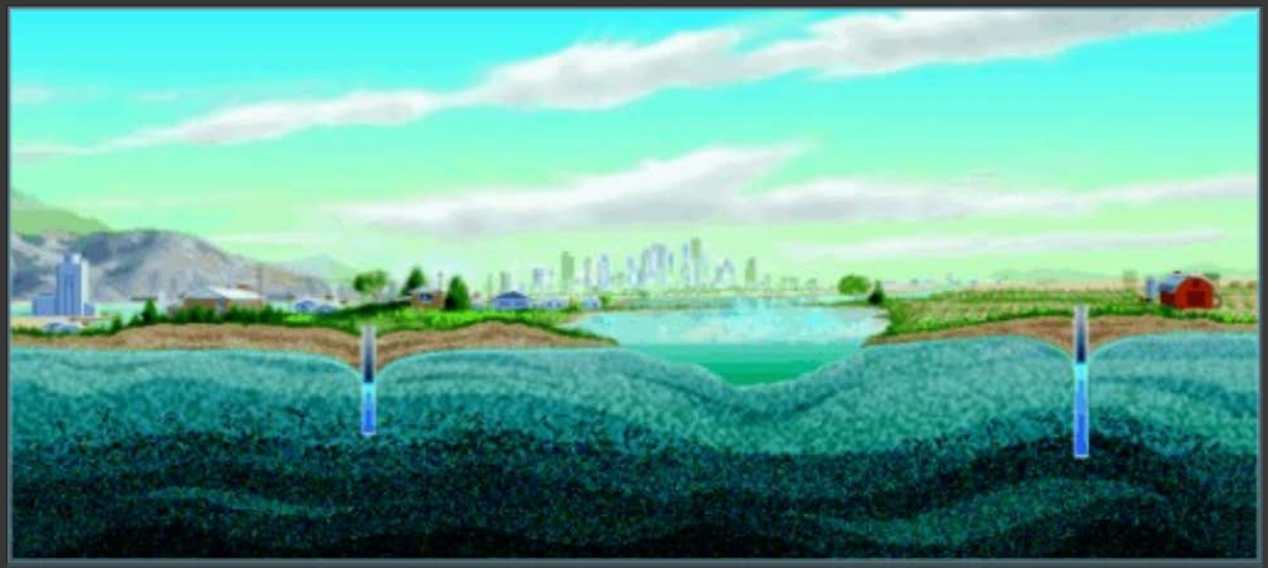
Groundwater in the San Joaquin Valley



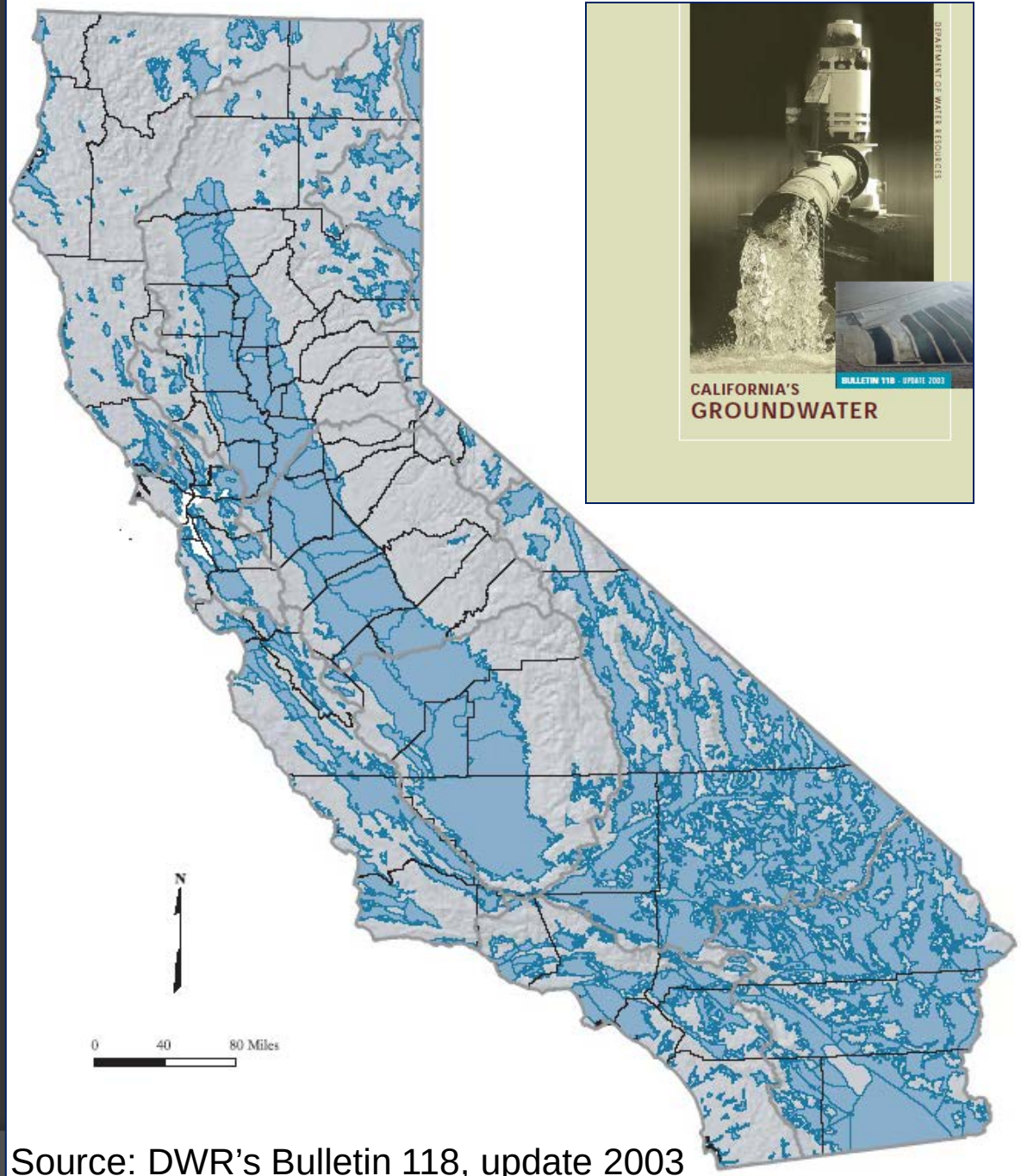
March 2015

Dane Mathis, PG, CEG, CHG
Senior Engineering Geologist
Division of Integrated Regional Water Management
South Central Region Office

DEPARTMENT OF WATER RESOURCES
STATE OF CALIFORNIA

OUTLINE

- Groundwater Overview
- Drought Response
- Central Valley Conditions
- Groundwater Information

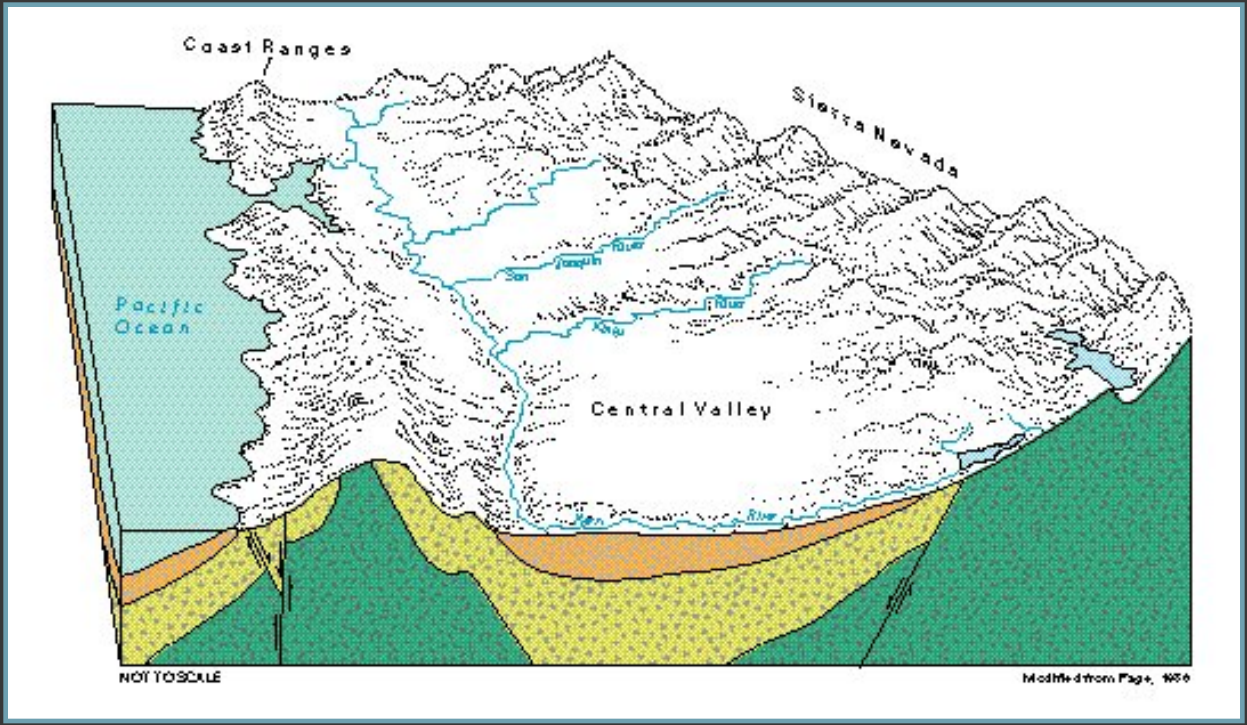


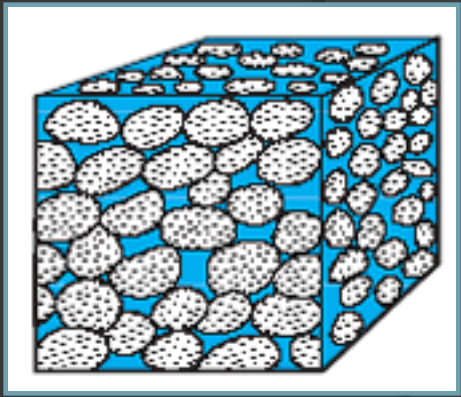
California's Groundwater Basins

- 515 alluvial basins/subbasins
- ~ 40% of state's water supply
- Basins, precipitation, population, and demands are not evenly distributed

Source: DWR's Bulletin 118, update 2003

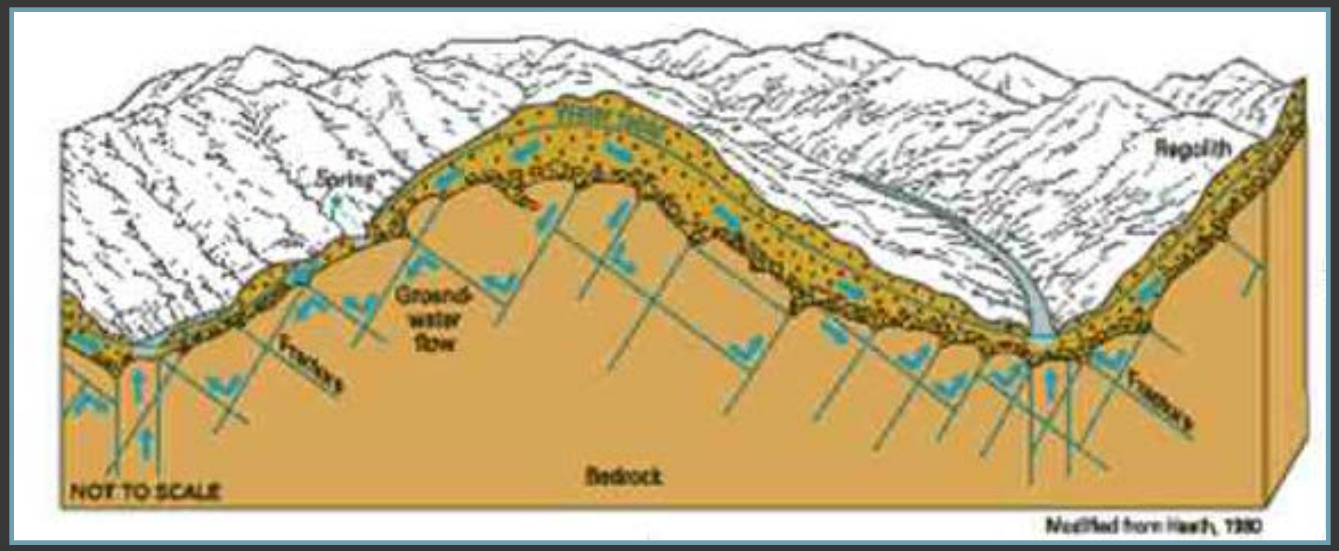
Alluvial Aquifers

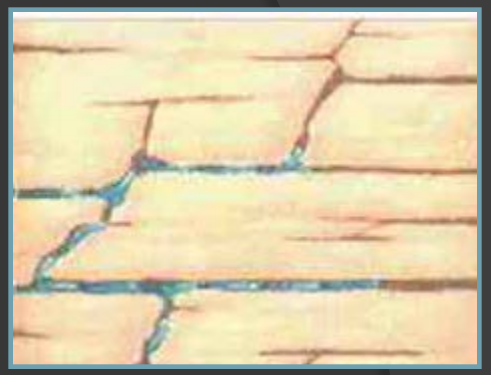


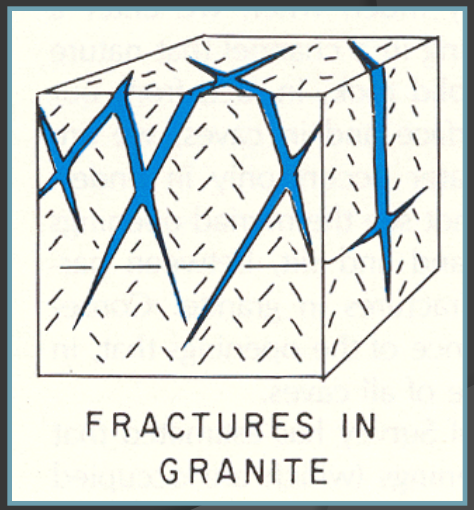


- Unconsolidated material
- Underlies valley floors & coastal plains

Fractured Rock Aquifers

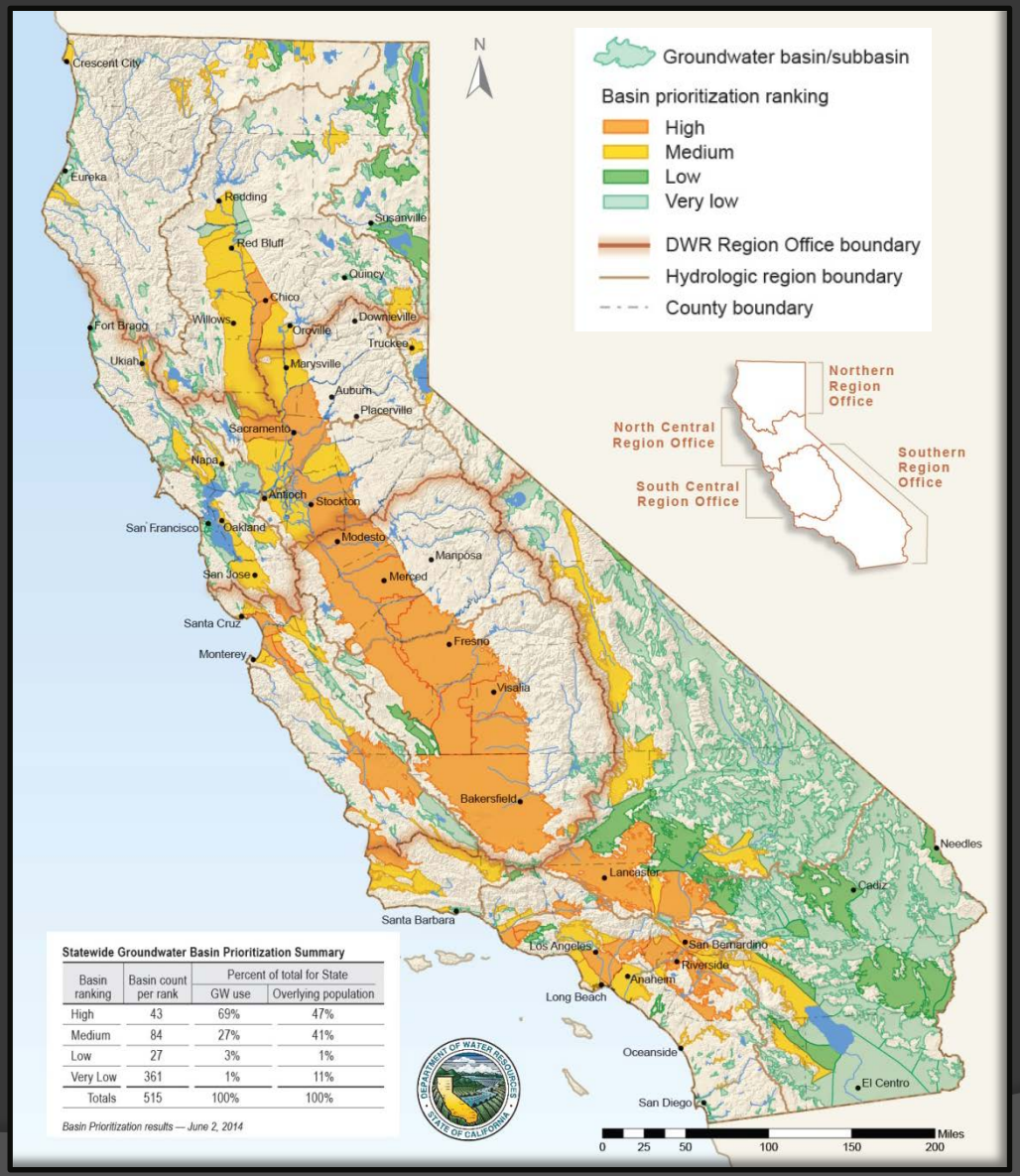






- Consolidated “hard” rock
- Underlies mountainous & highland areas

CASGEM Basin Prioritization



Statewide Breakdown

Basin Ranking	Basin Count per Rank	Percent of Total for Hydrologic Region	
		GW Use	Overlying Population
High	43	69%	47%
Medium	84	27%	41%
Low	27	3%	1%
Very Low	361	1%	11%
Totals	515	100%	100%

127 High & Medium Priority basins

- 96% of groundwater use
- 88% of overlying population

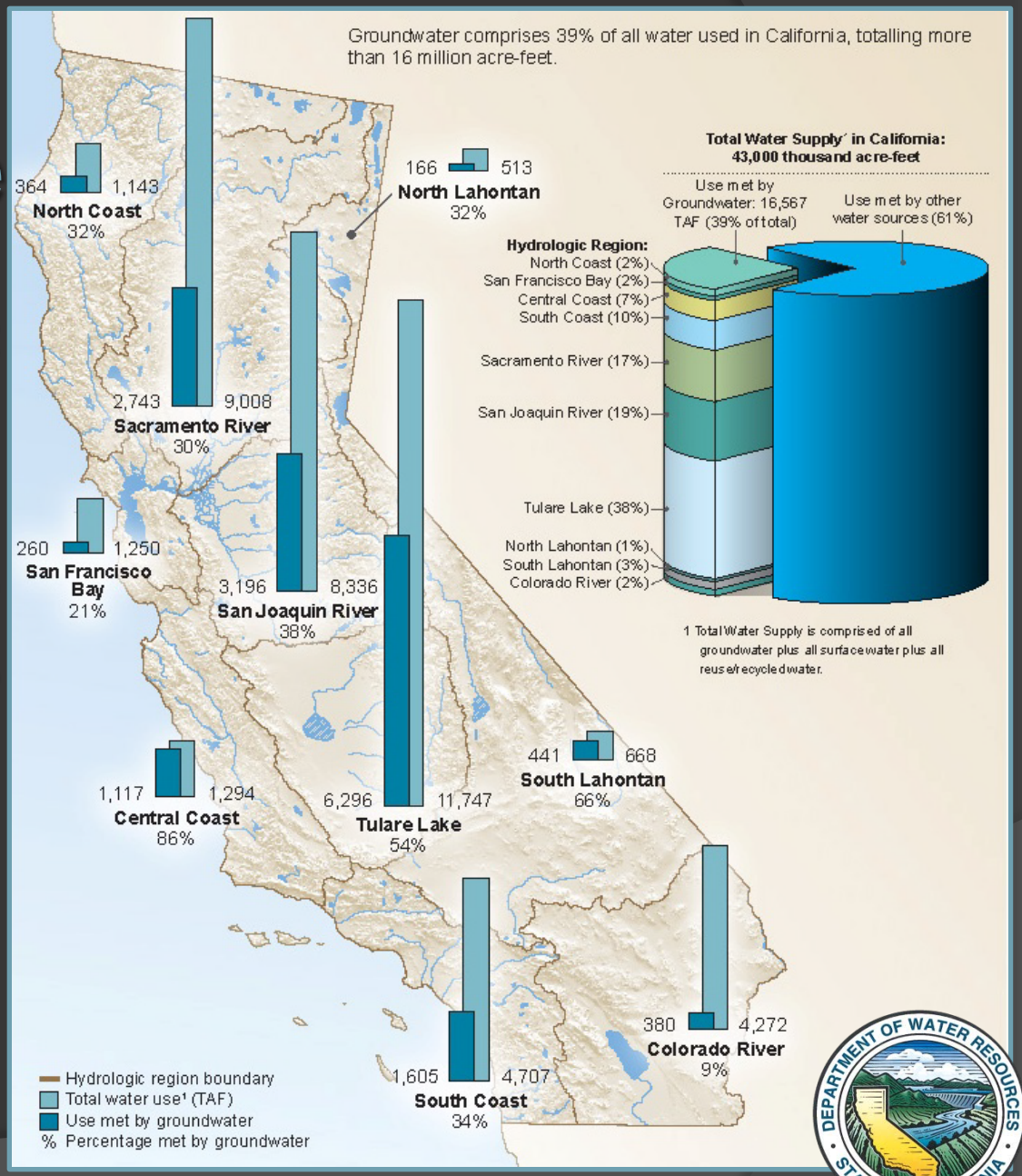
http://www.water.ca.gov/groundwater/casgem/

Statewide Groundwater Use

Regions with highest use:
(relative to statewide total)

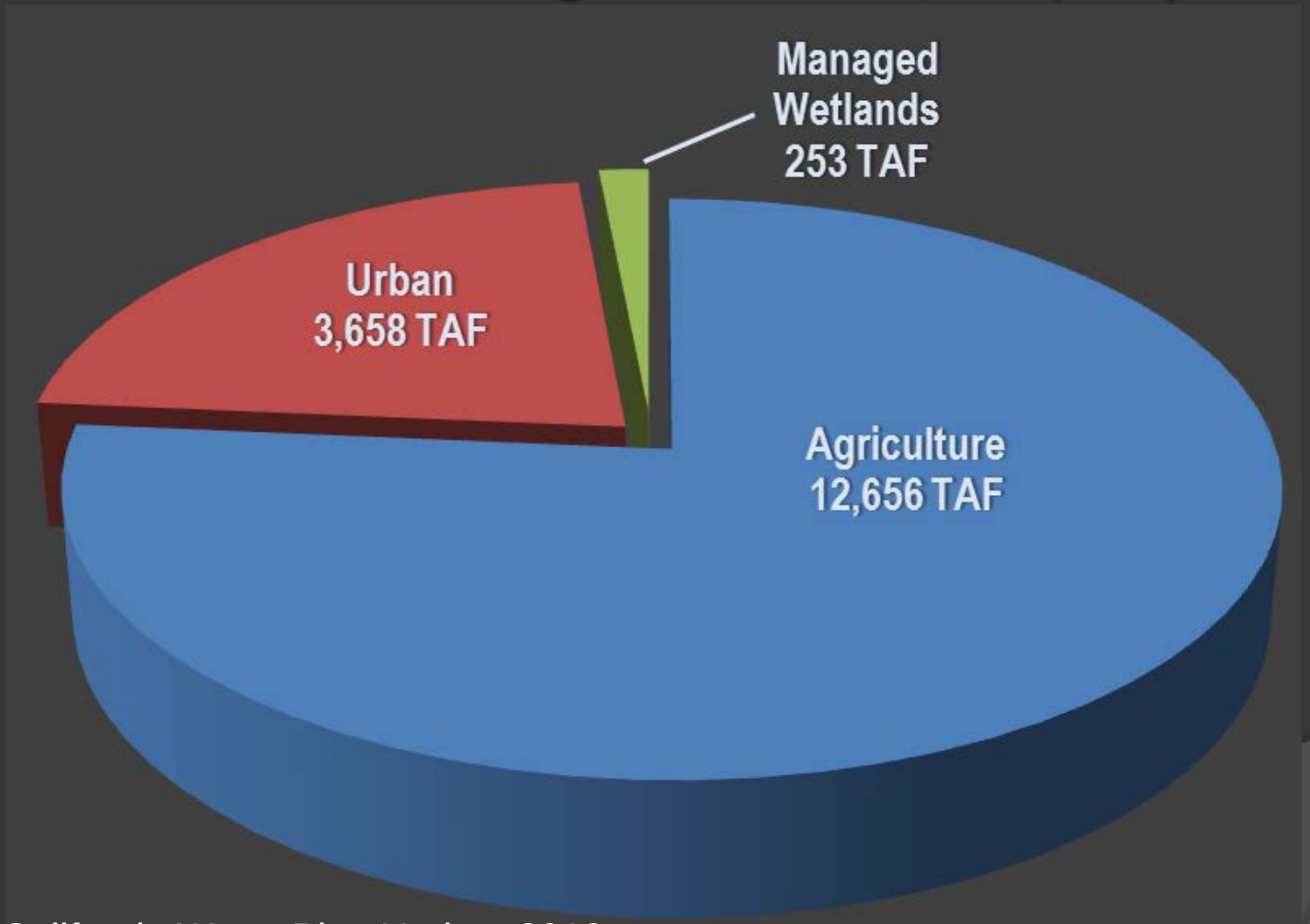
- Tulare Lake 38%
- San Joaquin River 19%
- Sacramento River 17%
- South Coast 10%

(2005 to 2010 Average Annual Data)



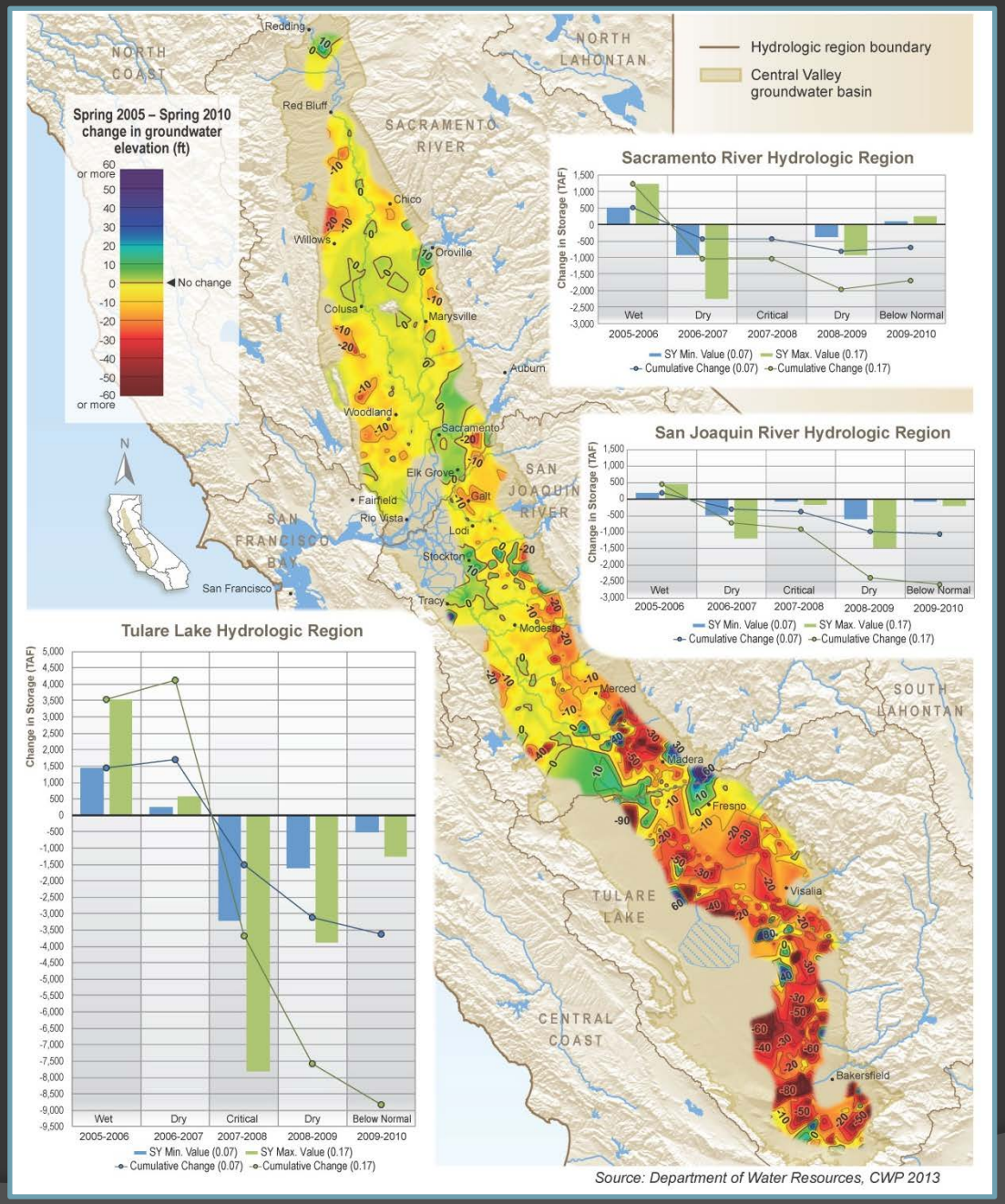
Statewide Groundwater Use

2005-2010 Average Annual: 16,567 (TAF)



Source: California Water Plan Update 2013

Spring 2005-Spring 2010 Change in Groundwater Storage



Source: Department of Water Resources, CWP 2013

<u>Sacramento River HR</u>

+

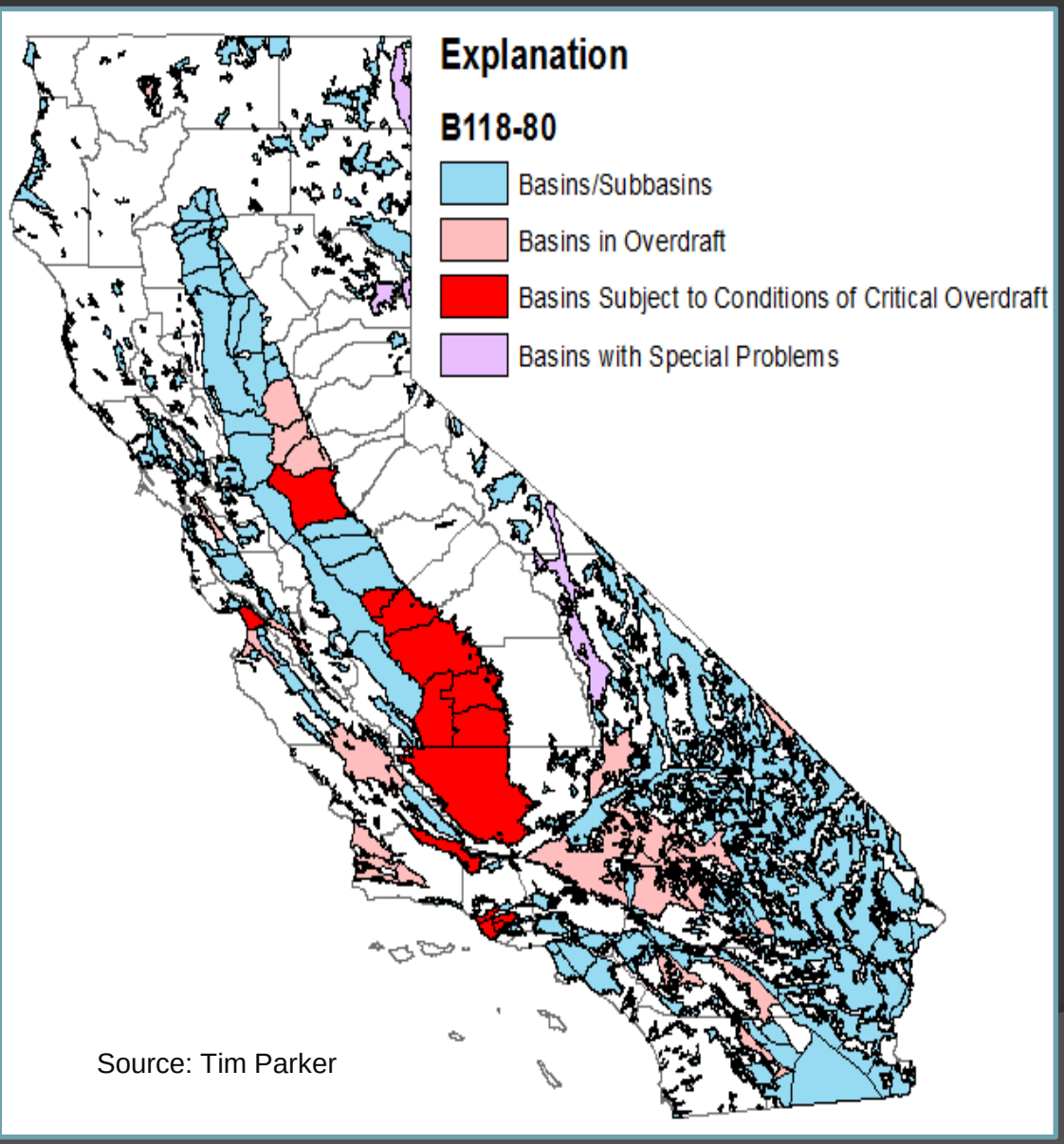
<u>San Joaquin River HR</u>

+

<u>Tulare Lake HR</u>

= approx. -5 to -13 Million Acre feet (MAF)

Overdraft in 1980

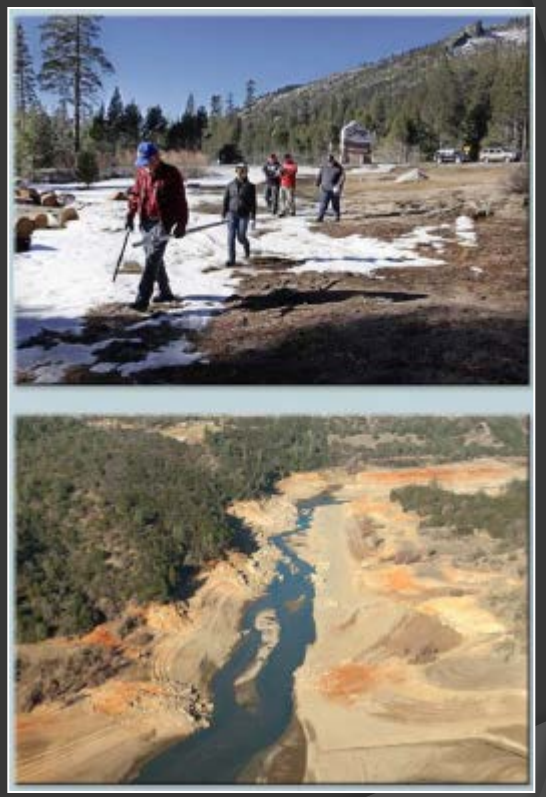


Source: Tim Parker

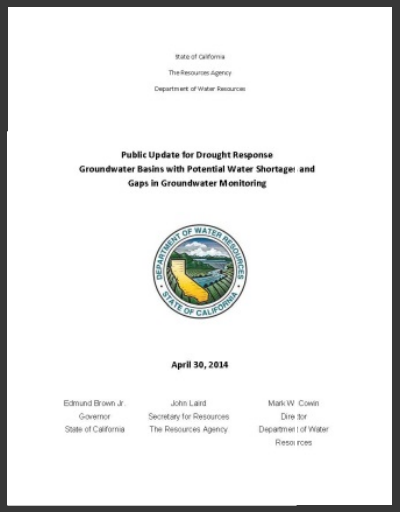
- 31 basins with evidence of overdraft
- 11 basins subject to critical overdraft
- 4 basins with special problems

35 years later - many of these basins show signs of continued overdraft and impacts have not yet been adequately addressed

2014 Drought



2014 Drought Reports


State of California
The Resources Agency
Department of Water Resources

Public Update for Drought Response
Groundwater Basins with Potential Water Shortages and Gaps in Groundwater Monitoring

April 30, 2014

Edmund Brown Jr.
Governor
State of California

John Laird
Secretary for Resources
The Resources Agency

Mark W. Cowin
Director
Department of Water Resources

Public Update for Drought Response
April 30, 2014

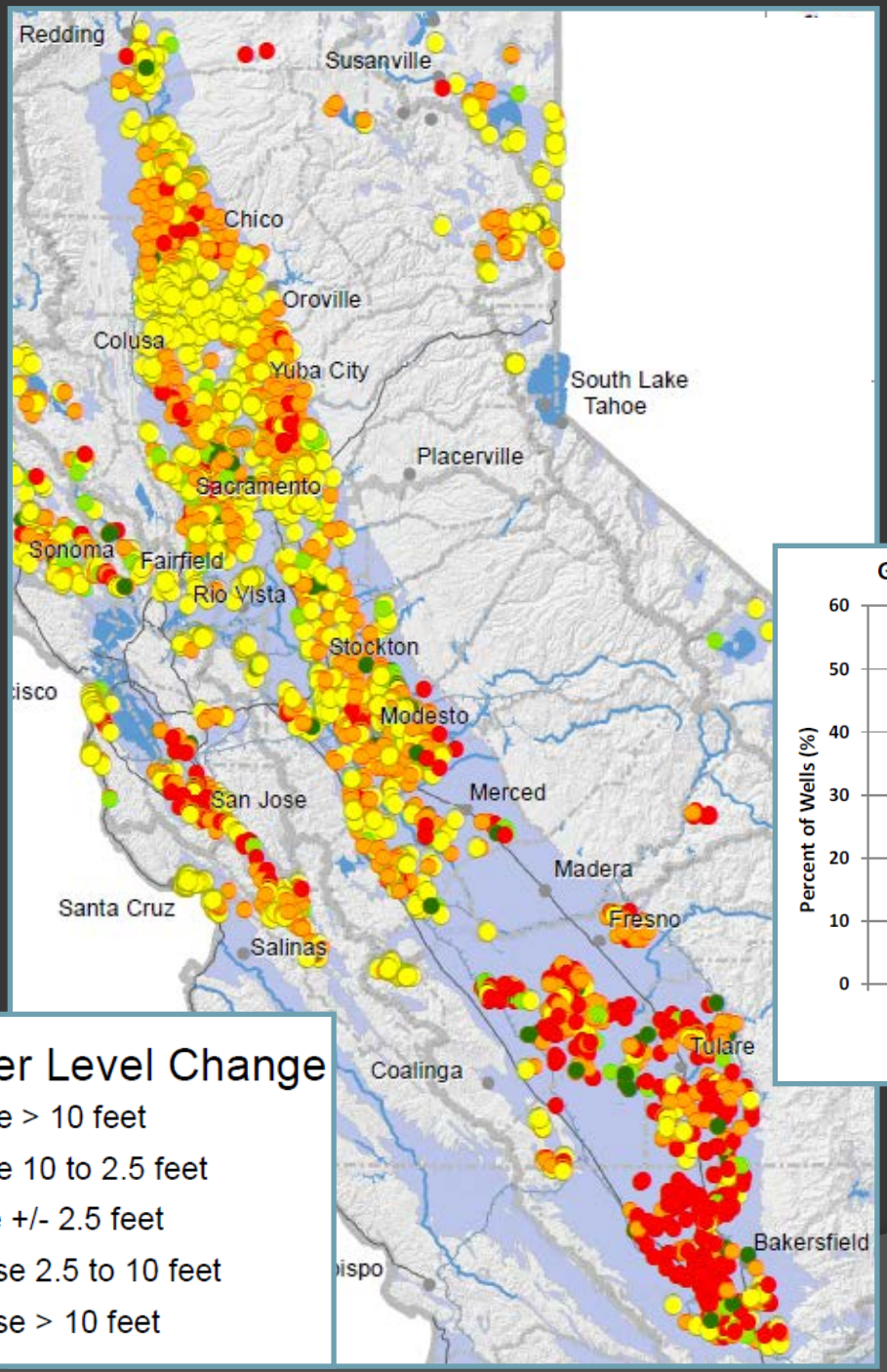
Groundwater Basins with Potential Water Shortages and Gaps in Groundwater Monitoring

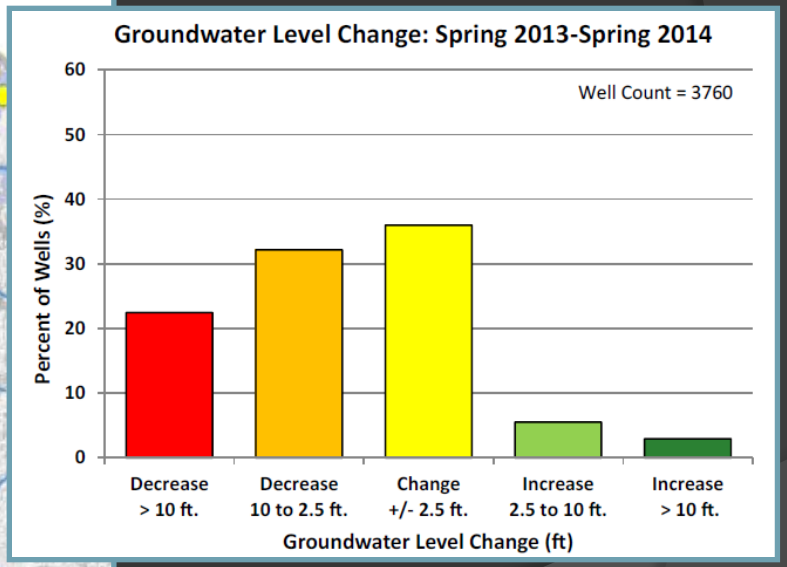
Public Update for Drought Response
November 25, 2014

Groundwater Basins with Potential Water Shortages, Gaps in Groundwater Monitoring, Monitoring of Land Subsidence, and Agricultural Land Fallowing

Groundwater Level Change

Spring 2013 to Spring 2014





Groundwater Level Change

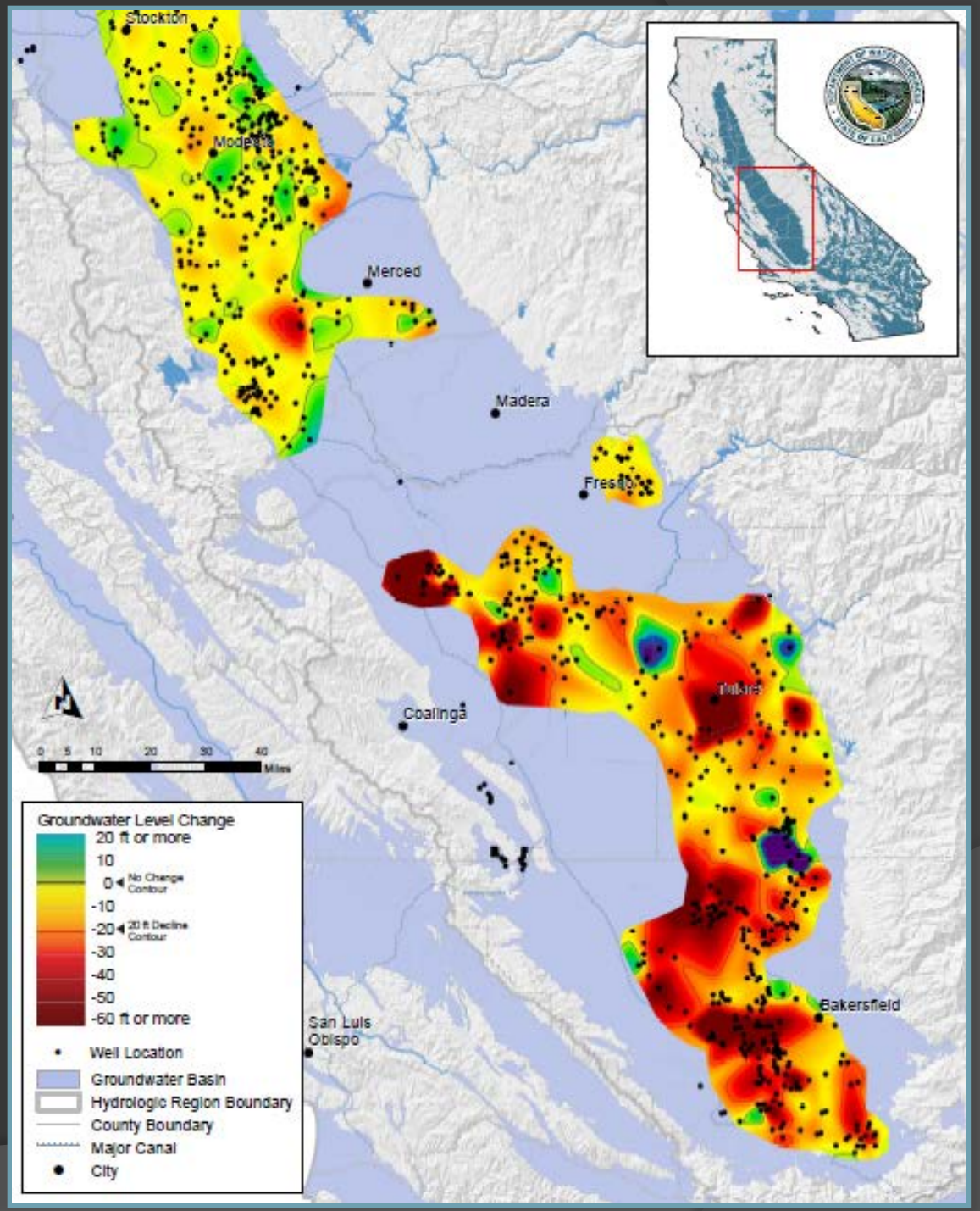
- Increase > 10 feet
- Increase 10 to 2.5 feet
- Change +/- 2.5 feet
- Decrease 2.5 to 10 feet
- Decrease > 10 feet

DEPARTMENT OF WATER RESOURCES · STATE OF CALIFORNIA ·

Groundwater Level Change

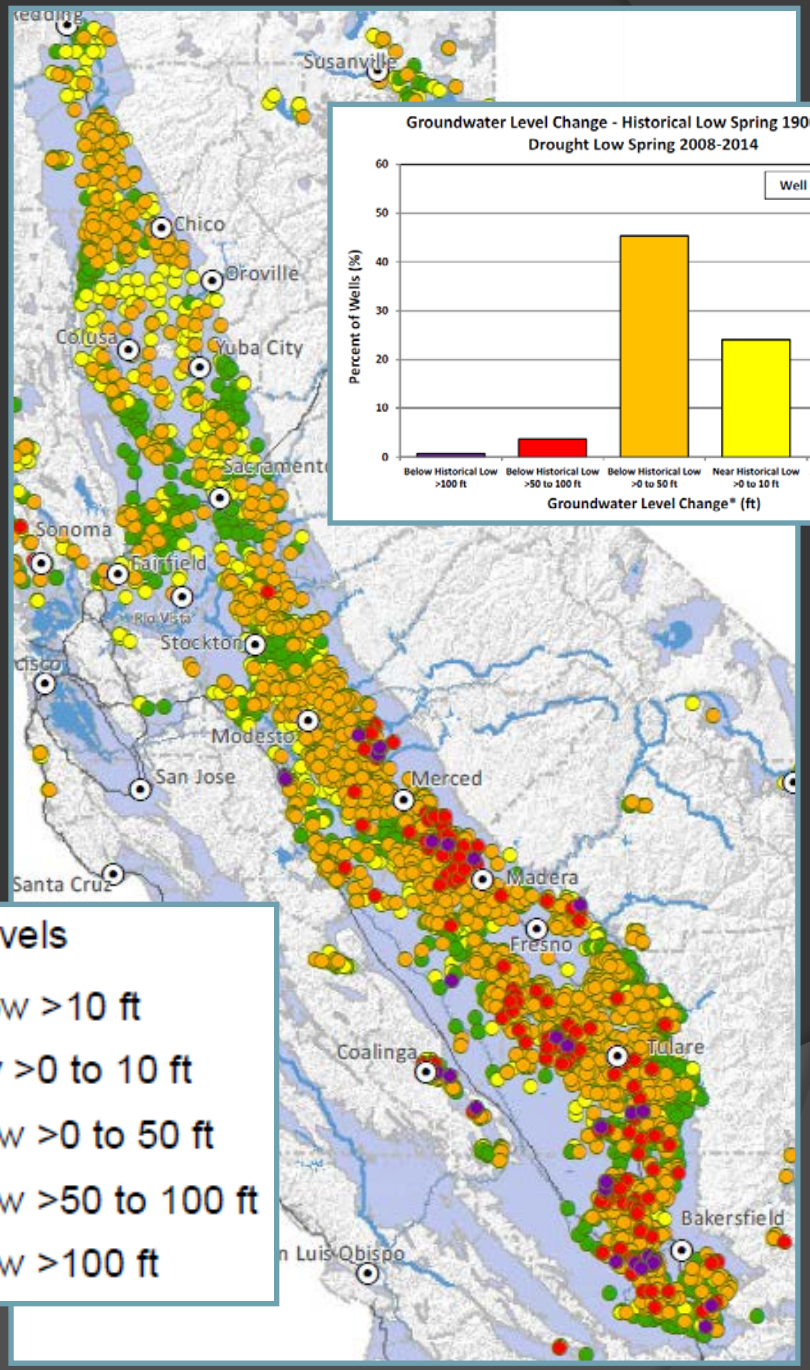
Southern Central Valley

Spring 2013 to Spring 2014



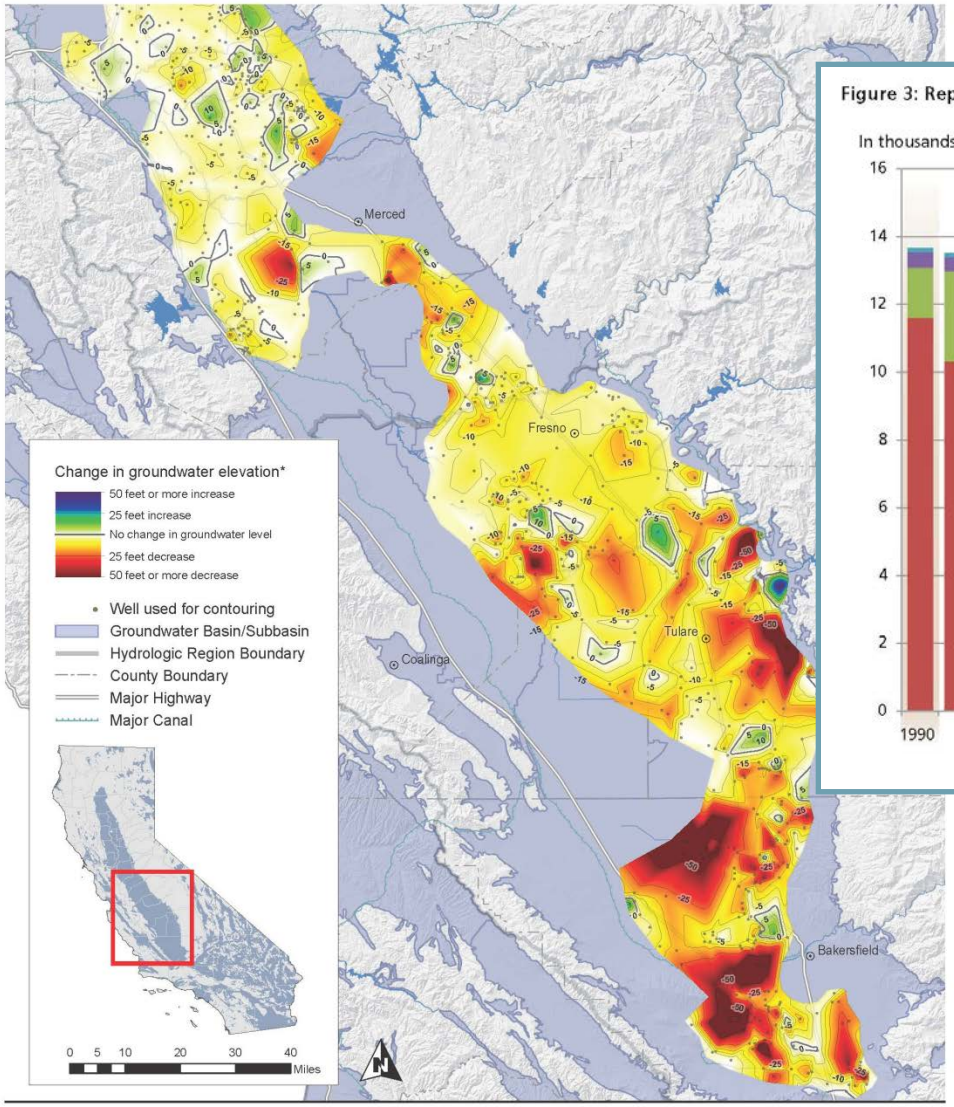
Groundwater Level Change

Historical Low Spring 1900-1998 to Drought Low Spring 2008-2014



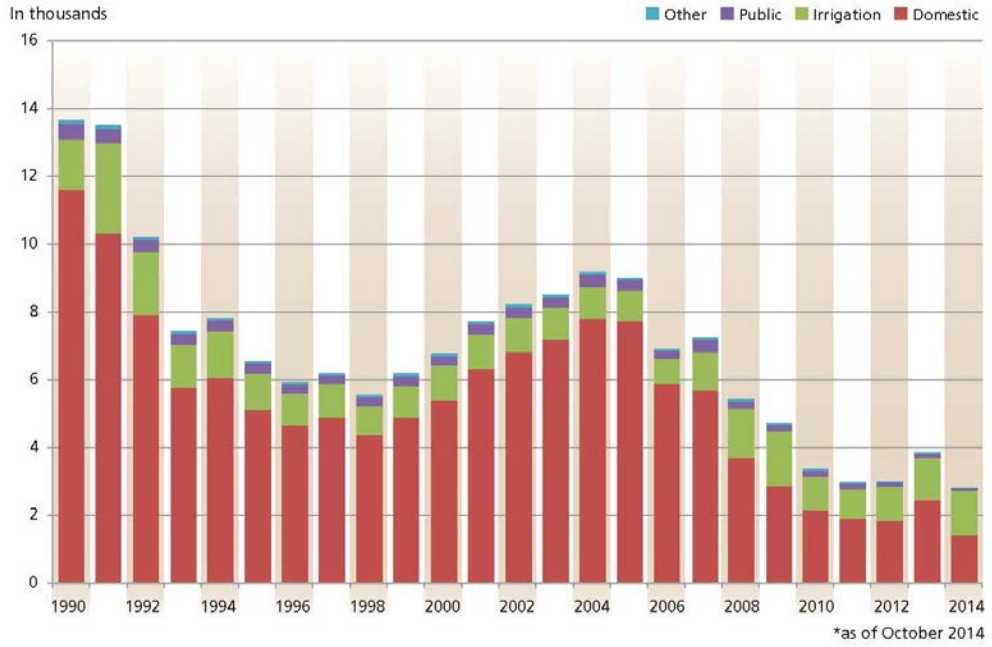
November 2014 Public Update

FIGURE 8: Change in Groundwater Elevation, Southern Central Valley – Spring 2013 to Spring 2014



*Groundwater level change determined from water level measurements in wells. Map and chart based on available data from the DWR Water Data Library as of 11/08/2014. Data subject to change without notice.

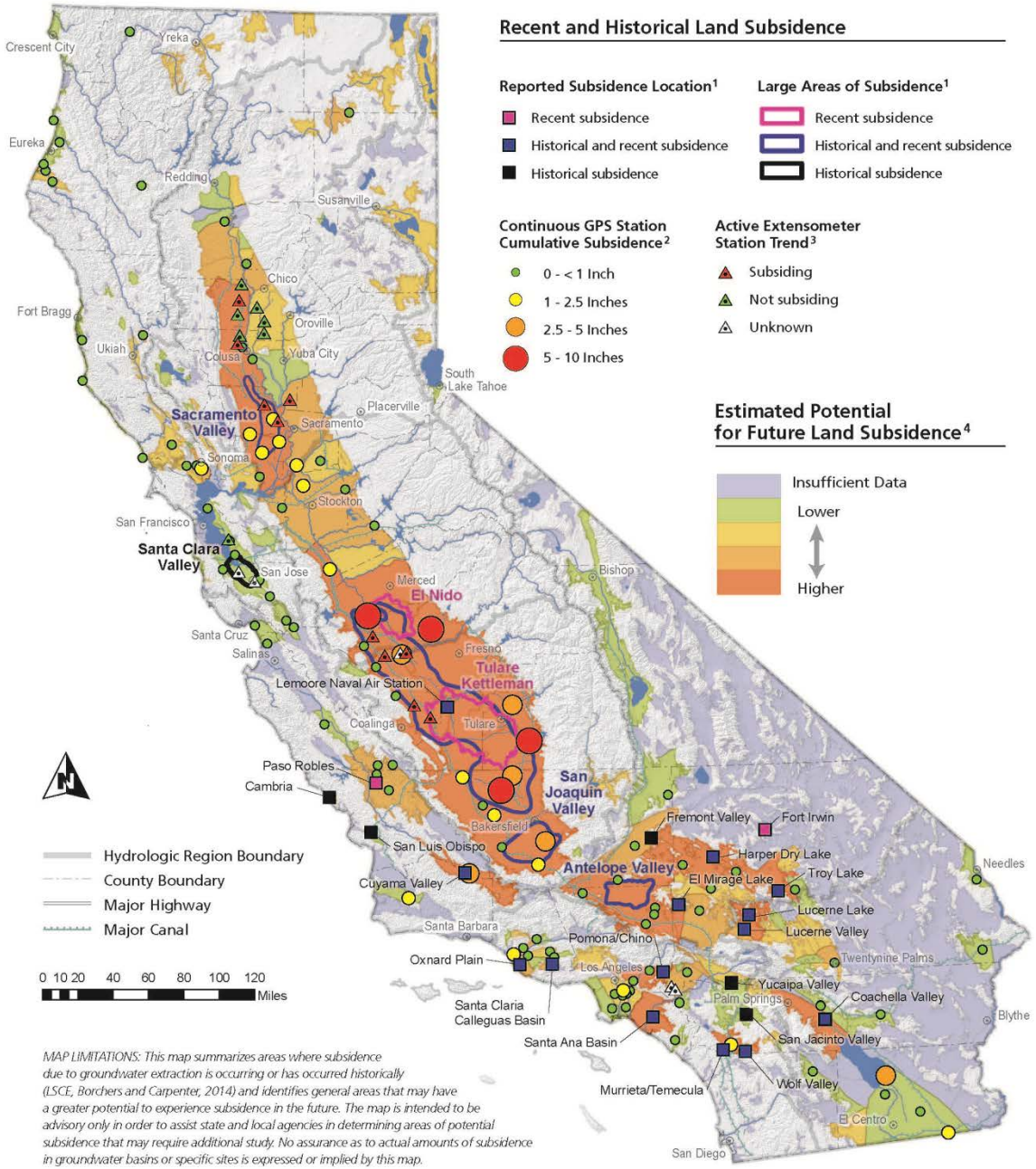
Figure 3: Reported New Water Supply Wells 1990 to 2014*



OSWCR

The new Online System for Well Completion Reports, (OSWCR, pronounced "Oscar") will allow drillers to submit their reports online and will result in gathering timely, complete, and consistent well data. OSWCR is scheduled to be available in summer 2015. For more information, or to sign up for email news, please visit www.water.ca.gov/oswcr.

Figure 14: Summary of Recent, Historical, and Estimated Potential for Land Subsidence



November 2014 Public Update

- As of September 2014, more than 350 new water supply wells for Fresno and Tulare counties, and more than 200 for Merced County.
- Groundwater levels have decreased in many basins since spring 2013; more notably since spring 2010.
- Groundwater levels have decreased in many basins since fall 2013.
- Many High and Medium Priority Basins with spring 2014 groundwater levels which rank in the lowest 10th percentile of measurements.

2014 Historic Groundwater Legislation

AB 1739, SB 1168, and SB 1319

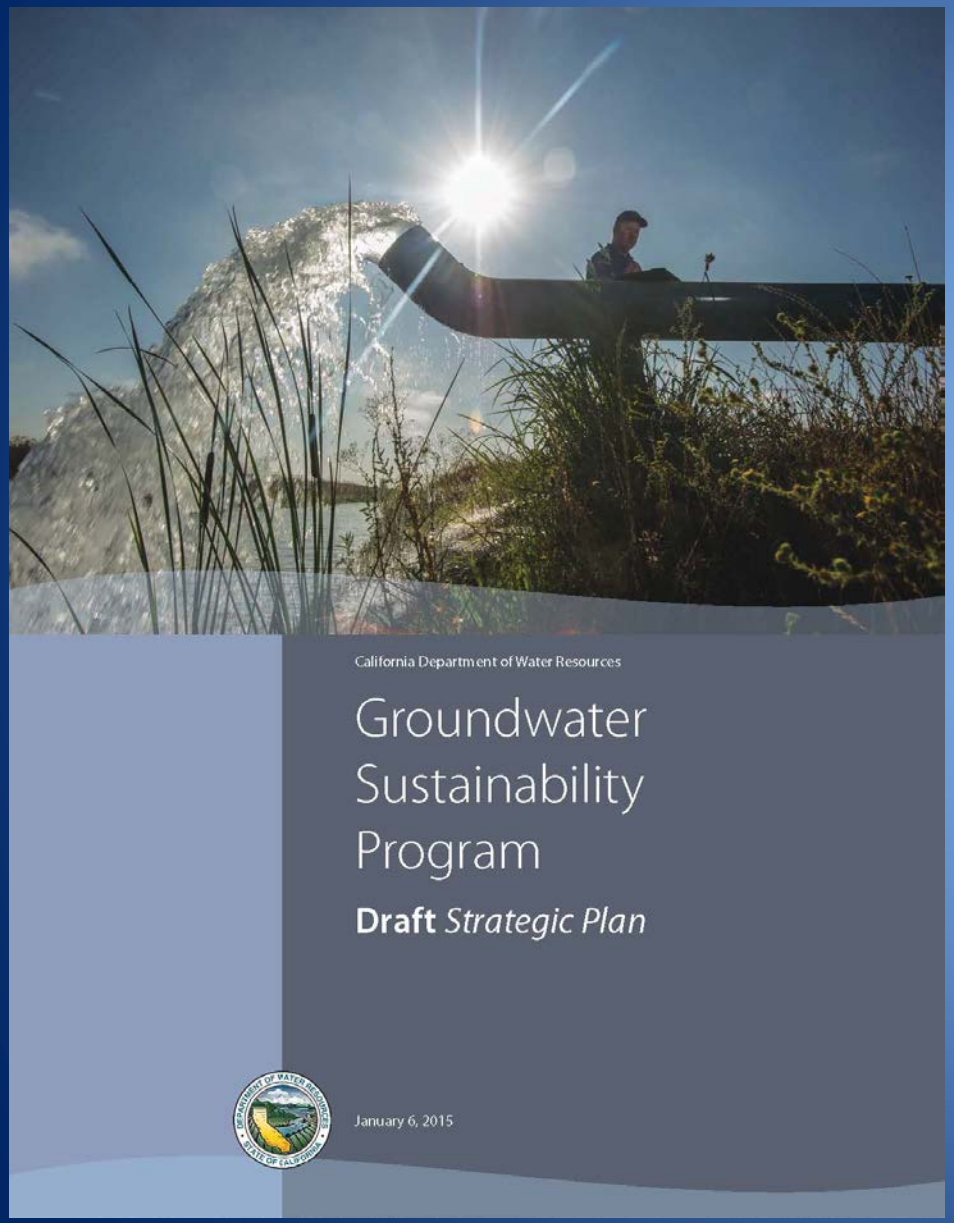
- Supports California Water Action Plan
- 2016
  - Regulations for:
    - Basin boundaries
    - GSPs and Alternatives
- 2017
  - BMPs
  - GSAs (H&M)
- 2020
  - Critical overdraft basins managed under GSPs
- 2022
  - All H&M basins under GSP
- ~2040
  - Achieve sustainability

Sustainability

Prevent "Undesirable Results"

- Lowering of Groundwater Levels
- Water Quality Degradation
- Reduction in Groundwater Storage
- Seawater Intrusion
- Land Subsidence
- Depletions of Surface Water

DWR's SGM Strategic Plan



- Implementation of SGM
- Share information to stakeholders
- Describe the structure through which DWR implements specific actions in coordination with stakeholders and partners

DWR's Strategic Plan (cont.) - Communication/Outreach Plan

- Document stakeholder's specific issues
- Document tools to aid future GSAs develop GSPs
- Stress importance of CASGEM compliance and collaborate and assist local agencies
- Gain understanding of how GSA formation is progressing
- DWR offering of facilitation services

Groundwater Data Links

- DWR Groundwater Information Center
  - Main Page - www.water.ca.gov/groundwater/gwinfo/index.cfm
  - Maps and Reports - ww.water.ca.gov/groundwater/maps_and_reports/index.cfm
- GIC Interactive Map (water level and subsidence maps)
  - www.water.ca.gov/groundwater/MAP_APP/index.cfm
- Water Management Planning Tool (boundaries map)
  - www.water.ca.gov/groundwater/boundaries.cfm
- Water Data Library (water level data)
  - www.water.ca.gov/waterdatalibrary/
- CASGEM (water level data)
  - www.water.ca.gov/groundwater/casgem/

Groundwater Information Center

Introduction

The Groundwater Information Center is DWR's portal for groundwater information, groundwater management plans, water well basics, and statewide and regional reports, maps and figures. California's groundwater provides approximately 30 to 46 percent of the State's total water supply, depending on wet or dry years, and serves as a critical buffer against drought and climate change. Some communities in California are 100 percent reliant upon groundwater for urban and agricultural use.

DWR has a long-standing history of collecting and analyzing groundwater data, investigating and reporting groundwater conditions, implementing local groundwater assistance grants, encouraging integrated water management, and providing the technical expertise needed to improve groundwater management practices. DWR will continue to work with local agencies and regional organizations to provide data that enables sustainable groundwater management. The Groundwater Information Center website will be updated as new information becomes available.

Water Management Planning Tool

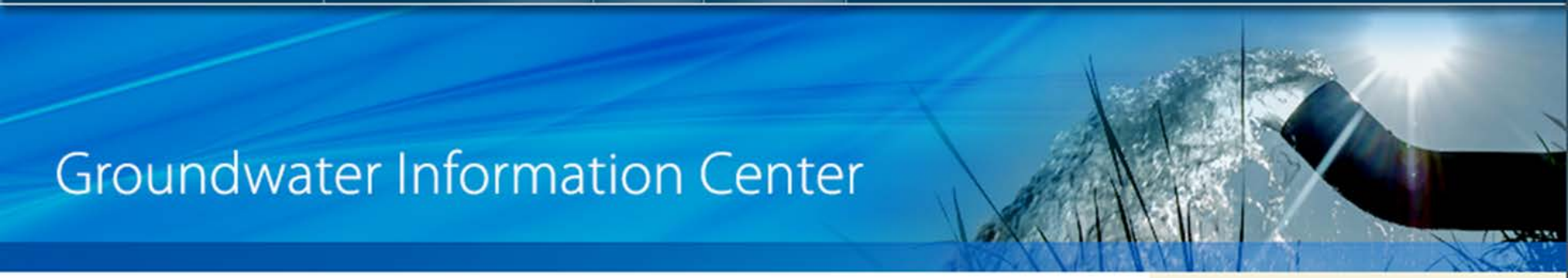
In February 2015, DWR released its new **Water Management Planning Tool** to view boundaries important to water planners. The Department intends to test this **interactive map application** internally while also providing a beta version to the public.

GROUNDWATER HOME

GROUNDWATER INFORMATION CENTER

» Groundwater Basics
» Maps and Reports
» Groundwater Management
» Groundwater Well Information
» Monitoring and Data Collection
  » CASGEM
  » Water Data Library
» GIC Interactive Map Application
» Contacts

» SUSTAINABLE GROUNDWATER MANAGEMENT



Maps and Reports

Groundwater data and related information can be reported in a variety of formats, including maps, figures, and written reports.

This page provides access to PDF documents which report groundwater conditions in a variety of formats. Documents are organized by report type (for example, "Groundwater Level Change Maps") and by region. Statewide reports, or reports that cover large regions of the state are found on this page, whereas local reports are available at Region Office Reports and Data below. Please note that data reports and other information is being added to this page regularly.

Statewide and Regional Maps

+ Groundwater Level Change Maps (click here to view)

Statewide and Regional Reports

Public Update for Drought Response - November 30, 2014

GROUNDWATER HOME

GROUNDWATER INFORMATION CENTER

» Groundwater Basics
» Maps and Reports
» Groundwater Management
» Groundwater Well Information
» Monitoring and Data Collection
» CASGEM
» Water Data Library
» GIC Interactive Map Application
» Contacts

» SUSTAINABLE GROUNDWATER MANAGEMENT

California Department of Water Resources
Groundwater Information Center
Map Interface

Data | Boundaries | Disclaimer | Help!

Groundwater Level Measurements

Select Data Type:

- ○ Depth Below Ground
- ◉ Groundwater Elevation
- ○ Change in Groundwater Level

Choose Time Period:

2014 — Select Year

Spring — Select Season

2004 to 2014 — Select Range

(Change in Groundwater Level Only)

Show Data Layers:

- ☑ Measurements
- ☑ Contours
- ☐ Color Ramp

Legend:

Measurements

▼ Groundwater Elevation Measurement

Contours

- Sea Level
- Primary Contour
- Secondary Contour

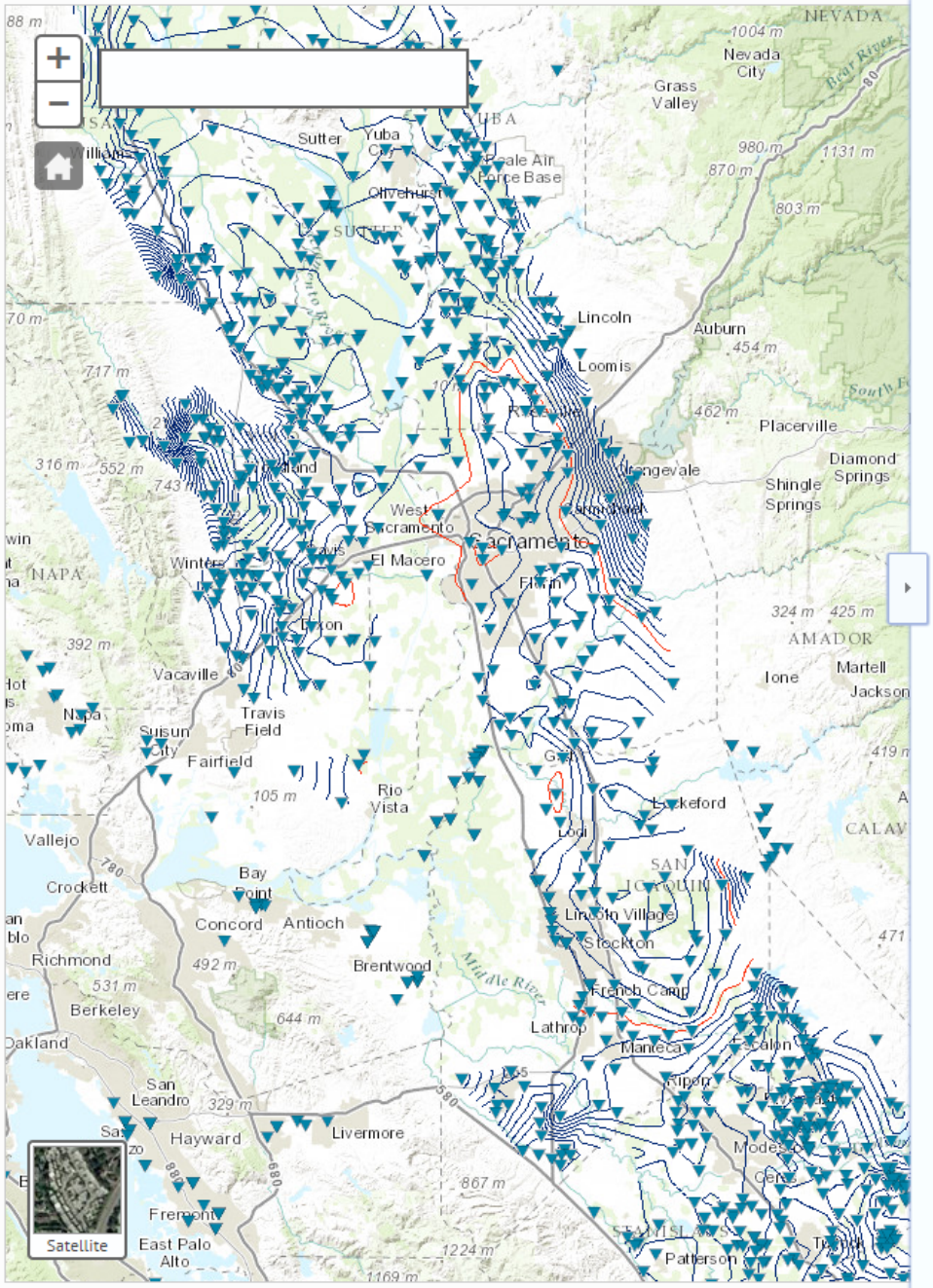
Color Ramp

300 feet

0 feet mean sea level

-300 feet

Subsidence



Groundwater Elevation

These layers show the groundwater elevation and are derived from water level measurements collected from wells. Water level measurements are filtered based on measurement date and well construction information (when available) and are intended to approximate groundwater elevations in the unconfined to uppermost semi-confined aquifers.

Measurements values are based on data collected from wells in the field, while the contours and color ramp layers provide a smoothed approximation of the groundwater elevation "surface" based on the measurement data. Note that the measurement values may not exactly match the contour or color ramp values because of surface and contour smoothing process.

Groundwater elevations are shown as feet above or below mean sea level (positive values indicate groundwater elevations above means sea level, negative values indicate groundwater elevations below mean sea level).

Layer Attribute Explanation:

Site Code: Unique Well ID

Local Well Name: Well ID defined by local agency or well owner

State Well Number: DWR State Well Number

WCR Number: Well Completion Report number (DWR form 188)

Well Use: Intended use of well

Msmt Date: Date water level measurement was collected

Msmt Agency: Agency that collected the water level measurement

WSEL: Groundwater Surface Elevation (ft-msl), NAVD88

DGBS: Groundwater Depth Below Ground

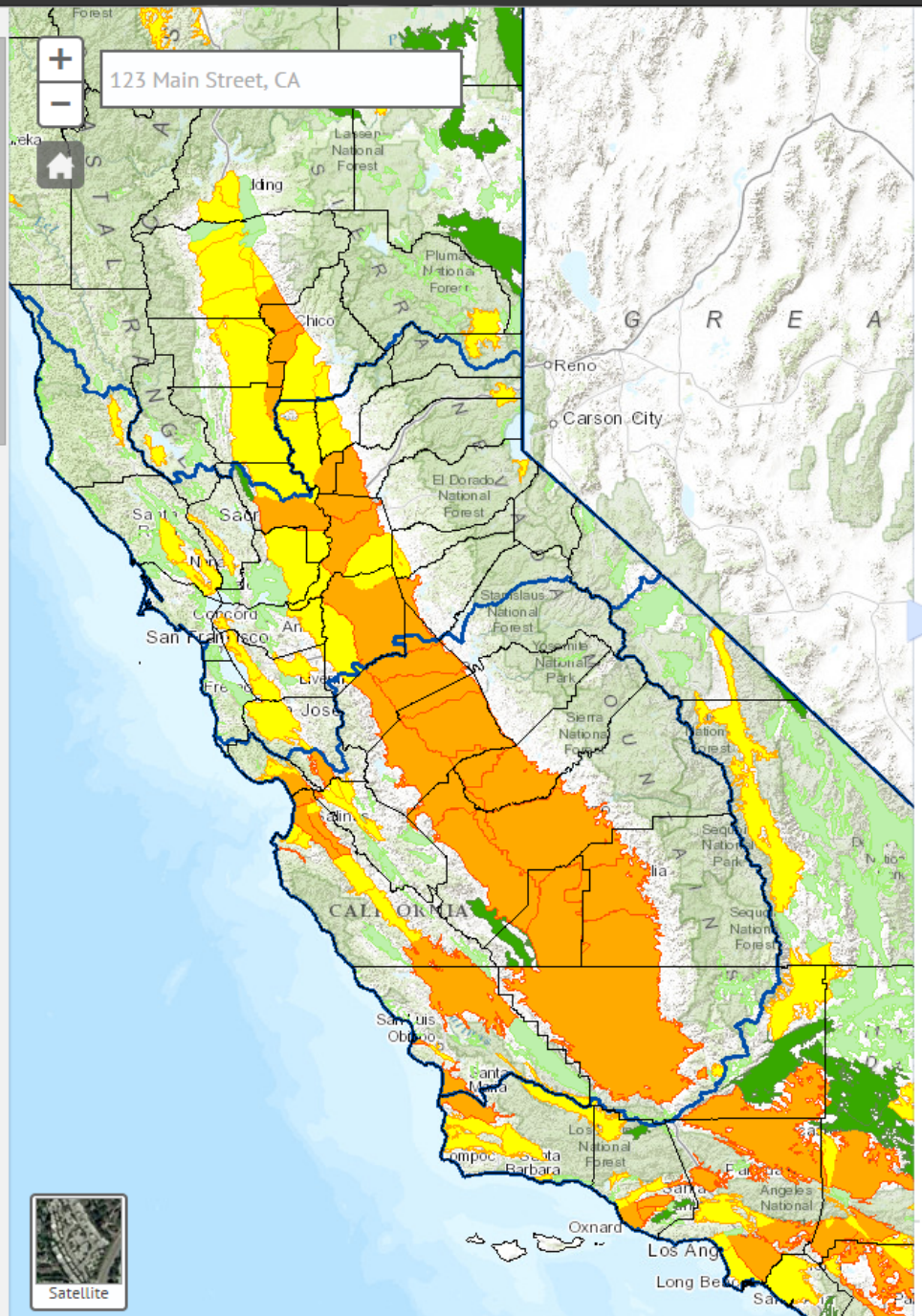
Download selected data

Water Managment Planning Tool

Clear all Help!

Boundaries Map

- [x] County Boundaries
  - County Boundary
- [x] Region Office Service Areas
  - Region Office Service Areas
- [ ] Hydrologic Regions
  - Hydrologic Regions
- [ ] Prop 84 Funding Areas
  - Prop 84 Funding Areas
- [ ] Regional Water Quality Control Board Boundaries
  - Regional Water Quality Control Board Boundaries
- [ ] Tribal Lands
  - Location of a Historic or Landless Tribe
  - Tribal Trust Land held by U.S. Government
  - Tribal Trust Land in a Public Domain Allotment
  - Tribal Trust Land Out of State
- [ ] Regional Flood Planning Boundaries
  - Area of Local Interest
  - Regional Flood Planning Area



Boundaries Map

This application contains a variety of boundaries that could be useful to water management planners.
Click on features in the map or see below for more information:

DATA DISCLAIMER

All information provided by the Department of Water Resources on its Web pages and Internet sites, is made available to provide immediate access for the convenience of interested persons. While the Department believes the information to be reliable, human or mechanical error remains a possibility. Therefore, the Department does not guarantee the accuracy, completeness, timeliness, or correct sequencing of the information. Neither the Department of Water Resources nor any of the sources of the information shall be responsible for any errors or omissions, or for the use or results obtained from the use of this information.

The following layers are contained in the map (scroll down for brief descriptions):

- County Boundaries
- Region Office Service Areas
- Hydrologic Regions
- Prop 84 Funding Areas
- Regional Water Quality Control Board Boundaries
- Tribal Lands
- Regional Flood Planning Boundaries
- Reclamation Districts
- CA State Park Lands
- Federal Lands
- CASGEM Groundwater Basin Prioritization
- Groundwater Management Plans
- IRWM Regions
- Adjudicated Groundwater Basins
- Disadvantaged Communities Block Groups
- Disadvantaged Communities Tracts
- Disadvantaged Communities Places

Unavailable

- Water Data Library Home
- Groundwater Level Data
- Water Quality Data
- Continuous Data
- Historical Information
- Contact Information

DWR CLIENTS ONLY

- Admin Login
- Climate Data (Beta 1.1)
- Climate Data (Access Prototype)

Water Data Library

Use the map below to locate monitoring stations. You can find an area of interest if you zoom and pan the map. Quickly find an area searching for named features on a map such as the name of a city, park, landmark, lake, water feature, or zip code within California. Once at the area of interest, select the desired Site Type and click the "Refresh Map" button to show monitoring stations in the area. Additional searches by data type are possible by clicking the links on the left. For help on these and other ways to find your data click here.

WDL STATION MAP

Location Search

To find monitoring stations for a specific area, enter the placename or zip code into the text box below

Site Type

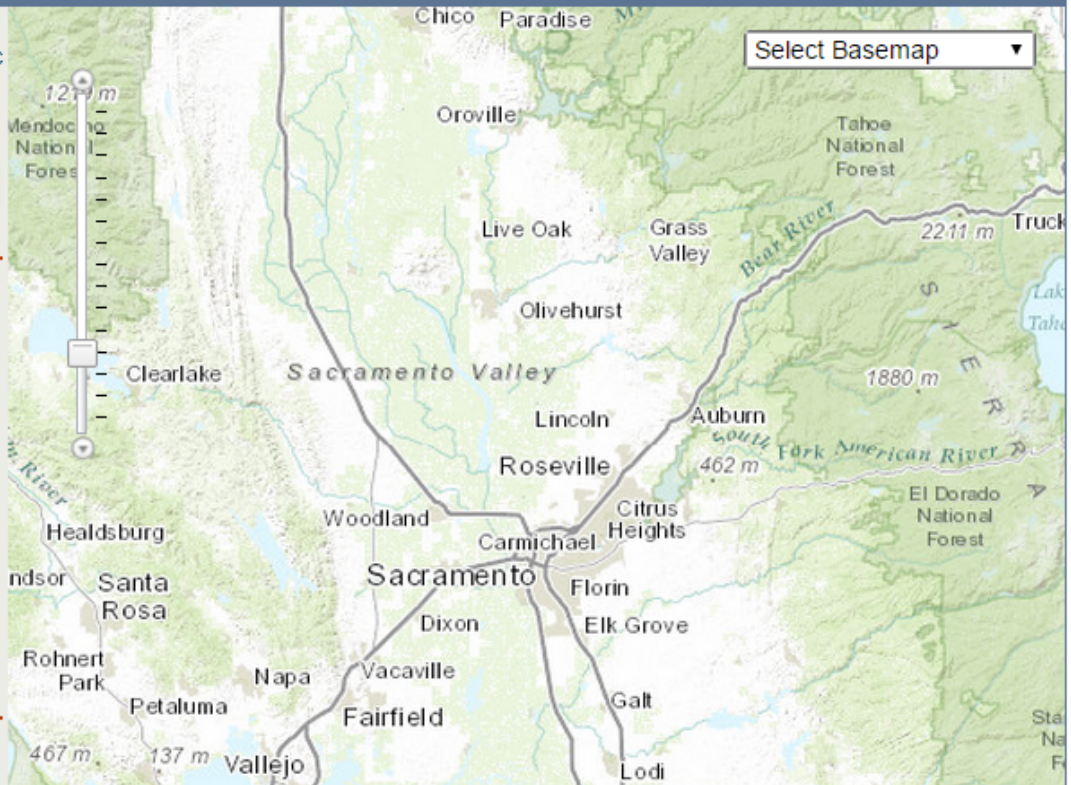
Select the desired site type using the checkboxes

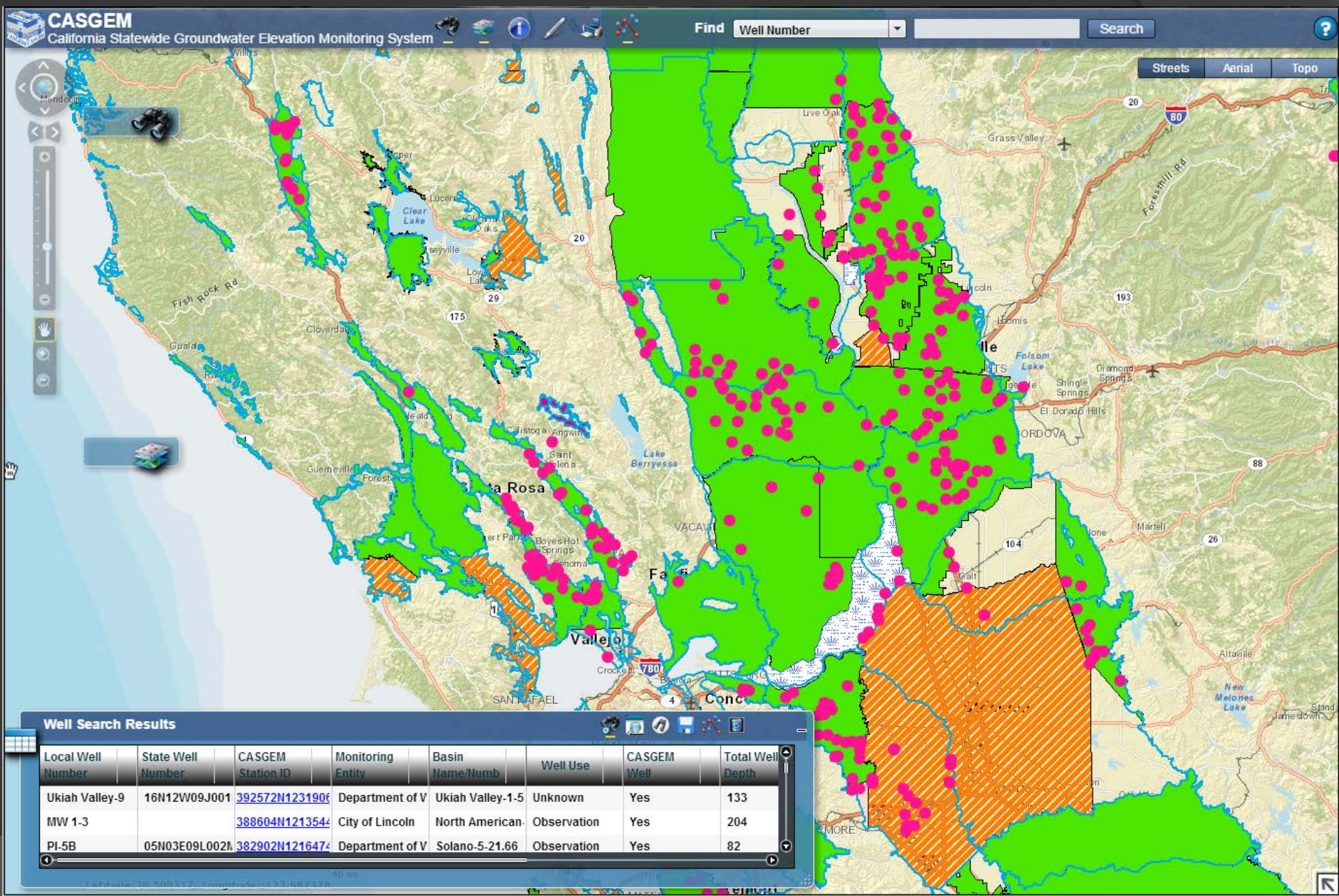
- Groundwater Level
- Water Quality
  - Include Historic Data
- Continuous Data

= Multiple Stations at one Location

= Cluster, showing number of stations

Cursor Coordinates (WGS84)




CASGEM
California Statewide Groundwater Elevation Monitoring System
Find
Well Number
Search
Streets
Aerial
Topo
Well Search Results
Local Well Number
State Well Number
CASGEM Station ID
Monitoring Entity
Basin Name/Numb
Well Use
CASGEM Well
Total Well Depth
Ukiah Valley-9
16N12W09J001
392572N123190
Department of V
Ukiah Valley-1-5
Unknown
Yes
133
MW 1-3
388604N121354
City of Lincoln
North American
Observation
Yes
204
PI-5B
05N03E09L002M
382902N121647
Department of V
Solano-5-21.66
Observation
Yes
82

Thank you!

Dane Mathis, PG, CEG, CHG
Senior Engineering Geologist
Division of Integrated Regional Water Management
South Central Region Office