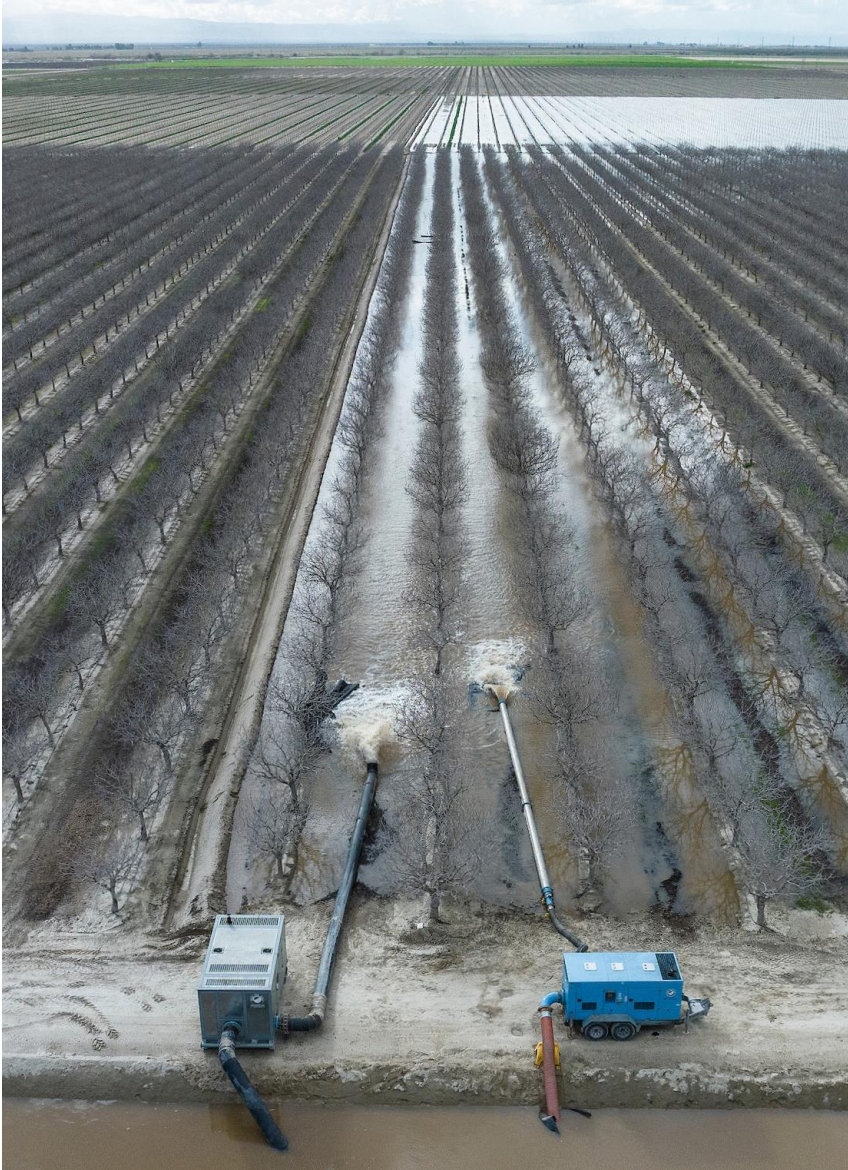


DWR Data & Tools

Ben Brezing - DWR, SGMO





Agenda

DWR Data Tools/Viewers Overview

SGMA Data Viewer & Dataset Updates





DWR Data Tools/Viewers



Overview



DWR Data Tools/Viewers Overview

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>

The screenshot shows the California Department of Water Resources (DWR) Water Data Library (WDL) Station Map interface. The header includes the CA.GOV logo, the DWR logo, and the text "CALIFORNIA DEPARTMENT OF WATER RESOURCES". Navigation links for "WDL Station Map", "Water Quality", "Groundwater", and "Continuous Data" are visible. The main content area is titled "Water Data Library (WDL) Station Map" and includes a search box and a legend. The legend shows three categories: "Continuous Data" (blue dot), "Groundwater" (red dot), and "Water Quality" (purple dot). The map displays a large number of monitoring stations across California, with a high density in the Central Valley and Southern California. The map also shows geographical features like Carson City, Great Basin, and Las Vegas. The footer of the map interface includes the text "Esri, USGS | California State Parks, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA | California Department of Water Resources".



DWR Data Tools/Viewers Overview

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>

The screenshot displays the SGMA Data Viewer web application. The interface features a search bar at the top right with the text "Find address or place" and a magnifying glass icon. Below the search bar is a map of California showing various groundwater basins and regions, including the Sacramento Valley, San Joaquin Valley, and Mojave Desert. The map is overlaid with a grid and various data points. On the left side, there is a sidebar with a "Current Conditions" section. This section includes several checkboxes and labels: "Active Groundwater Level Network" with a sub-option "DWR GW Level Percentile Statistics"; "Locally Reported Dry Wells" with a sub-option "Reported"; "Active Subsidence Network - GPS Stations" with a sub-option "GPS Stations"; and "Active Subsidence Network - InSAR Data" with sub-options "Vertical Displacement (06/2015 - 10/2020)" and "Vertical Displacement (10/2019 - 10/2020)". Below these options are two links: "DWR's Current Conditions Page" and "DWR Groundwater Level Summary Report". At the bottom of the sidebar, there is a list of data layers with expandable arrows: "Groundwater Levels", "Groundwater Storage", "Water Quality", "Land Subsidence", "Interconnected Surface Water", "Water Budget", "Hydrogeologic Conceptual Model", and "Boundaries".



DWR Data Tools/Viewers Overview

CalGW Live

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

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



DWR Data Tools/Viewers Overview

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, there is a navigation bar with the CNRA logo, the text "CALIFORNIA NATURAL RESOURCES AGENCY", and links for "Open Data", "Organizations", "Topics", and "Training". On the right side of the navigation bar 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 sub-header "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 input field 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).





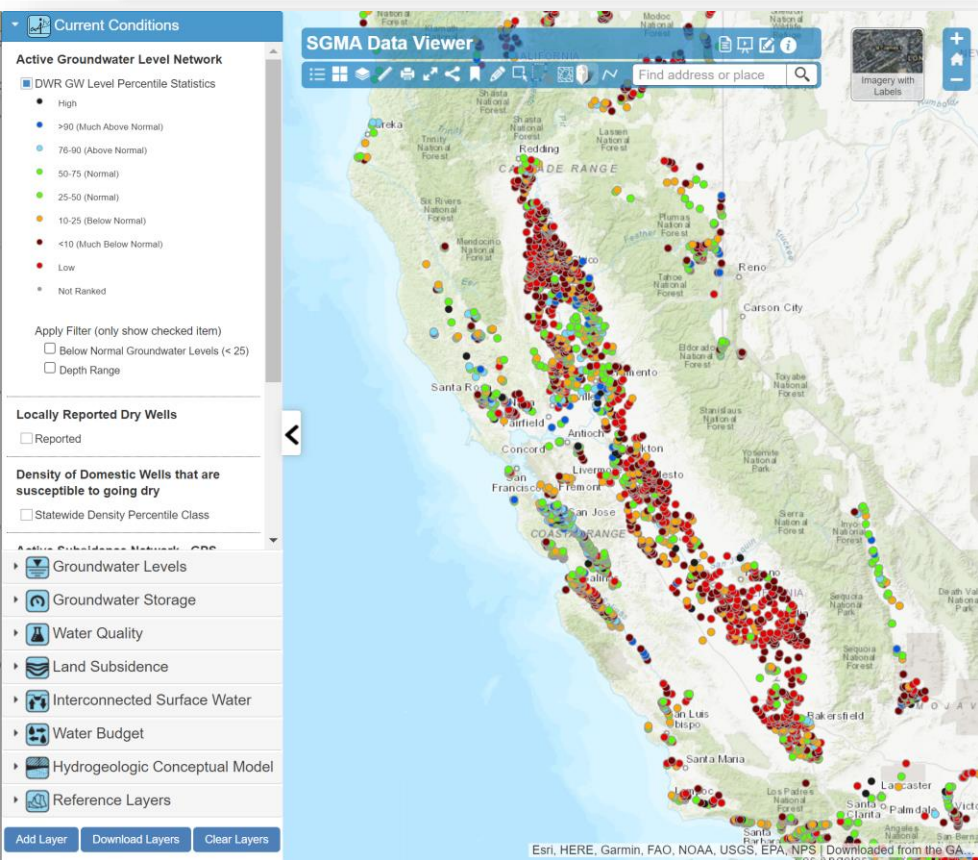
SGMA Data Viewer & Datasets



Updates

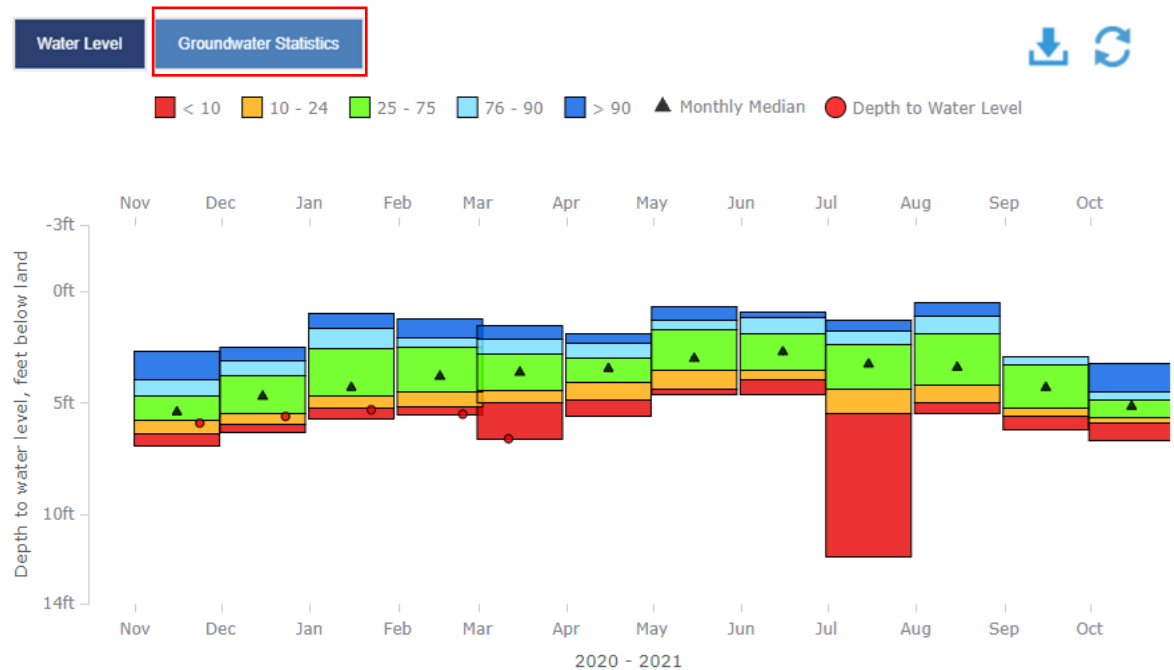


SGMA Data Viewer & Dataset Updates

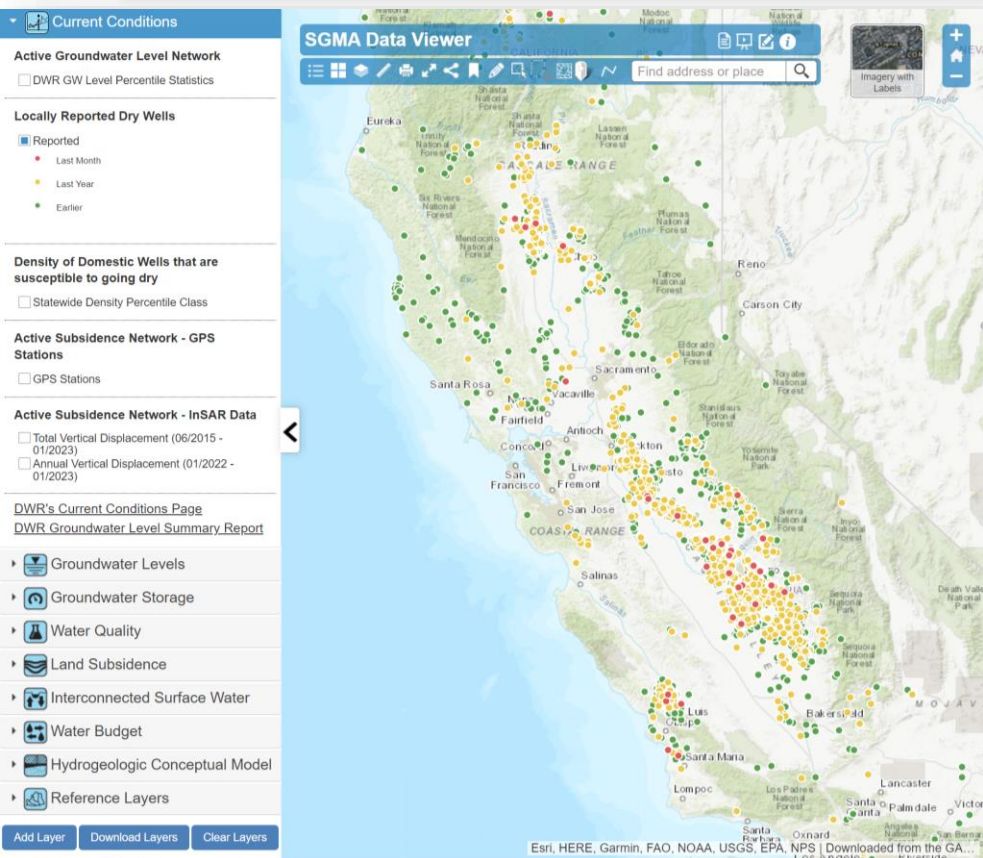


Current Conditions Tab

- **GWL Percentile Statistics**



SGMA Data Viewer & Dataset Updates



Current Conditions Tab

- **Dry Well Reports**

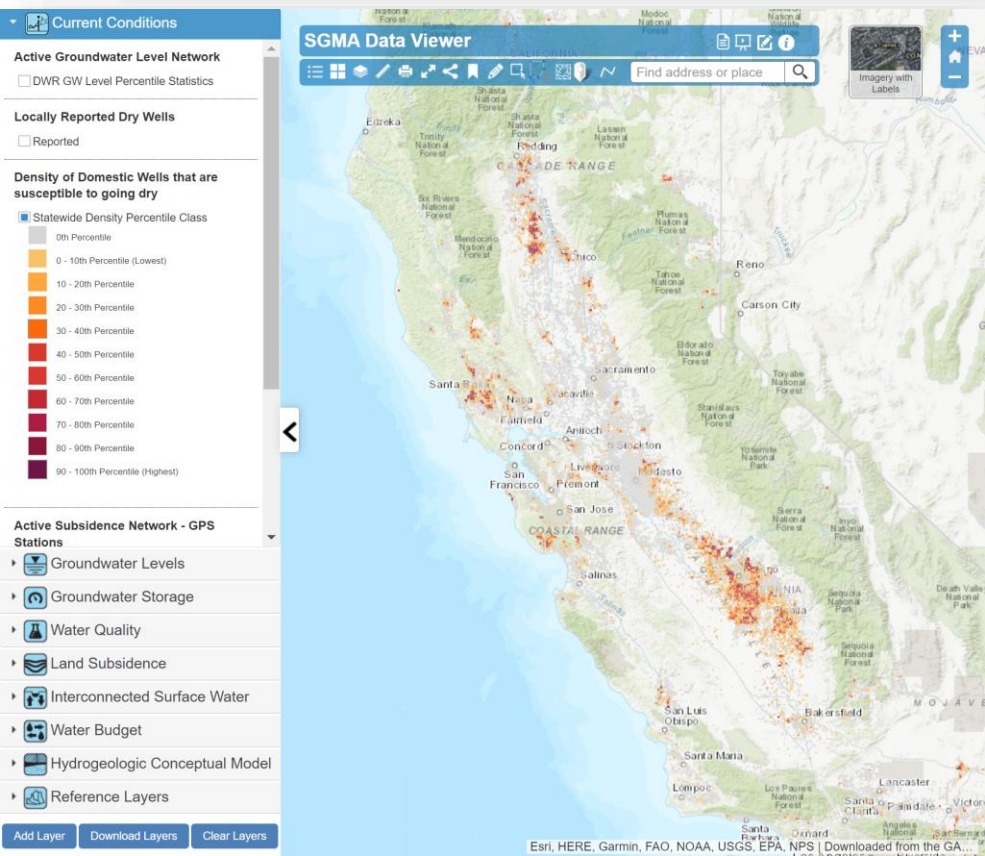
Locally Reported Dry Wells

- Reported
 - Last Month
 - Last Year
 - Earlier

The screenshot shows the Dry Well Reporting System website. The header includes the logo and navigation links: Contact Us, Feedback, Help, and Sign In. The main content area features a large image of a faucet with water dripping, and the text: "Has your well gone dry? Report it here to inform state and local agencies on drought impacts". Below this is the title "Dry Well Reporting System" and the URL <https://mydrywell.water.ca.gov>. At the bottom, there is a section titled "Report your Dry Well and Find Resources Here" with a disclaimer: "This site is for Californians experiencing problems with their private (self-managed) wells (not for residents served by a public water system already regulated by the State). Report your dry well in a few steps and find available resources." Below the disclaimer are three buttons: "Submit Report", "Enviar Reports", and "Resources".

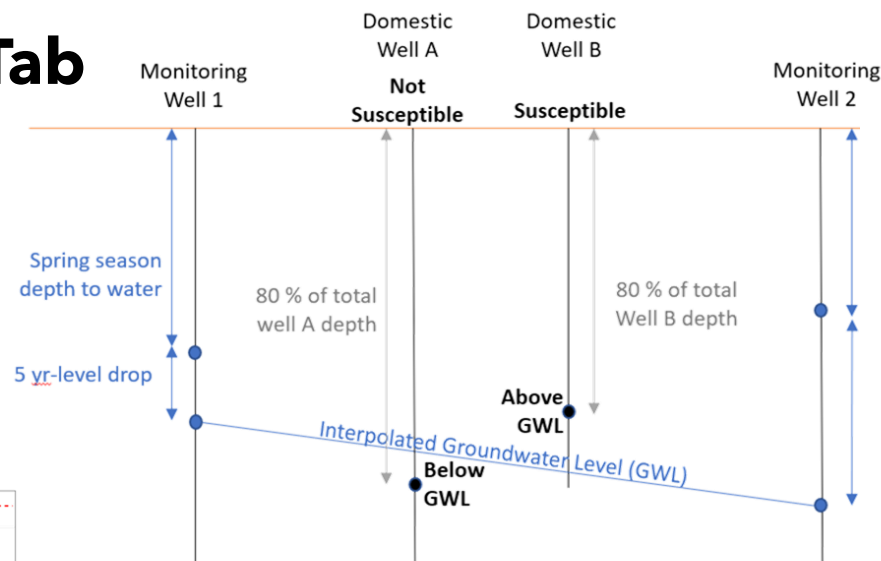


SGMA Data Viewer & Dataset Updates



Current Conditions Tab

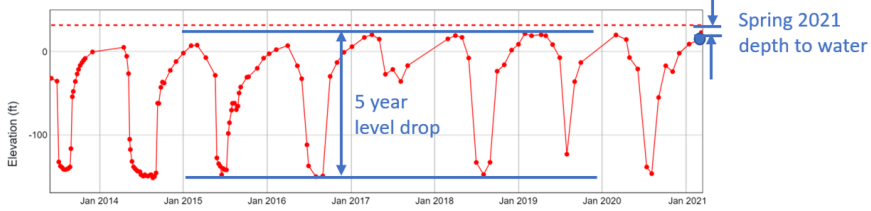
- Domestic Dry Well Susceptibility



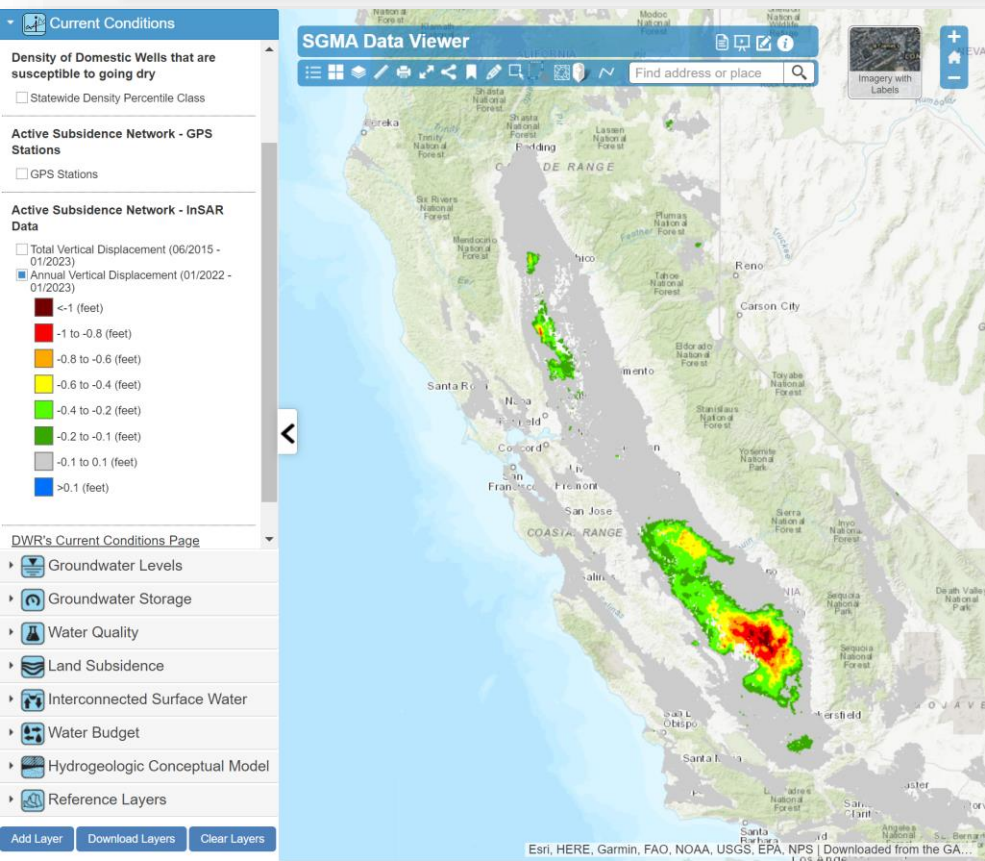
Monitoring Well 1 Hydrograph



Monitoring Well 2 Hydrograph



SGMA Data Viewer & Dataset Updates



Current Conditions Tab

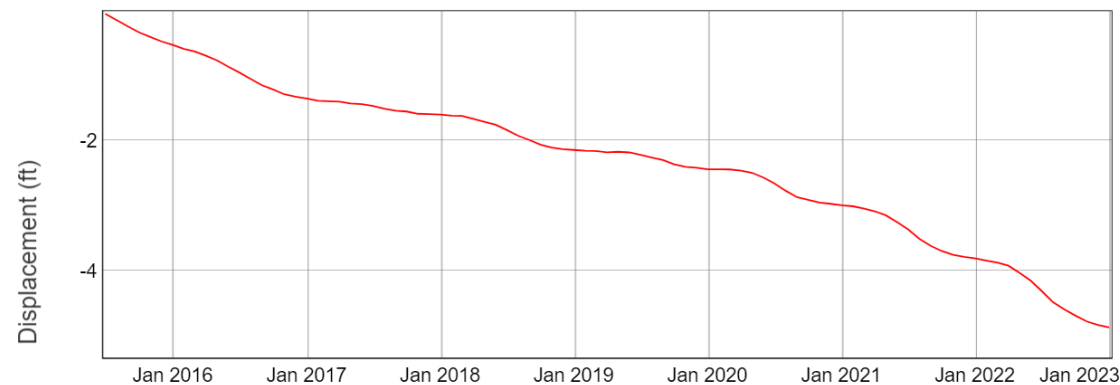
• Land Subsidence

Annual Vertical Displacement (01/2022 - 01/2023)

- <1 (feet)
- 1 to -0.8 (feet)
- 0.8 to -0.6 (feet)
- 0.6 to -0.4 (feet)
- 0.4 to -0.2 (feet)
- 0.2 to -0.1 (feet)
- 0.1 to 0.1 (feet)
- >0.1 (feet)

— TRE Altamira Interpolated Vertical Displacement

Total Interpolated Vertical Displacement (ft) for (36.208699375017595, -119.46481565646593)

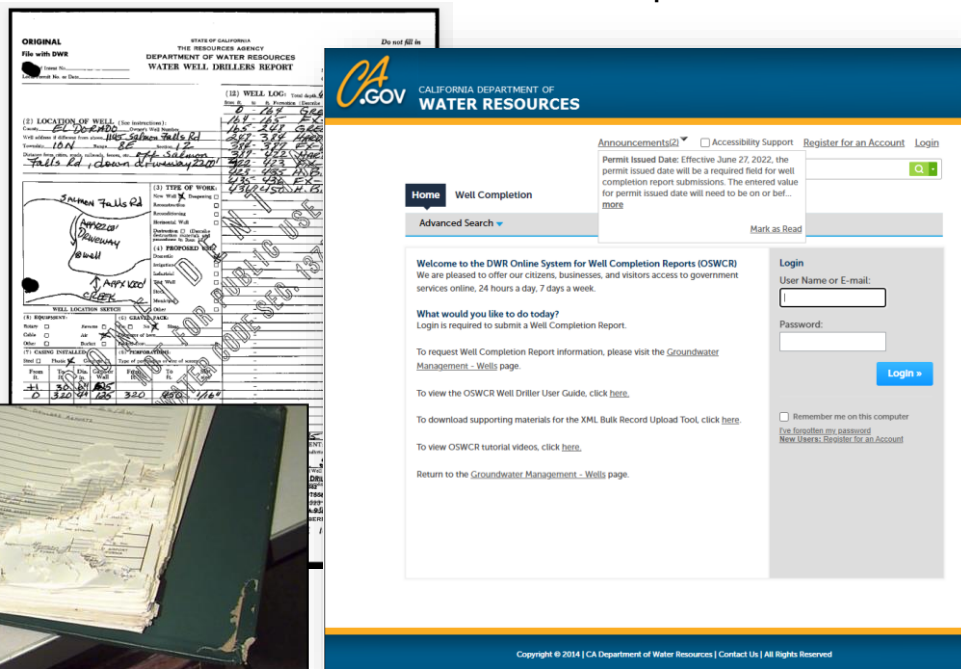


SGMA Data Viewer & Dataset Updates

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

Well Completion Reports

- Tabular Dataset and PDFs available on Open Data



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

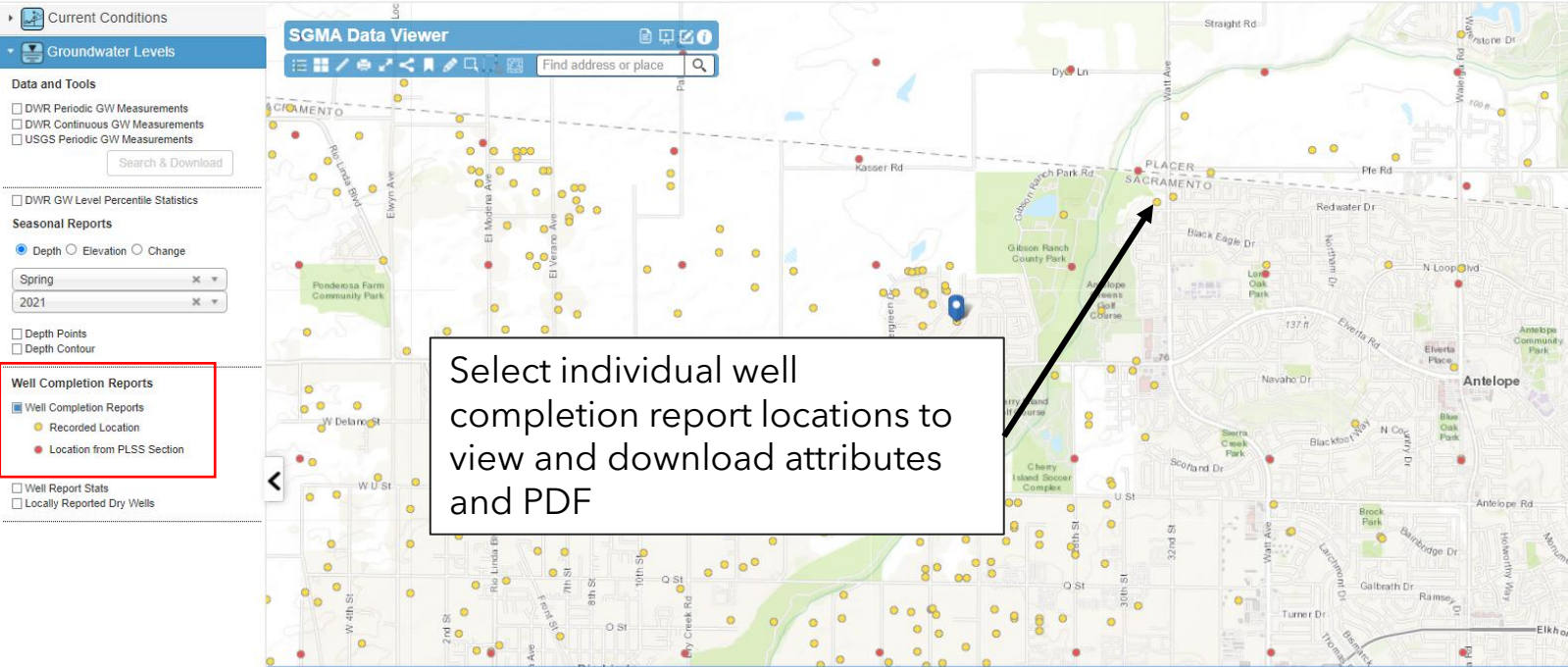
WCRNUMBER	INTERVALSTART	INTERVALEND	DESCRIPTION
WCR2018-011445	80	90	green clay
WCR2018-011445	90	100	clay/sand
WCR2018-011445	100	120	sand
WCR2018-011445	120	130	clay
WCR2018-011445	130	140	sand
WCR2018-011445	140	210	clay/sand
WCR2018-011445	210	220	sand/gravel
WCR2018-011445	220	230	clay
WCR2018-011445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

Geologic Logs - Free Form



SGMA Data Viewer & Dataset Updates

https://sgma.water.ca.gov/webgis/?appid=SGMADataviewer#gwlevels



Select individual well completion report locations to view and download attributes and PDF

ORIGINAL File with DWR
 Page 1 of 1
 Owner's Well No. 5-28-99 6-9-99 435549
 Date Work Began 5-28-99 Permitted 6-9-99
 Local Permit Agency SACRAMENTO ENVIRONMENTAL HEALTH
 Permit No. 094632 Permit Date 5-28-99

STATE OF CALIFORNIA
WELL COMPLETION REPORT
 Refer to Instructions Pamphlet
 STATE WELL NO./STATION NO. 10.40.3.1.15
 LATITUDE LONGITUDE
 APN/TOWNSHIP

GEOLOGIC LOG

DEPTH FROM SURFACE	DEPTH TO FIRST WATER	DESCRIPTION
0 - 1		TOP SOIL
1 - 15		HARD CLAY
15 - 22		SILT CLAY
22 - 44		SANDY CLAY
44 - 58		BROWN CLAY
58 - 110		SAND FINE SANDS
110 - 118		GRAY CLAY
118 - 146		GRAY CLAY
146 - 195		GRAY DECOMPOSED CLAY
195 - 230		GRAY CLAY
230 - 233		SAND FINE TO COARSE
233 - 269		GRAY CLAY
269 -		GRAY FINE SANDS
		GRAY CLAY

WELL LOCATION
 Address 18125
 City ELVERTA
 County SACRAMENTO
 APN Book 203 Page 0690 Parcel 009-000
 Township Range Section
 Latitude Longitude

LOCATION SKETCH
 NORTH
 WEST EAST
 SOUTH
 Illustrate or Describe Distances of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc. PLEASE BE ACCURATE & COMPLETE.

DRILLING METHOD CABLE
FLUID NONE
WATER LEVEL & YIELD OF COMPLETED WELL
 WATER LEVEL (P) & DATE MEASURED 6-9-99
 ESTIMATED YIELD (GPM) & TEST TYPE 100 Bailer
 TEST LENGTH (hrs) TOTAL DRAWDOWN (ft)
 TOTAL DEPTH OF BORING 280 (Feet)
 TOTAL DEPTH OF COMPLETED WELL 275 (Feet)

CASINGS(S)				ANNULAR MATERIAL	
DEPTH FROM SURFACE	BORE-HOLE DIA. (Inches)	TYPE (Z)	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OFF WALL THICKNESS
4-1-99	X	STEEL	6.2	1.34	0-58 X

ATTACHMENTS (Z)
 - Geologic Log
 - Well Construction Diagram
 - Geophysical Log(s)
 - Soil/Water Chemical Analysis
 - Other

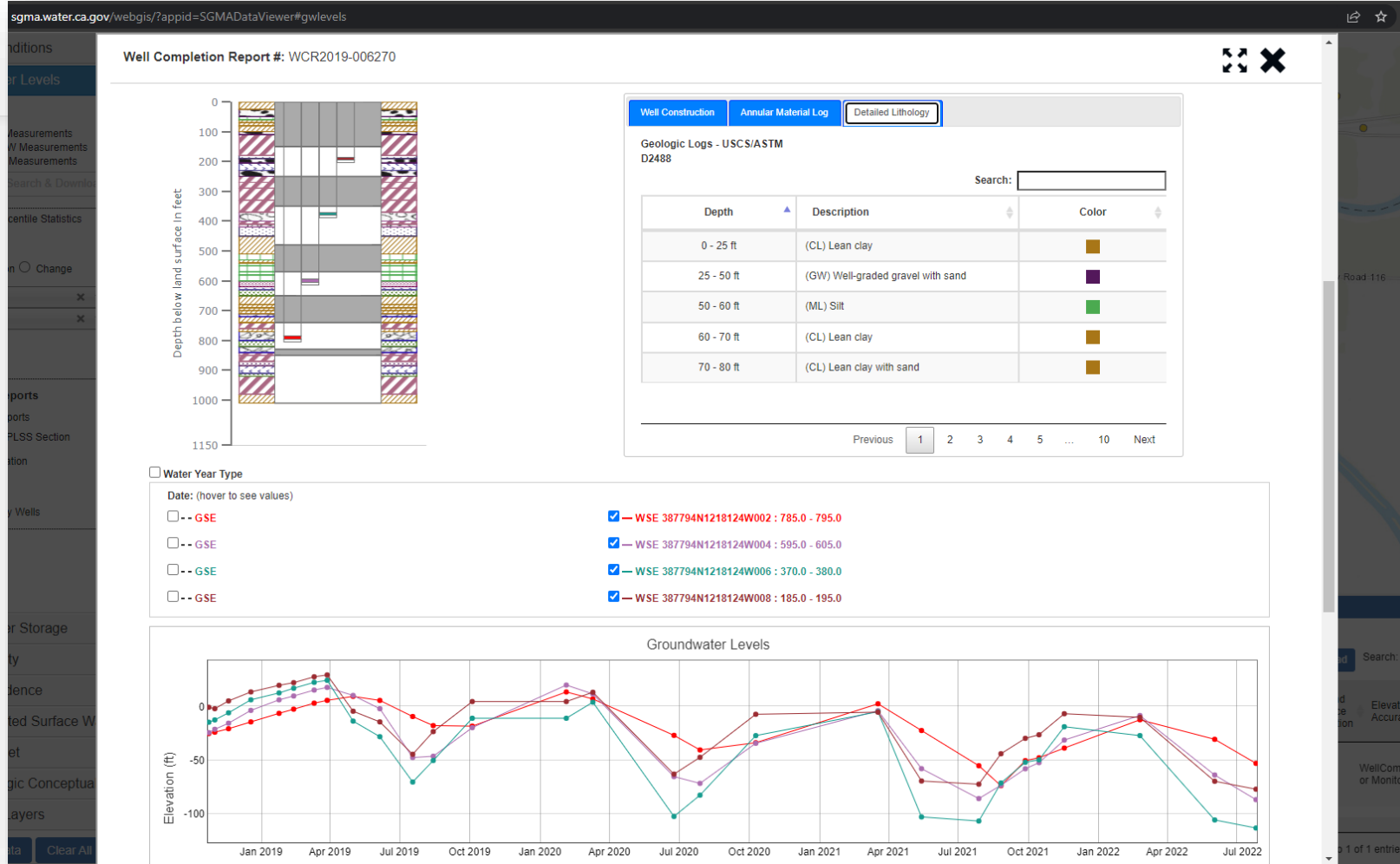
CERTIFICATION STATEMENT
 I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
 NAME ROBERT A. NIX WELL DRILLING
 (LICENSE NO. OR EXPIRATION) (1990 OR EXPIRES)
 ADDRESS PO BOX 495 WILSON CA 95693
 Other
 Signed [Signature] 6-20-99
 DWR 100 REV. 1/90 IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

Results
 Well Completion Reports

WCR Number	WCR Links	Latitude	Longitude	Legacy Log Number	Region Office	County Name	Local Permit Agency	Permit Date	Permit Number	Owner Assigned Well Number	Well Location	City	Planned Use/Former Use	Driller Name	Driller License Number	Record Type	Method of Determination LL	LL Accuracy	Horizontal Datum	Ground Surface Elevation	Elevation Accuracy
WCR1999-000226	https://cadwr.app.box.com/v/WellCompletionReports/file/462788184568	38.717415	-121.412662	435549	DWR North Central Region Office	Sacramento County Environmental Compliance Division		5-28-99	094632	435549	8125 BELLINGRATH ELVERTA DR	Elverta	Water Supply Domestic	NIX ROBERT A. WELL DRILL NIX ROBERT A. WELL DRILLING	376587	Well Completion/New/Production Derived from or Monitoring/NA	8125 BELLINGRATH ELVERTA DR		NAD 83	>50 FT	WGS84









SGMA Data Viewer & Dataset Updates



- Dynamic well construction diagram from tabular well completion dataset on Open Data
- Linked groundwater level data
- Ongoing effort for existing DWR monitoring wells and new Technical Support Services (TSS) wells: Integrating well construction and lithology data from OSWCR with groundwater level data from CASGEM and SGMA Portal's Monitoring Module.



-  **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

SGMA Data Viewer & Dataset Updates

Groundwater Levels

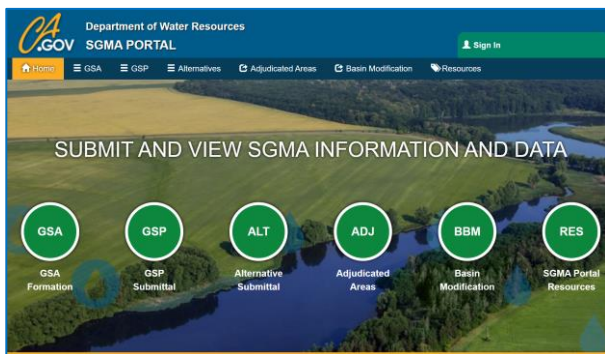


Available on Open Data at

<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

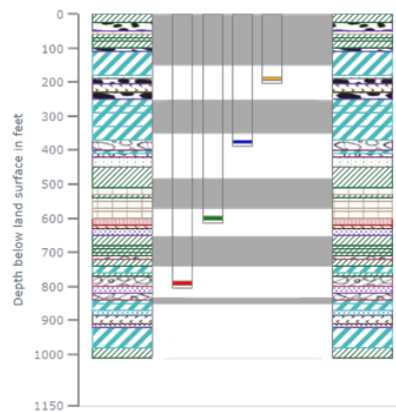


SGMA Data Viewer & Dataset Updates

sgma.water.ca.gov/SGMAMapServices/report/groundwater?site_code=387794N1218124W002&stn_id=52915&swn=11N01E24Q503M

Site Code: 387794N1218124W002 State Well Number: 11N01E24Q503M Local Well Name: ZAM(R)-P1

Well Completion Report (WCR2019-006270)



Well Construction | Annular Material Log | Detailed Lithology

Geologic Logs - USCSI/ASTM D2488

Search:

Depth	Description	Color
0 - 25 ft	(CL) Lean clay	Green
25 - 50 ft	(GW) Well-graded gravel with sand	Purple
50 - 60 ft	(ML) Silt	Brown
60 - 70 ft	(CL) Lean clay	Green
70 - 80 ft	(CL) Lean clay with sand	Green

Previous 1 2 3 4 5 ... 10 Next

Groundwater Levels

- Deep link to GWL Measurements for station specified in URL

[https://sgma.water.ca.gov/SGMAMapServices/report/groundwater?](https://sgma.water.ca.gov/SGMAMapServices/report/groundwater?site_code=387794N1218124W002&stn_id=52915&swn=11N01E24Q503M)

[site_code=387794N1218124W002&](#)

[stn_id=52915&](#)

[swn=11N01E24Q503M](#)

Groundwater Elevation

Water Year Type

Date: (hover to see values)

-- GSE

-- GSE

-- GSE

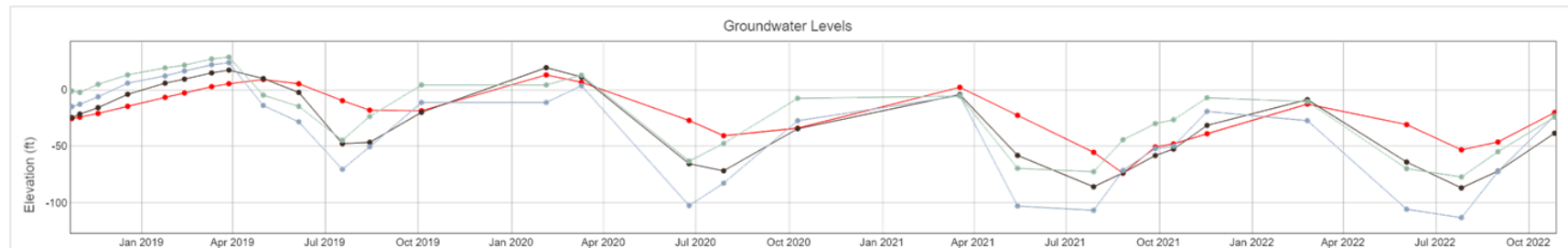
-- GSE

-- WSE 387794N1218124W002 : 785.0 - 795.0

-- WSE 387794N1218124W004 : 595.0 - 605.0

-- WSE 387794N1218124W006 : 370.0 - 380.0

-- WSE 387794N1218124W008 : 185.0 - 195.0



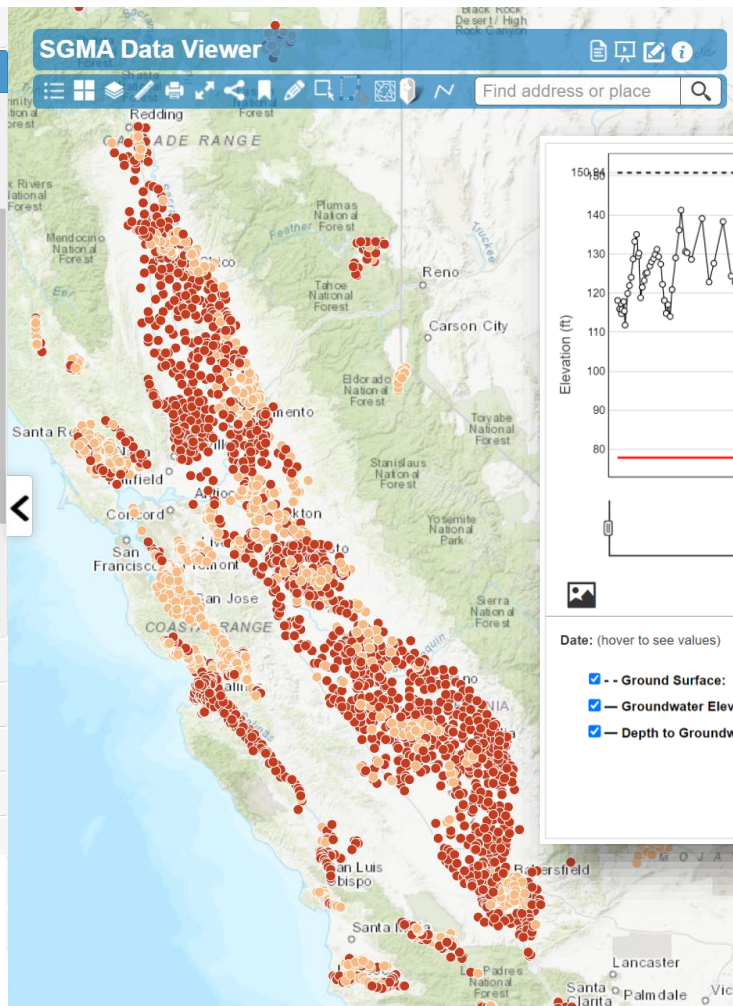
CALIFORNIA DEPARTMENT OF WATER RESOURCES
SUSTAINABLE GROUNDWATER
MANAGEMENT OFFICE

SGMA Data Viewer & Dataset Updates

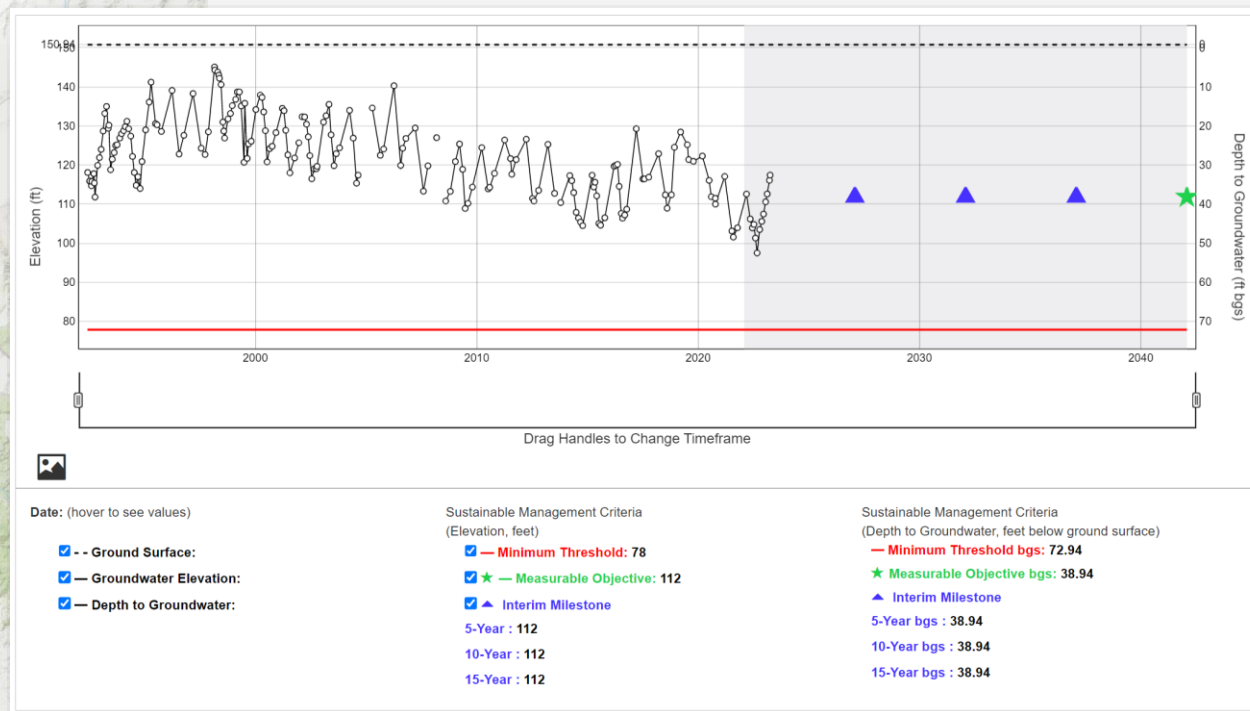
GSP Monitoring Data Dataset available on Open Data at <https://data.cnra.ca.gov/dataset/gspmd>

Current Conditions
 Groundwater Levels
 Groundwater Storage
 Water Quality
 Land Subsidence
 Interconnected Surface Water
 Water Budget

Groundwater Sustainability Plan Monitoring Sites
 Indicator Type:
 Groundwater Level
 Site Type:
 No Filter
 GSP Monitoring Sites
 SGMA Representative
 SGMA
 DWR GW Level Percentile Statistics
Seasonal Reports
 Depth Elevation Change
 Spring
 2022
 Depth Points
 Depth Contour



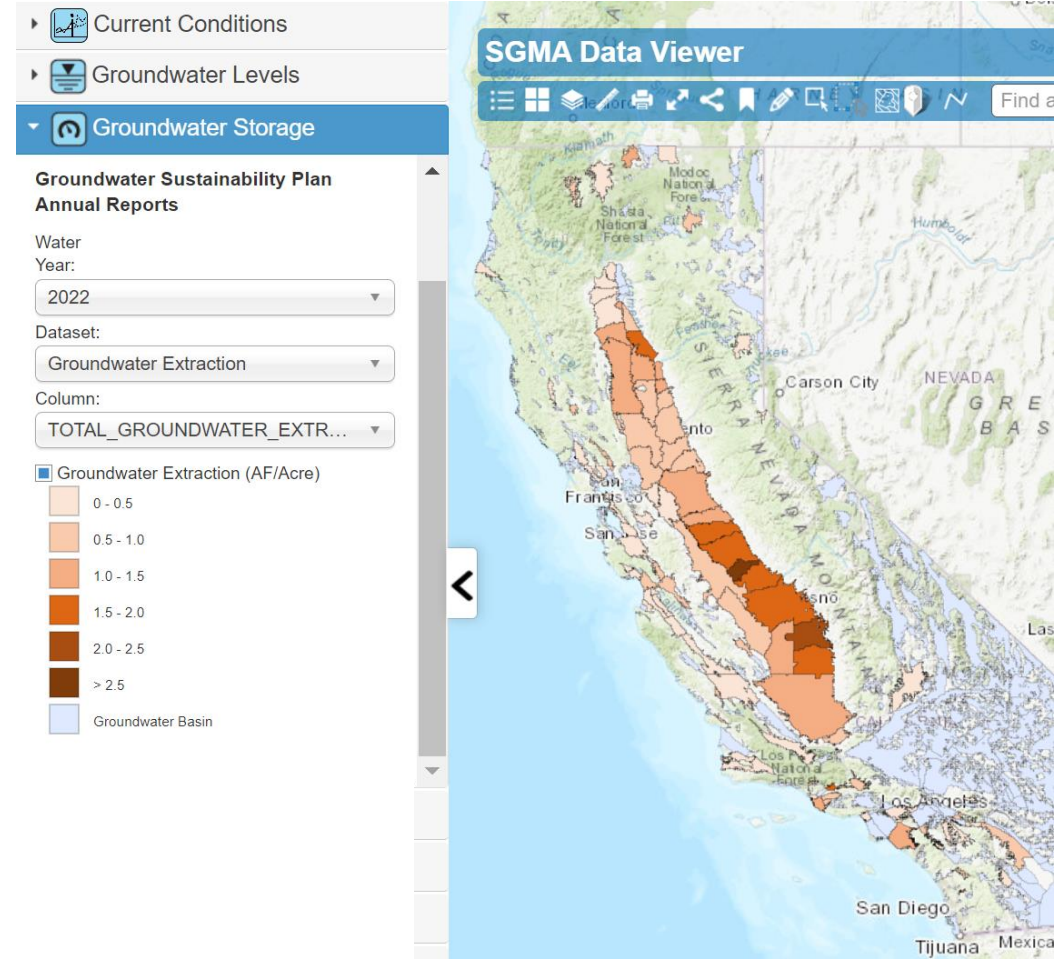
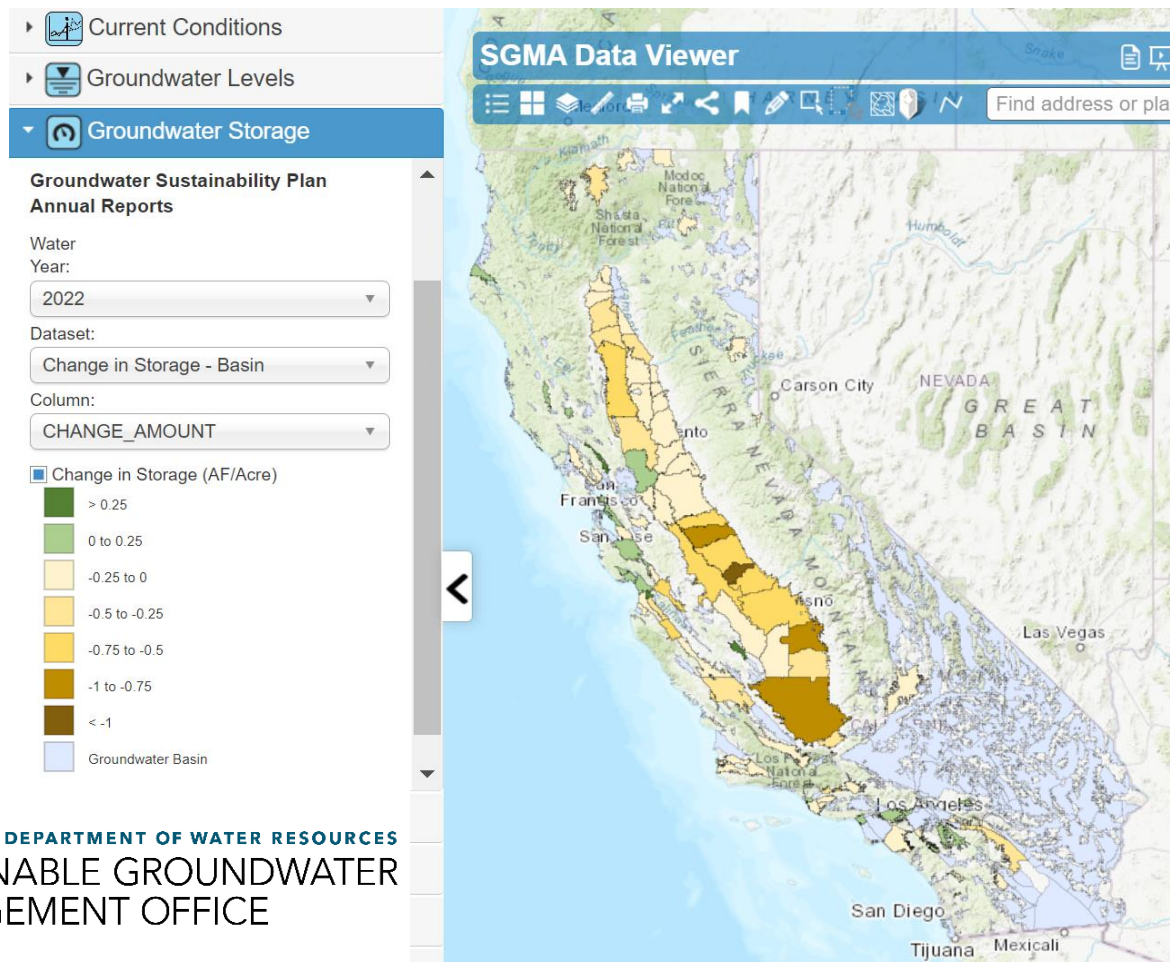
Representative GWL Monitoring Site Chart



SGMA Data Viewer & Dataset Updates

GSP Annual Report Data

Dataset available on Open Data at <https://data.cnra.ca.gov/dataset/gspar>



SGMA Data Viewer & Dataset Updates

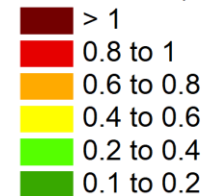
Dataset and Reports Available on Open Data at
<https://data.cnra.ca.gov/dataset/tre-altamira-insar-subsidence>

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)

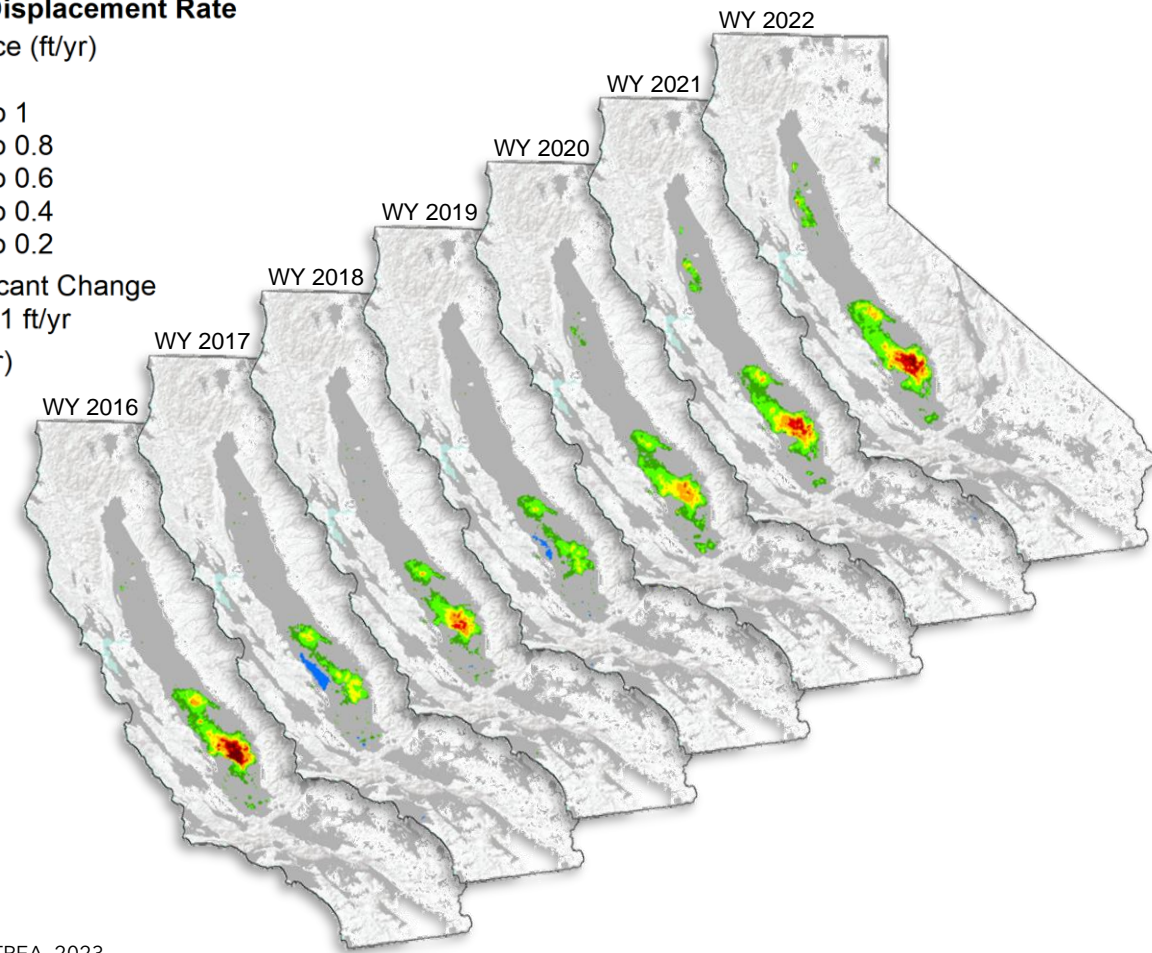
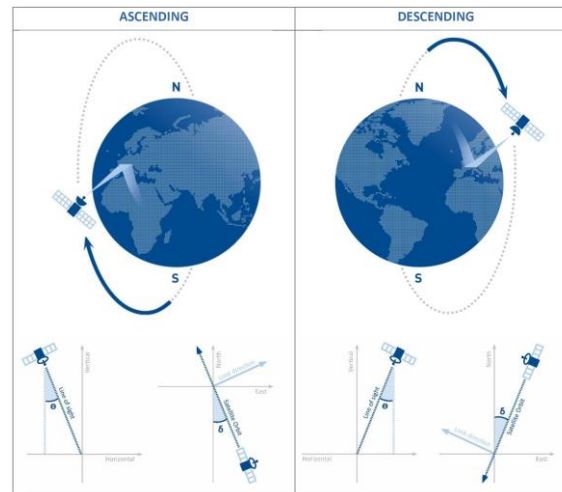


No Significant Change

< ±0.1 ft/yr

Uplift (ft/yr)

> 0.1



TREA, 2023



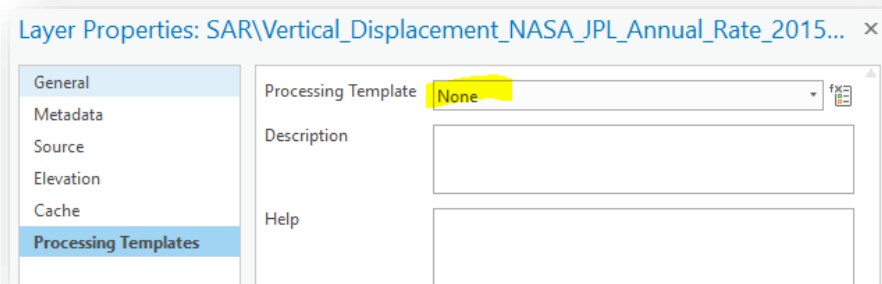
SGMA Data Viewer & Dataset Updates

TREA InSAR Subsidence Data








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

GIS Image Services of Vertical Displacement Rasters

- The image services carry the raw pixel values in addition to the RGB symbology values. **To expose the raw pixel values in ESRI ArcMap or ArcGIS Pro, set the Processing Templates Function to 'None' in the raster layer properties.**



Data and Resources

-  **InSAR Data Report - TRE ALTAMIRA - January 2023 Update**
Technical Report: InSAR land surveying and mapping services in support of the DWR SGMA program
-  **InSAR Data Accuracy Report - TOWILL - October 2022 Update**
-  **Tutorial on DWR's SGMA Data Viewer and Updated Subsidence Information** 🔥
The tutorial video on DWR's SGMA Data Viewer and updated subsidence information is available at...
-  **TRE Altamira InSAR Dataset on SGMA Data Viewer** 🔥
The SGMA Data Viewer provides access to groundwater related datasets that are organized by the...
-  **GIS Image Services of Vertical Displacement Rasters** 🔥
The data range that a raster represents is indicated in the last 17 digits of the service name....
-  **Vertical Displacement Point Data Locations**
ArcGIS file geodatabase of vertical displacement point data locations (version WY2023Q1). GIS Map...
-  **Vertical Displacement Point Data** 🔥
Vertical displacement point data in csv format (version WY2023Q1). For details, see sections 5...

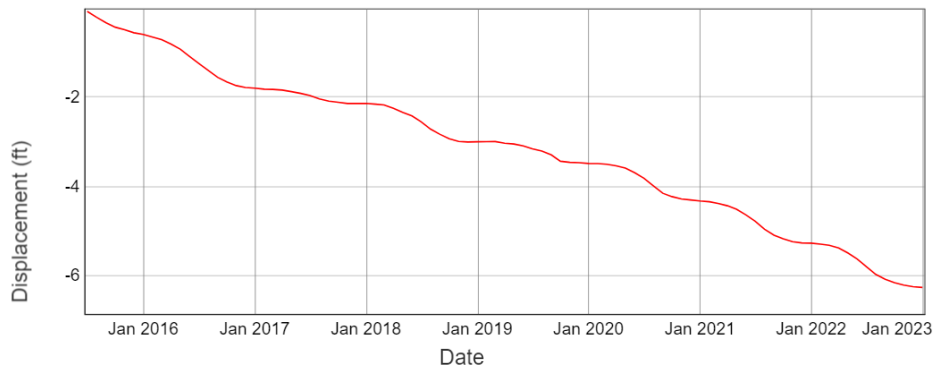


SGMA Data Viewer & Dataset Updates

TREA InSAR Subsidence Data

Select any location on the InSAR map layer to view and download vertical displacement timeseries data, or use direct links .

Total Interpolated Vertical Displacement (ft) for (36.23328, -119.52009)



CSV

Excel

Example Links:

Raster Data Chart direct link:

<https://sgma.water.ca.gov/SGMAMapServices/report/displacement/raster?latitude=36.23328&longitude=-119.52009>

Raster Data Download direct link:

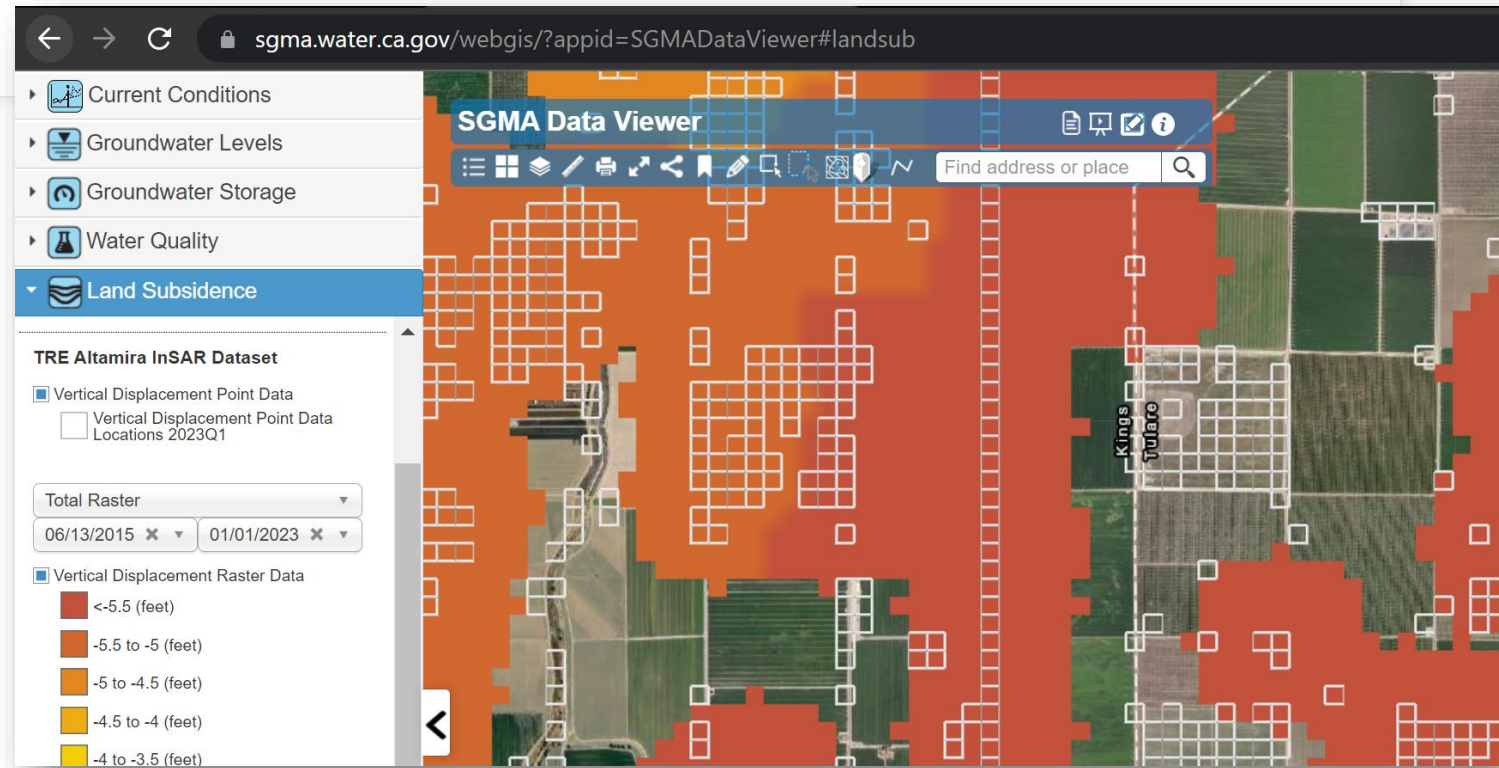
<https://sgma.water.ca.gov/SGMAMapServices/service/displacement/raster/download/csv?latitude=36.23328&longitude=-119.52009>

Point Data Chart direct link:

<https://sgma.water.ca.gov/SGMAMapServices/report/displacement/point?code=BTOTU4U>

Point Data Download direct link:

<https://sgma.water.ca.gov/SGMAMapServices/service/displacement/point/download/csv?code=BTOTU4U>



SGMA Data Viewer & Dataset Updates

Dataset and Reports Available on Open Data at
<https://data.cnra.ca.gov/dataset/aem>

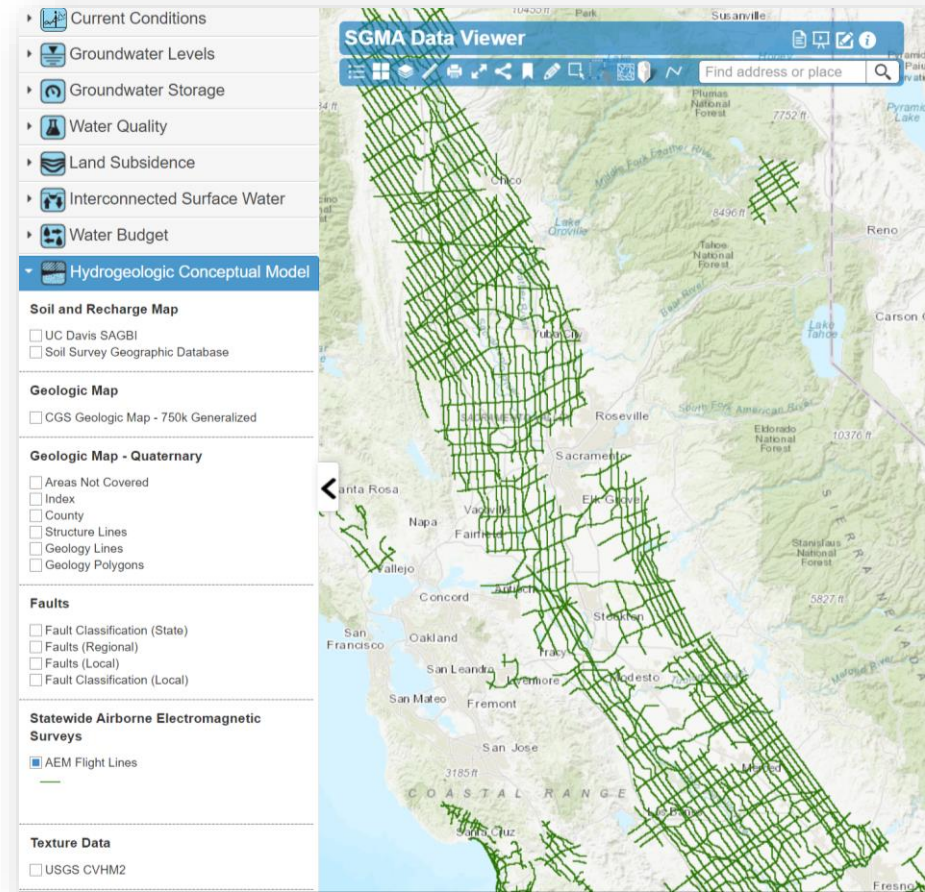
DWR Airborne Electromagnetic (AEM) Surveys Data

AEM Datasets

- Raw AEM Data
- Processed AEM Data
- Inverted AEM Data
- Inverted AEM Data Uncertainty Analysis
- Interpreted AEM Data
- Interpreted AEM Data Uncertainty Analysis

Supporting Datasets

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

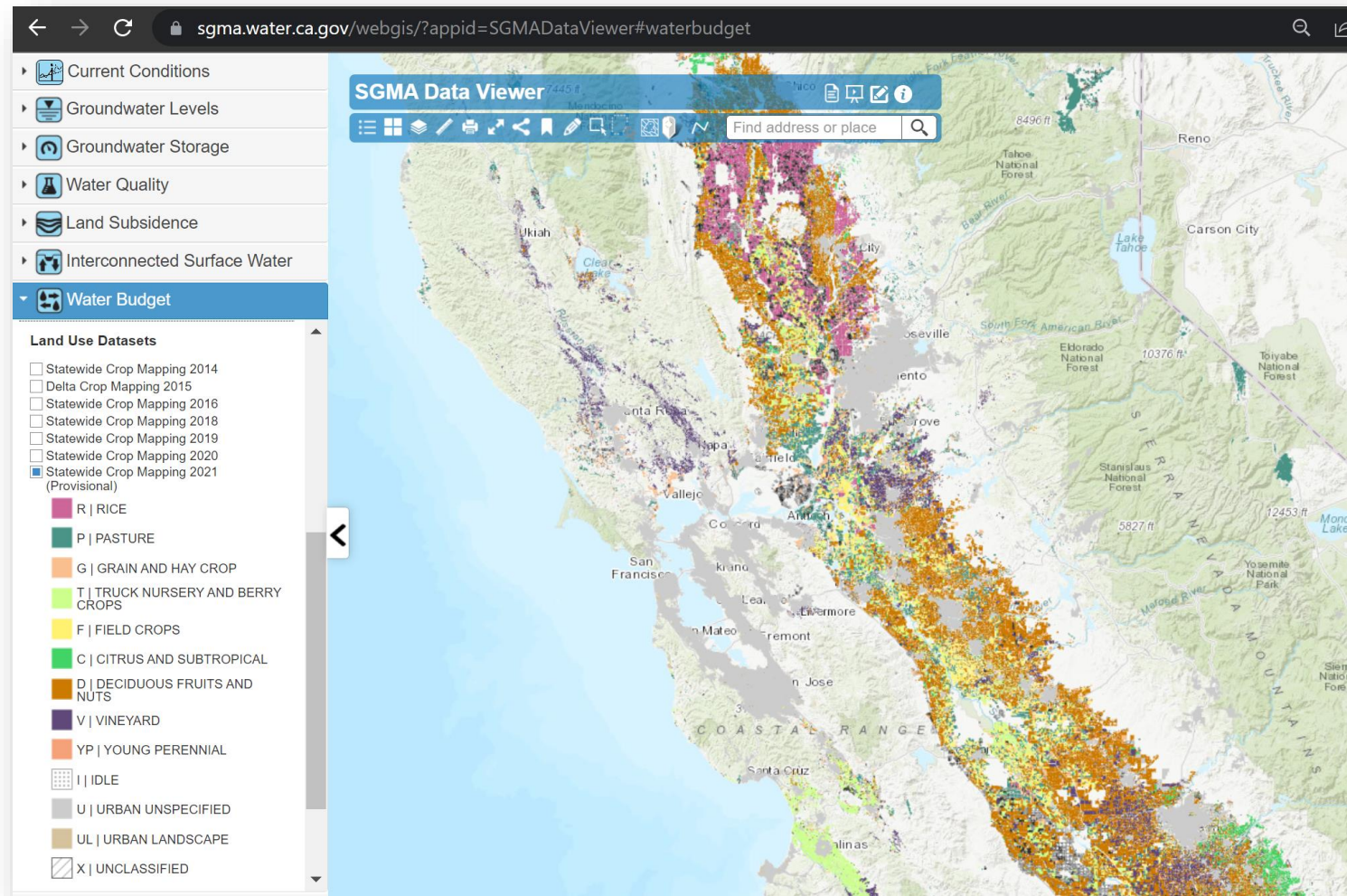


SGMA Data Viewer & Dataset Updates

Statewide Crop Mapping

At the request of users, the Department of Water Resources (DWR) Land Use Program has released **PROVISIONAL** statewide land use data for Water Year (WY) 2021 to the public.

Dataset Available on Open Data at <https://data.cnra.ca.gov/dataset/statewide-crop-mapping>



SGMA Data Viewer & Dataset Updates

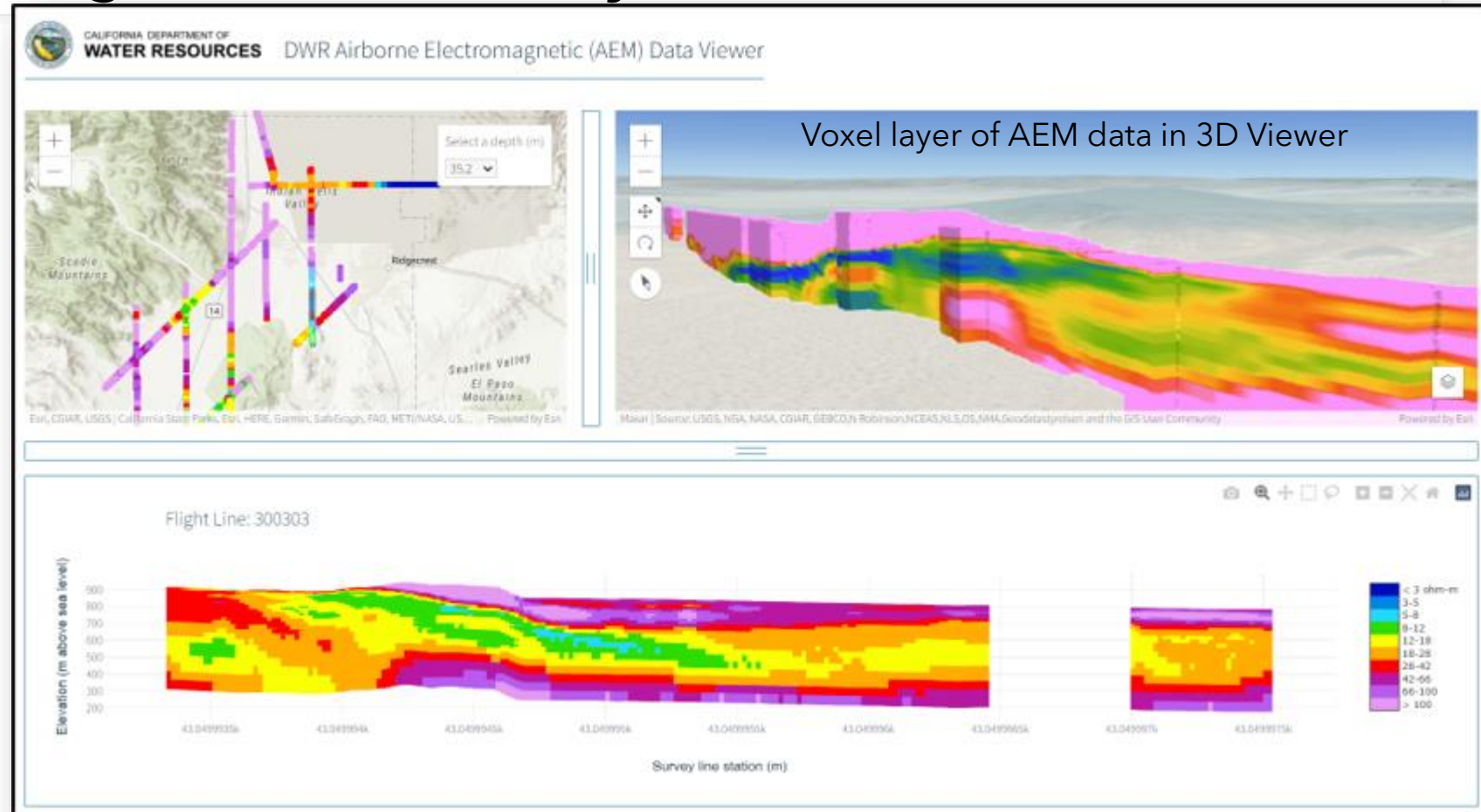
DWR Airborne Electromagnetic (AEM) Surveys Data Viewers

Initial goals

- Online viewer/no software required
- Easy hosting on ArcGIS Online (app template)
- 3D View
- 2D Map
- Section View

Not quite there yet...

Pre-processing and custom app code will be made public

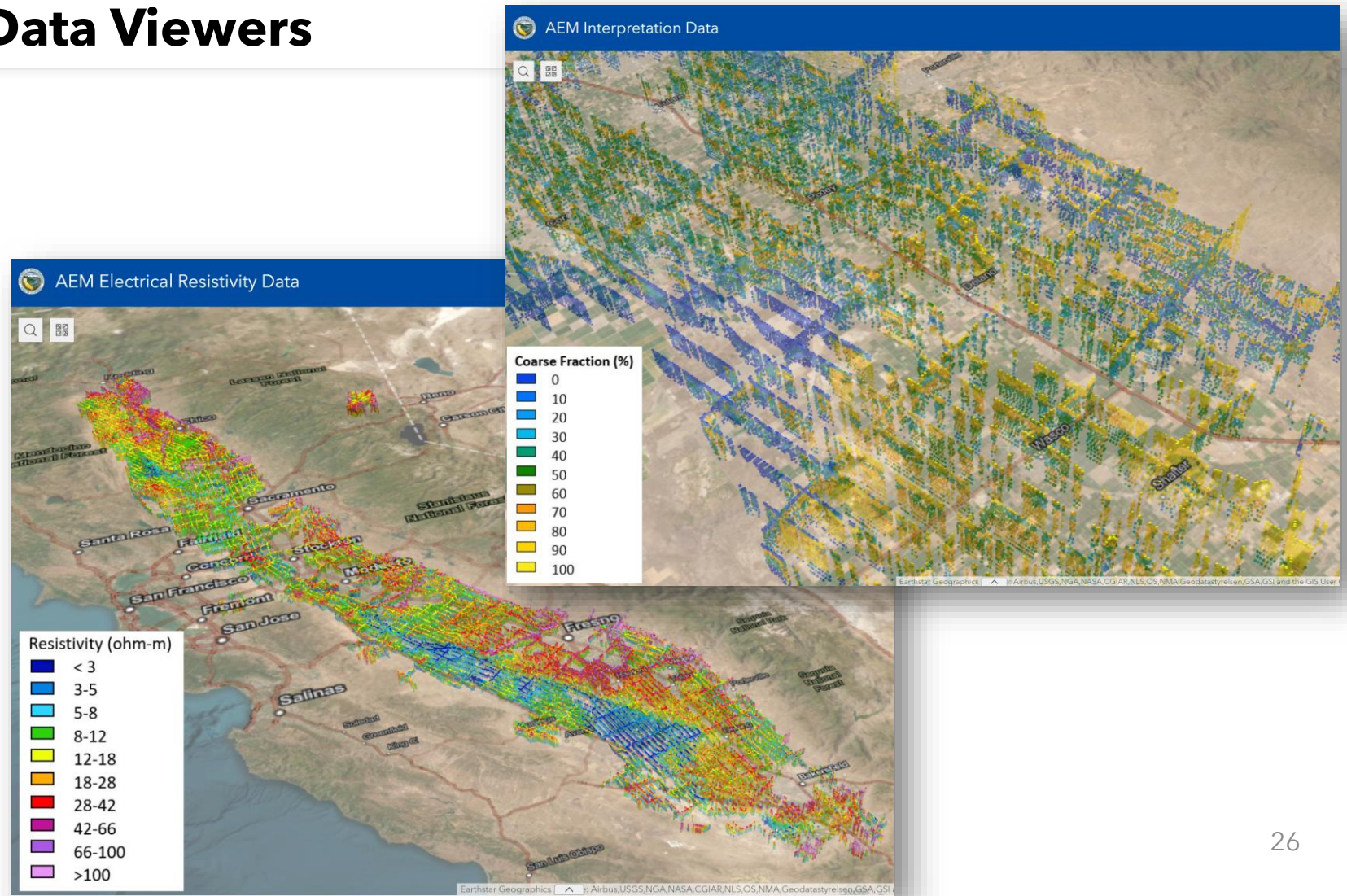


SGMA Data Viewer & Dataset Updates

DWR AEM Surveys Data Viewers

What we do have:

ArcGIS Online point cloud scene layer viewers



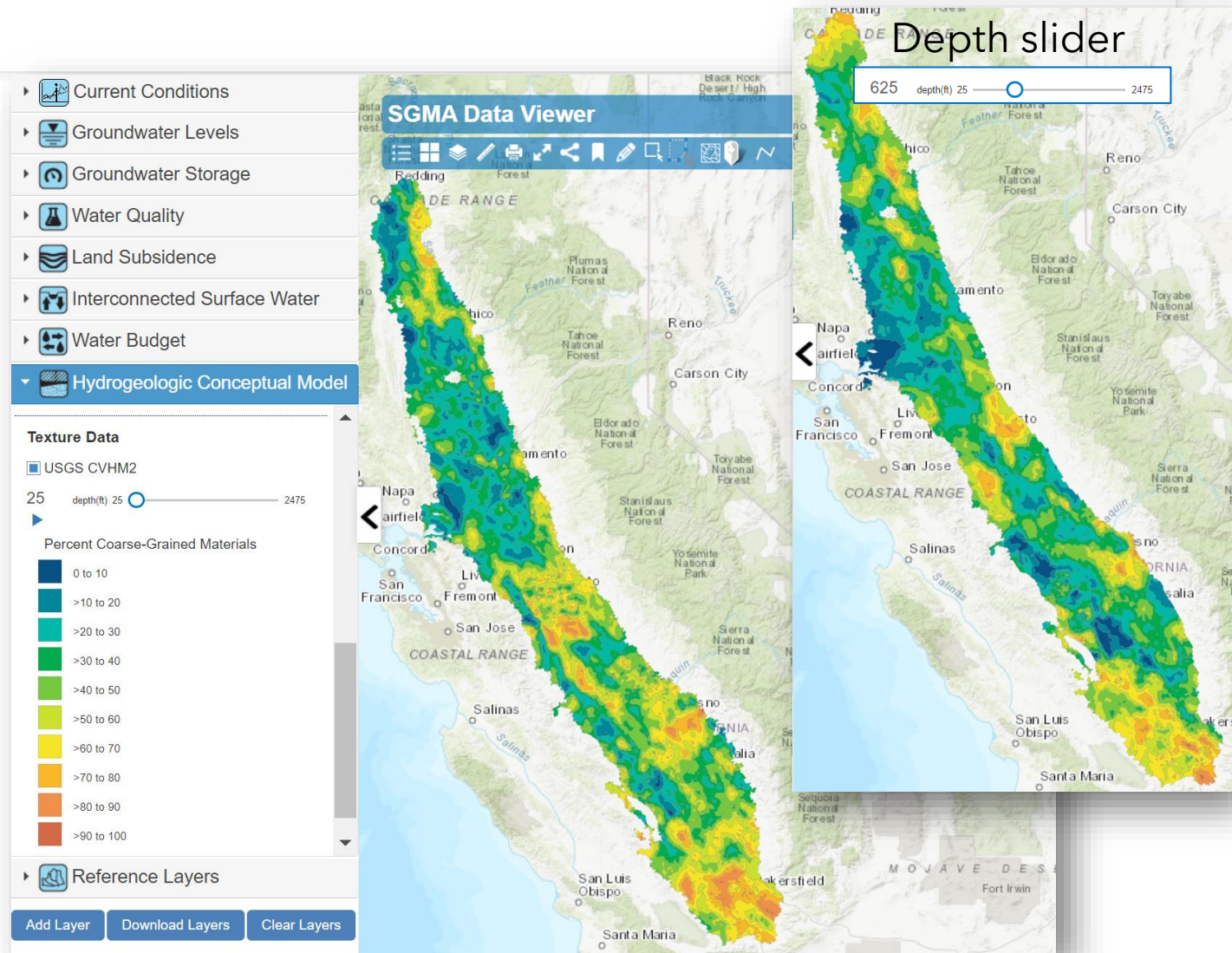
SGMA Data Viewer & Dataset Updates

Texture Data

- USGS CVHM2

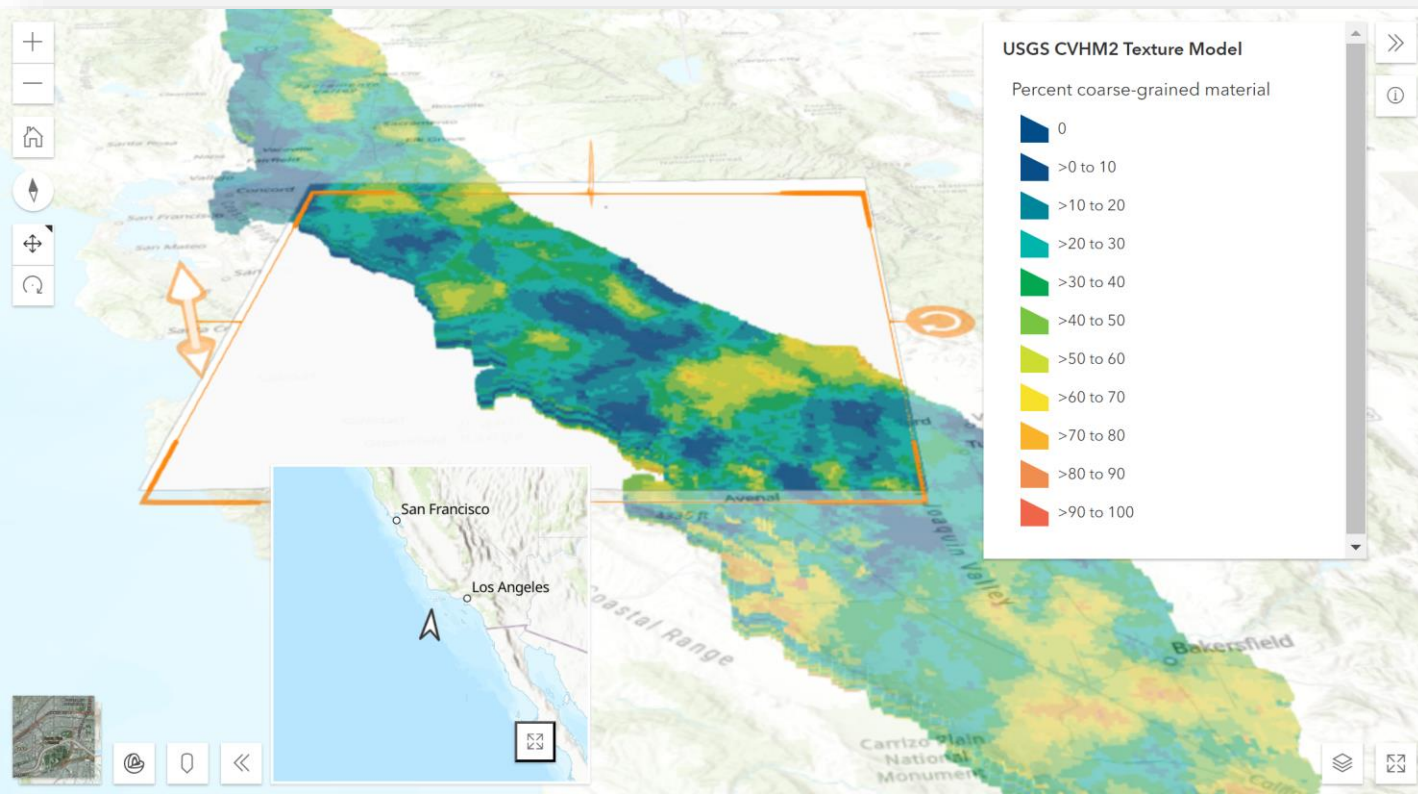
Next:

- C2VSim/SVSim for Sac Valley
- AEM interpretations
- Combined and stewarded texture model as part of B118 and basin characterization work

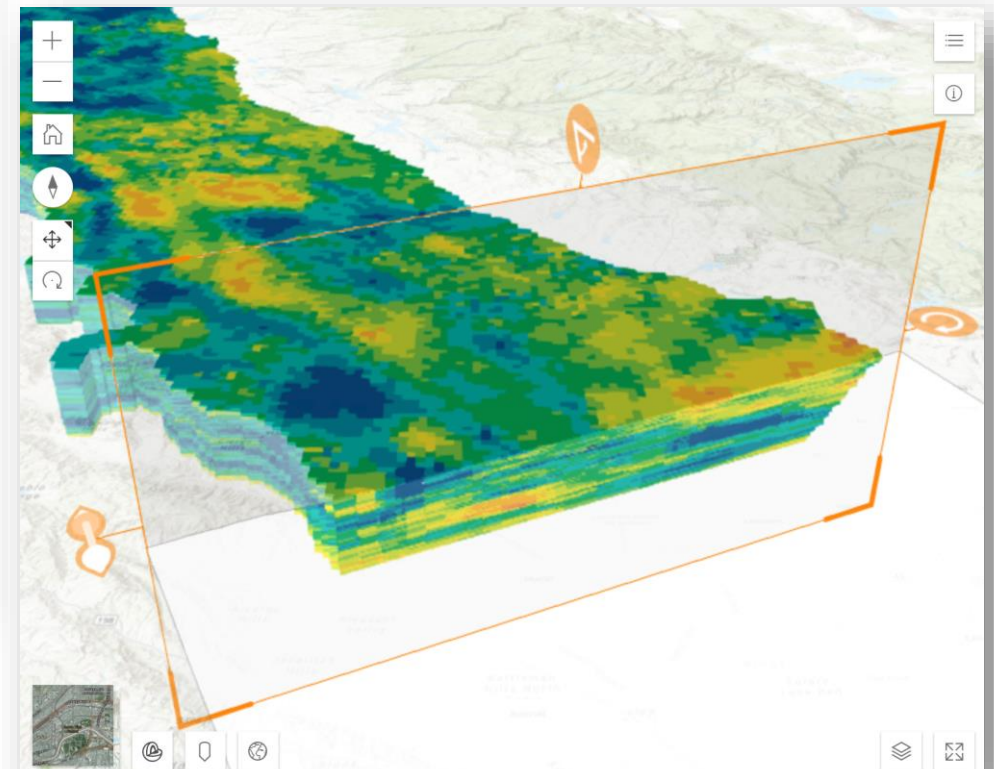


SGMA Data Viewer & Dataset Updates

Texture Data 3D Visualization



- ArcGIS Online 3D Viewer Instant App
- Voxel layer created with ArcGIS Pro 3.1 Nearest Neighbor 3D tool





Thank you



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

