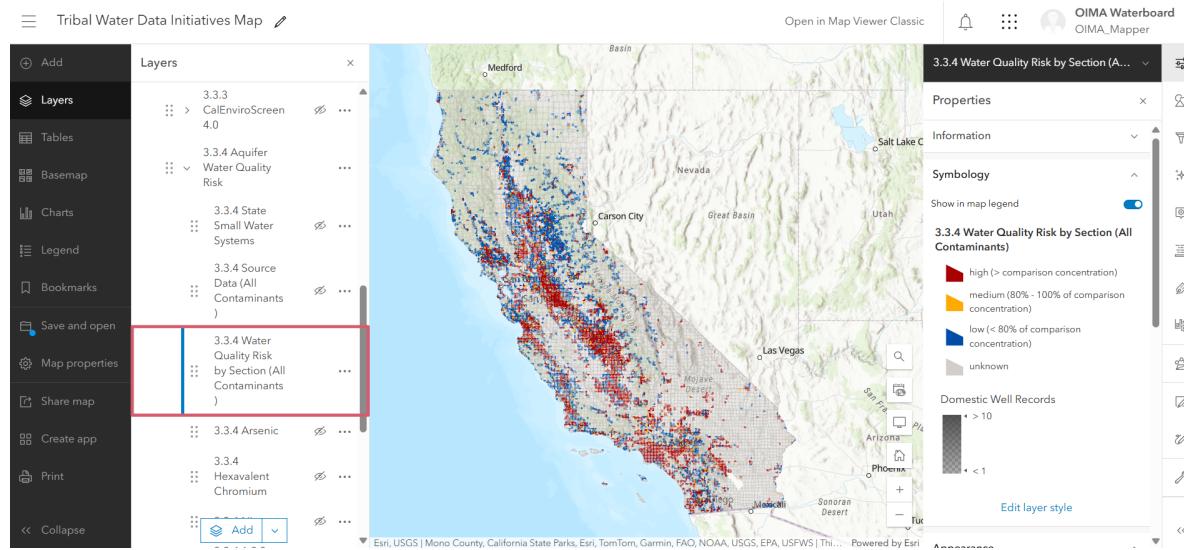


### 3.4.6.2 Source Data (All Contaminants)



### 3.4.6.3 Water Quality Risk by Section (All Contaminants)

This layer shows estimated water quality risk for domestic wells and state small water systems for a variety of contaminants.



This layer was developed for use by the State Water Boards SAFER Program to help prioritize areas where domestic wells and state small water systems may be accessing groundwater that does not meet primary drinking water standards.

Source: [Groundwater Ambient Monitoring and Assessment \(GAMA\) Program](#)

Data Update Frequency: As needed

Contact: [SAFER Program](#)

### **3.4.6.4 Arsenic**

### **3.4.6.5 Hexavalent Chromium**

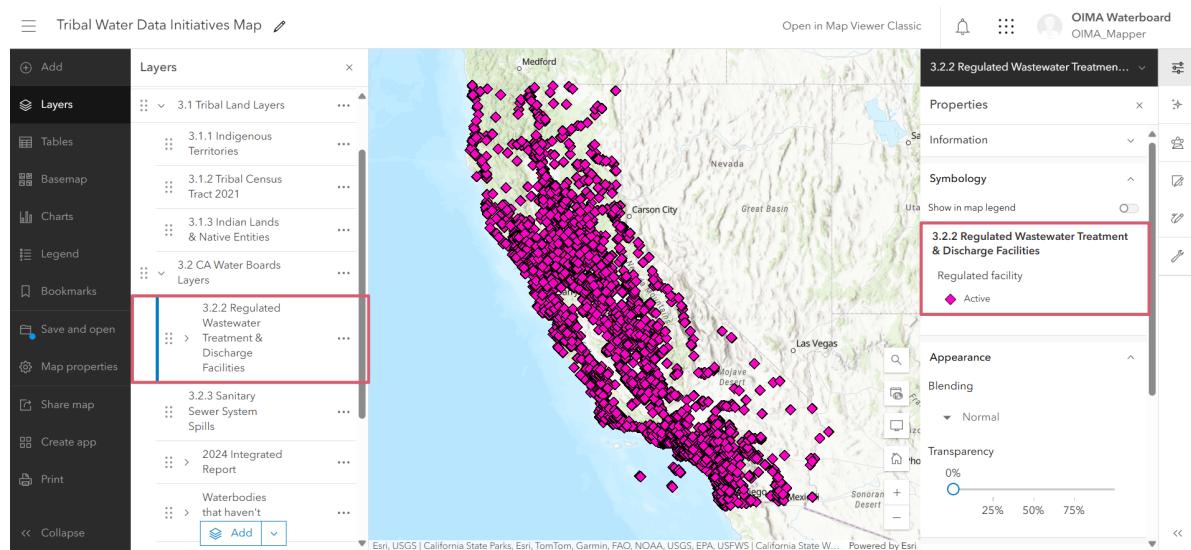
### **3.4.6.6 Nitrate**

### **3.4.6.7 Tricholororopropane**

### **3.4.6.8 Uranium**

## **3.4.7 Regulated Wastewater Treatment & Discharge Facilities**

Layer showing National Pollutant Discharge Elimination System (NPDES) and Waste Discharge Requirements (WDR) facilities regulated by State Water Board programs, as reflected in the California Integrated Water Quality System (CIWQS) project.



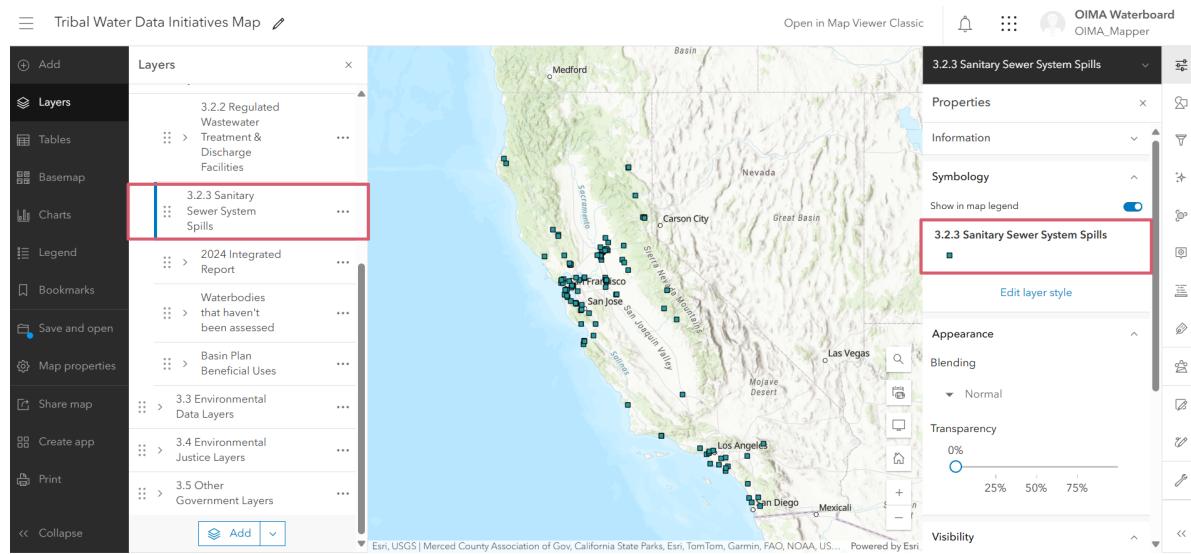
These facilities are mandated to hold active permits to discharge into or alter the surface or ground water. More information about these permits can be found in the CIWQS database.

Source: [California Integrated Water Quality System \(CIWQS\)](#)

Data Update Frequency: Nightly

### 3.4.8 Sanitary Sewer System Spills

Layer showing locations with XXXXXXXX

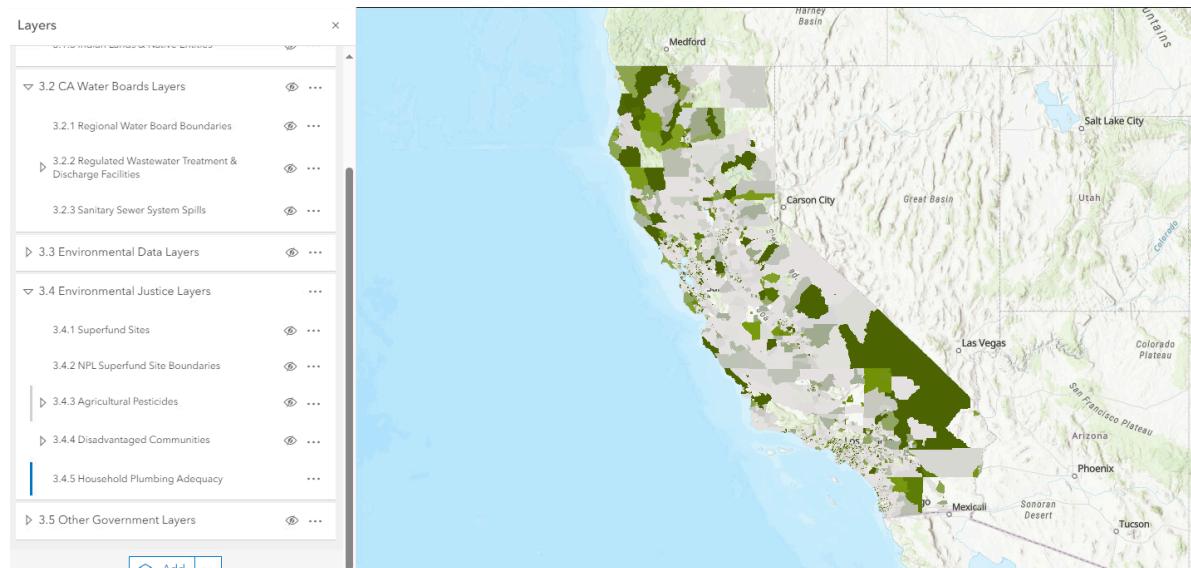


Source:

Data Update Frequency:

### 3.4.9 Household Plumbing Adequacy

This layer shows the ratio of households that do *not* have access to adequate plumbing.



This statistic is what determines a household as “livable” according to source California Healthy Places Index (HPI).

Source: [California Healthy Places Index \(HPI\)](#)

Data Update Frequency: Dependent on HPI’s component indicators, typically annually

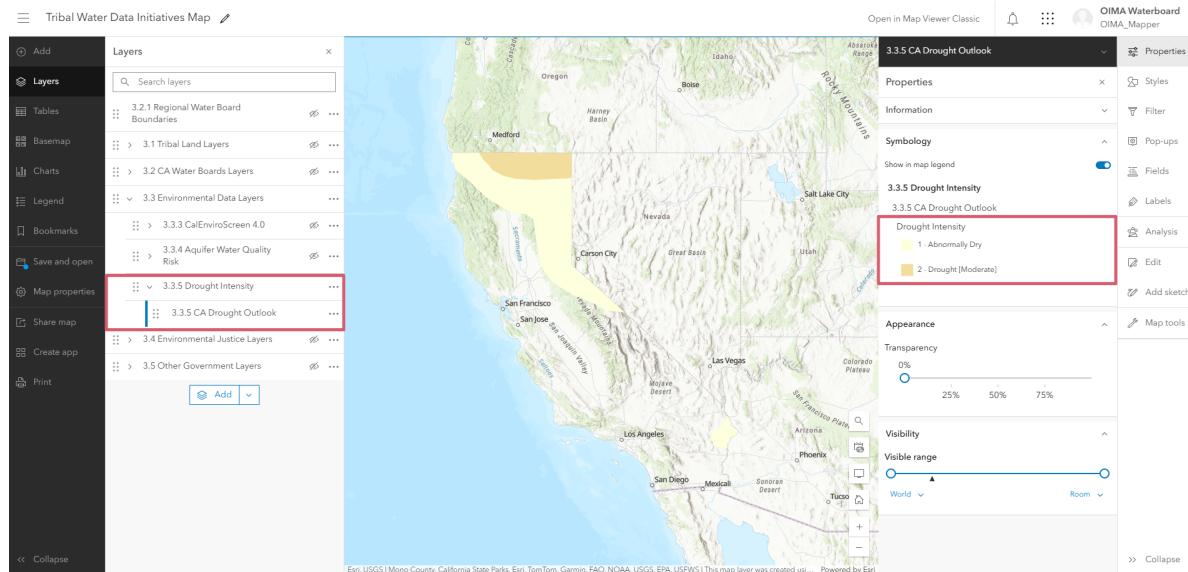
## 3.5 Water Quality

*New layers coming soon*

## 3.6 Climate Change Indicators

### 3.6.1 Drought Intensity

Drought Outlook: This layer shows regions in California impacted by drought.



Drought severity is determined by precipitation deviation, stream flow, soil moisture content, subjective observation, and reported impact.

Source: [U.S. Drought Monitor](#)

Data Update Frequency: Weekly, on Thursdays

Contact: [National Drought Mitigation Center \(NDMC\)](#)

## 3.7 Hydrology

### 3.7.1 Groundwater Basins

This layer shows the boundaries of 515 groundwater basins and subbasins as defined by the California Department of Water Resources.



Source: [California Department of Water Resources](#)

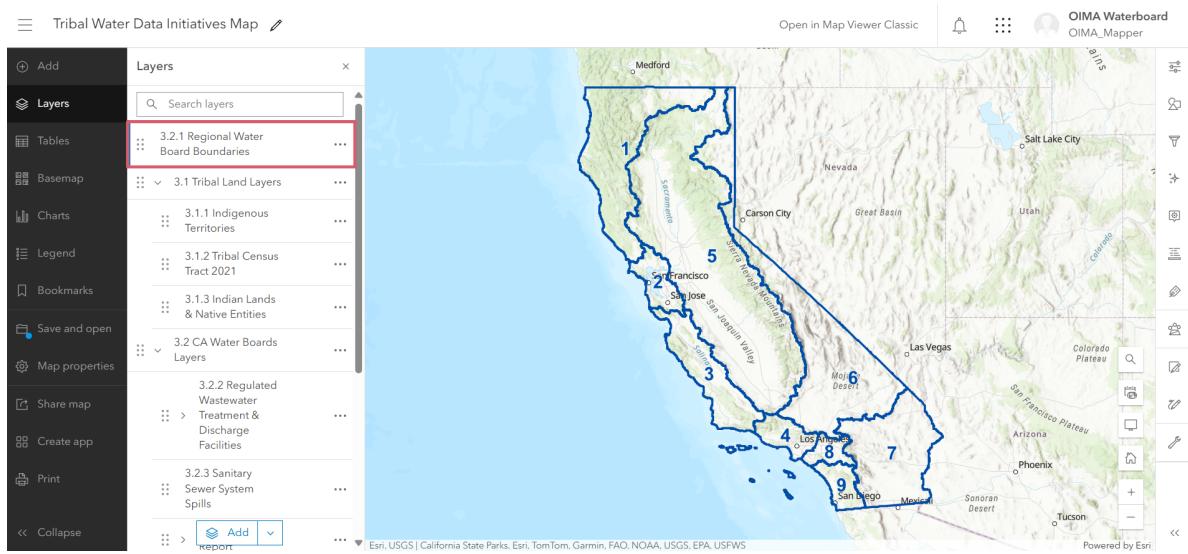
Data Update Frequency: As needed

### 3.7.2 Hydrography, Water Boundaries

## 3.8 Geopolitical Boundaries

### 3.8.1 Regional Water Board Boundaries

Layer showing the boundaries of the nine Regional Water Quality Control Boards in California.



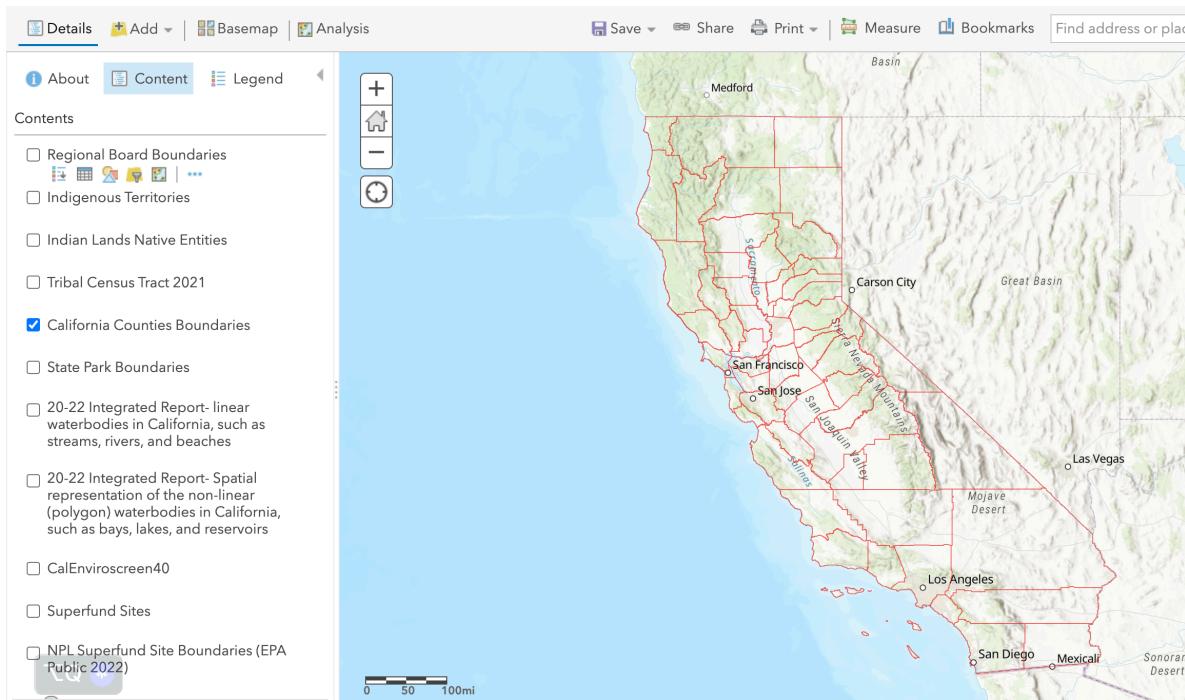
Source: [California State Water Resources Control Board \(SWRCB\)](#)

Data Update Frequency: As needed

### 3.8.2 Census Tracts

### 3.8.3 County Boundaries

This layer shows County boundaries within California.



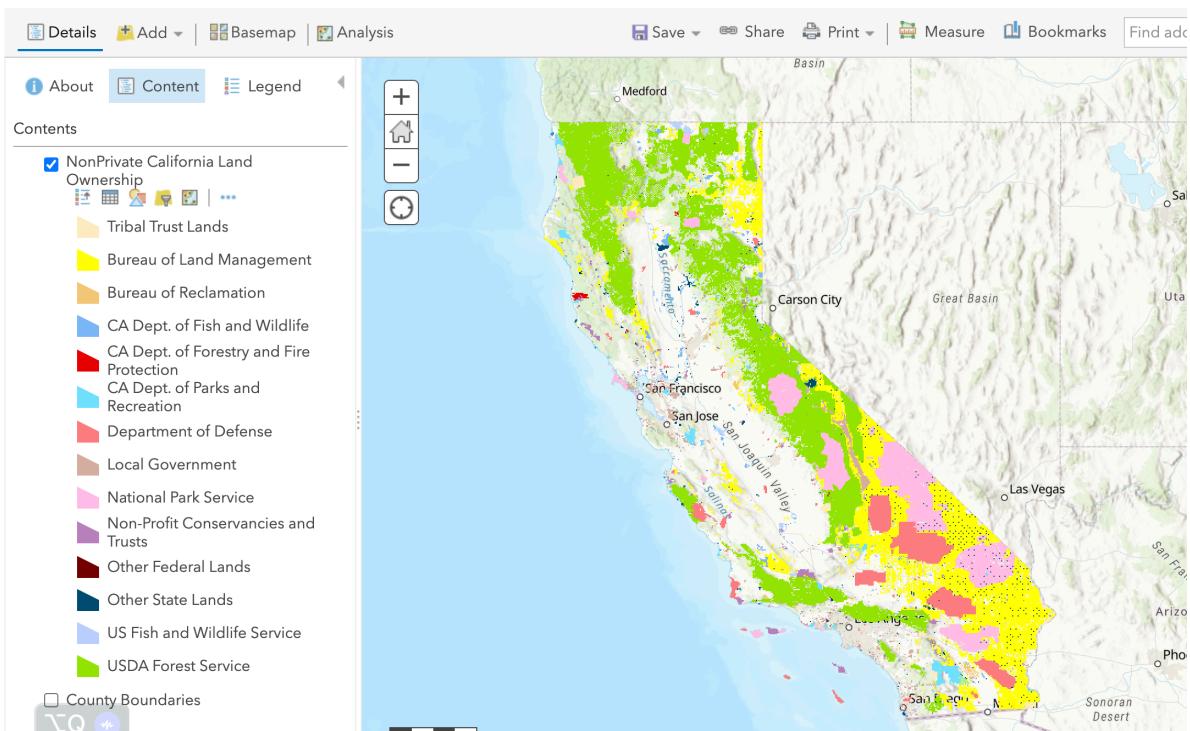
In this dataset, all bays (plus bay islands and constructed features) are merged into the mainland, and coastal features (such as islands and constructed features) are not included, with the exception of the Channel Islands which ARE included.

Source: [California Dept. of Forestry and Fire Protection \(CalFIRE\)](#)

Data Update Frequency: As needed

### 3.8.4 Non-private Land Holders

This layer shows boundaries for non-private land holders in California.



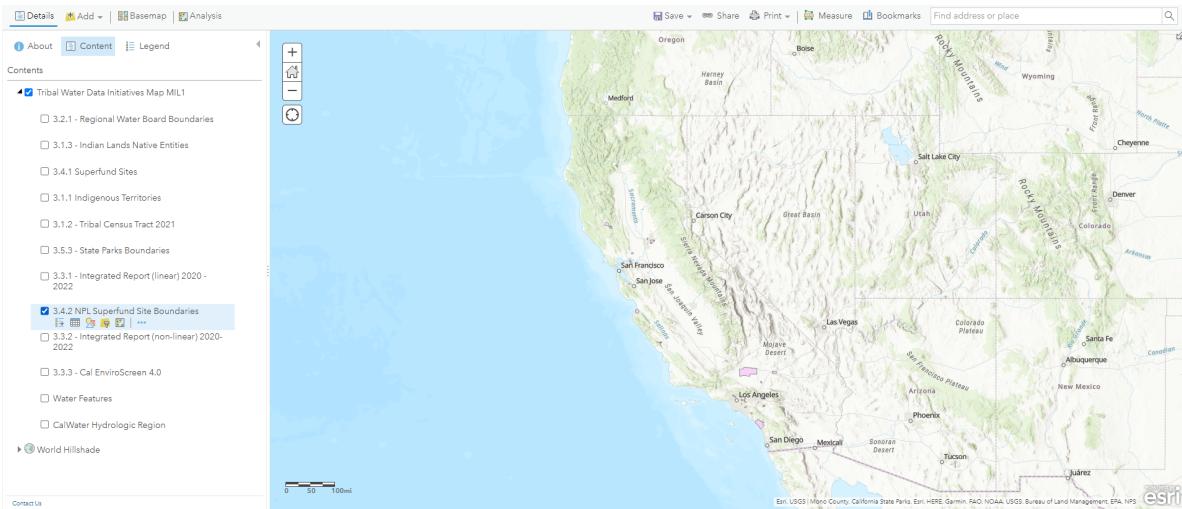
Source: [California Dept. of Forestry and Fire Protection \(CalFIRE\)](#)

Data Update Frequency: As needed

### 3.8.5 California National Parks

### 3.8.6 State Park Boundaries

This layer shows the State Parks in California.

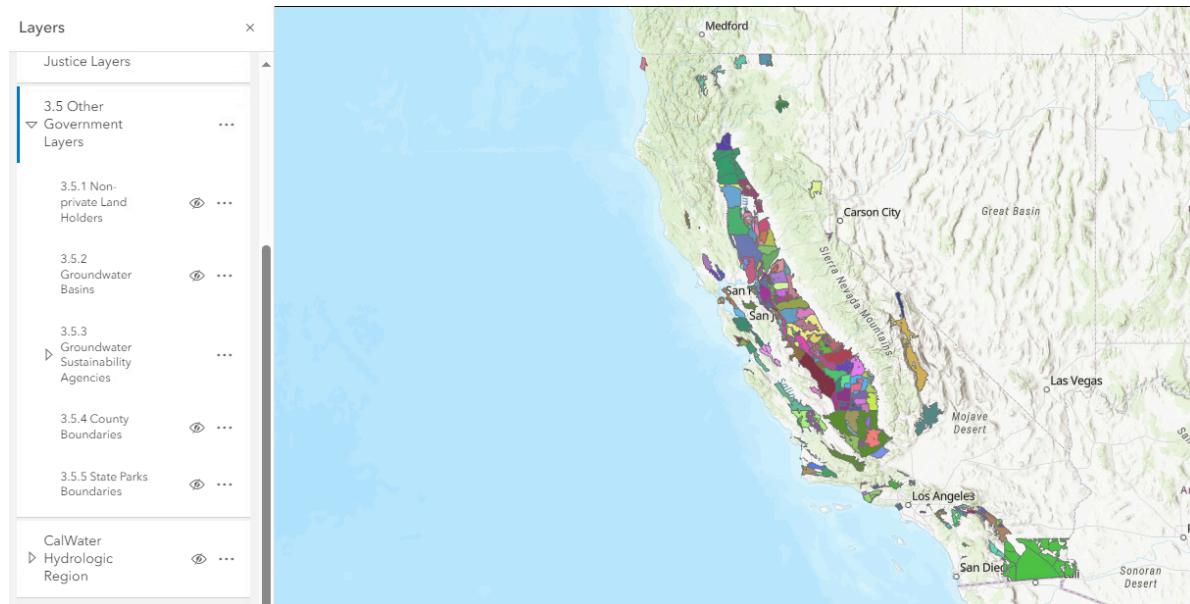


Source: [California Dept. of Pesticides Regulation \(DPR\)](#)

Data Update Frequency: As needed

### 3.8.7 Groundwater Sustainability Agencies

This layer shows the boundaries of California's Groundwater Sustainability Agencies as defined on the DWR SGMA Data Viewer.



Source: [California Department of Water Resources, for use by Groundwater Ambient Monitoring and Assessment \(GAMA\) Program](#)

Data Update Frequency: As needed

### **3.8.8 Marine Protected Areas**

# 4 Resources

Here you will find a curated list of presentations, webpages and other resources related to the development, implementation and scaling of the Water Board's Tribal Water Data Map.

All Water Boards authors are **bolded** below.

## 4.1 Websites

[Water Boards' Tribal Water Data Initiatives](#)

## 4.2 SWAMP Information

- The Surface Water Ambient Monitoring Program (SWAMP) unit falls within the OIMA at the State Water Resources Control Board
- Below are resources directly from the SWAMP website that may be useful in addition to this map:
  - [SWAMP Data Dashboard](#)
  - [Safe to Swim Map](#)
  - [Freshwater Harmful Algal Bloom \(FHAB\) Program](#)

## 4.3 Presentations

[Using California Water Board's Tribal Water Data Map to Understand Pollution & Climate in your Area](#). Jan 2025. **Anna Holder**. National Tribal Data Resilience Workgroup. Recording

[Using California Water Board's Tribal Water Data Map to Understand Pollution in your Area](#). Oct 2023 (Fall Tribal Conference). **Anna Holder**, Sarah Ryan. Tribal EPA & US EPA Region 9 Annual Conference. Recording

[CA Water Boards' Tribal Water Data Resources Update](#). Aug 2023 ([Summer Meeting](#)). **Badhia Yunes Katz, Anna Holder.** California Issues Workgroup - US EPA Region 9 Regional Tribal Operations Committee (RTOC).

[Introduction to CA Water Boards' Tribal Water Data Resources](#). Feb 2023 ([Winter Meeting](#)). **Badhia Yunes Katz, Anna Holder.** California Issues Workgroup - US EPA Region 9 Regional Tribal Operations Committee (RTOC).

## 4.4 Other Data Visualization Tools

[Tribal Drinking Water](#) - This tool is intended to compile and display information that can inform and help prioritize outreach related to drinking water issues in tribal areas within California. It is a work in progress, and is not intended to be a comprehensive source of tribal-related water data.

[Healthy Places Index \(HPI\)](#) - The HPI maps data on social conditions that drive health — like education, job opportunities, clean air and water, and other indicators that are positively associated with life expectancy at birth. The HPI is a project of the Public Health Alliance of Southern California, with the aim of supporting efforts to prioritize equitable community investments and policy.

[Social Vulnerability Index \(SVI\)](#) - The SVI is designed to identify and quantify communities experiencing social vulnerability and help public health officials and local planners better prepare for and respond to emergency events. It is developed by the US Centers for Disease Control and Prevention and Agency for Toxic Substances and Disease Registry.

# 5 Meet the Team!

The development of the [Map](#) and this User Manual has been a team effort from the start. Below is a list of team members within OIMA and tribal partners who have been integral to the development of these resources.

If you would like to join the Team, please email Anna Holder at: [anna.holder@waterboards.ca.gov](mailto:anna.holder@waterboards.ca.gov).

## 5.1 OIMA

Name	Title
Anna Holder	Open Data Science, Equity & Tribal Coordinator
Hannah Merges	2025 California Sea Grant Fellow

## 5.2 Tribal Partners

Table 5.2: Tribal partners listed in ascending order by Affiliation. We are appreciative and grateful for Meyo Marrufo and Shasta Gaughen who invested time to provide us early feedback on the content of the [Tribal Water Data Initiatives Webpage](#), the [Tribal Water Data Map](#), and this [Manual](#).

Name	Title	Affiliation
Sarah Ryan	Environmental Director	Big Valley Band of Pomo Indians, Environmental Protection Department ( <a href="#">Big Valley EPA</a> )
Meyo Marrufo	Former Environmental Director	Guidiville Rancheria
Shasta Gaughen	Director	Pala Band of Mission Indians, Environmental Department ( <a href="#">PED</a> )

We also regularly receive critical feedback from the California Issues Workgroup of the US EPA Region 9 Regional Tribal Operations Committee ([RTOC](#)). See the [Resource Chapter](#) of this User Manual for past presentations.

### **5.3 Former OIMA Fellows**

Name	Title	Fellowship Period
Kevin Song	Stanford Fellow	Summer 2024
Daly Wettermark	Stanford Fellow	Summer 2024
Leah Benton	CivicSpark Fellow	2023-2024
Josh Davenport	Stanford Fellow	Summer 2023
Badhia Yunes Katz	CivicSpark Fellow	2022-2023

# 6 Contributing

## 6.1 Who can contribute

Currently, only members of the OIMA Team are able to make *edits* to this User Manual and the Map, however we are always looking for feedback!

! We want your feedback!

If you have recommendations for improvement related to the Map or this User Manual you can send it to us by:

- Completing the [Tribal Water Data Map Survey](#), OR
- Emailing Anna Holder at: [anna.holder@waterboards.ca.gov](mailto:anna.holder@waterboards.ca.gov), OR
- Submitting a [GitHub Issue](#)
  - Note this requires the individual to have a GitHub Account.
  - If you would like to create a GitHub Account, complete Step 3 in the [Setup Section](#) below; no other steps need to be completed to submit an Issue.

## 6.2 How we contribute at OIMA

We develop the content for this User Manual using RStudio, build the book using [Quarto](#) (via RStudio), and collaborate and publish using GitHub (also via RStudio).

### 6.2.1 Setup

To contribute, OIMA Team members must do the following, and it should only take about 20 minutes to complete:

#### 1. Install R and RStudio

Both R and RStudio should be available in the Software Center (for Windows 10) or Company Portal (for Windows 11) – if you don't see them in your Software Center/Company

Portal or you have issues/questions during the installation process, please send a request to the DIT HelpDesk and they can help you install them.

Also see these [step by step instructions on how to install these programs](#) – you will only need to go through steps 1 and 2

If you are new to R, it would also be helpful if you could review the [Getting Started Module](#) so you can begin to familiarize yourself with the fundamentals of the program.

## 2. Install Quarto

[Quarto download and install instructions](#)

## 3. Create a GitHub Account

[Create your free personal account GitHub account](#)

[Tips on choosing your username](#)

## 4. Download and Install Git

Follow your operating system's normal [Git installation process](#). Note: you will not see an application called Git listed but if the installation process completed it was likely successful, and we will confirm together.