

# Data Access, Management, and Visualization

Ben Brezing - DWR, SGMO



# Data Access

## CNRA Open Data Portal

- Bulk Dataset Downloads
- Data APIs
- Links to GIS Services
- Data Reports







<https://data.cnra.ca.gov>

The screenshot shows the homepage of the California Natural Resources Agency Open Data Portal. At the top left is the agency logo, and to its right are navigation links for "Open Data", "Organizations", "Topics", and "Training". Further right are links for "Log in", "Sign up", and "Contact". The main header features a large blue banner with the text "California Natural Resources Agency Open Data" and a mission statement: "Our mission is to restore, protect and manage the state's natural, historical and cultural resources for current and future generations." Below the banner is a search bar with the text "Get started by searching from 24584 datasets and maps from across California" and a search button labeled "Search Datasets". To the right of the search bar is a link to "Advanced Search Terms for more specific results". Below the search bar is a "Topics" section with the text "As datasets are published, they are tagged with categories so you can learn about popular topics. Explore them below." and four topic cards: "Oceans" (with a sun and waves icon), "Land Management" (with a tree and mountain icon), "Water" (with a water drop icon), and "Wildlife" (with a bear and tree icon).



# Data Access

## Data and Resources

-  **Stations** 🔥  
Station - Groundwater well location inform
-  **Measurements** 🔥  
Measurements - Groundwater level time s
-  **Well Perforations** 🔥  
Well Perforation data is not available for al
-  **Bulk Data Download** 🔥  
Zip file containing all resources from Perio
-  **Change Log**  
Text file containing a record of schema ch
-  **Link to spatial data resources** 🔥  
Links to spatial data resources for the gro

## Groundwater Levels

Available on Open Data at

<https://data.cnra.ca.gov/dataset/periodic-groundwater-level-measurements>



## California Statewide Groundwater Elevation Monitoring (CASGEM)

Collaboration between local monitoring entities (MEs) and DWR - Voluntary program



## Sustainable Groundwater Management Act (SGMA) Portal's Monitoring Network Module (MNM)

Groundwater Sustainability Agencies (GSAs) are required to use the SGMA Portal to submit information required by SGMA, such as Groundwater Sustainability Plans (GSPs), and GSP monitoring data, including Groundwater Levels

Now also includes daily measurements from DWR's automated monitoring network of groundwater sites



# Data Access



## Measurements

Download

Data API

URL: <https://data.cnra.ca.gov/dataset/dd9b15f5-6d08-4d8c-bace-37dc761a9c08/resource/bfa9f262-24a1-45bd-8dc8-138bc8107266/download/measurements.csv>

Measurements - Groundwater level time series measurements

Data Table

Fullscreen

Embed

site\_code:

320000N1140000W001

Add Filter

Show 10 entries

Hide/Unhide Columns

Export

Search:

Showing 1 to 10 of 49 entries (filtered from 5,668,886 total entries)

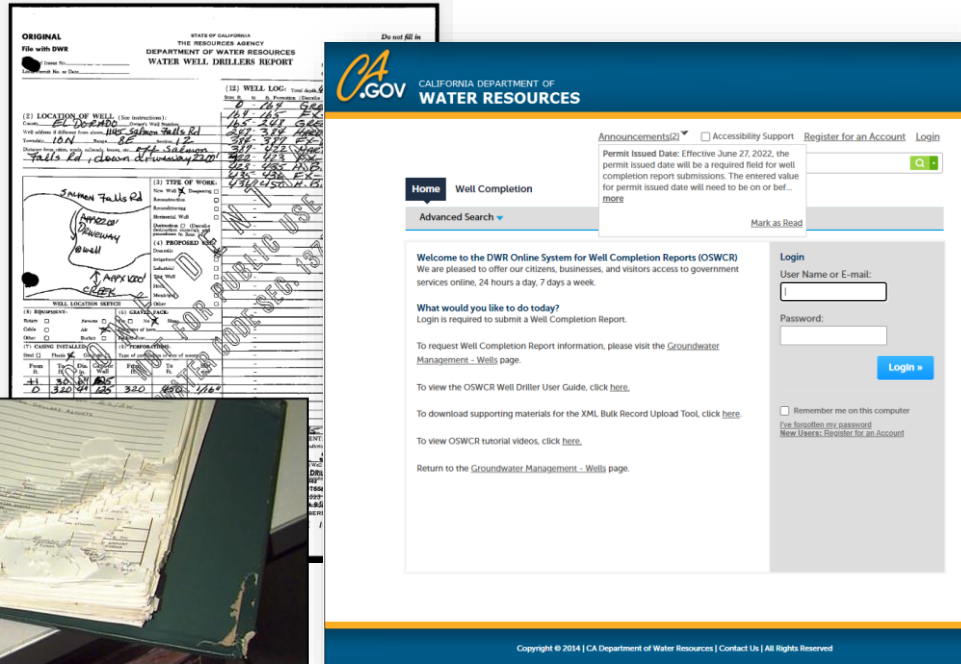
site_code	msmt_date	wlm_rpe	wlm_gse	gwe	gse_gwe	wlm_qa_desc	wlm_qa_detail	wlm_mthd_desc	wlm_acc_desc	wlm_org_name	coop_org_name	monitoring_program
320000N1140000W001	2023-11-30T14:59:00	545.92	545.92	122.82	423.1	Good		Electric sounder measurement	0.01 Ft	Monterey Peninsula Water Management District	Monterey Peninsula Water Management District	VOLUNTARY
320000N1140000W001	2023-10-26T16:08:00	545.92	545.92	162.42	383.5	Good		Electric sounder measurement	0.01 Ft	Monterey Peninsula Water Management District	Monterey Peninsula Water Management District	VOLUNTARY
320000N1140000W001	2023-09-28T00:00:00	545.92	545.92	160.92	385.0	Good		Electric sounder measurement	0.01 Ft	Monterey Peninsula Water Management District	Monterey Peninsula Water Management District	VOLUNTARY
320000N1140000W001	2023-08-31T00:00:00	545.92	545.92	168.92	377.0	Good		Electric sounder measurement	0.01 Ft	Monterey Peninsula Water Management District	Monterey Peninsula Water Management District	VOLUNTARY



# Data Access

## Well Completion Reports

- Tabular Dataset and PDFs available on Open Data



<https://data.cnra.ca.gov/dataset/well-completion-reports>

### Data and Resources

**Well Completion Reports** 🔥  
This Well Completion Report dataset represents an index of records from the California Department...

**Well Numbers** 🔥  
Table of state and local well numbers that are stored in OSWCR

**Geologic Logs - Free Form** 🔥  
OSWCR provides three different methods to enter

**Geologic Logs - Quick Pick** 🔥  
OSWCR provides three different methods to enter

**Geologic Logs - USCS/ASTM D2488** 🔥  
OSWCR provides three different methods to enter

**Geologic Logs - Generalized Lithology**  
This table provides generalized lithology descriptions

**Casing Data**  
Casing data that have been entered into OSWCR

**Annular Material Log**  
Annular fill data that have been entered into OSWCR including the Fill Type and Fill Type Details.

**Borehole Information**  
Diameter of the boreholes and the depth range over which that diameter applies

WCRNUMBER	INTERVALSTART	INTERVALEND	DESCRIPTION
WCR2018-011445	80	90	green clay
WCR2018-011445	90	100	clay/sand
WCR2018-011445	100	120	sand
WCR2018-011445	120	130	clay
WCR2018-011445	130	140	sand
WCR2018-011445	140	210	clay/sand
WCR2018-011445	210	220	sand/gravel
WCR2018-011445	220	230	clay
WCR2018-011445	230	240	clay/sand
WCR2018-011445	240	250	sand

### Geologic Logs - Free Form





# Data Access

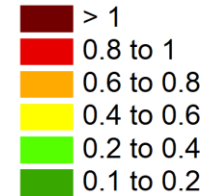
Dataset and Reports Available on Open Data at  
<https://data.cnra.ca.gov/dataset/tre-altamira-insar-subsidence>

## TREA InSAR Subsidence Data

- Monthly timesteps
- Cumulative Displacement since June 2015
- Annual Displacement since January 2015
- 100x100 meter resolution
- GIS Raster Image services

### Vertical Displacement Rate

Subsidence (ft/yr)

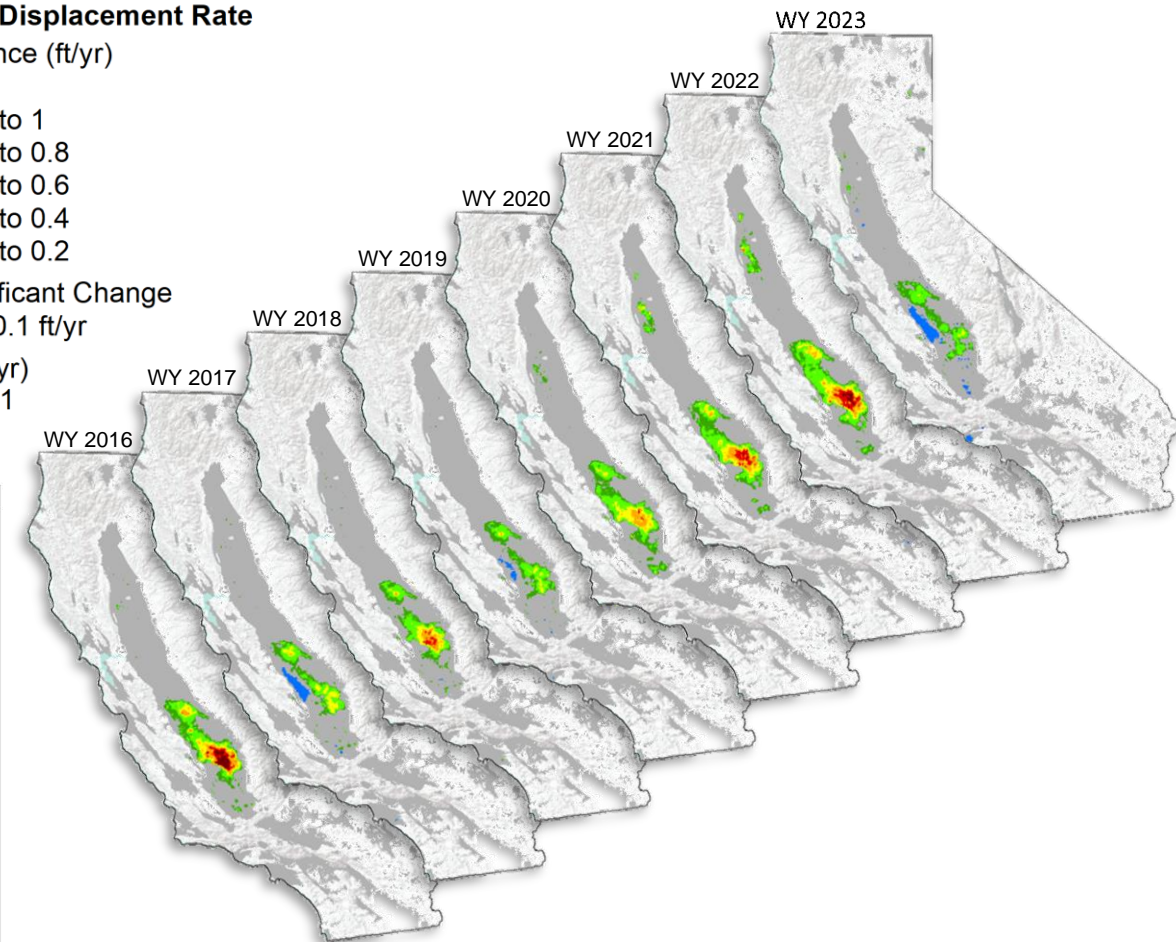
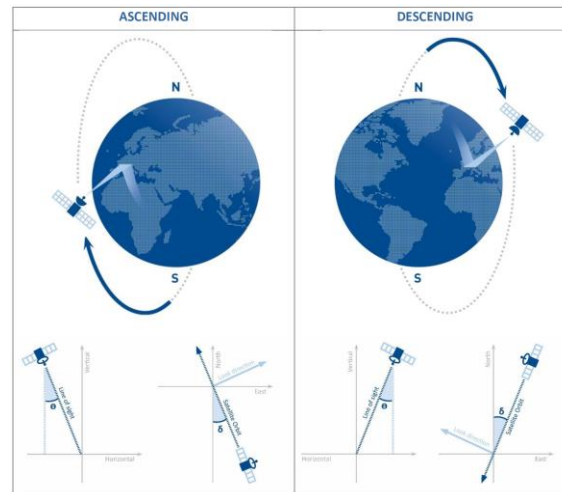


No Significant Change

<  $\pm 0.1$  ft/yr

Uplift (ft/yr)

> 0.1



TREA, 2023



# Data Access

<https://data.cnra.ca.gov/dataset/aem>



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[Home](#) / [Organizations](#) / [California Department of...](#) / **DWR Airborne Electromagnetic (AEM) Surveys Data**

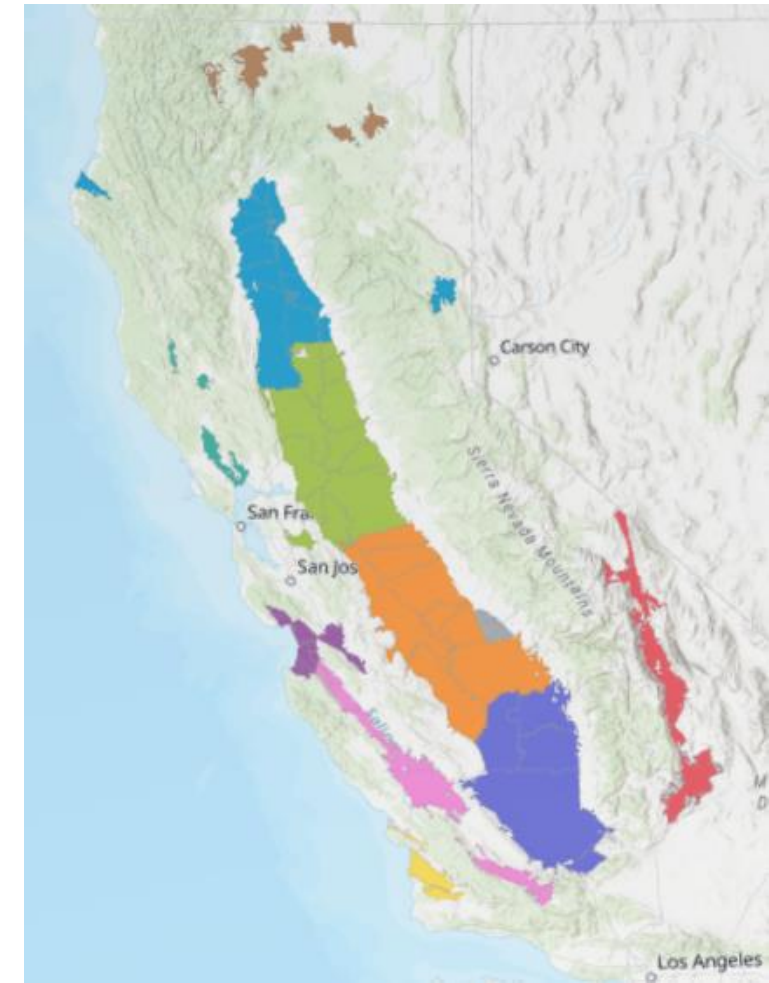
## DWR Airborne Electromagnetic (AEM) Surveys Data

### AEM Datasets

- Raw AEM Data
- Processed AEM Data
- Inverted AEM Data
- Inverted AEM Data Uncertainty Analysis
- Interpreted AEM Data (for coarse fraction)
- Interpreted AEM Data Uncertainty Analysis

### Supporting Datasets

- Flown Survey Lines
- Digitized Lithology Logs
- Digitized Geophysical Logs



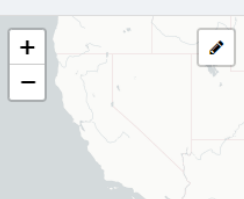
CALIFORNIA DEPARTMENT OF WATER RESOURCES  
SUSTAINABLE GROUNDWATER  
MANAGEMENT OFFICE

# Data Access



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Filter by location [Clear](#)



© [OpenStreetMap](#) contributors,  
© [Carto](#)  
© [OpenStreetMap](#) contributors, © [Carto](#)

### Organizations

Ocean Data Partners **13178**

California Department of Water Resources **1457**

Water Data Partners **1071**

California Department of Water Resources **431**

California Energy Commission **114**

California Department of Water Resources **91**

National Oceanic and Atmospheric Administration **78**

United States Geological Survey **69**

California Department of Water Resources **54**

California State Water Resources Control Board **47**

[Advanced Search Terms](#)

C2VSim



## 16,736 datasets found for "C2VSim"

Order by: [Relevance](#)



### C2VSimFG Stream Observations

The data set contains observed streamflow data locations at stream gages in the Sacramento and San Joaquin Valley compared with the C2VSimFG simulated streamflow in the...

[HTML](#) [ArcGIS GeoServices REST API](#)



### C2VSimFG Subsidence Observations

The data set is used as the C2VSimFG observed subsidence data to compare with the simulated subsidence data to evaluate the impact on subsidence, groundwater budgets, and...

[HTML](#) [ArcGIS GeoServices REST API](#)



### C2VSimCG v1.0

(Released November 17, 2022) The California Central Valley Groundwater–Surface Water Simulation Model - Coarse Grid (C2VSimCG) is an integrated hydrologic model that simulates...

[PDF](#) [ZIP](#)



### C2VSimCG R374\_rev

A new version of the C2VSimCG model is available here (<https://data.cnra.ca.gov/dataset/c2vsimcg-v1-0>) Revised version of the C2VSimCG R374 (released April 27, 2018). Coarse...

[PDF](#) [ZIP](#) [MSI](#) [WMV](#)





# Data Access



## Bulletin 118 Update 2003 - Basin Reports (formerly known as Basin Descriptions)

This dataset includes the basin reports for the 515 groundwater basins developed as part of Bulletin 118 Update 2003. The reports include descriptions of basin boundaries, summaries of the hydrologic and hydrogeologic setting, groundwater storage capacity and water budget, groundwater level and quality trends, well yields, basin management, and references.

**Organization**



**California Department of Water Resources**









DWR manages California's water resources, systems, and infrastructure, including the State Water Project (SWP), in a responsible, sustainable way.

[read more](#)

**Social**

Twitter

### Data and Resources

-  **Bulletin 118 Update 2003 - Basin Report 1\_001**  
This file contains the basin report (formerly known as basin description) for...
-  **Bulletin 118 Update 2003 - Basin Report 1\_002\_01**  
This file contains the basin report (formerly known as basin description) for...
-  **Bulletin 118 Update 2003 - Basin Report 1\_002\_02**  
This file contains the basin report (formerly known as basin description) for...
-  **Bulletin 118 Update 2003 - Basin Report 1\_003**  
This file contains the basin report (formerly known as basin description) for...
-  **Bulletin 118 Update 2003 - Basin Report 1\_004**  
This file contains the basin report (formerly known as basin description) for...
-  **Bulletin 118 Update 2003 - Basin Report 1\_005**  
This file contains the basin report (formerly known as basin description) for...
-  **Bulletin 118 Update 2003 - Basin Report 1\_006**  
This file contains the basin report (formerly known as basin description) for...
-  **Bulletin 118 Update 2003 - Basin Report 1\_007**  
This file contains the basin report (formerly known as basin description) for...

Tulare Lake Hydrologic Region  
San Joaquin Valley Groundwater Basin

California's Groundwater  
Bulletin 118

### San Joaquin Valley Groundwater Basin Tule Subbasin

- Groundwater Basin Number: 5-22.13
- County: Tulare
- Surface Area: 467,000 acres (733 square miles)

#### Basin Boundaries and Hydrology

The San Joaquin Valley is surrounded on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The northern portion of the San Joaquin Valley drains toward the Delta by the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin including the beds of the former Tulare, Buena Vista, and Kern Lakes.

The Tule Groundwater Subbasin is generally bounded on the west by the Tulare County line, excluding those portions of the Tulare Lake Subbasin Water Storage District and Sections 29 and 30 of Township 23 South, Range 23 East, that area west of the Homeland Canal. This boundary is shared with the Tulare Lake Groundwater Subbasin. The northern boundary of the subbasin follows the northern boundaries of Lower Tule Irrigation District and Porterville Irrigation District and is shared with the Kaweah Groundwater Subbasin. The eastern boundary is at the edge of the alluvium and crystalline bedrock of the Sierra Nevada foothills, and the southern boundary is the Tulare-Kern County line and is shared with the Kern County Groundwater Basin

West-flowing Tule River, Deer Creek and the White River are the major drainages in the subbasin which empty into the Tulare lakebed. Annual average precipitation is seven to 11 inches, increasing eastward.

#### Hydrogeologic Information

The San Joaquin Valley represents the southern portion of the Great Central Valley of California. It is a structural trough up to 200 miles long and 70 miles wide filled with up to 32,000 feet of marine and continental sediments



# Data Access



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Benjamin Brezing

[Home](#) / [Organizations](#) / [California Department of...](#) / **DWR's Basin Characterization Program**

## DWR's Basin Characterization Program

PRIVATE

DWR has a long history of studying and characterizing California's groundwater aquifers as a part of California's Groundwater (Bulletin 118). Groundwater aquifers, where water is stored underground, provide approximately 40 percent of the State's total water supply during an average year and up to 60 percent in dry years. California's groundwater aquifers are categorized into a total of 515 groundwater basins and subbasins. The Basin Characterization Program provides the latest data and information about California's groundwater basins to help local communities better understand their aquifer systems and support local and statewide groundwater management.

All data, reports, analysis tools and maps and models will be publicly shared on this Open Data Portal website.



[Dataset](#) [Topics](#) [Showcases](#) [Activity Stream](#)

[Manage](#)

### Data and Resources



#### Data Viewers

AEM 3D Viewer (Beta) The AEM 3D Viewer shows AEM electrical resistivity...

[Explore](#)

[aquifers](#)

[geophysical logs](#)

[geophysics](#)

[hydrostratigraphic ...](#)

[lithology logs](#)

[texture model](#)



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# Visualization



Updates



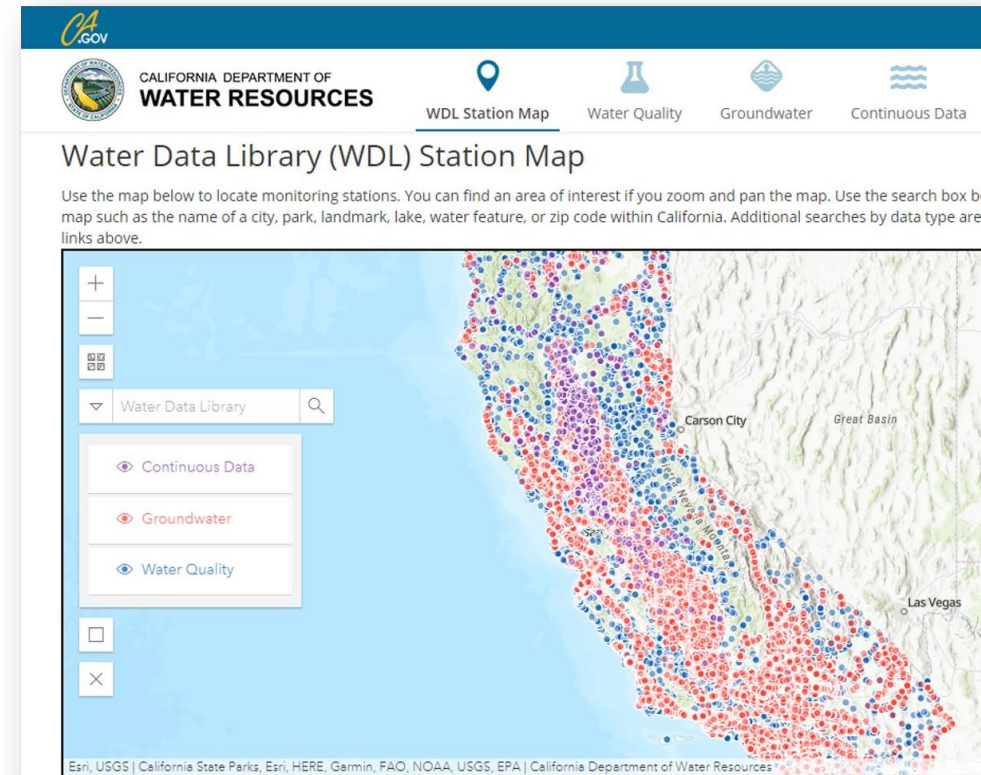
# Visualization

## Water Data Library

DWR environmental parameter databases:

- Water Quality Field and Lab sample data
- Groundwater Levels (CASGEM/SGMA, manual measurements)
- Continuous (automated/high-frequency) water level, water quality data

<https://wdl.water.ca.gov>

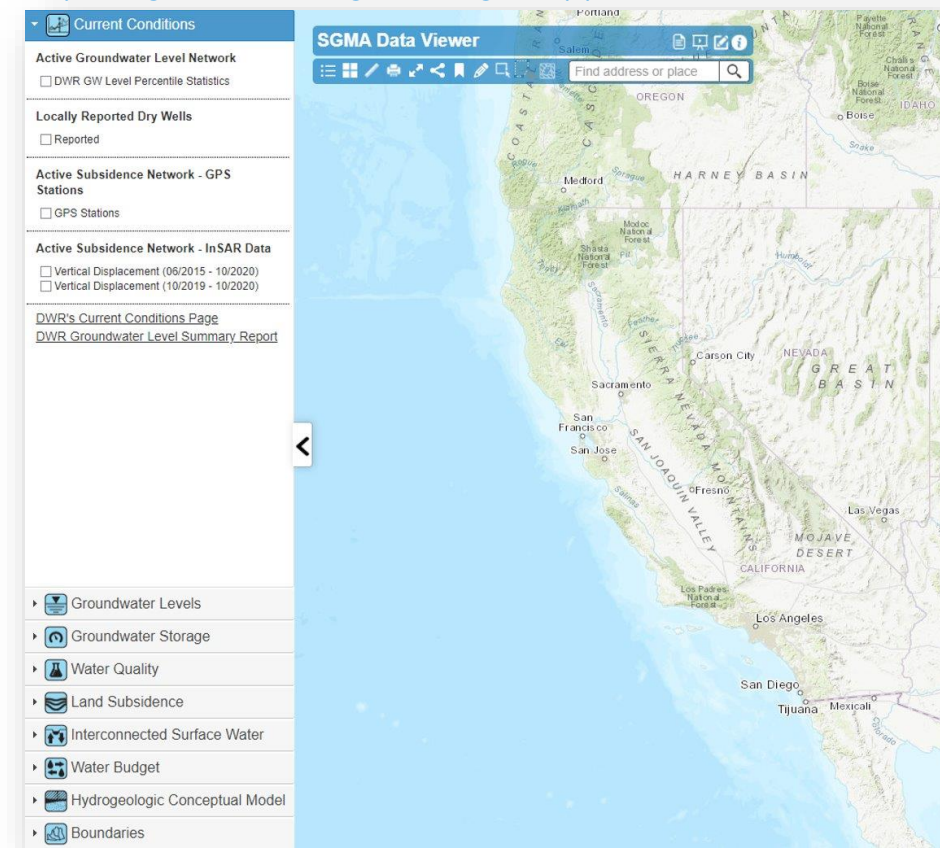


# Visualization

## SGMA Data Viewer

- Developed as part of DWR's technical assistance to Groundwater Sustainability Agencies (GSAs), other water managers, and the public
- Provides access to groundwater related datasets (from DWR and other sources) that are organized by the requirements of SGMA and the Groundwater Sustainability Plan (GSP) regulations for the purpose of supporting GSP development and implementation
- Indented users: practitioners, technical audience

<https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer>





# Visualization

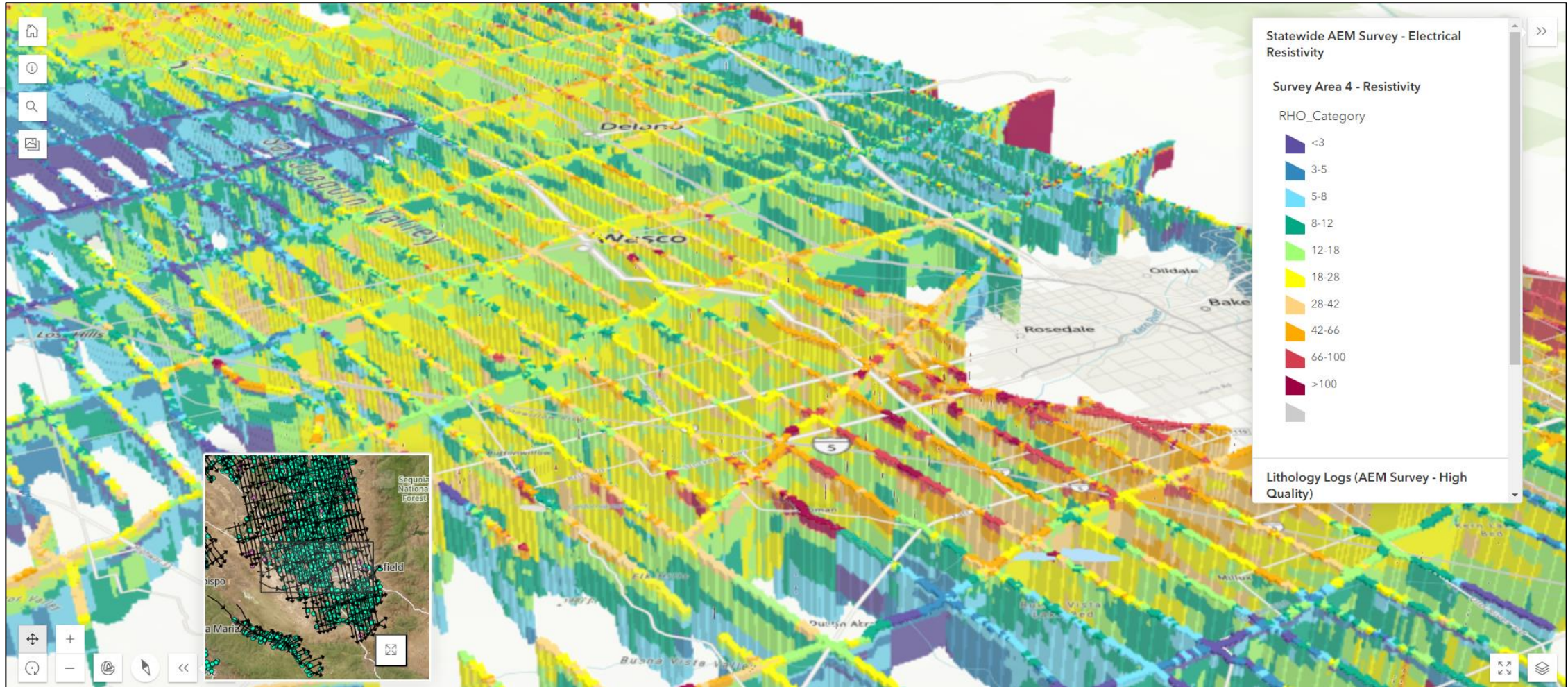
## CalGW Live

- Provides latest groundwater information, live statistics and a series of interactive dashboards
- Indented users: General public

<https://sgma.water.ca.gov/CalGWLIVE/>

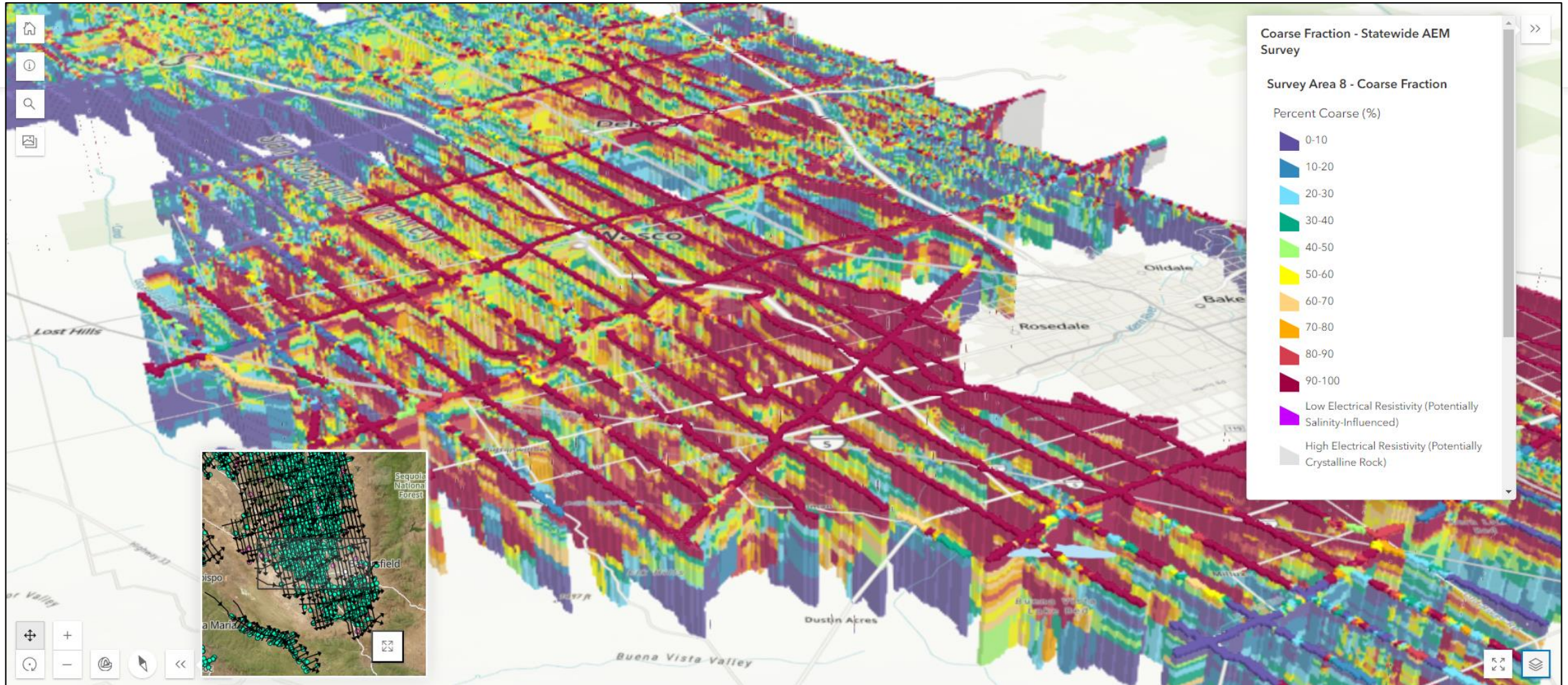


# Visualization - AEM 3D Viewer

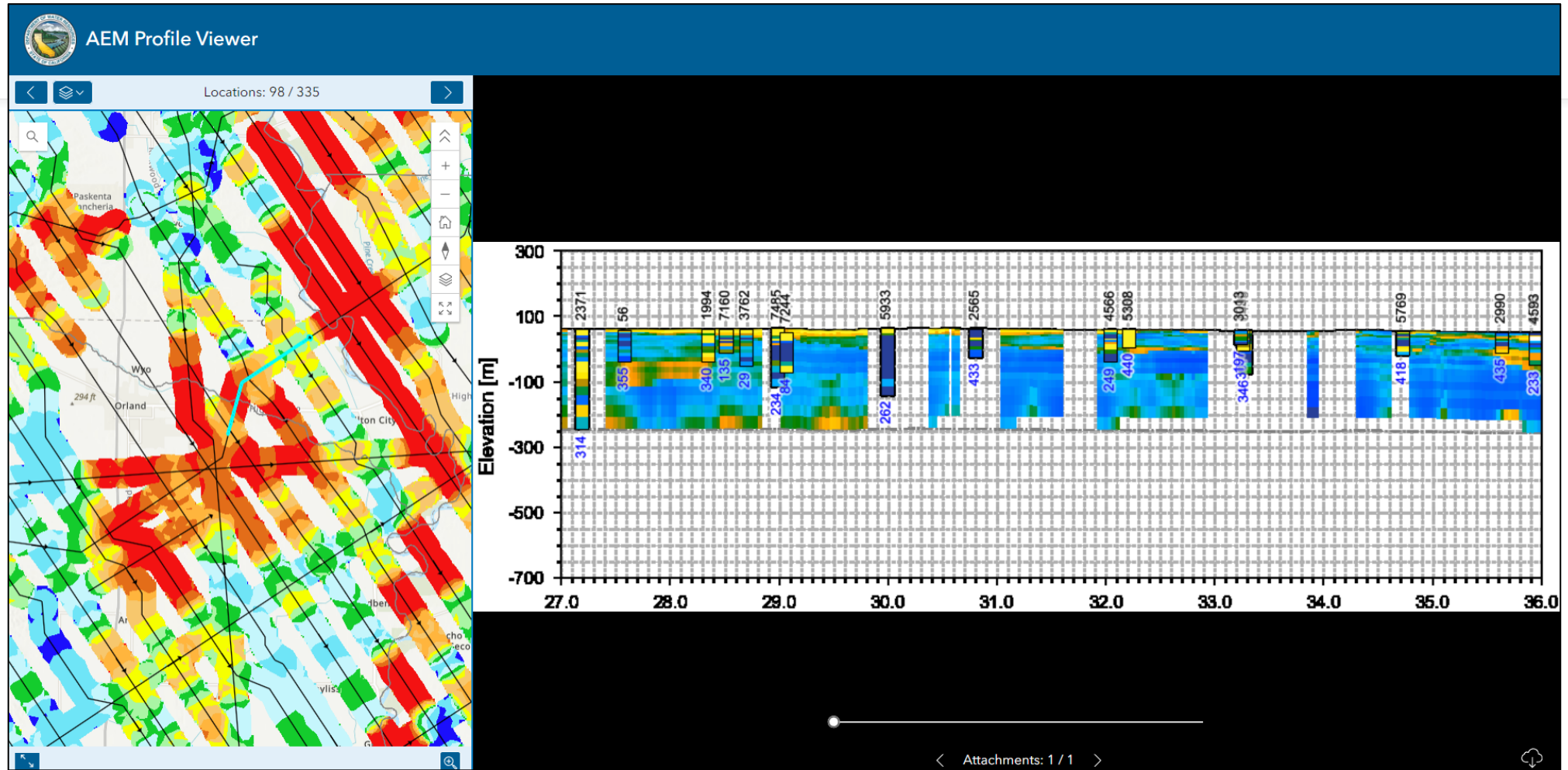




# Visualization - AEM 3D Viewer

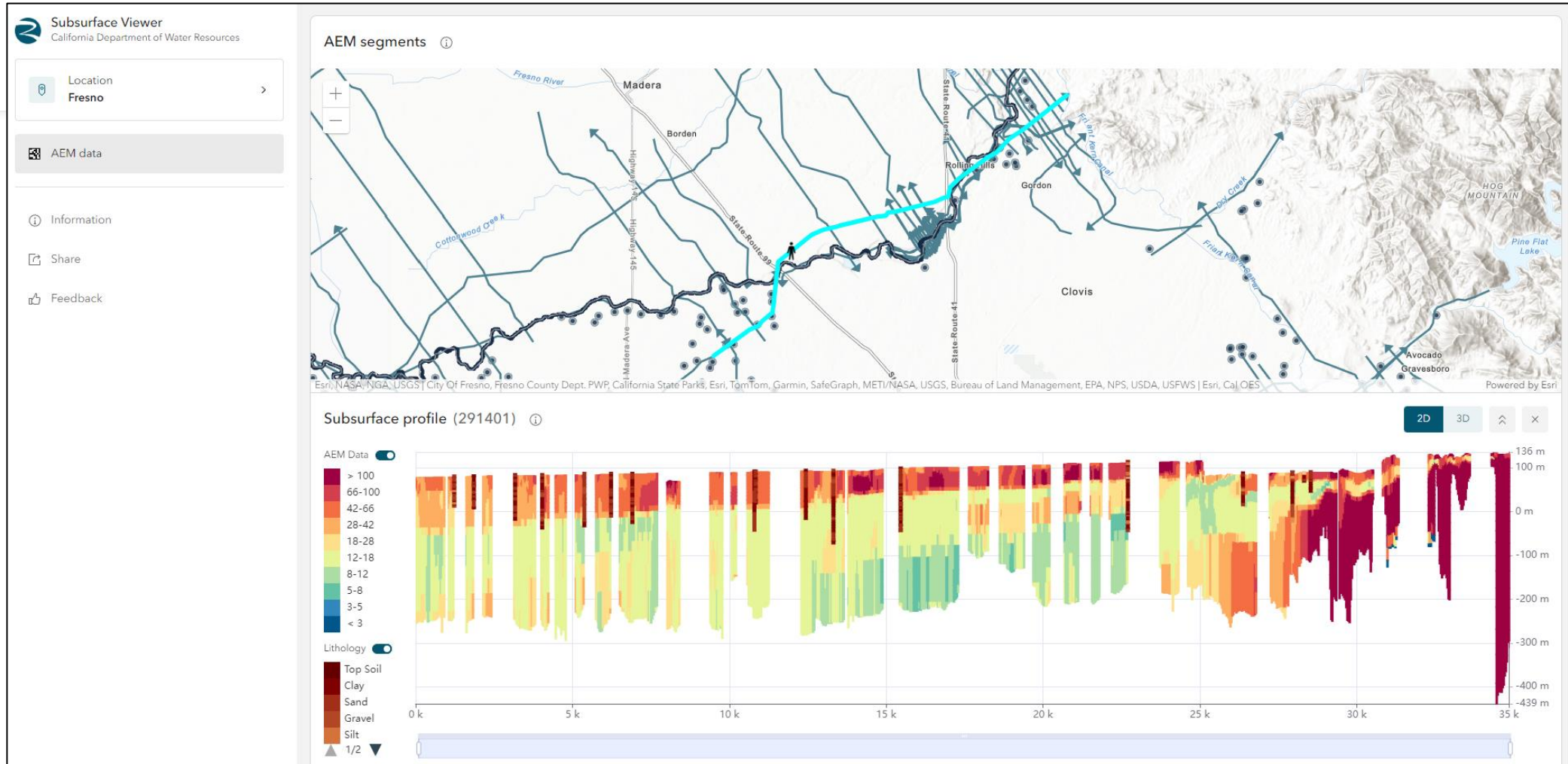


# Visualization - AEM Profile Viewer



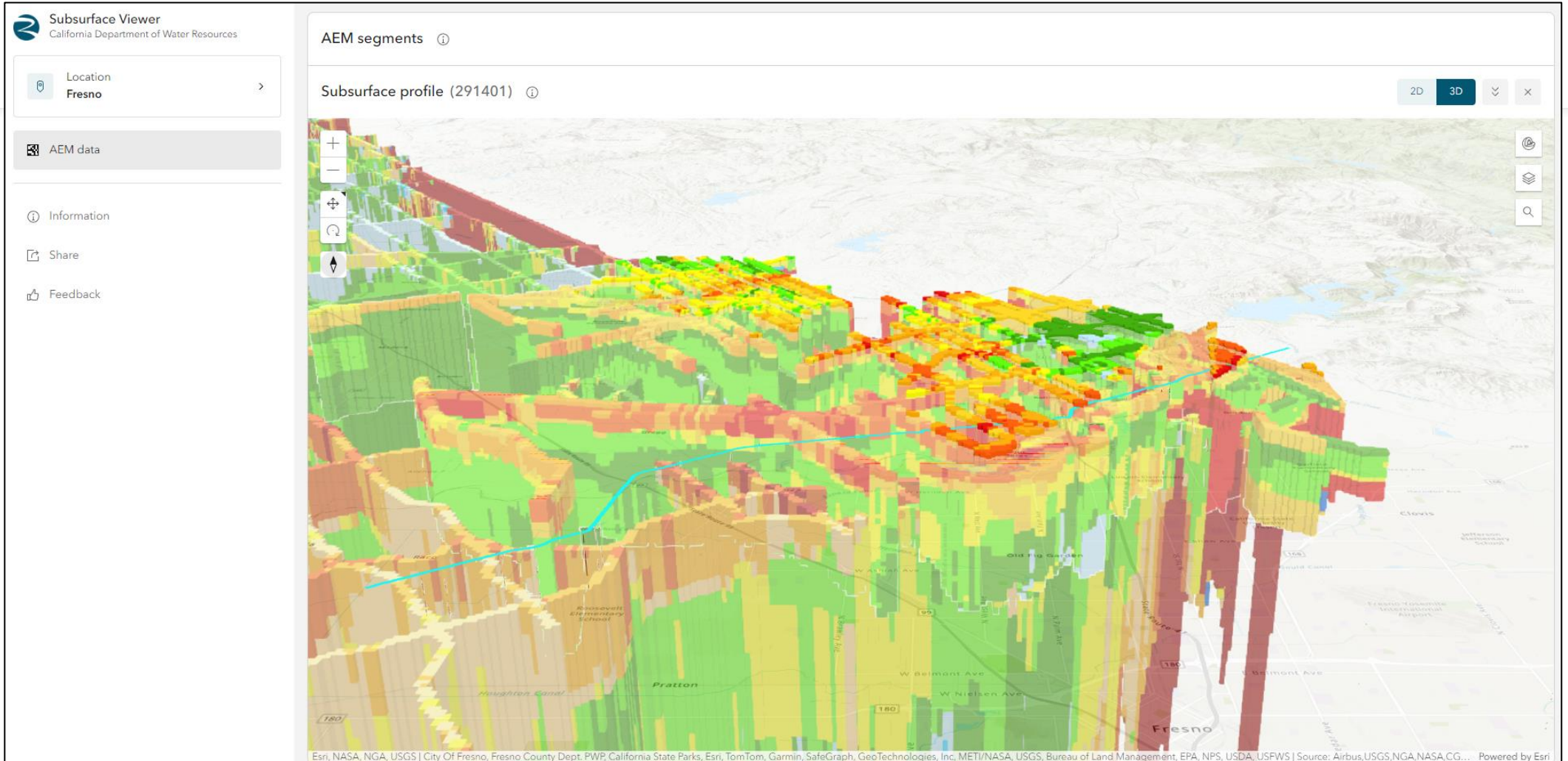


# Visualization - Dev AEM Viewer





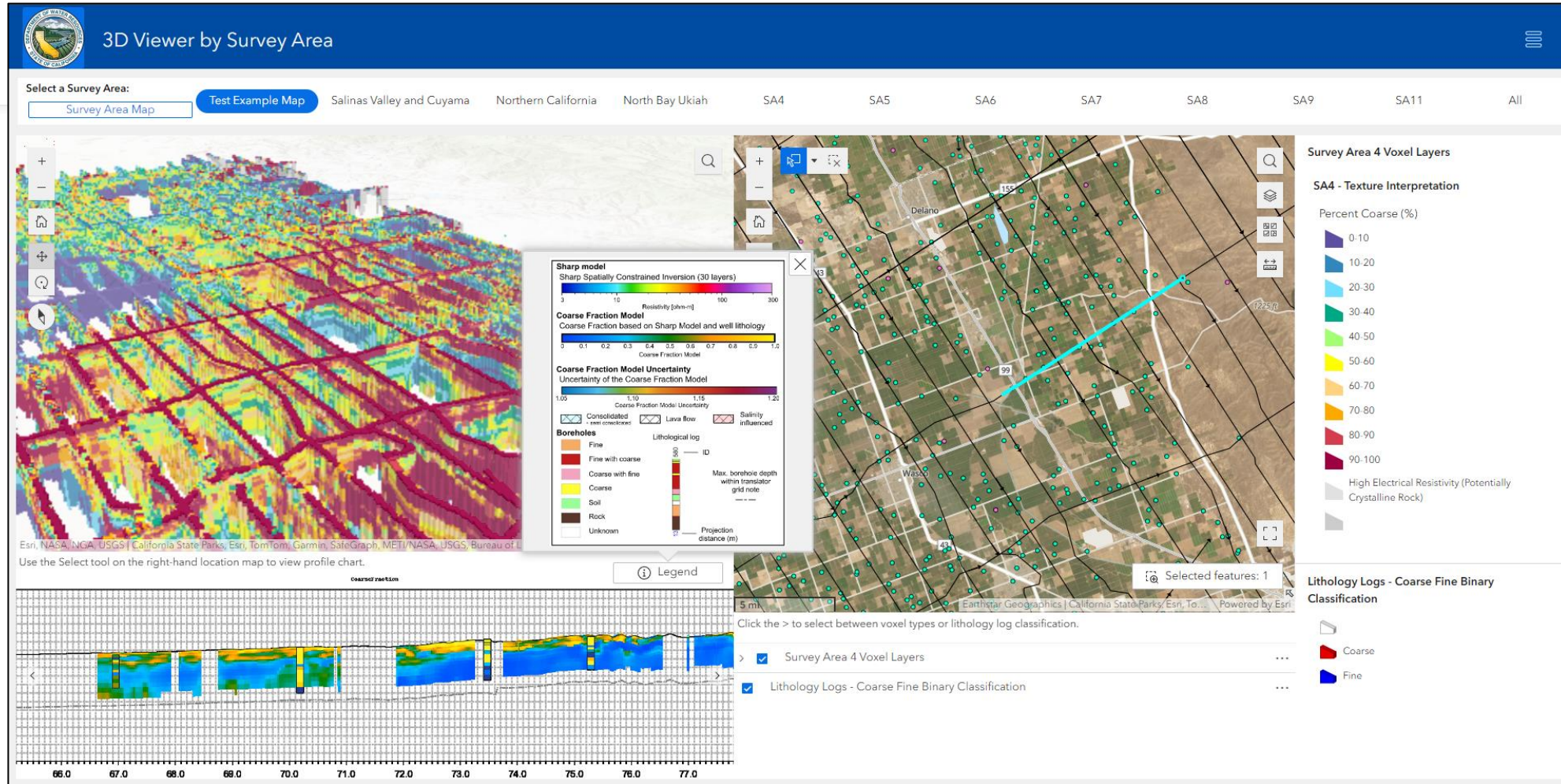
# Visualization - Dev AEM Viewer



Esri, NASA, NGA, USGS | City Of Fresno, Fresno County Dept. PWP, California State Parks, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS | Source: Airbus,USGS,NGA,NASA,CG... Powered by Esri



# Visualization - In-house Dev AEM Viewer





# SGMA Data Viewer Updates

- New Basin Characterization tab that displays maps and datasets that are related to DWR's Basin Characterization Program.
- Sections within the tab are structured to show maps and data related to Hydrogeologic Conceptual Models, Geologic Maps, and Lithology and Geophysical Data.

The screenshot displays the SGMA Data Viewer interface. The main menu on the left includes: Current Conditions, Groundwater Levels, Groundwater Storage, Water Quality, Land Subsidence, Interconnected Surface Water, Water Budget, and Basin Characterization (selected). The Basin Characterization tab is expanded to show several sections:

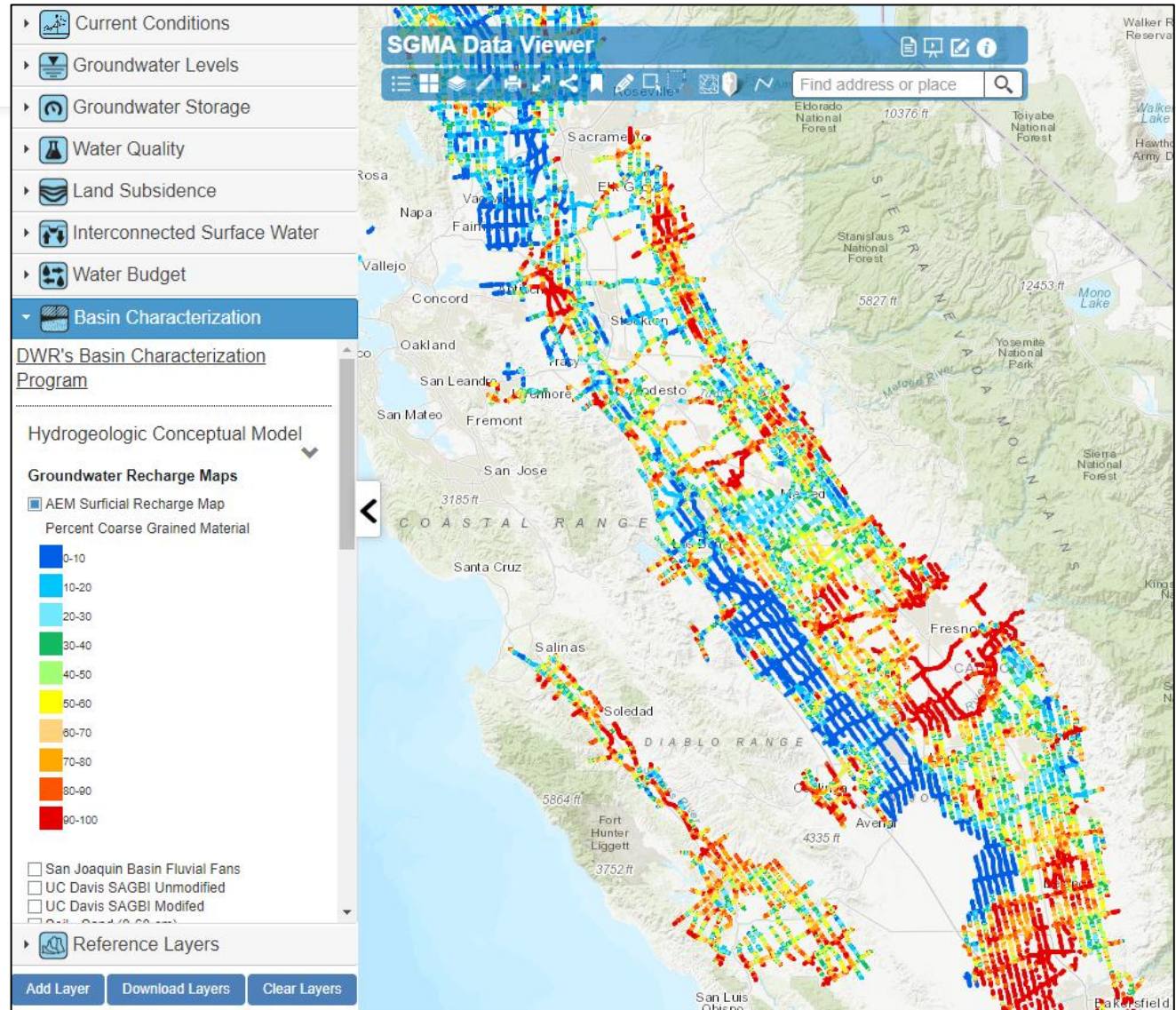
- DWR's Basin Characterization Program**
  - Hydrogeologic Conceptual Model
  - Groundwater Recharge Maps
    - AEM Surficial Recharge Map
    - San Joaquin Basin Fluvial Fans
    - UC Davis SAGBI Unmodified
    - UC Davis SAGBI Modified
    - Soil - Sand (0-60 cm)
  - Regional Hydrostratigraphic Units
    - USGS Corcoran Clay (Thickness - Feet)
    - USGS Corcoran Clay (Extent)
    - USGS Corcoran Clay (Depth - Feet)
    - USGS Basement (Elevation - Meters)
  - Subsurface Texture
    - DWR AEM Surveys, Depth Slices
    - USGS CVHM2
  - Geologic Maps
    - Geologic Map
      - National Geologic Map Database MapView
      - CGS Geologic Map - 750k Generalized
    - Geologic Map - Quaternary
      - Areas Not Covered
      - Index
      - County
      - Structure Lines
      - Geology Lines
      - Geology Polygons
    - Geologic Faults
      - Fault Classification (State)
      - Faults (Regional)
      - Faults (Local)
      - Fault Classification (Local)
- Lithology and Geophysical Data
  - DWR AEM Data Viewers
  - Lithology Logs
    - Well Completion Reports
    - Other Lithology Logs
  - Borehole Geophysical Logs
    - Electrical Resistivity Logs
  - Airborne Electromagnetic (AEM) Electrical Resistivity Data
    - DWR AEM Surveys: Profile Images
    - DWR AEM Survey: Shallow Average (0-17m) Map
    - DWR AEM Surveys: Depth Slices



# SGMA Data Viewer Updates

New maps and data

- AEM Surficial Recharge Map

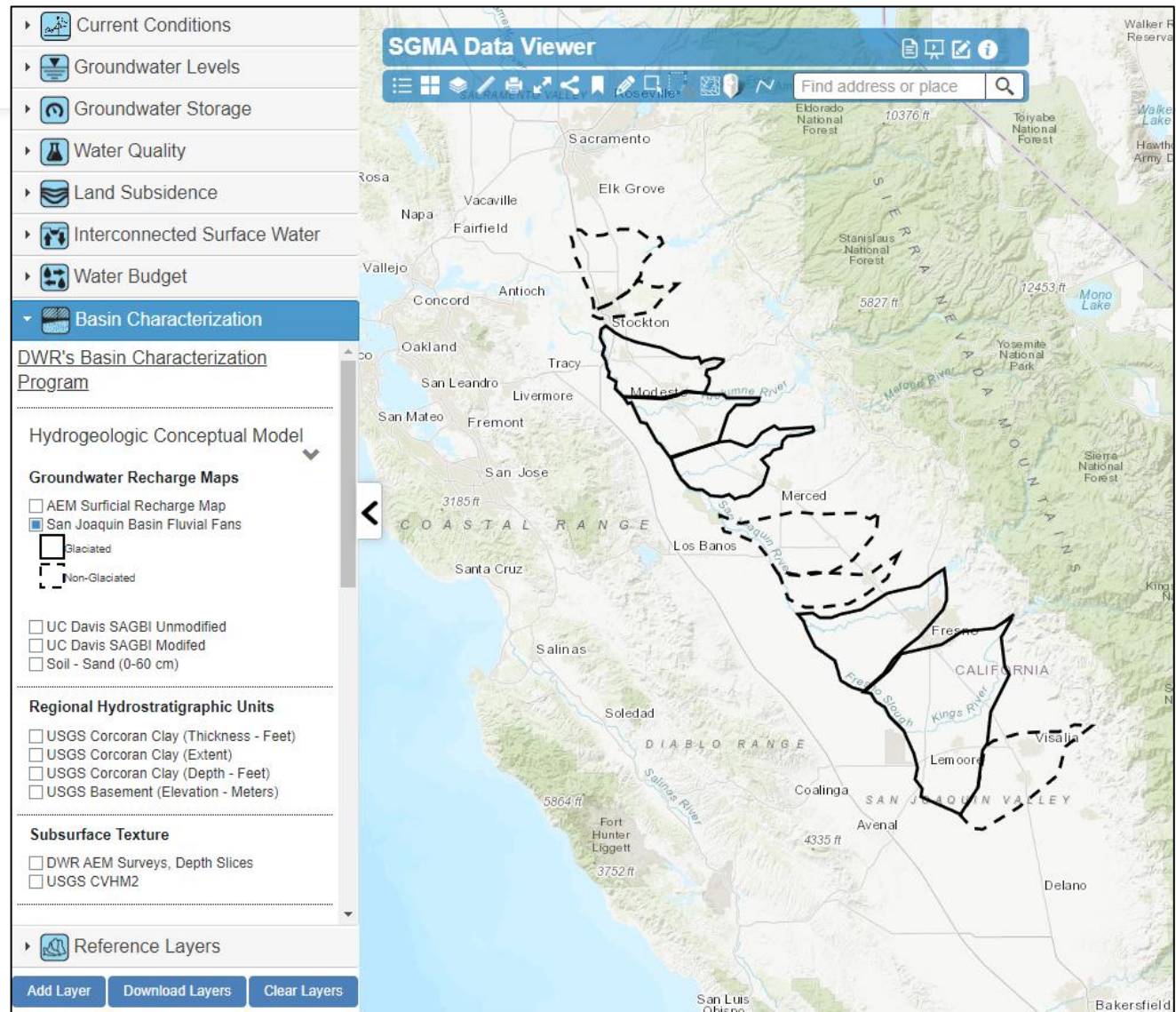




# SGMA Data Viewer Updates

New maps and data

- Locations of San Joaquin Basin Fluvial Fans

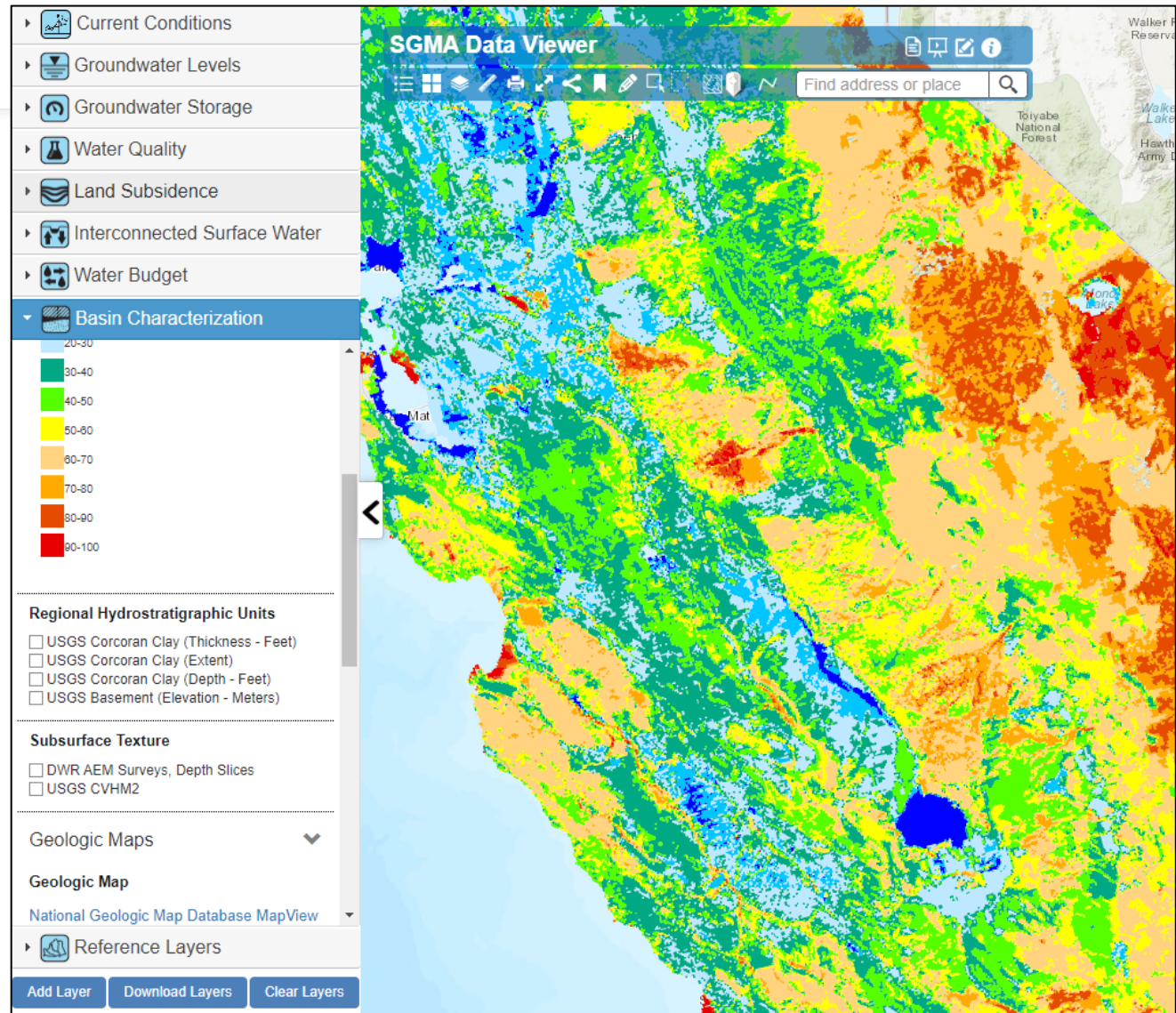




# SGMA Data Viewer Updates

New maps and data

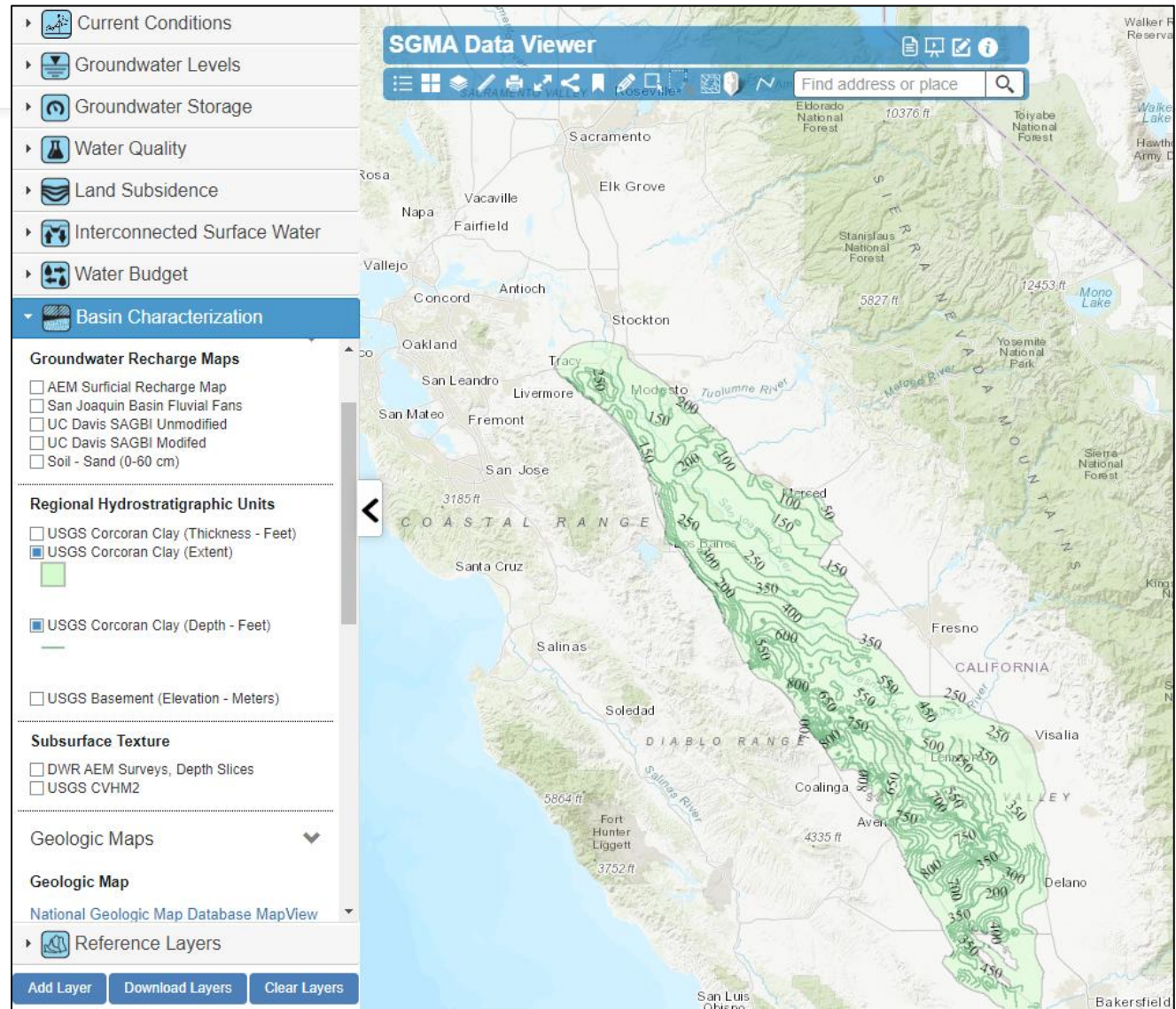
- Soil-Sand Texture (0-60 cm) map



# SGMA Data Viewer Updates

New maps and data

- USGS Corcoran Clay (thickness, depth, extent)

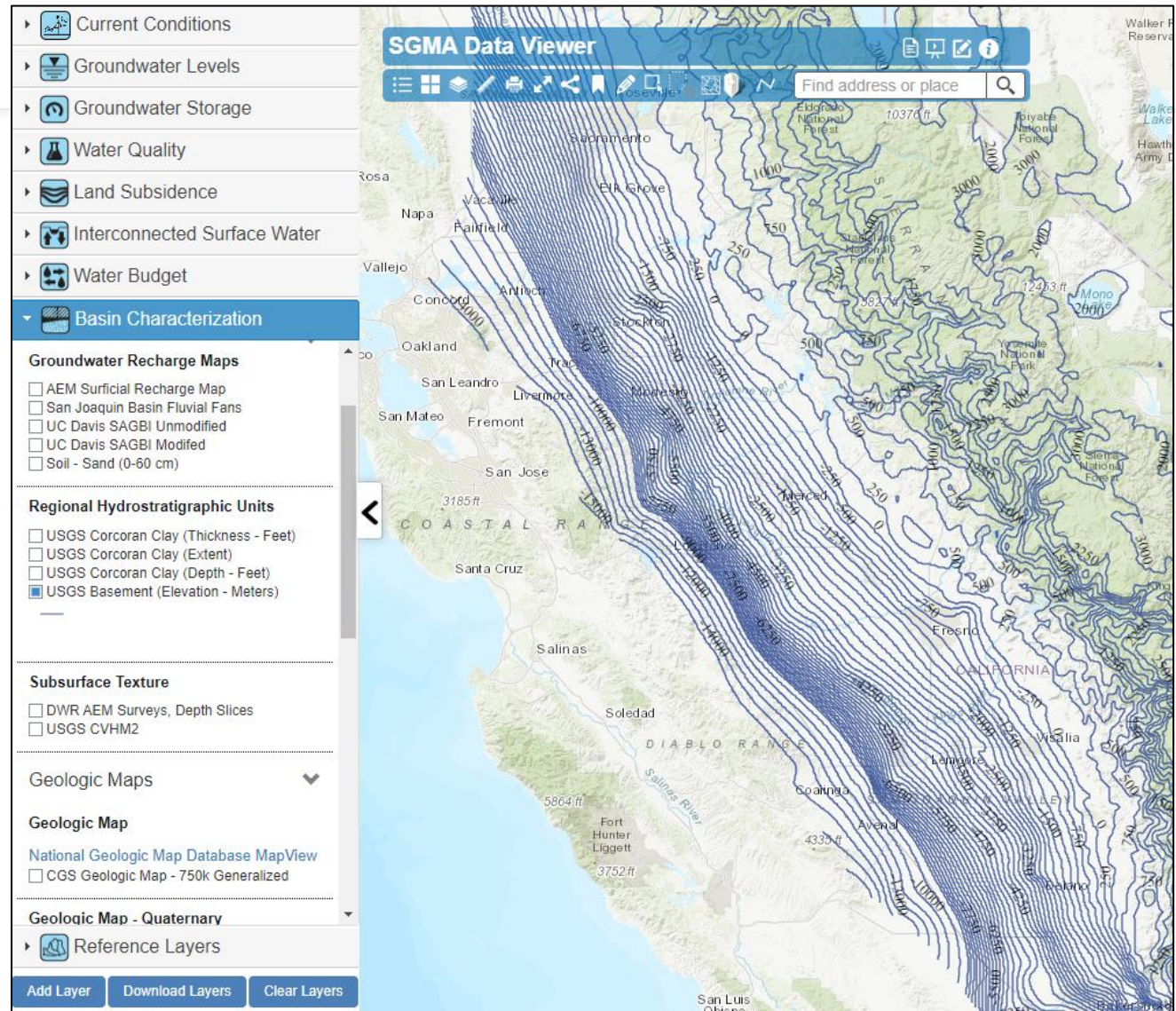




# SGMA Data Viewer Updates

New maps and data

- USGS Basement (elevation) map





# SGMA Data Viewer Updates

## Updates to DWR AEM Surveys

- Profile Images map allows users to view the AEM electrical resistivity and interpretation profiles (x-sections) within popups.



# 2D/3D Basin Characterization Viewer

- SGMA Data Viewer Modernization
  - 2D/3D, Animations, Lasers
  - CalGW Live Integration
  - Basin Reports Data
  - Outreach
    - Requirements gathering







# Thank you



Ben Brezing



[benjamin.brezing@water.ca.gov](mailto:benjamin.brezing@water.ca.gov)



<https://water.ca.gov/Programs/Groundwater-Management/Data-and-Tools>

