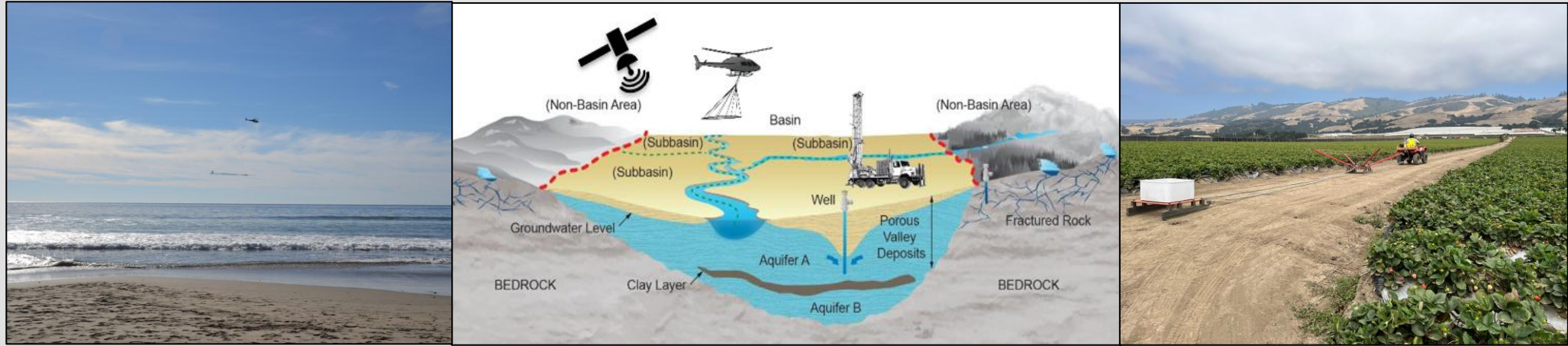




California's Groundwater - Basin Characterization Program



Local & Regional Investigations and Data Access

Katherine Dlubac and Steven Springhorn

Sustainable Groundwater Management Office, California Department of Water Resources



CALIFORNIA DEPARTMENT OF WATER RESOURCES
SUSTAINABLE GROUNDWATER
MANAGEMENT OFFICE



S.S. Papadopoulos & Associates, Inc.



 **Ecogite Consulting**



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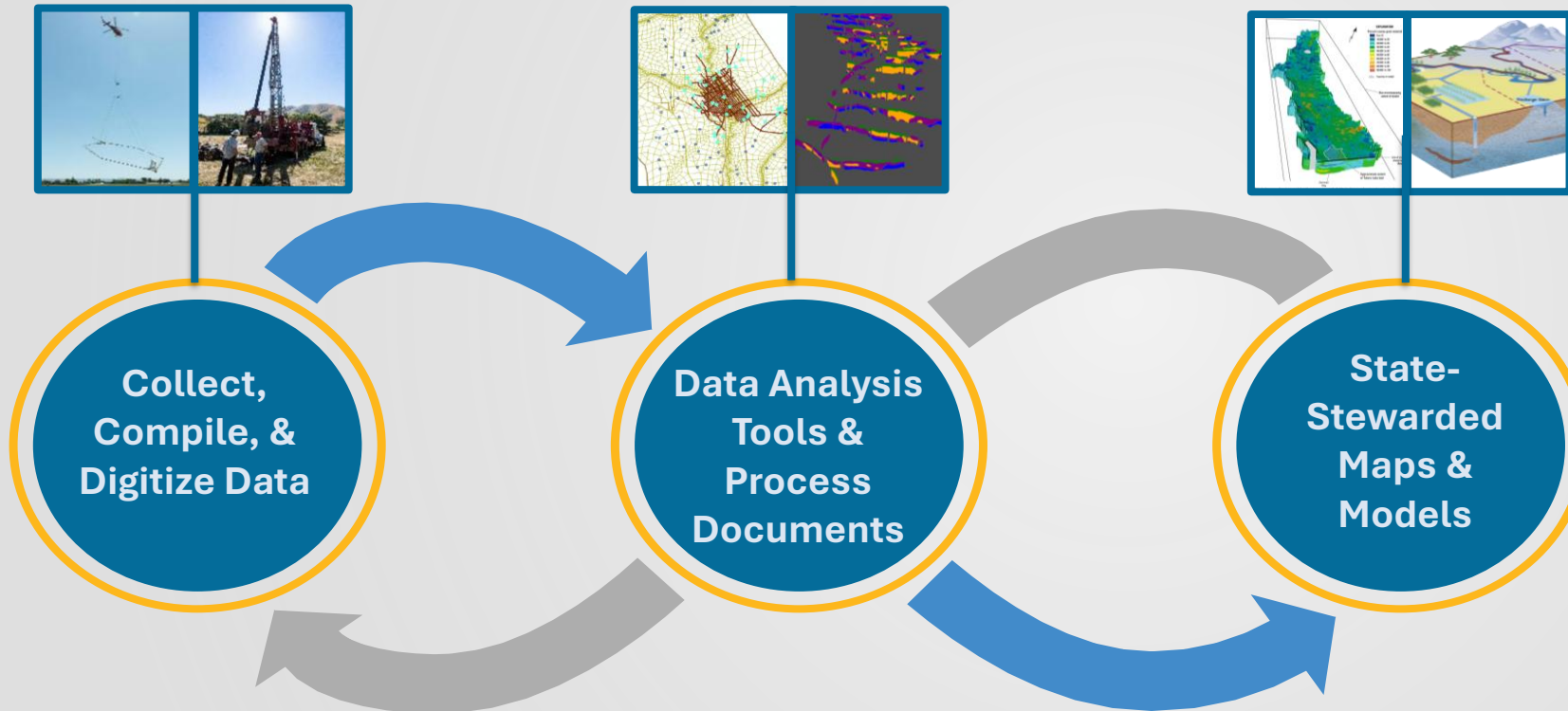
Marisa Perez-Reyes
Kevin Werbylo
Vanessa Nishikawa

**In coordination with GSAs
and other collaborators**

Basin Characterization Program Overview



Local, Regional, & Statewide Groundwater Evaluations



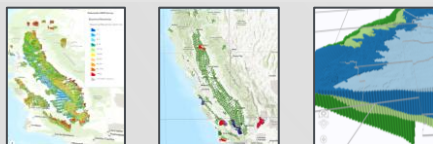
Goals for State-Stewarded Maps and Models

- Aquifer Recharge Potential
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- Aquifer Storage
- Hydrostratigraphic Model
- Important Aquifers
- Extent of Corcoran Clay
- Depth to Basement
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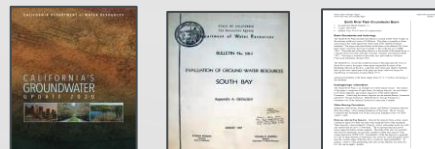
Basin Characterization Exchange (BCX)

- Community of Practice
- Tribal, Local, State, & Federal Agencies
- NGOs, Academia & Private Sector

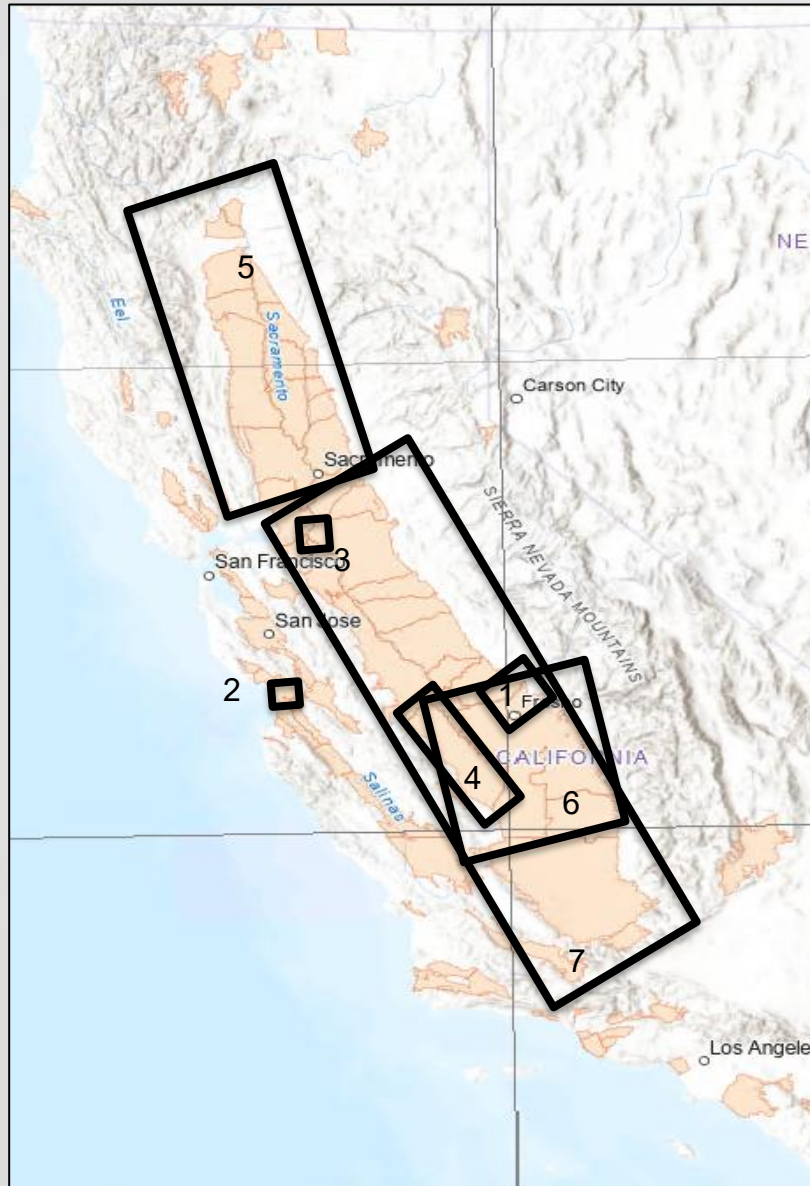
Data Access & Visualization



Data Archive | California's Groundwater



Local, Regional, and Statewide Investigations



Local Investigations

1. Madera & N. Kings
2. Pajaro Valley
3. Prospect Island
4. Western San Joaquin Valley

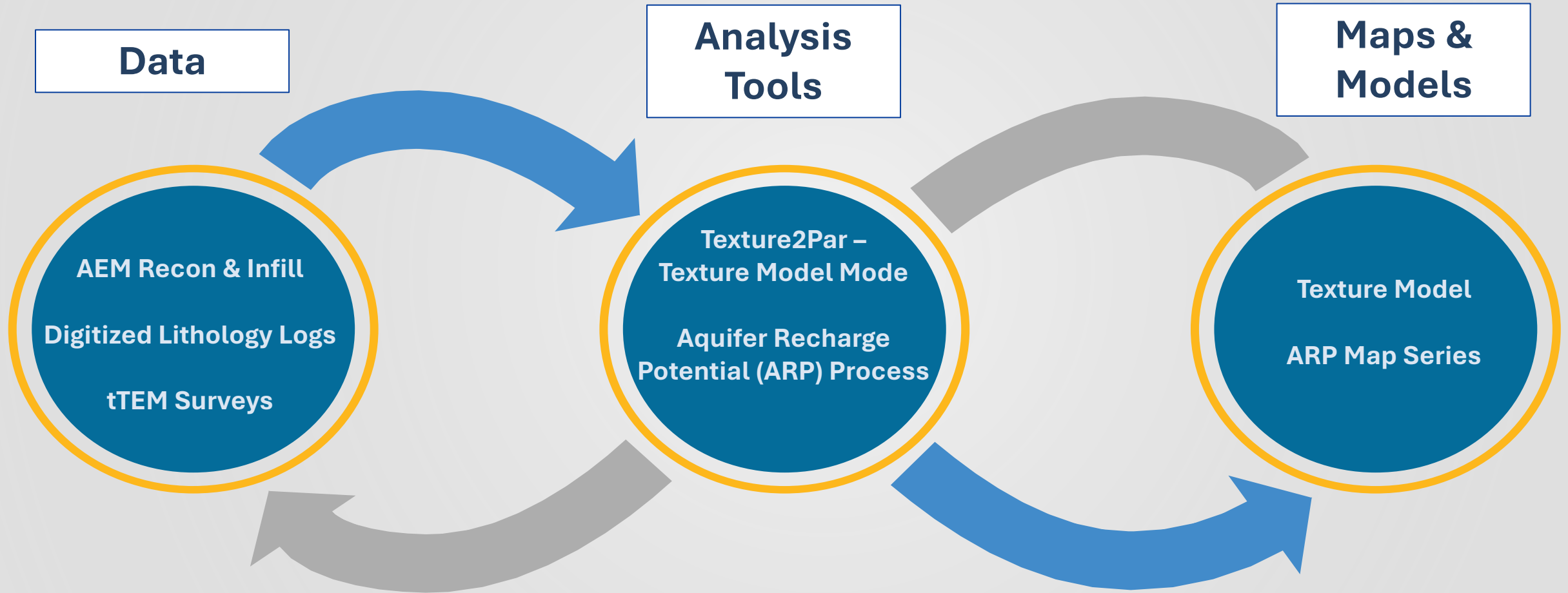
Regional Investigations

5. Sacramento Valley
6. Four County Area
7. San Joaquin Valley

Statewide Investigations

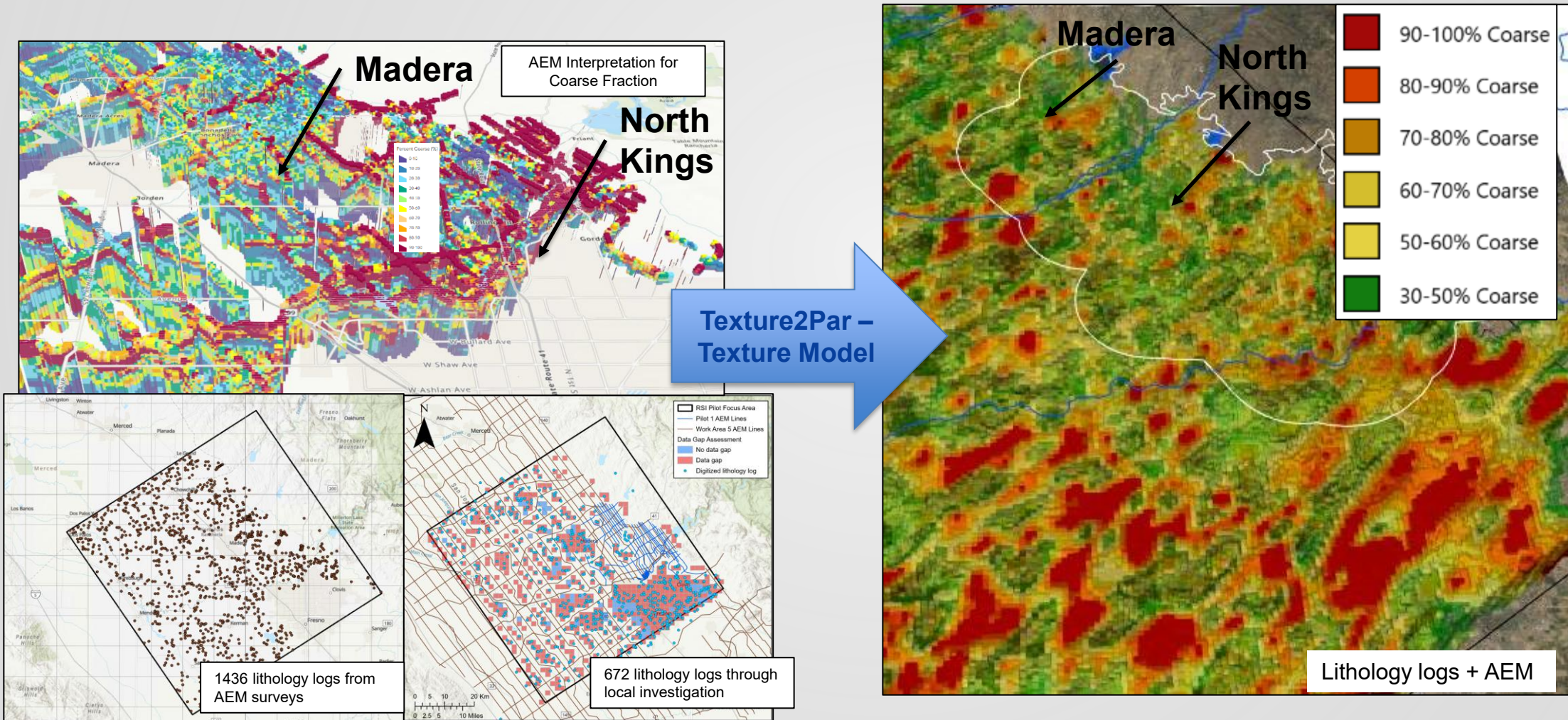
8. High and Medium Priority GW Basins

Basin Characterization in Madera & North Kings



Madera & North Kings Texture Model

Texture models developed using Texture2Par-Texture Model



Aquifer Recharge Potential Mapping Process

Maps describe potential for infiltration into the shallow and deep portion of the aquifer.

Gather



Rank



Weight

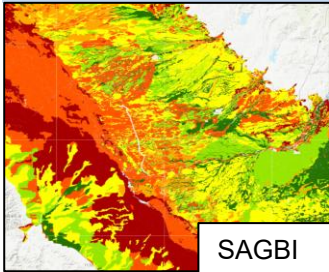


Combine



Datasets

Soil Conditions

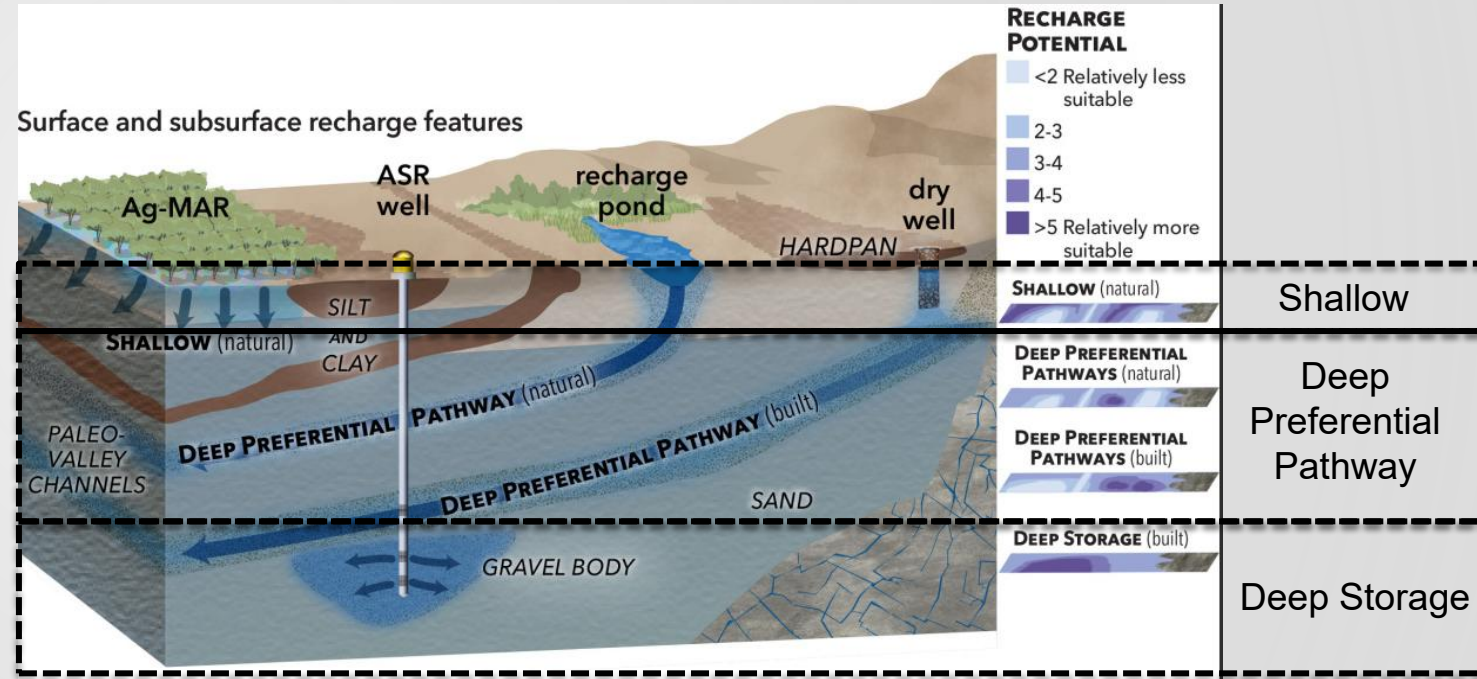
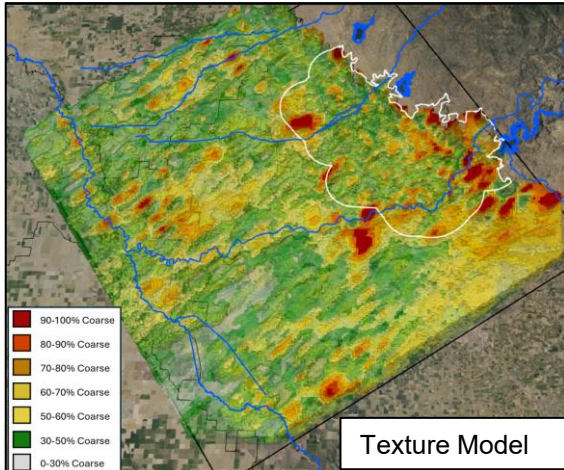
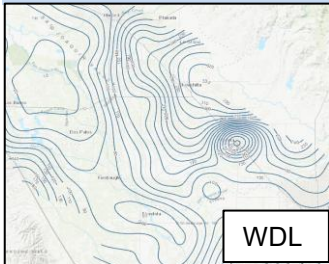


Depth to Fine Body

Average Shallow Coarse

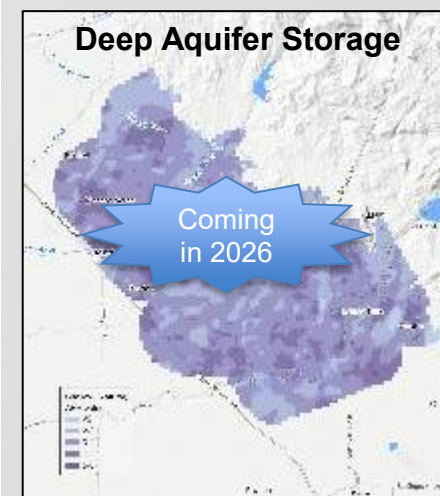
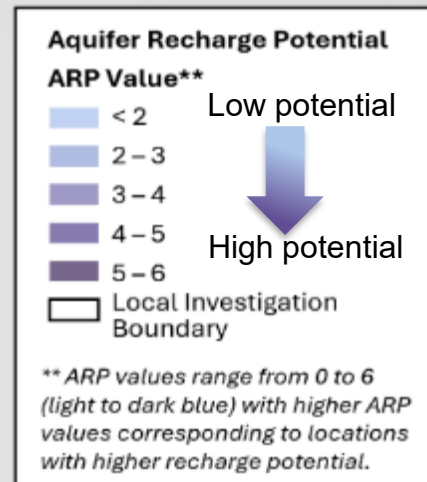
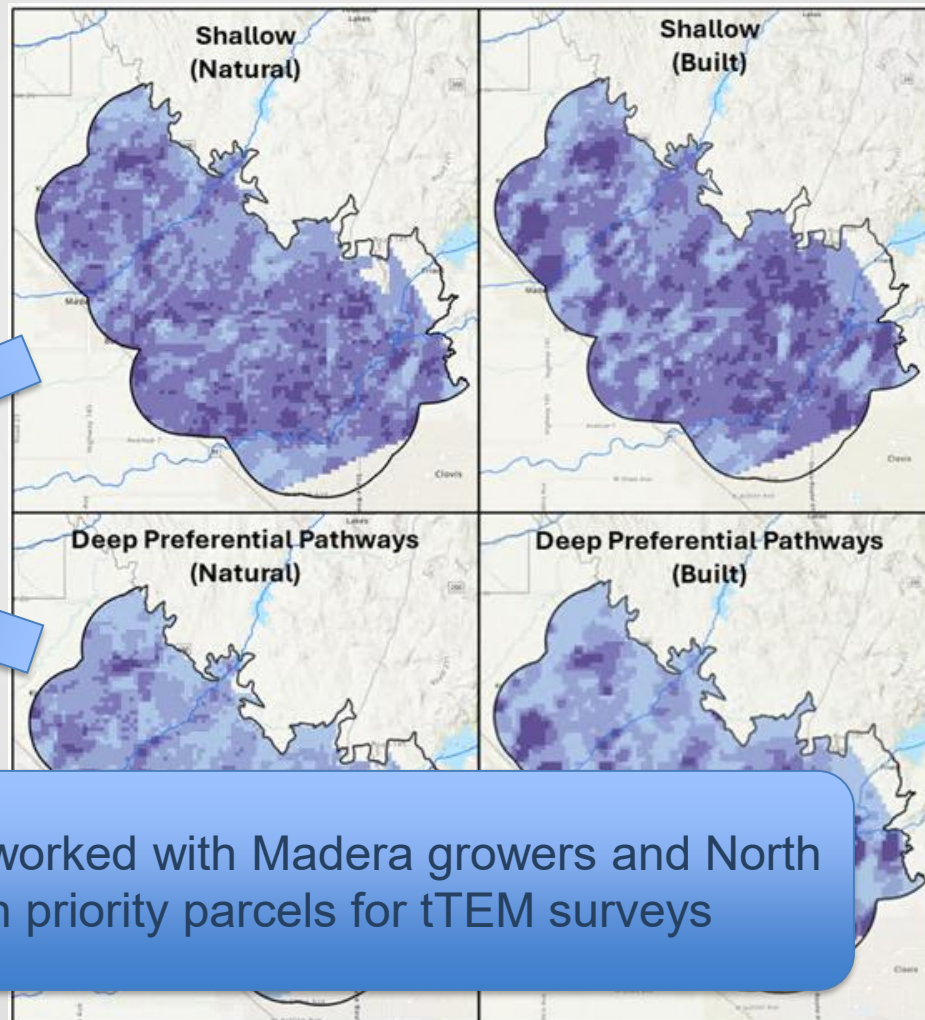
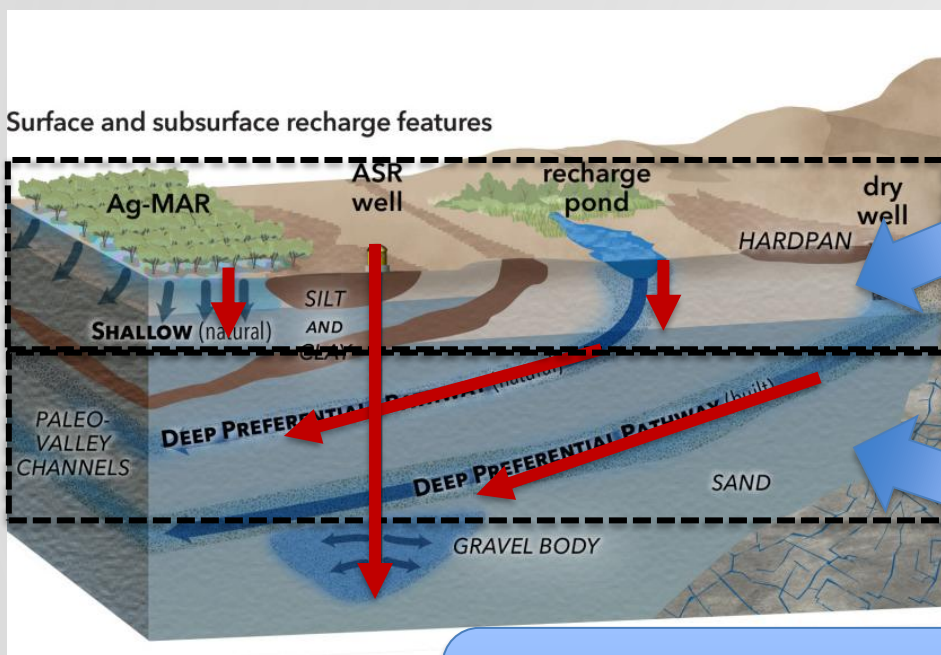
Interconnected Coarse Body

Depth to Water



Madera & North Kings Aquifer Recharge Potential Maps

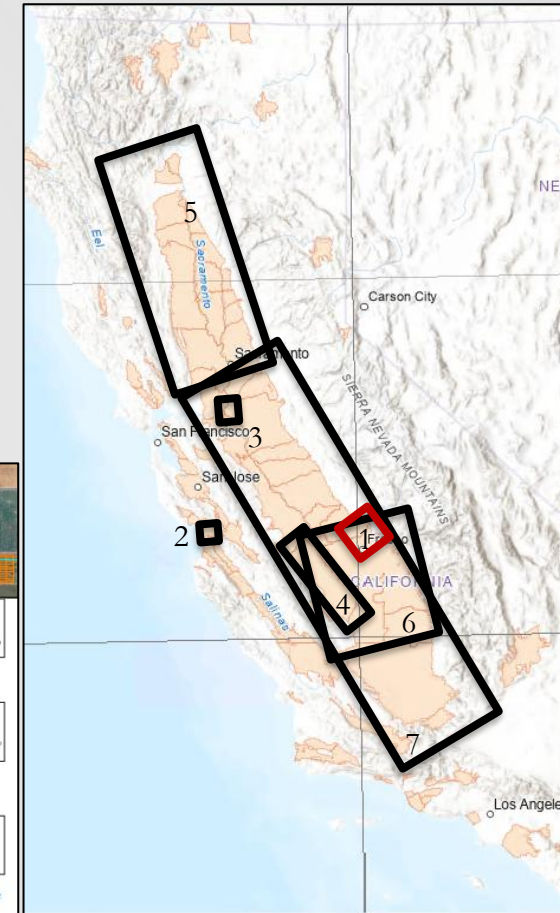
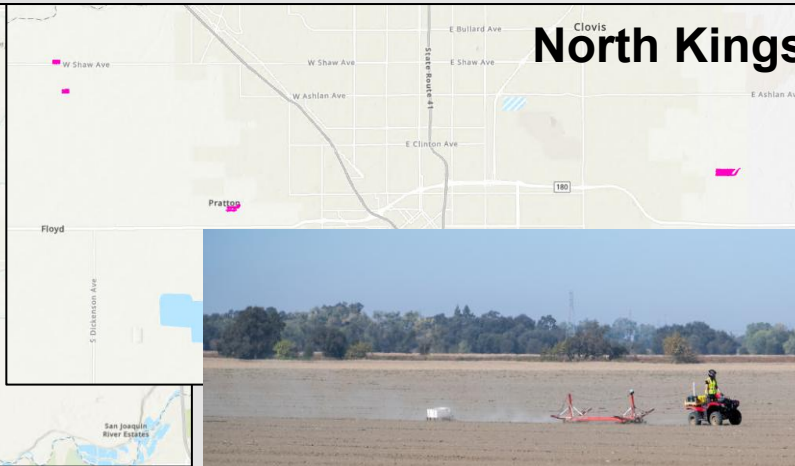
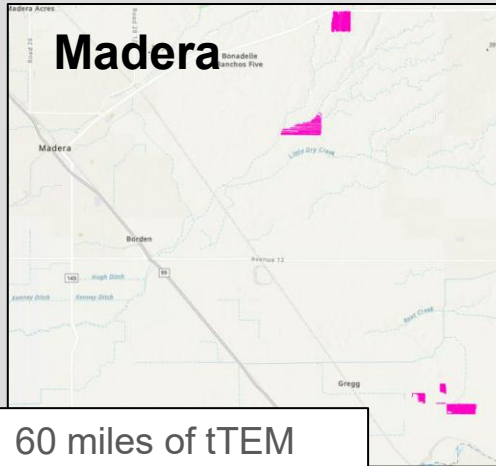
ARP maps are screening tool for parcel prioritization and additional investigation.



Utilized ARP maps and worked with Madera growers and North Kings to define high priority parcels for tTEM surveys

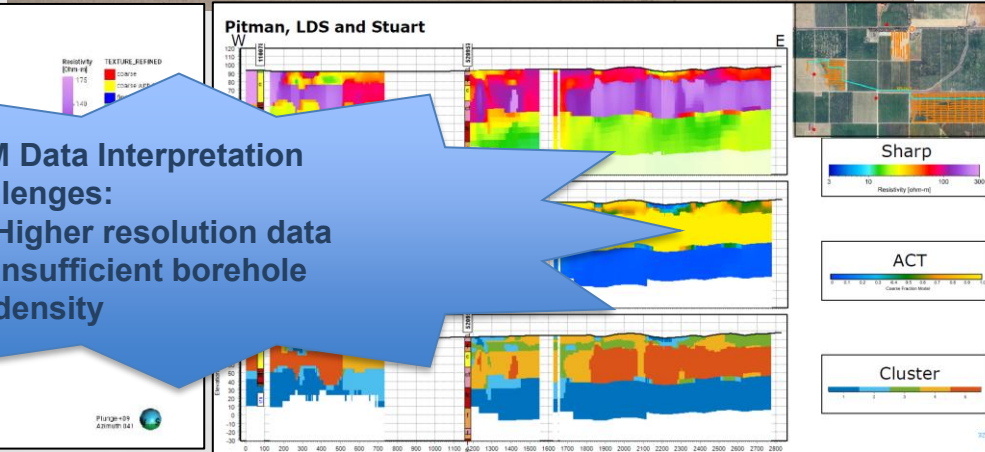
Towed-TEM Surveys at High Priority Locations

tTEM data to get high-resolution information to develop recharge sites.



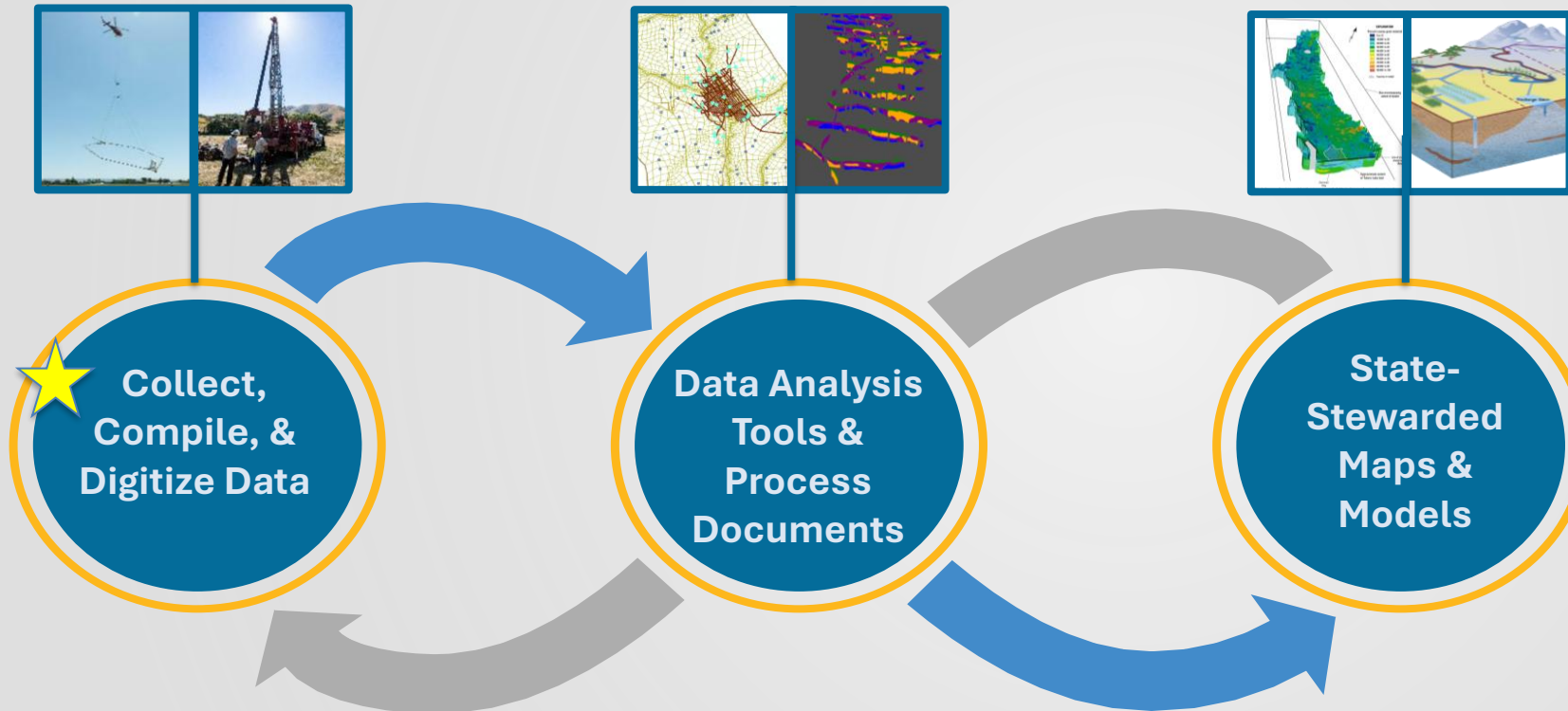
tTEM Data Interpretation Challenges:

- Higher resolution data
- Insufficient borehole density



Basin Characterization Program Overview

Local, Regional, & Statewide Groundwater Evaluations



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- Subsidence

Basin Characterization Exchange (BCX)

- Community of Practice
- Tribal, Local, State, & Federal Agencies
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Data Access & Visualization

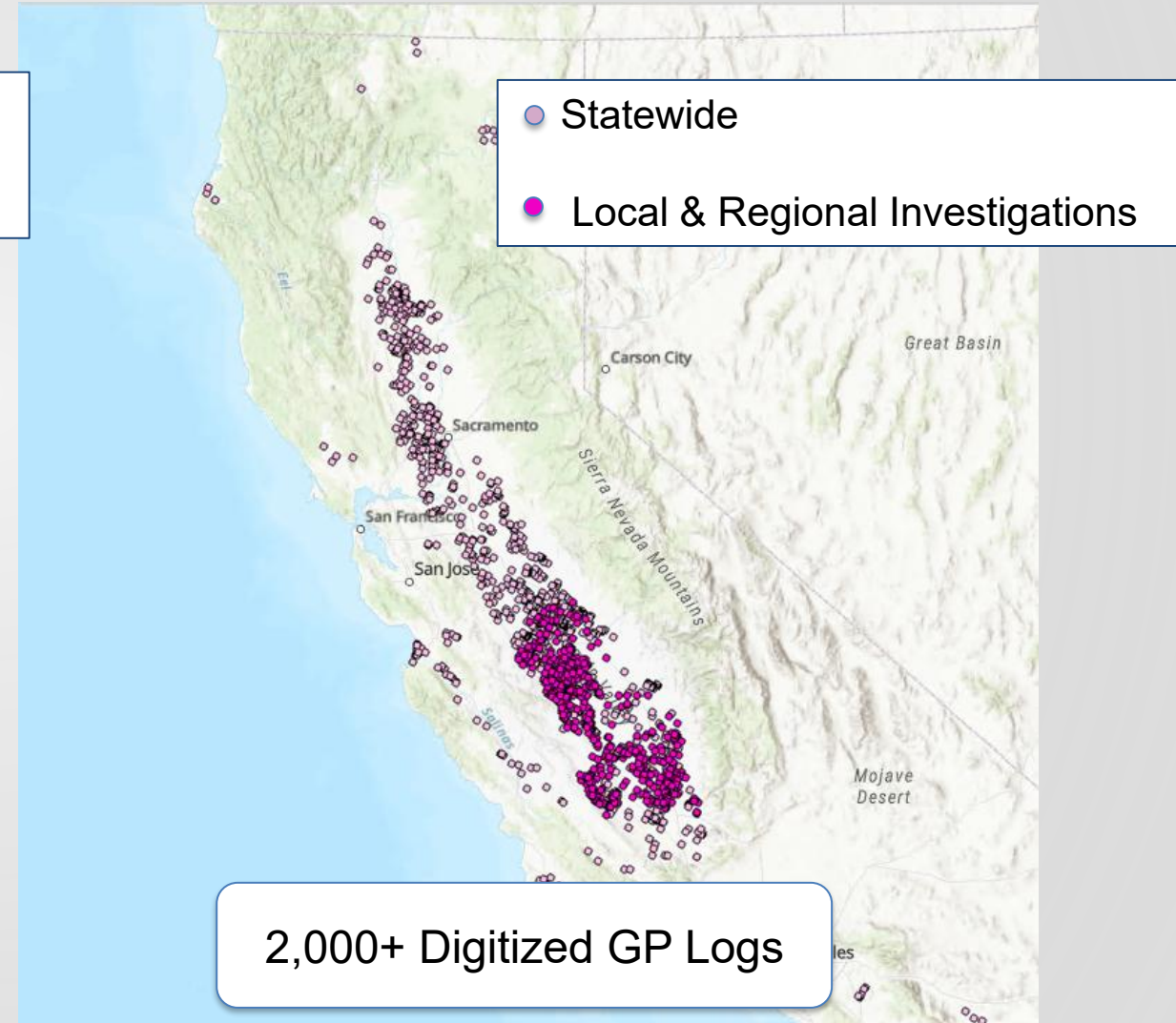
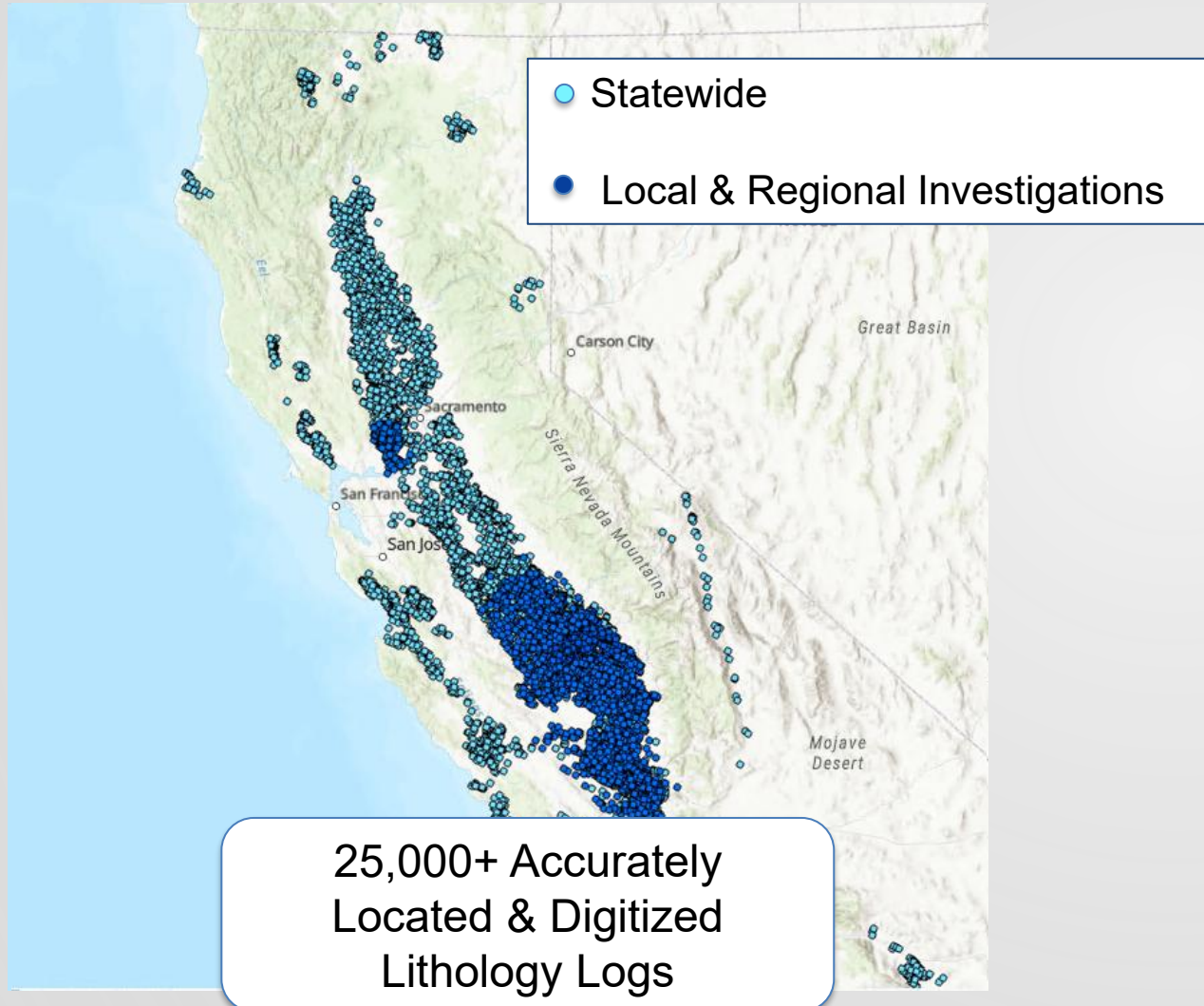


Data Archive | California's Groundwater

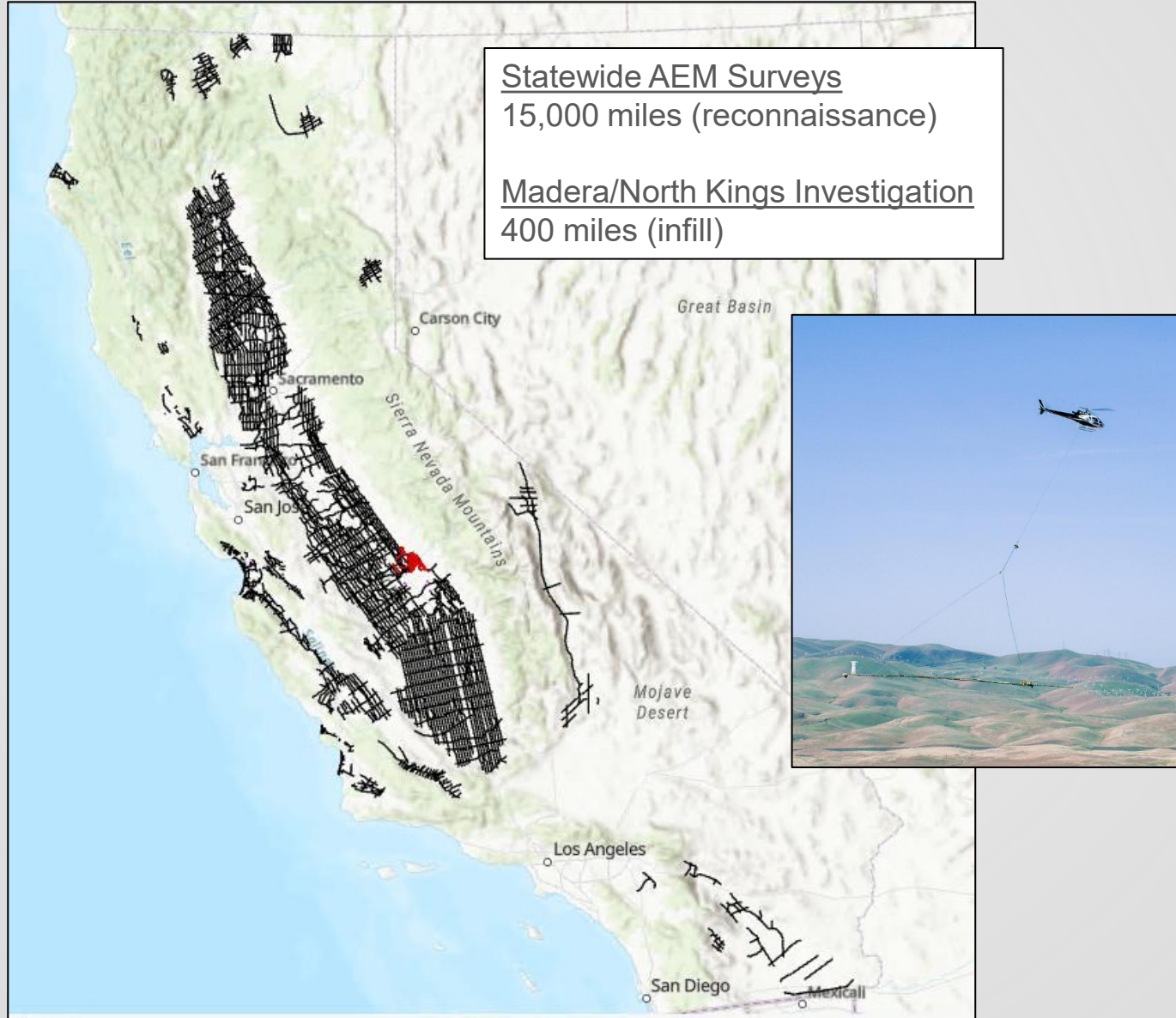


Data Digitization: Lithogy & Geophysical Logs

Data collected or digitized to support defining basin characteristics at the statewide, regional, and local scale.

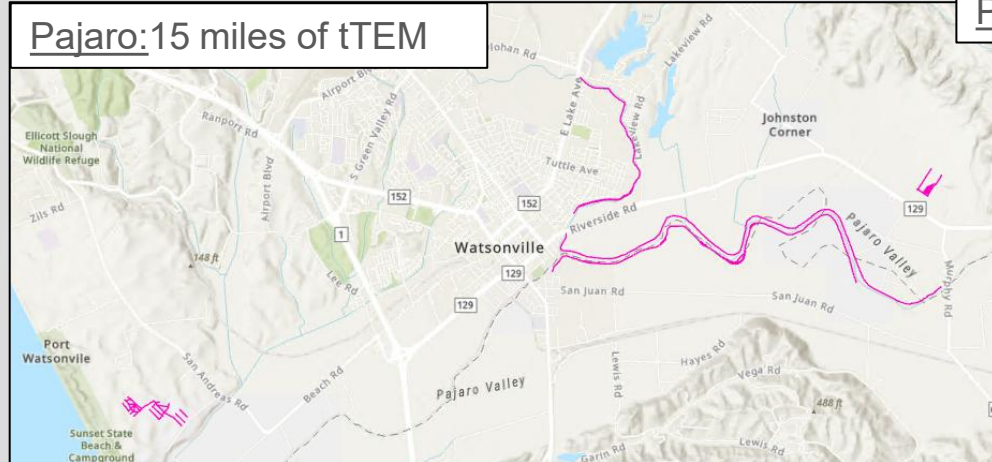


Data Collection: Airborne Electromagnetic (AEM)

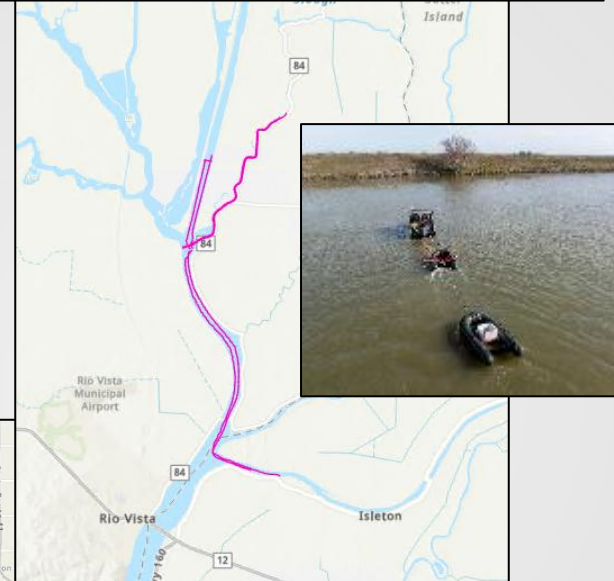


Data Collection: Towed and Floating Electromagnetic

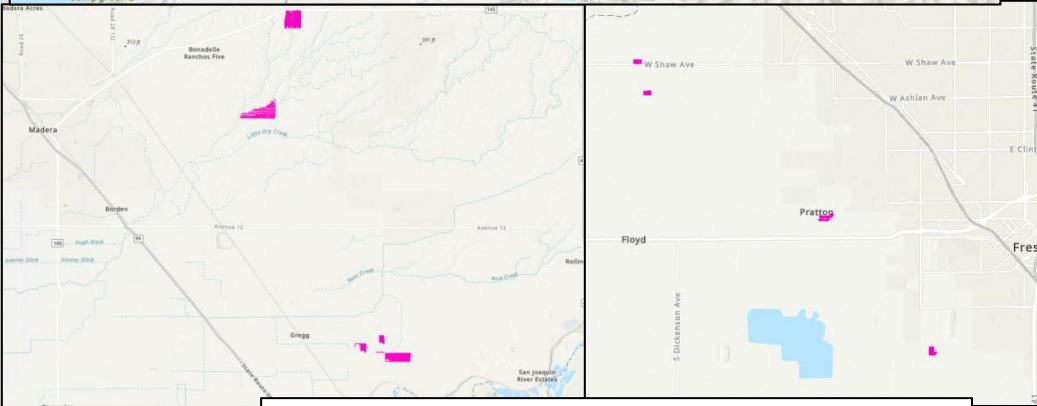
Pajaro: 15 miles of tTEM



Prospect Island: 20 miles of FloaTEM

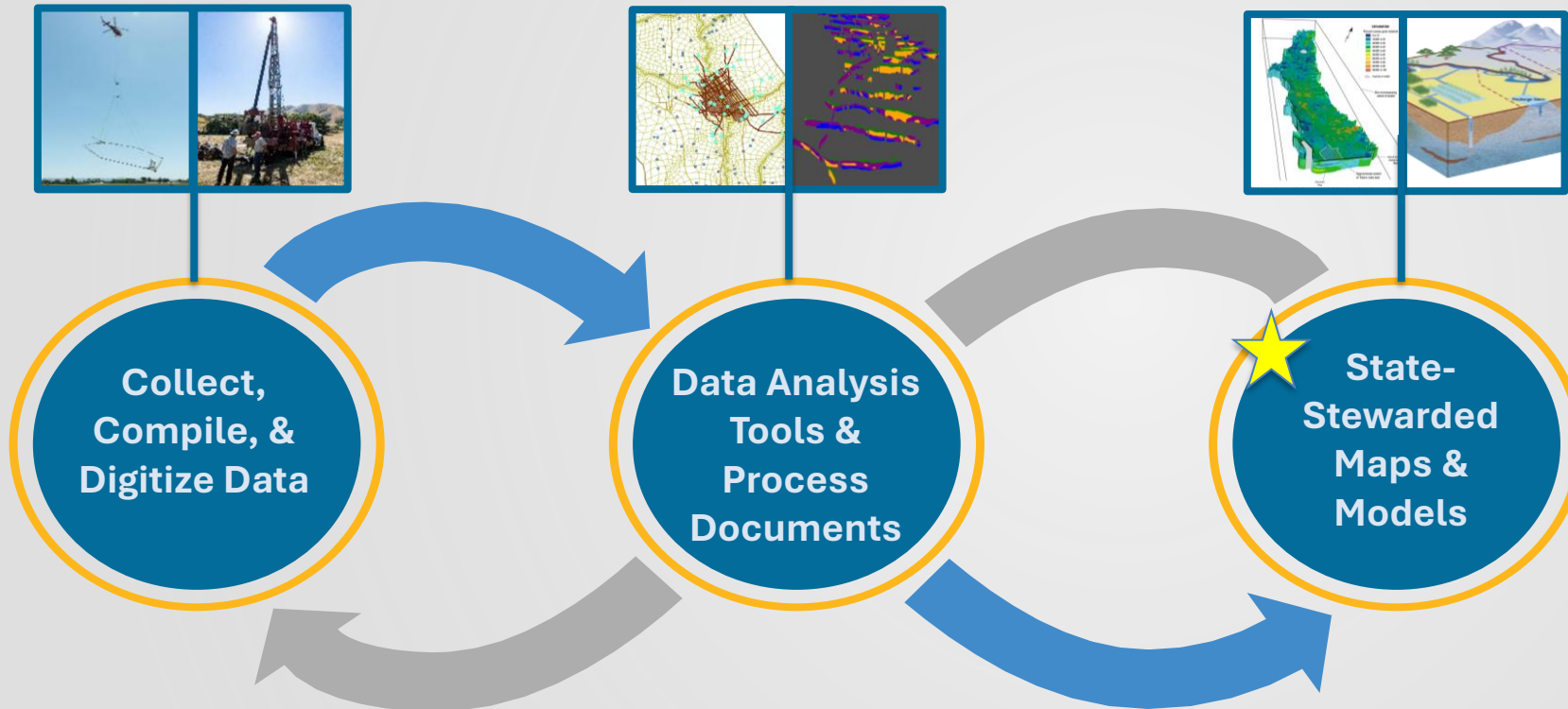


Madera & North Kings: 60 miles of tTEM



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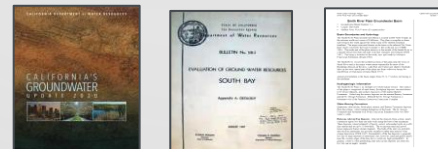
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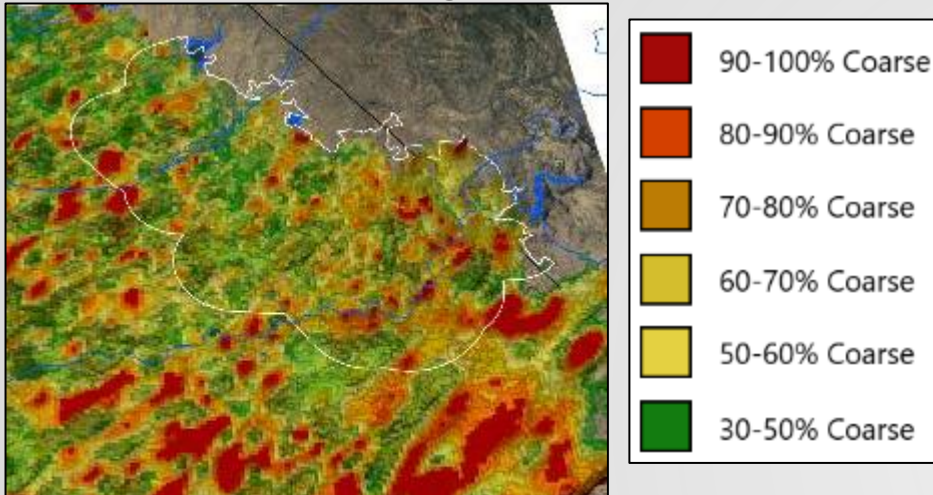


Data Archive | California's Groundwater

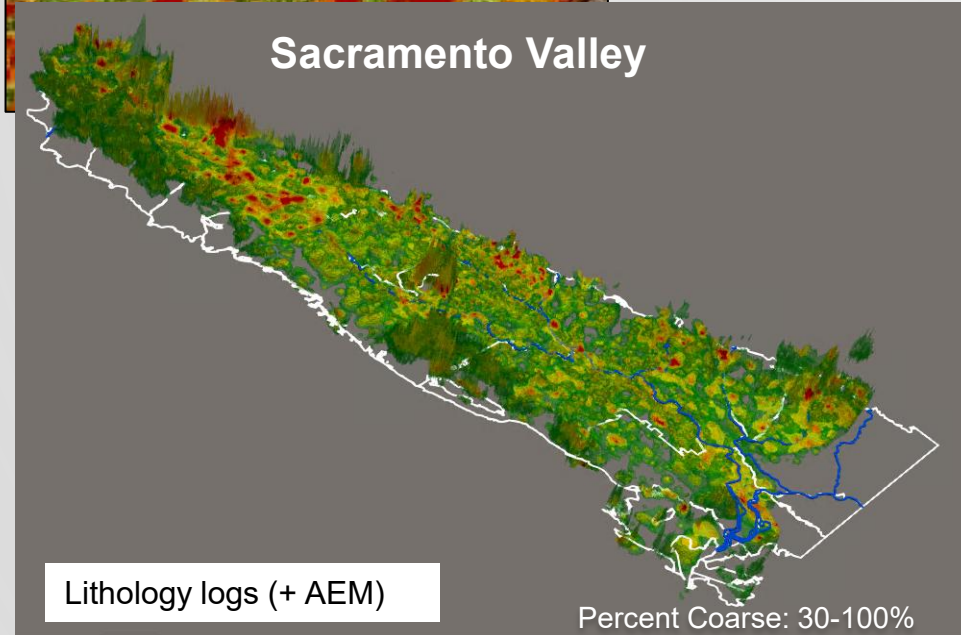


Texture Models

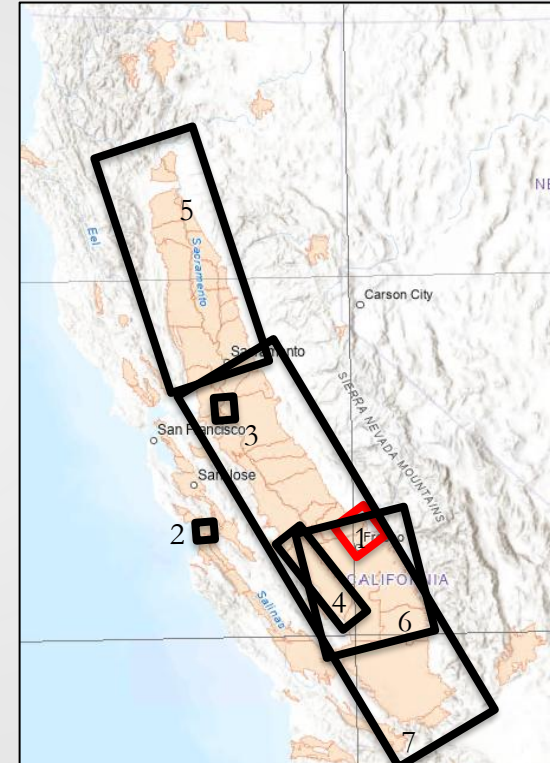
Madera & N. Kings



Sacramento Valley



Texture models developed using Texture2Par-Texture Model



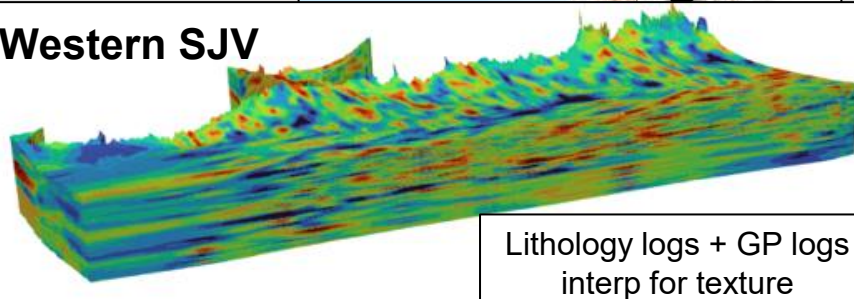
Local Investigations

1. **Madera & N. Kings**
2. Pajaro
3. Prospect Island
4. Western San Joaquin Valley – coming soon

Regional Investigations

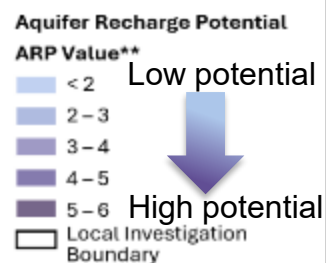
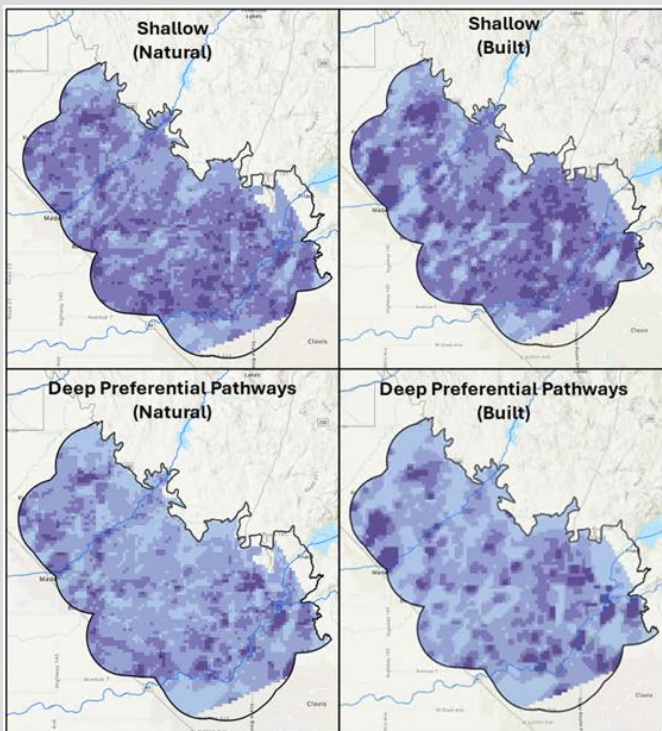
5. **Sacramento Valley – update coming soon**
6. Four County Area
7. San Joaquin Valley

Western SJV

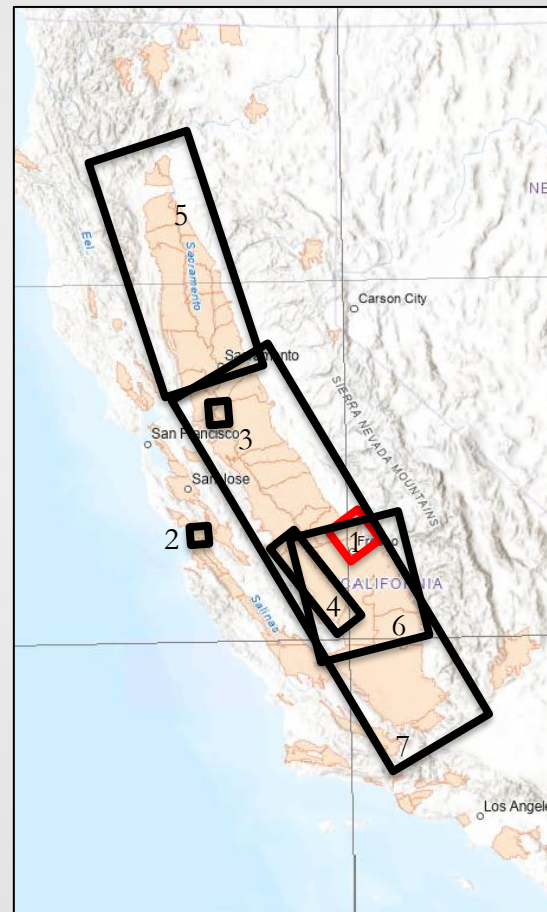
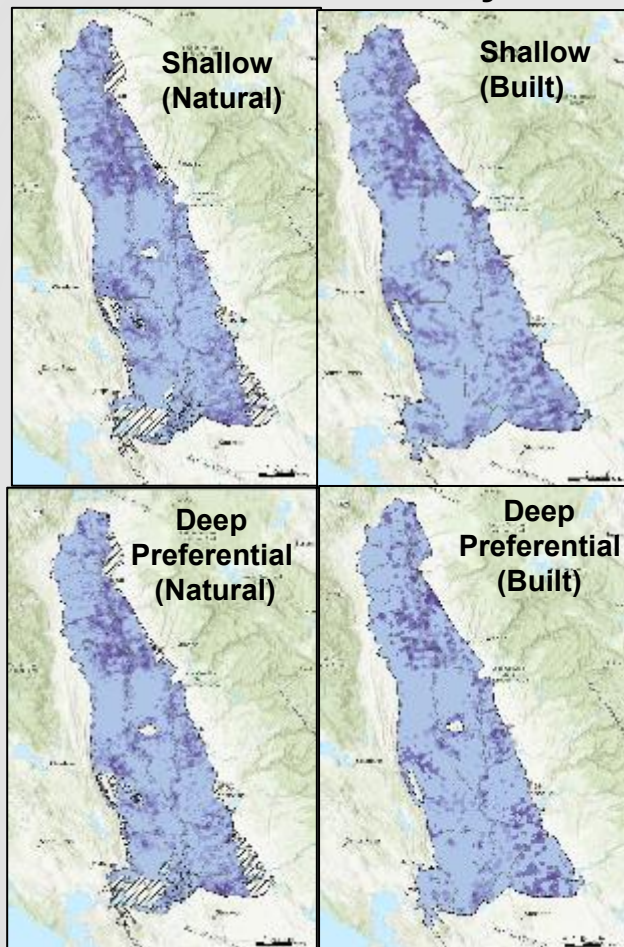


Aquifer Recharge Potential Maps

Madera & N. Kings



Sacramento Valley



Local Investigations

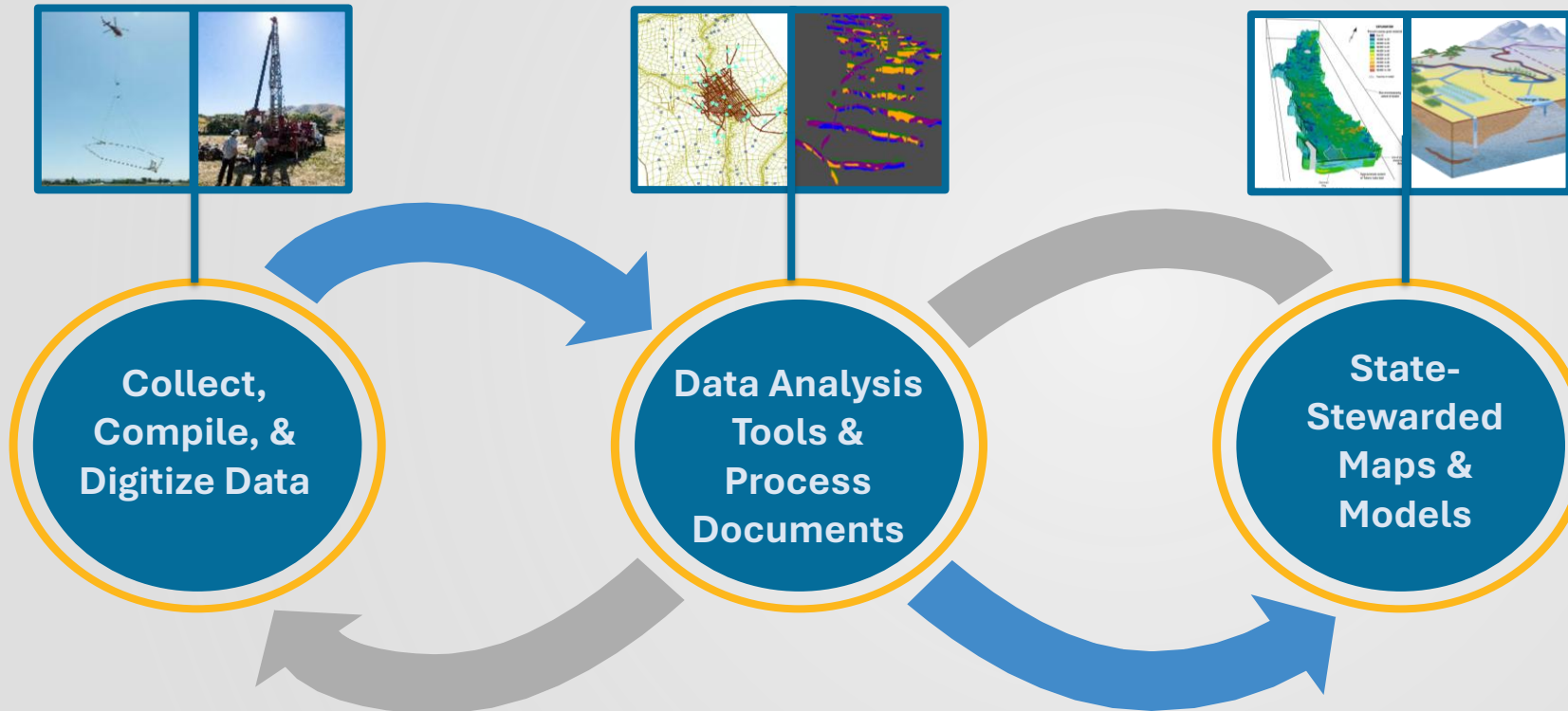
1. **Madera & N. Kings**
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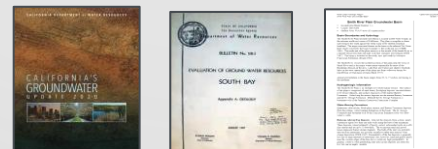
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Data Access & Visualization



Data Archive | California's Groundwater



California Natural Resource Agency Open Data Portal

[Open Data](#)[Organizations](#)[Topics](#)[Training](#)[Log in](#) [Contact](#)[Home](#) / [Organizations](#) / [California Department of Water Resources](#) / **DWR's Basin Characterization Program**

DWR's Basin Characterization Program

DWR has a long history of studying and characterizing California's groundwater aquifers as a part of [California's Groundwater \(Bulletin 118\)](#). [California's Groundwater 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.

Under the Basin Characterization Program, new and existing data (AEM, lithology logs, geophysical logs, etc.) are integrated to create continuous maps and three-dimensional models. To support this effort, new data analysis tools have been developed to create texture models, hydrostratigraphic models, and aquifer flow parameters. Data collection efforts have been expanded to include advanced geologic, hydrogeologic, and geophysical data.

Characterization Program has developed

Additional information can be found

Local, Regional, and Statewide

DWR is undertaking local, regional, and statewide investigations, and the work being conducted in each area

Local Investigations

- [Madera & North Kings](#): AEM data and models
- [Pajaro](#): AEM and TTEM data collection
- [Western San Joaquin Valley](#): AEM data collection
- [Prospect Island](#): AEM data collection

Regional Investigations

- [Sacramento Valley](#): AEM data collection
- [Four County Area of San Joaquin Valley](#): AEM data collection, clay delineation, and aquifer recharge potential
- [San Joaquin Valley](#): AEM data collection and aquifer recharge potential

Statewide Investigations

- [Statewide AEM Surveys](#): AEM data collection

Madera & North Kings Local Investigation

The Madera & North Kings Local Investigation focuses on providing information to support floodplain habitat rehabilitation, surface water-groundwater interaction, groundwater recharge, and domestic well assistance activities. The Local Investigation is located within the Kings and Madera subbasins and concentrated on the eastern side of the San Joaquin Valley, between the Upper San Joaquin and Fresno Rivers. Maps and models developed as a part of this Local Investigation support state and local agencies in determining locations for deep recharge (to get water into the main producing zone of the aquifer), shallow recharge (to provide water for vulnerable shallow domestic wells), and multi-benefit floodplain rehabilitation.

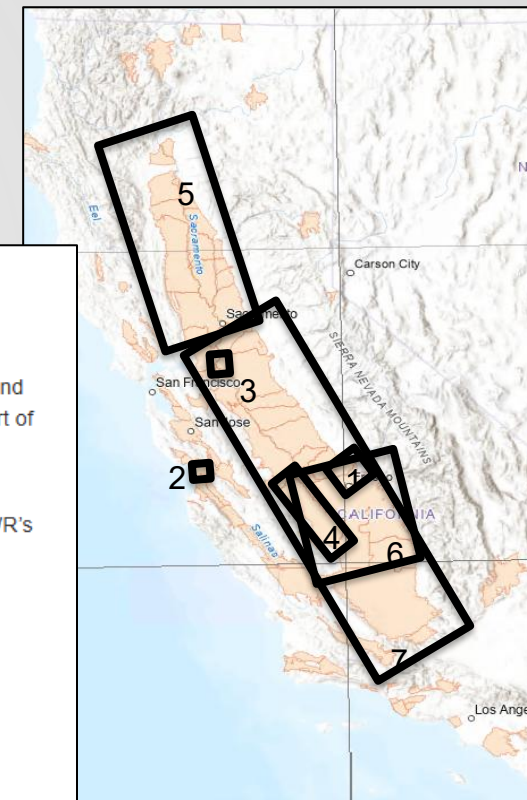
The Madera & North Kings Local Investigation is a collaboration between the Basin Characterization Program, the Madera and North Kings GSAs, DWR's Flood-MAR Program, and the Ecological Flood Inundation Potential (EcoFIP) team.

Maps and Models

- [Local Investigation: Madera/North Kings - Texture model \(Version 2024.3\)](#)
- [Local Investigation: Madera/North Kings - Aquifer Recharge Potential Maps \(Version 2024.3\)](#)
- [ARP Maps and Texture Model can be viewed online on the SGMA Data Viewer](#)

Datasets

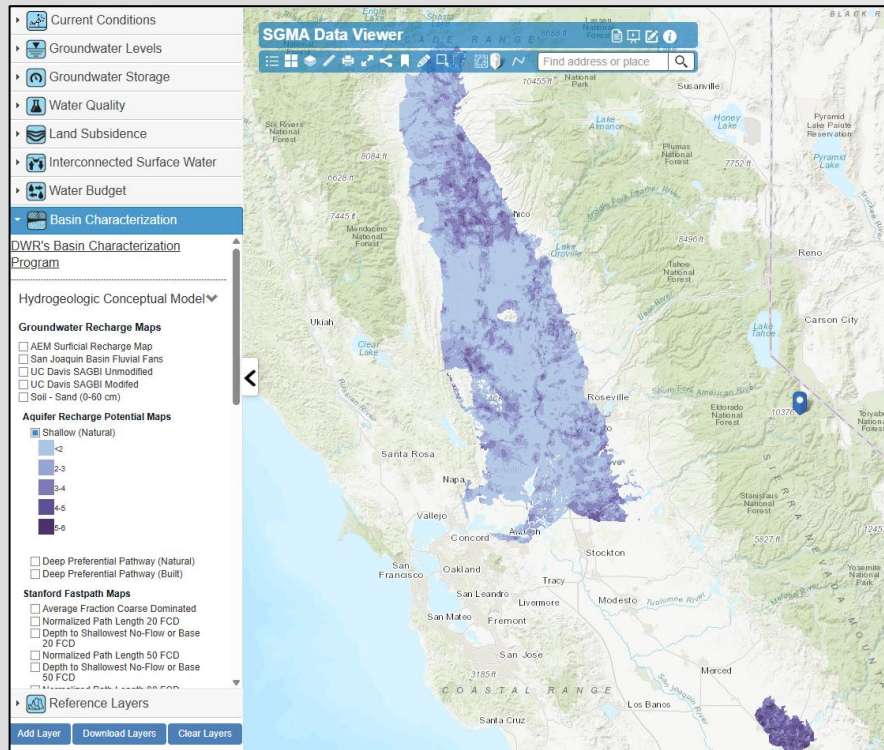
- [Digitized lithology and geophysical logs - Local Investigation: Madera/North Kings](#)
- [Digitized lithology and geophysical logs - Statewide AEM Surveys, Survey Areas 5 and 9](#)
- [AEM datasets - Statewide AEM Surveys, Survey Areas 5 and 9](#)



<https://data.cnra.ca.gov/dataset/dwr-basin-characterization>

Data Visualization

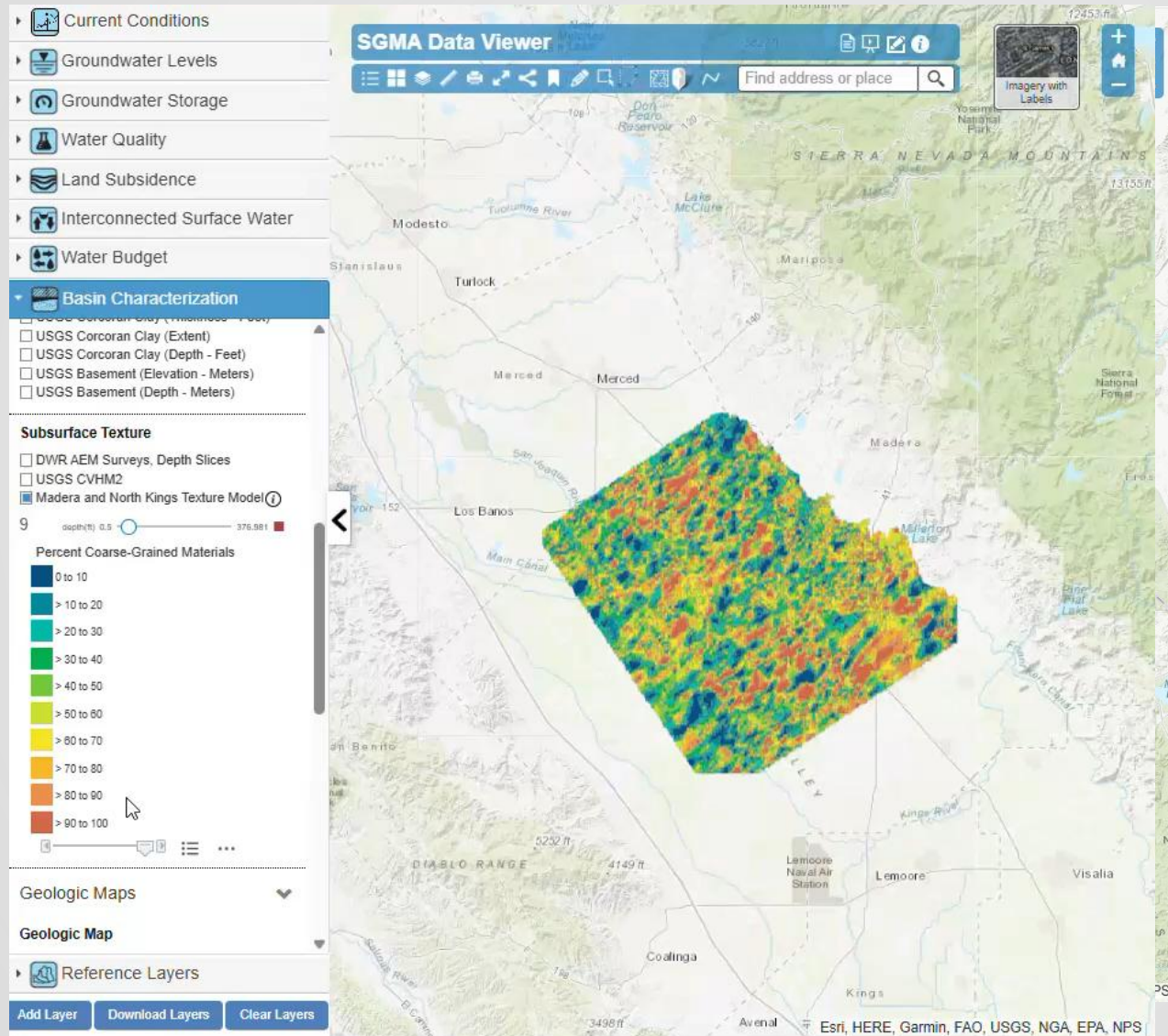
SGMA Data Viewer Map View



CalGW Subsurface Viewer Cross Section (2D) and 3D View



SGMA Data Viewer



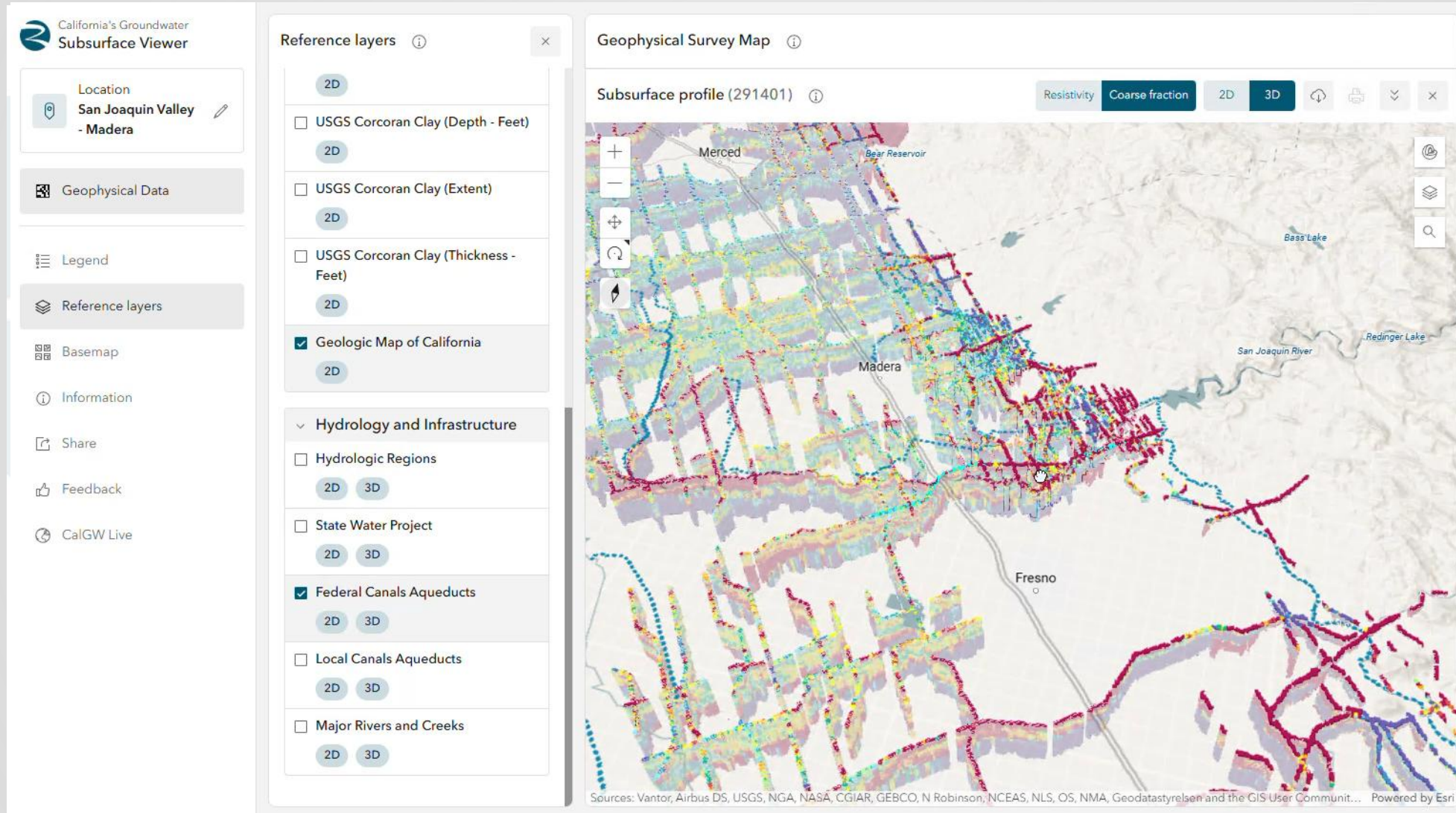
<https://sgma.water.ca.gov/sgmadataviewer>

CalGW Subsurface Viewer – AEM Data Example

The screenshot displays the CalGW Subsurface Viewer web application. On the left, a map of California shows county boundaries. A tooltip above the map reads: "Select a basin or county from the list or map to view its subsurface data or [view data for all of California.](#)". On the right, a sidebar contains a "Counties" tab and a "Basins" tab. Below the tabs is a search bar labeled "Search by name". A list of 20 California counties follows, each with a radio button: Alameda, Amador, Butte, Calaveras, Colusa, Contra Costa, Fresno, Glenn, Humboldt, Imperial, Inyo, Kern, Kings, Lassen, Madera, Mendocino, Merced, San Luis Obispo, Santa Barbara, Santa Clara, Santa Maria, Santa Rosa, Stanislaus, Stockton, Tehama, Tulare, and Yuba. At the bottom of the sidebar is a "Select location" button. The map shows various cities and geographical features, including the Nevada border and the San Francisco Bay Area.

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

CalGW Subsurface Viewer – AEM Data Example



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

Basin Characterization Exchange (BCX)

Upcoming BCX Webinars

April 28 (12:30-1-30 pm PST):

Title: Subsurface Geologic Framework Modeling in the Southern San Joaquin Basin

Presenter: Dan Boyd, California Geological Survey

May 19 (12:30-1-30 pm PST):

Topic: Groundwater Salinity Mapping in California's Central Valley

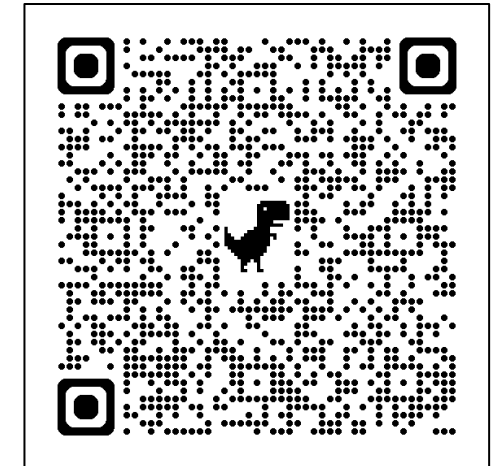
Presenter: Michael Stephens, US Geological Survey

June 16 (12:30-1-30 pm PST):

Topic: Basin Characterization Toolbox - Tools and Training

Presenter: Woodard & Curran and S.S. Papadopoulos & Associates

Join the BCX Listserv



Thank you!

Basin Characterization Program:

<https://water.ca.gov/Programs/Groundwater-Management/Bulletin-118/Basin-Characterization>

Tools, Maps, Models, and Data Available on
the CNRA Open Data Portal:

[https://data.cnra.ca.gov/dataset/
dwr-basin-characterization](https://data.cnra.ca.gov/dataset/dwr-basin-characterization)

Program Email:

Basin.Characterization@water.ca.gov

