

Groundwater Update Spring 2015

Northern Sacramento Valley Water Dialogue April 30, 2015

**Bill Ehorn, Senior Engineering Geologist
CA Department of Water Resources**

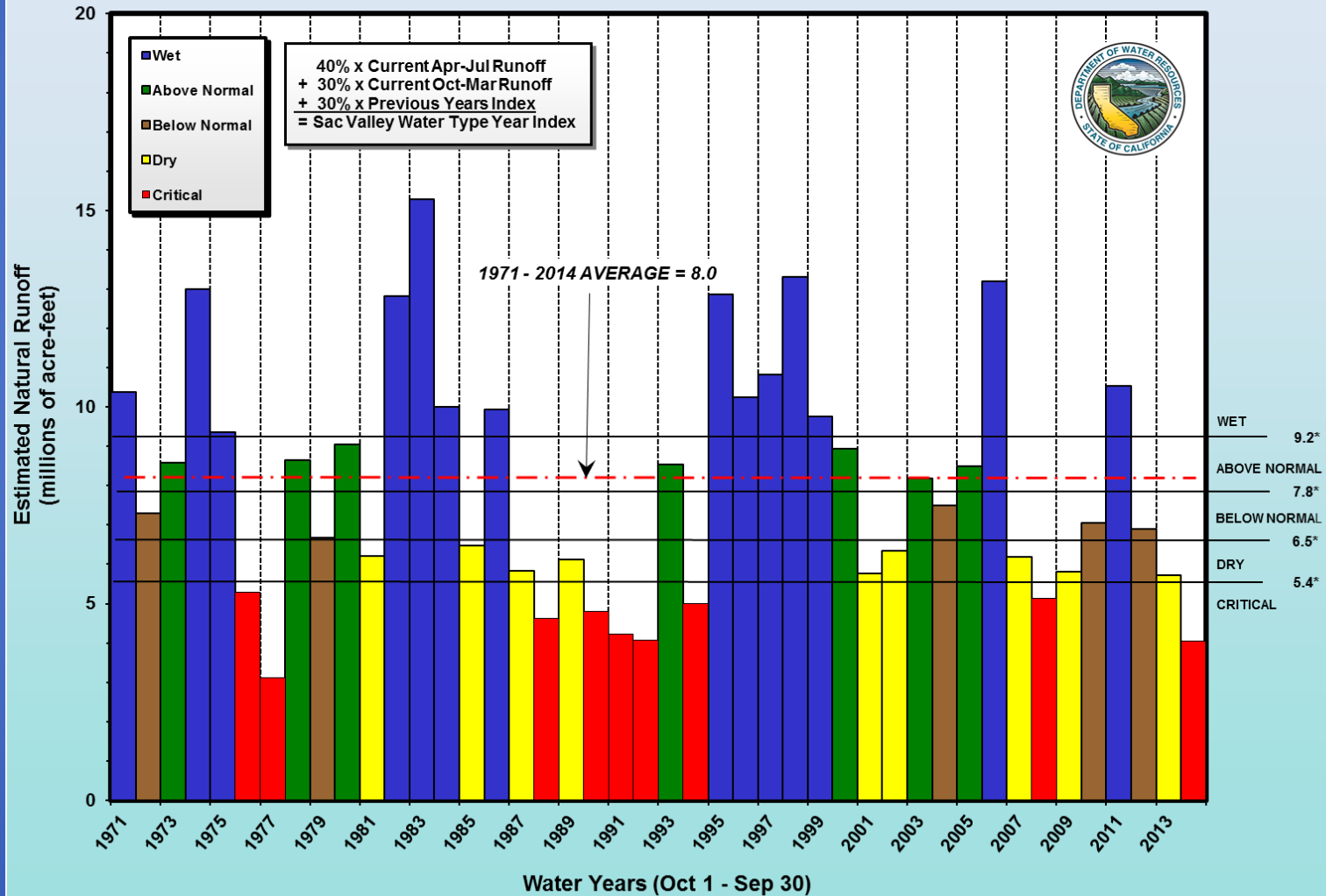


Outline

1. Water year index and precipitation summary
 2. Effects of declining groundwater levels
 3. Groundwater monitoring overview
 4. Spring 2015 groundwater level results
 5. Summary
- 
- A photograph of a concrete structure, possibly a wellhead or discharge point, with a pipe extending horizontally from it. Water is flowing out of the pipe into a body of water, creating a splash. The background shows a natural setting with trees and a body of water.

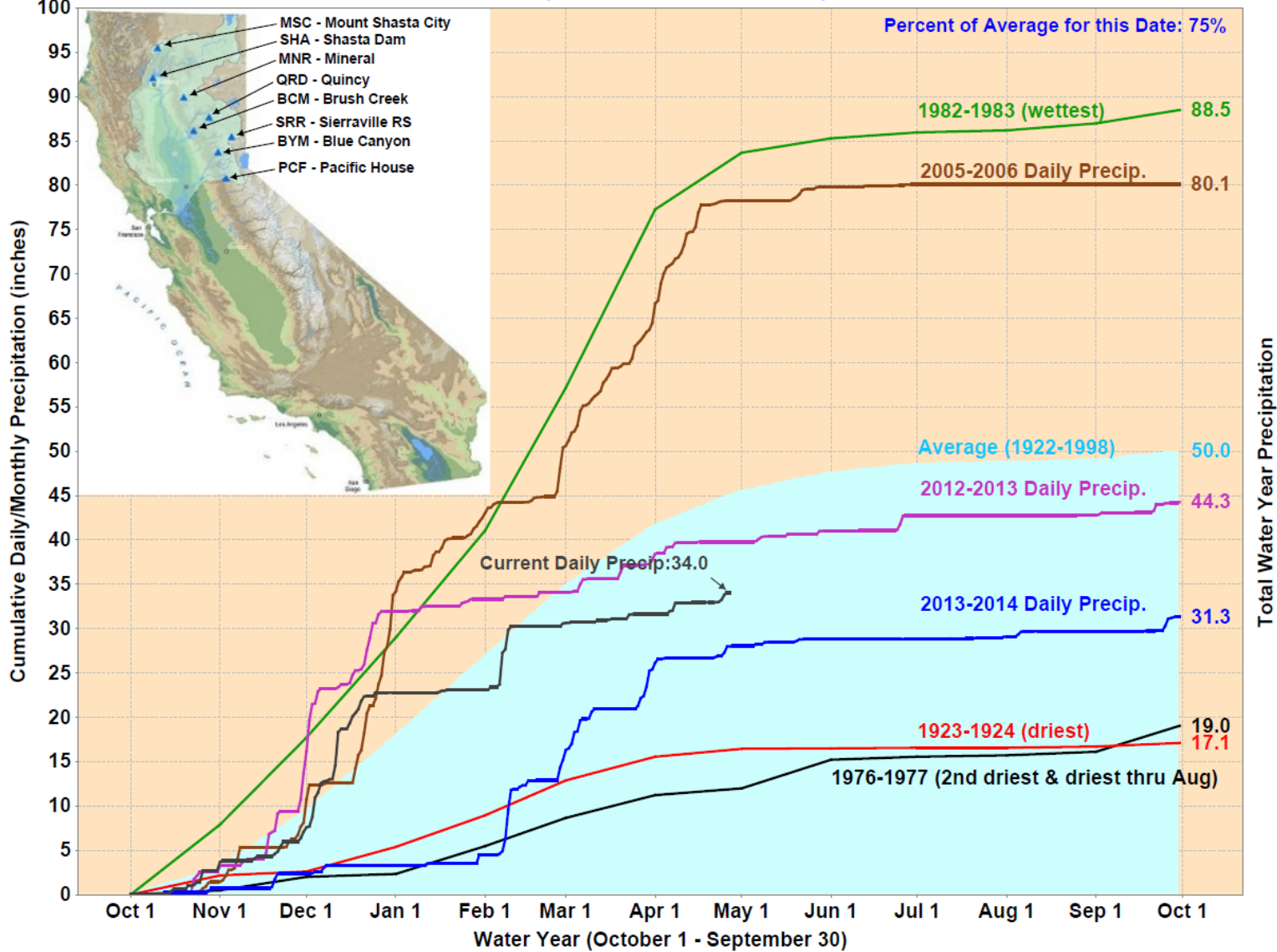
Water Year Index 1971-2014

SACRAMENTO VALLEY WATER YEAR TYPE INDEX
1971-2014

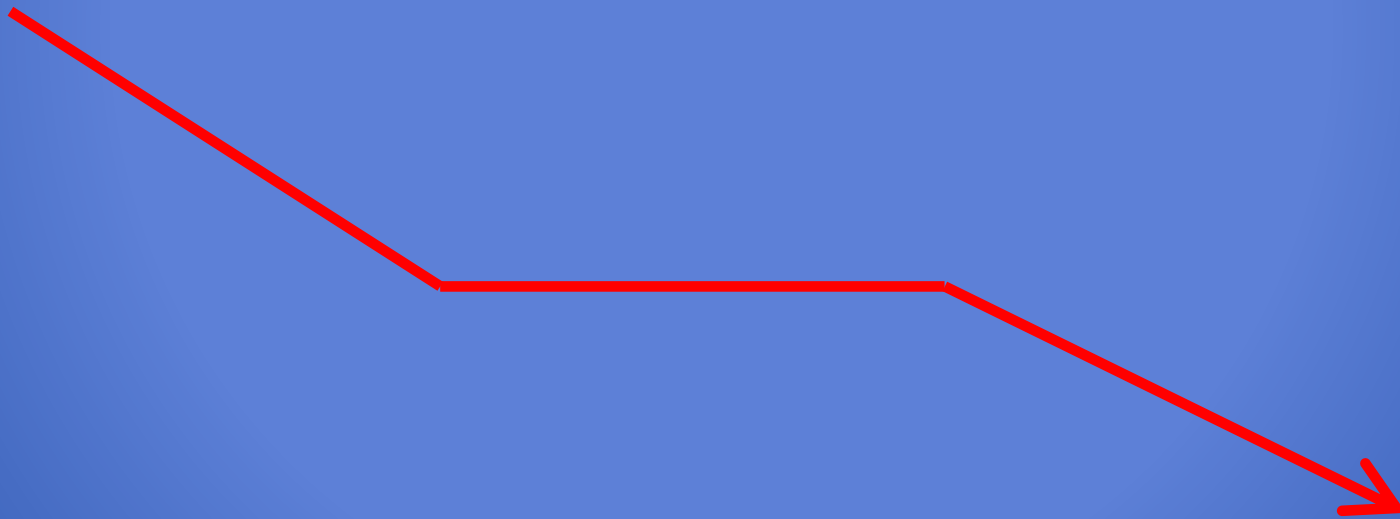


Sacramento Valley Precipitation – 8-Station Index

Northern Sierra Precipitation: 8-Station Index, April 27, 2015



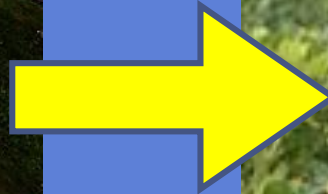
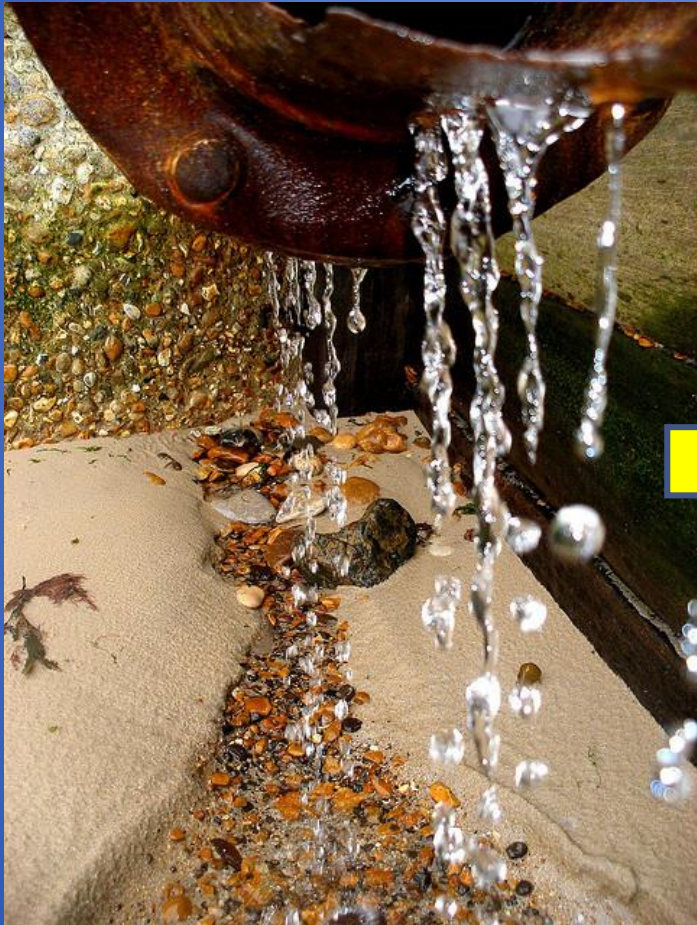
2. Effects of Declining Groundwater Levels



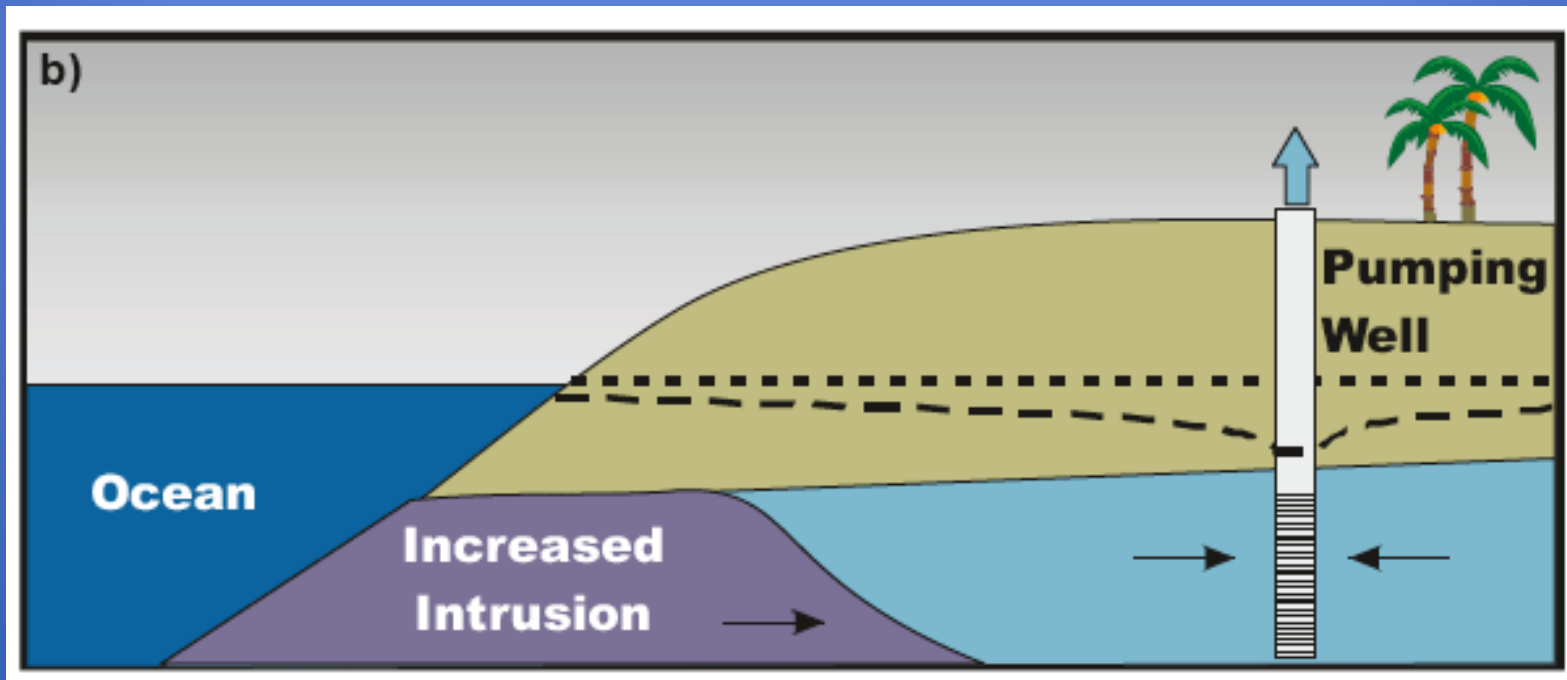
Wells Go Dry



Bad Groundwater Quality



This Includes Saltwater Intrusion



Stressed Vegetation



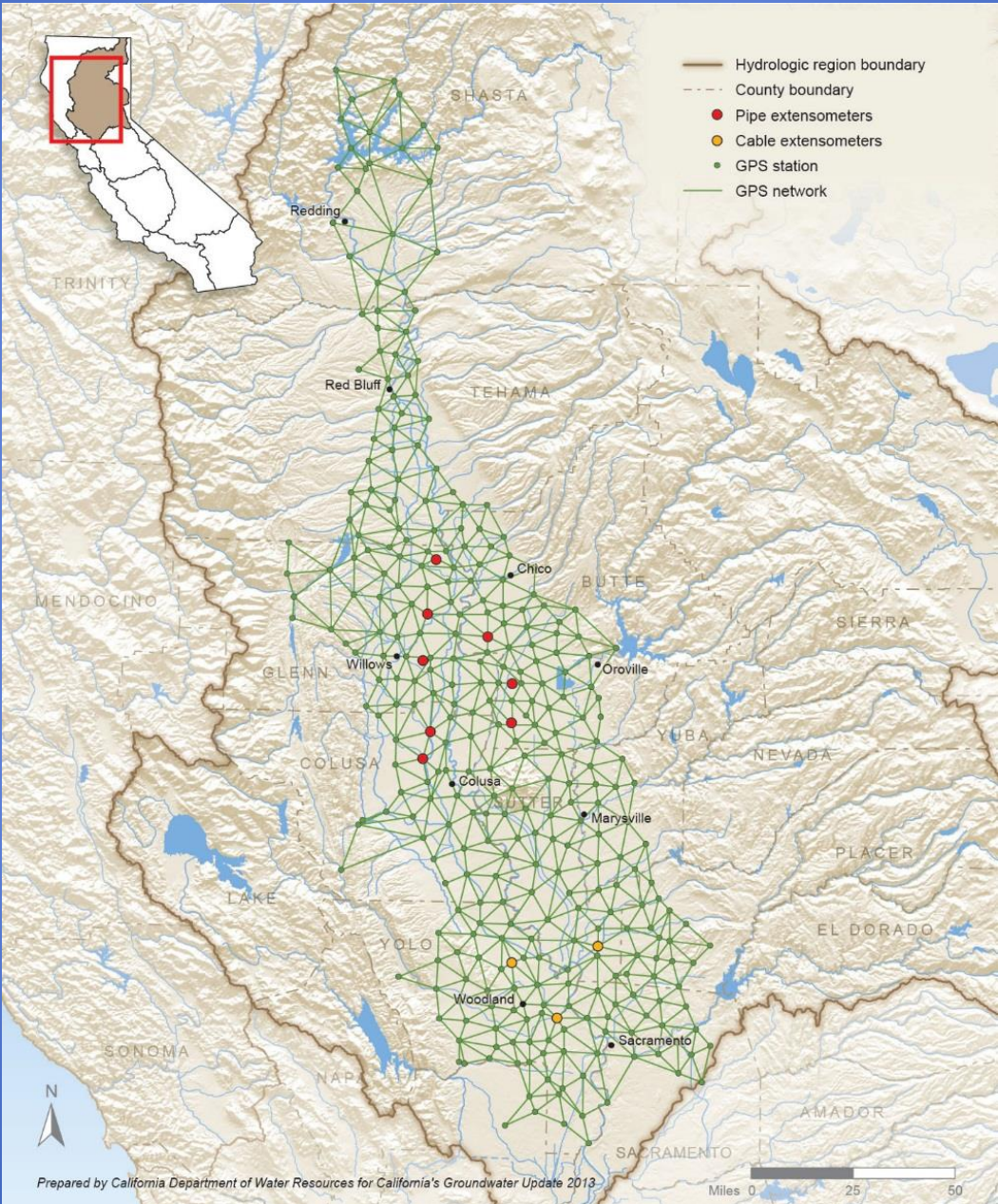
Land Subsidence



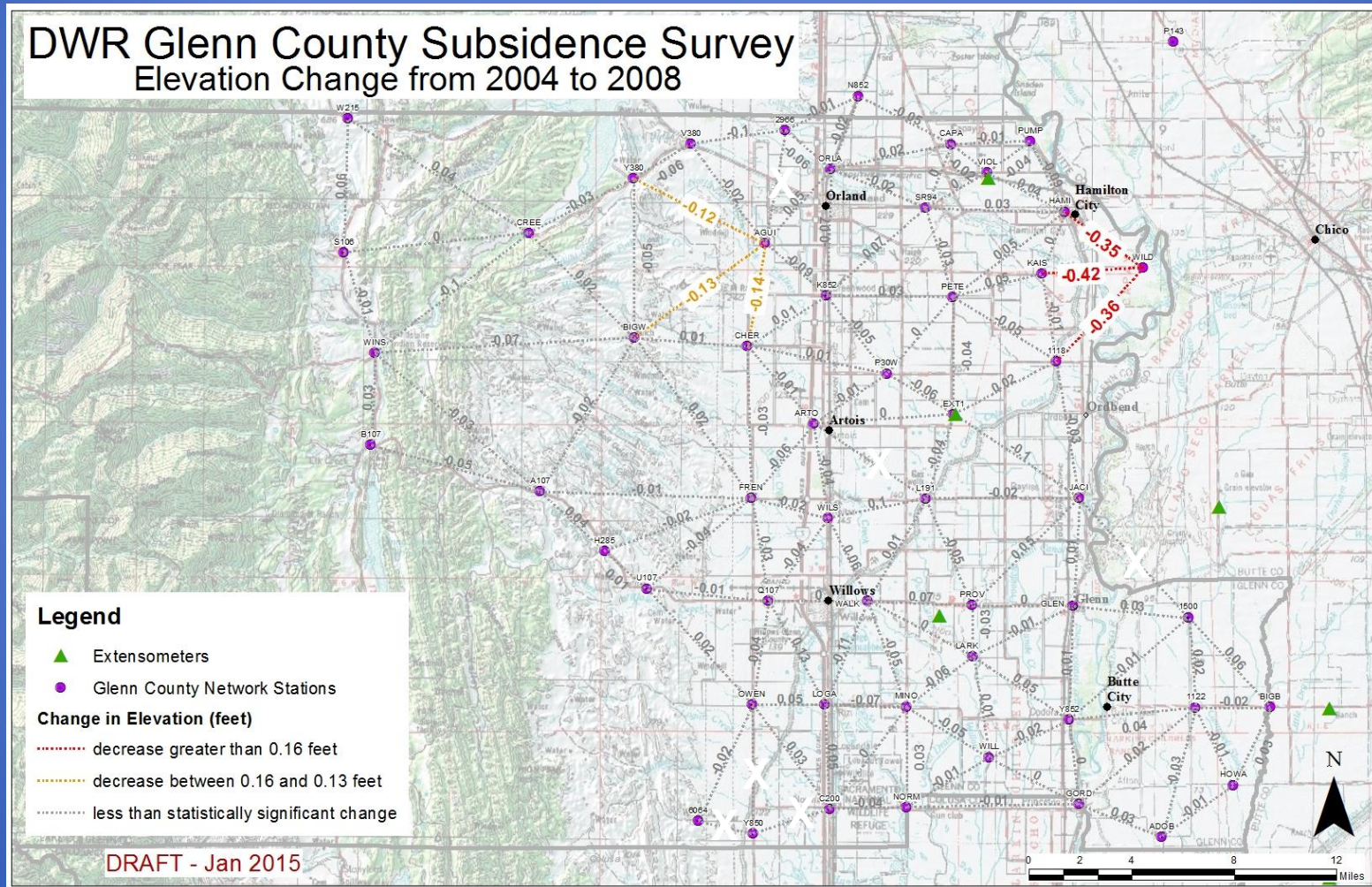
Land Subsidence



Land Subsidence - 2008 GPS Network



Glenn County Results



3. Groundwater Monitoring Overview

680 wells are measured every spring and fall and 590 are measured every summer in the Northern Sacramento Valley.



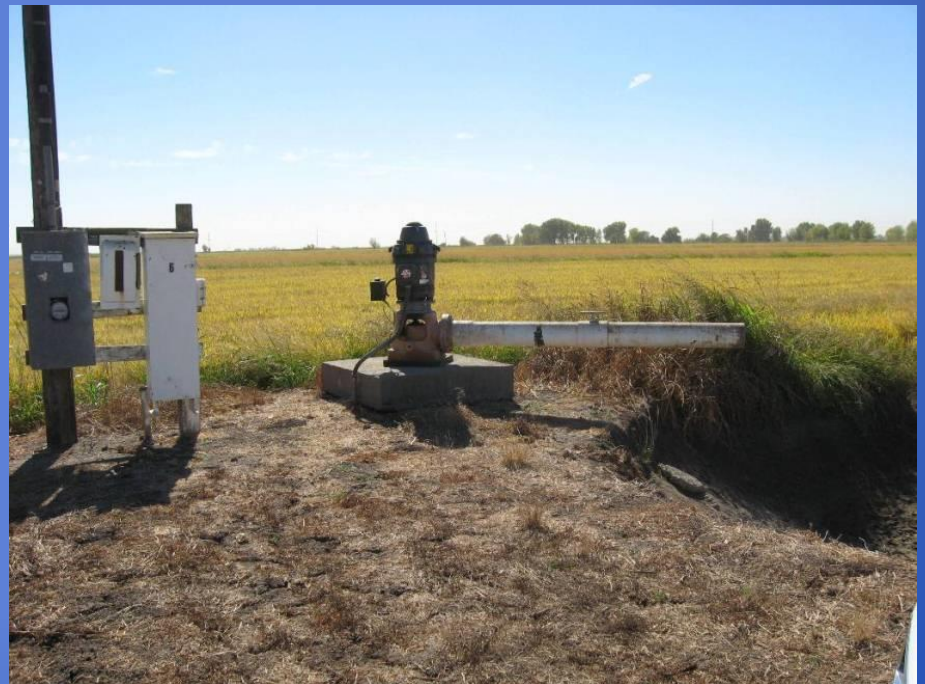
Well Types

Domestic Wells



Well Types

Irrigation Wells



Well Types

Industrial/Stock Wells



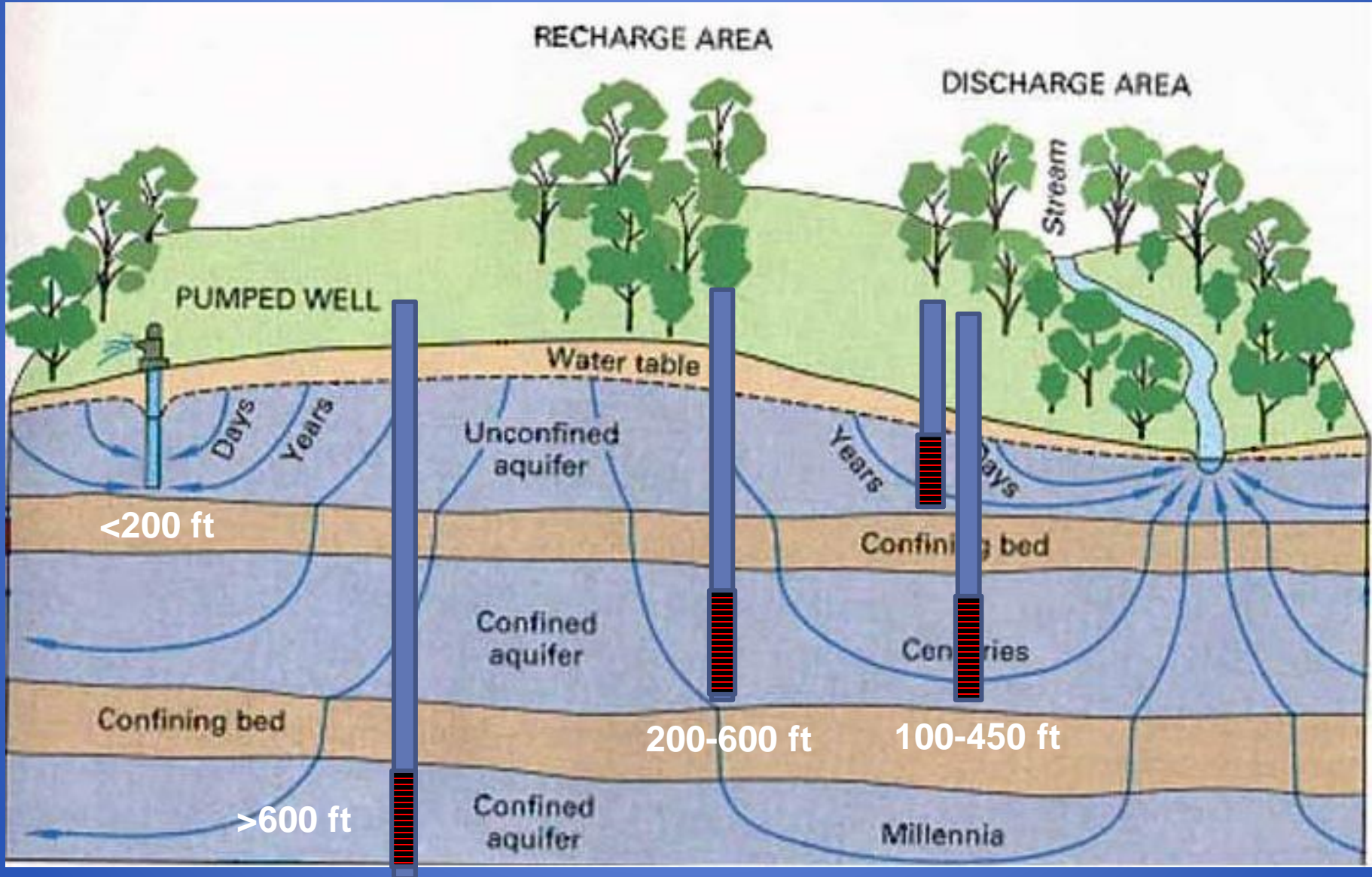
Well Types



Observation Wells

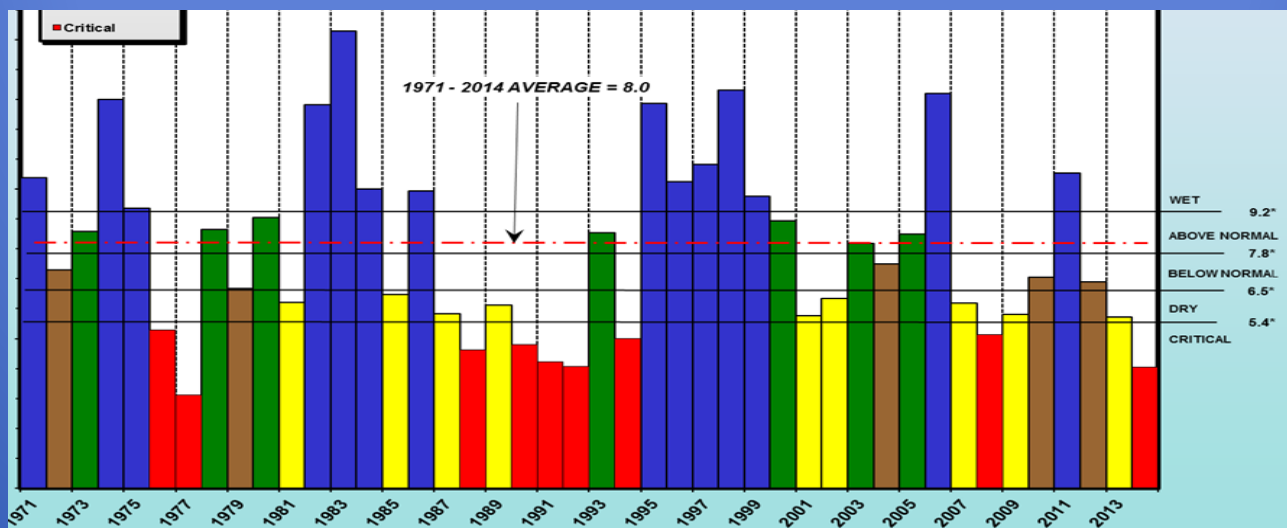


Groundwater level data are grouped for analysis by well depth



Groundwater level maps compare the current period with 2004

- 2004 is considered a “normal” precipitation year is also recent enough that we have a fair amount groundwater level data. We use it for our baseline



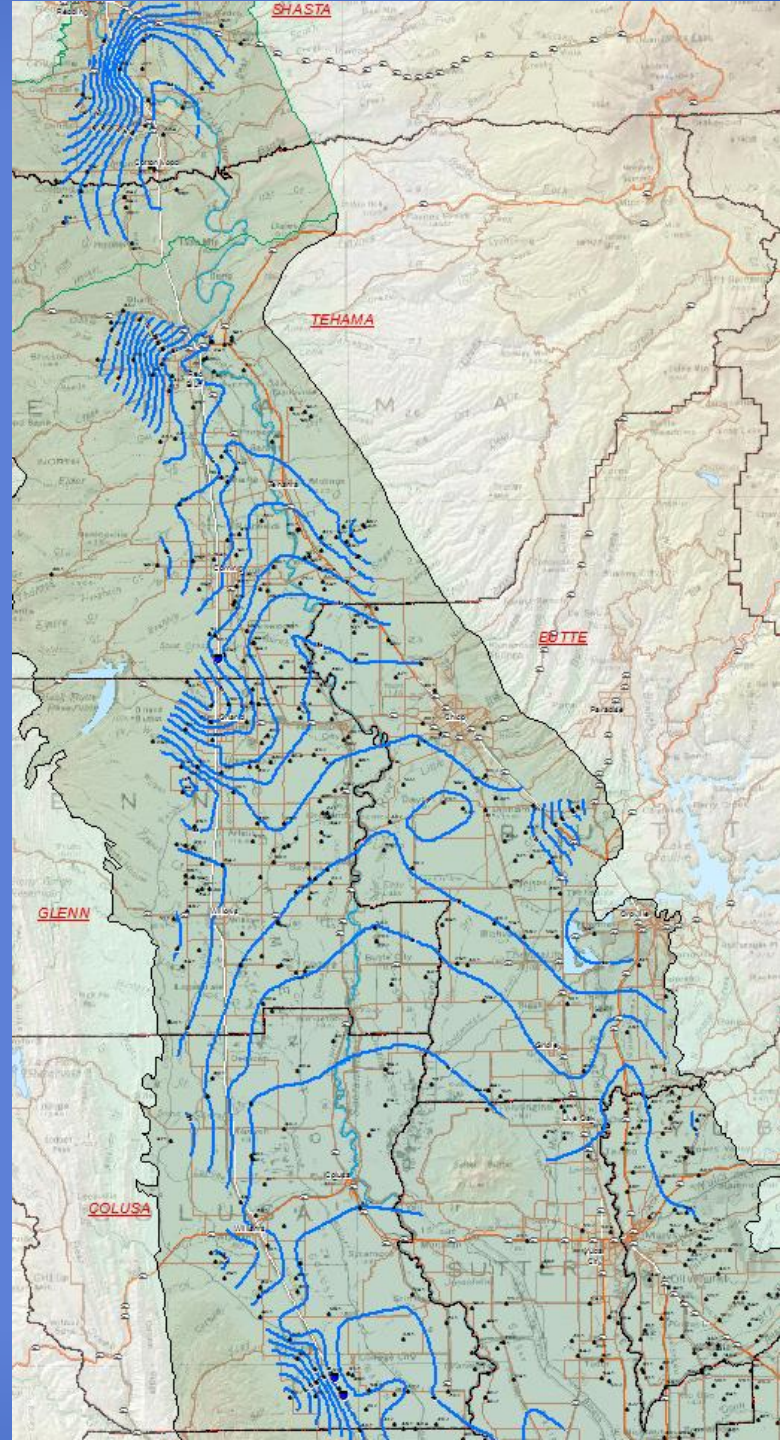
4. Spring 2015 Groundwater Level Results

Groundwater Contour Maps, Change
Maps, and Hydrographs

Groundwater Elevation Contour Map

Spring 2015

Average Well Depths:
100 to 450 feet
below ground surface



Groundwater Elevation Change Map

Spring 2014 to 2015

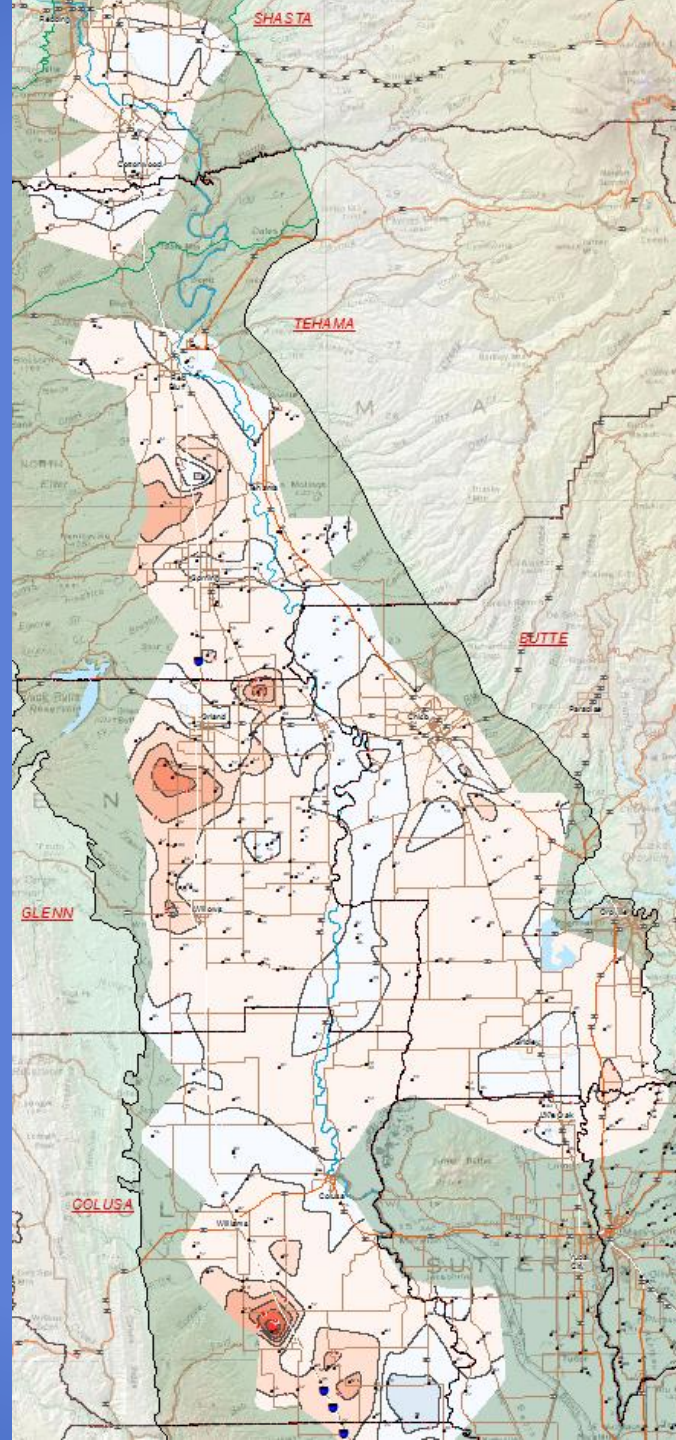
Average Well Depths:
100 to 450 feet
below ground surface

Sacramento Valley and
Redding Groundwater
Basins

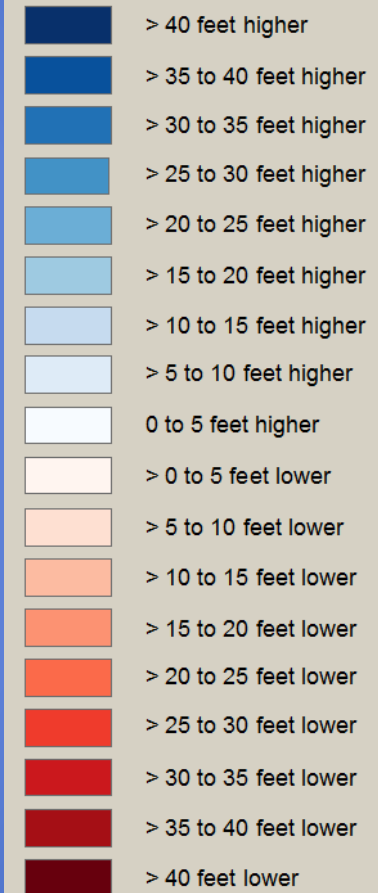
Number of wells: 282

Maximum decrease: -33 ft

Average change: -1.9 ft.



Groundwater Elevation Change



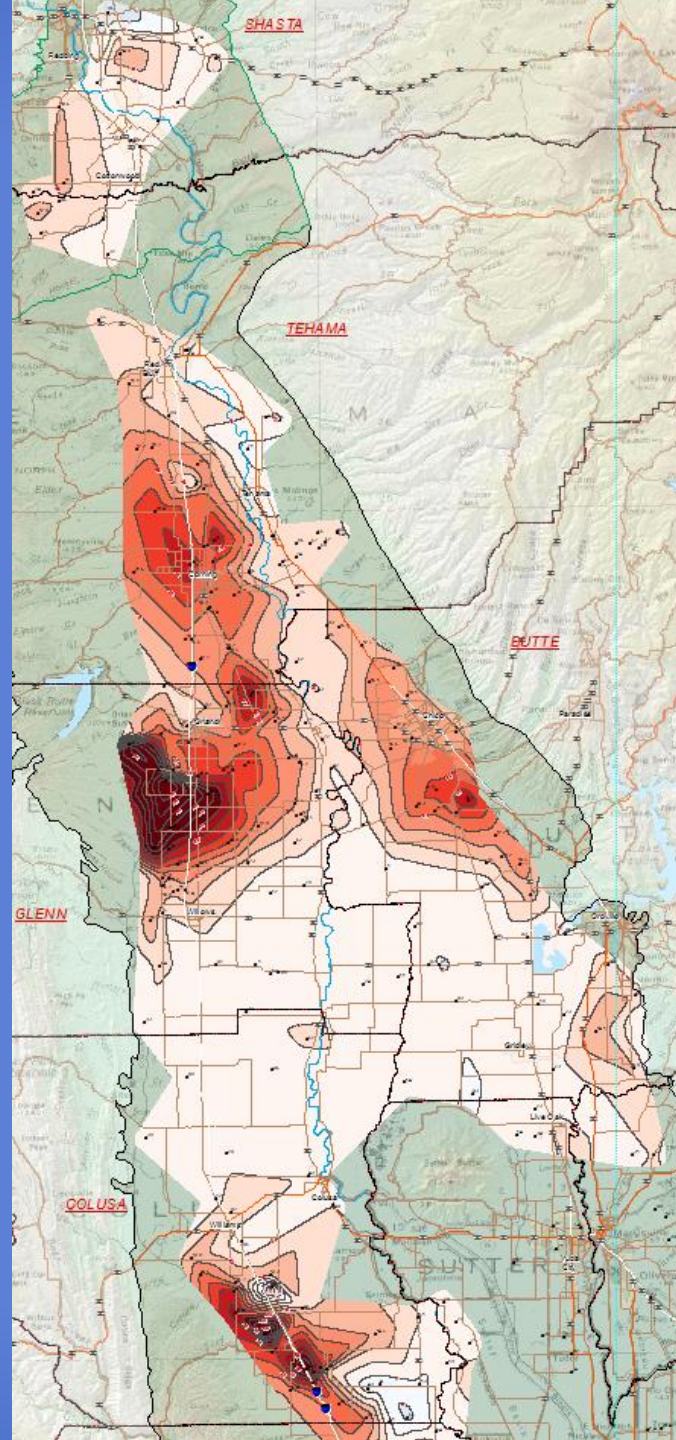
Groundwater Elevation Change Map

Spring 2004 to 2015

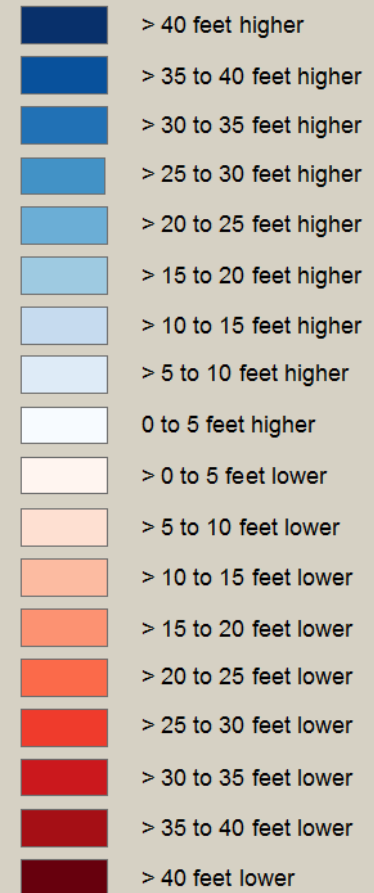
Average Well Depths:
100 to 450 feet
below ground surface

Sacramento Valley and
Redding Groundwater
Basins

Number of wells: 201
Maximum decrease: -73.6 ft.
Average change: -13.2 ft.



Groundwater Elevation Change



Groundwater Elevation Change Map

Spring 2014 to 2015

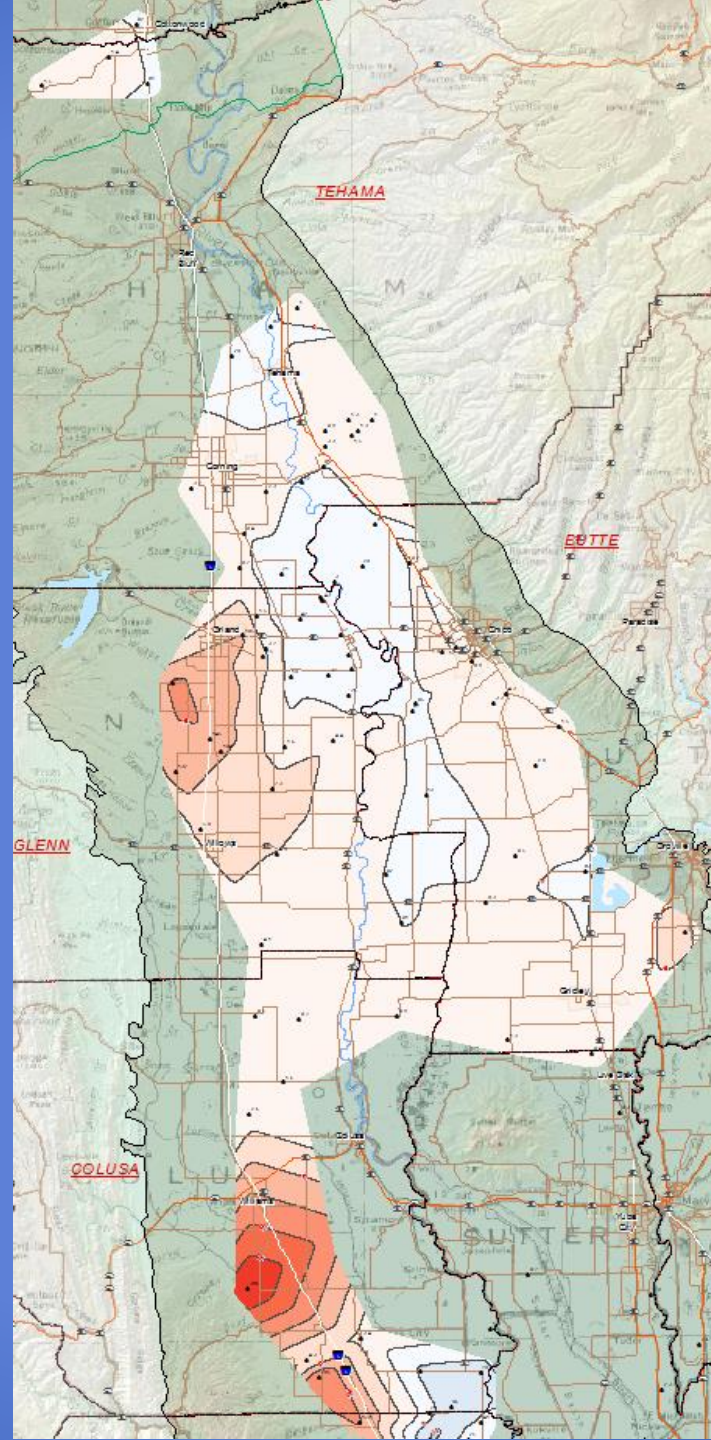
Average Well Depths:
> 600 feet
below ground surface

Sacramento Valley and
Redding Groundwater Basins

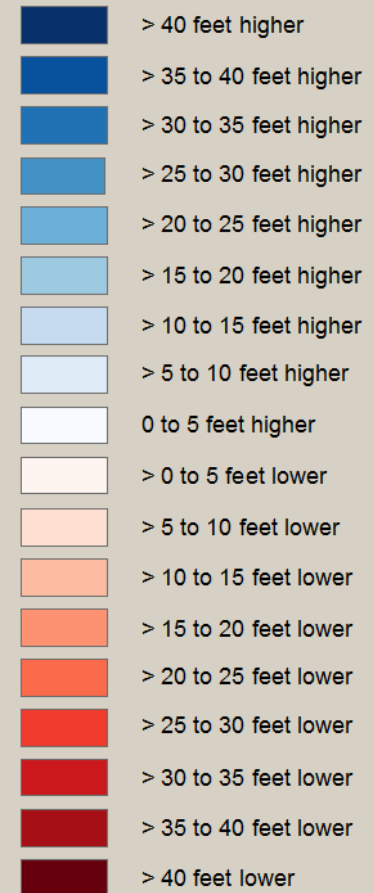
Number of wells: 78

Maximum decrease: -30.6 ft.

Average change: -1.8 ft.



Groundwater Elevation Change



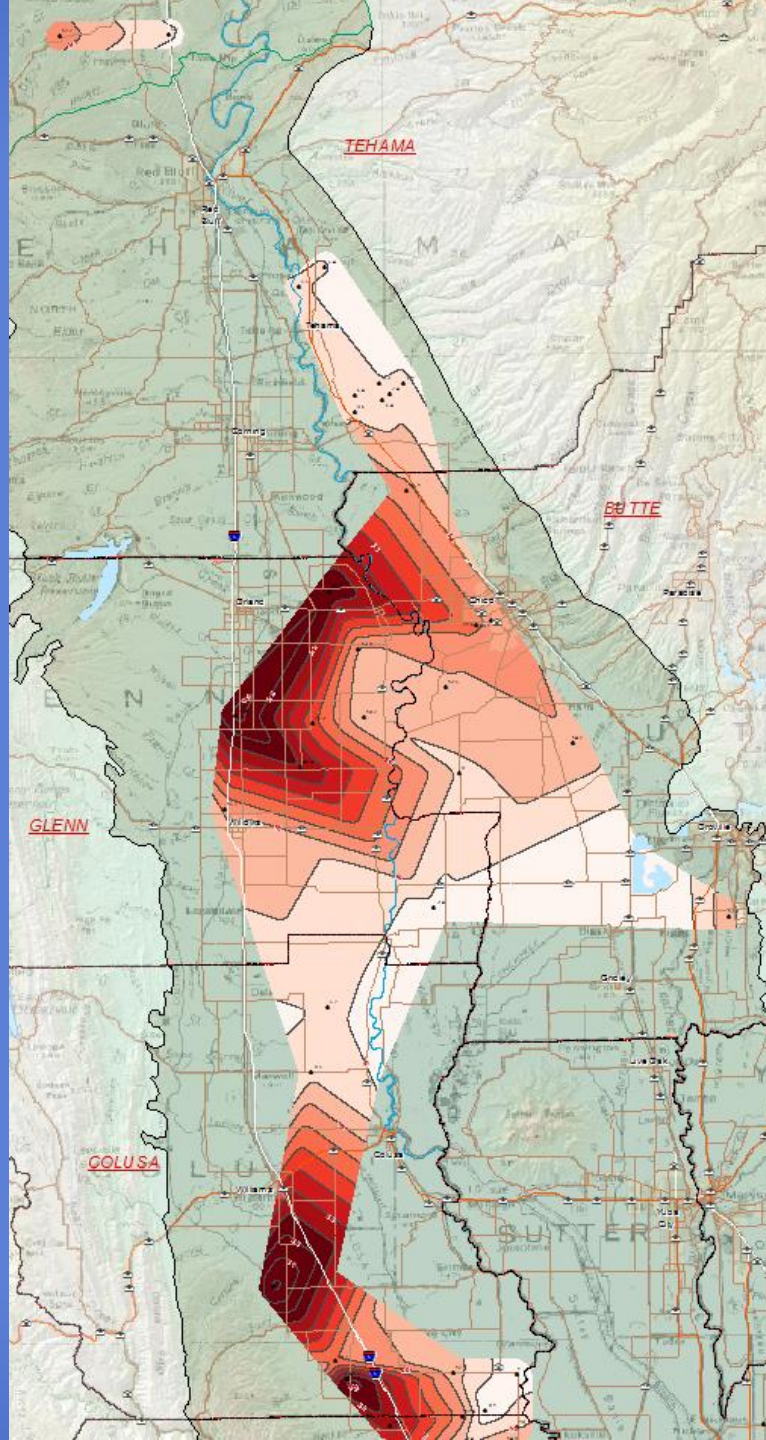
Groundwater Elevation Change Map

Spring 2004 to 2015

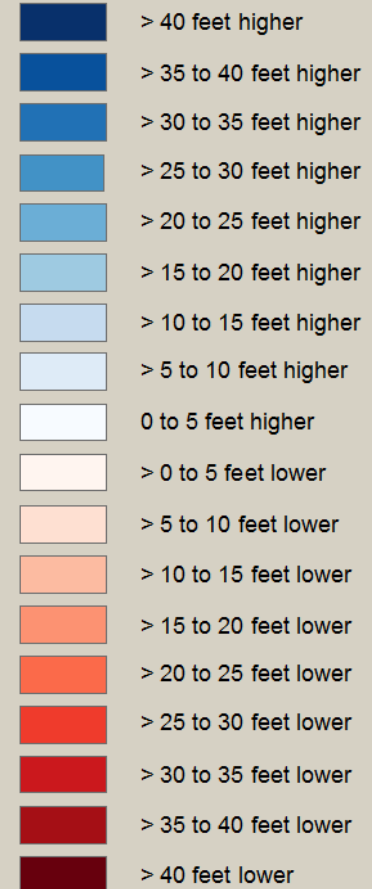
Average Well Depths:
> 600 feet
below ground surface

Sacramento Valley and
Redding Groundwater
Basins

Number of wells: 33
Max. decrease: -57.5 ft.
Average change: -16.4 ft.

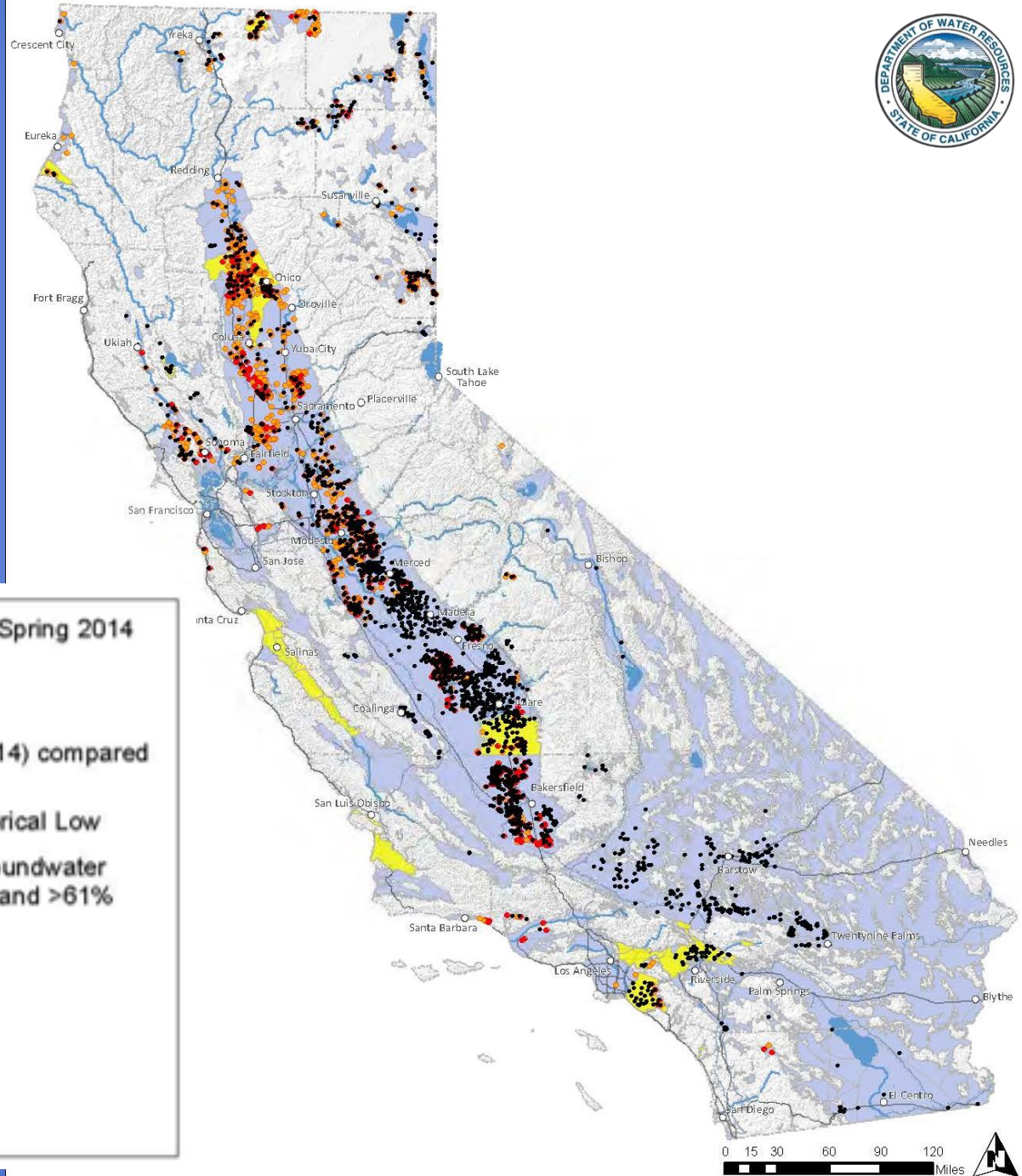


Groundwater Elevation Change





**Black Dots =
Groundwater Level
at Lowest Recorded**



Change in Groundwater Levels* - Spring 2010 to Spring 2014

- Decrease 2.5 to 10 feet
- Decrease > 10 feet

Current Drought Low (Spring 2008 to Spring 2014) compared to Historical Low (Spring 1900 to Spring 1998)

- Current Drought Low deeper than Historical Low

Basin with Moderately High to High Groundwater Reliance (use >0.61 acre-feet per acre and >61% total supply)

- Groundwater Basin
- ▭ Hydrologic Region Boundary
- County Boundary
- Major Highway
- ~~~~~ Major Canal



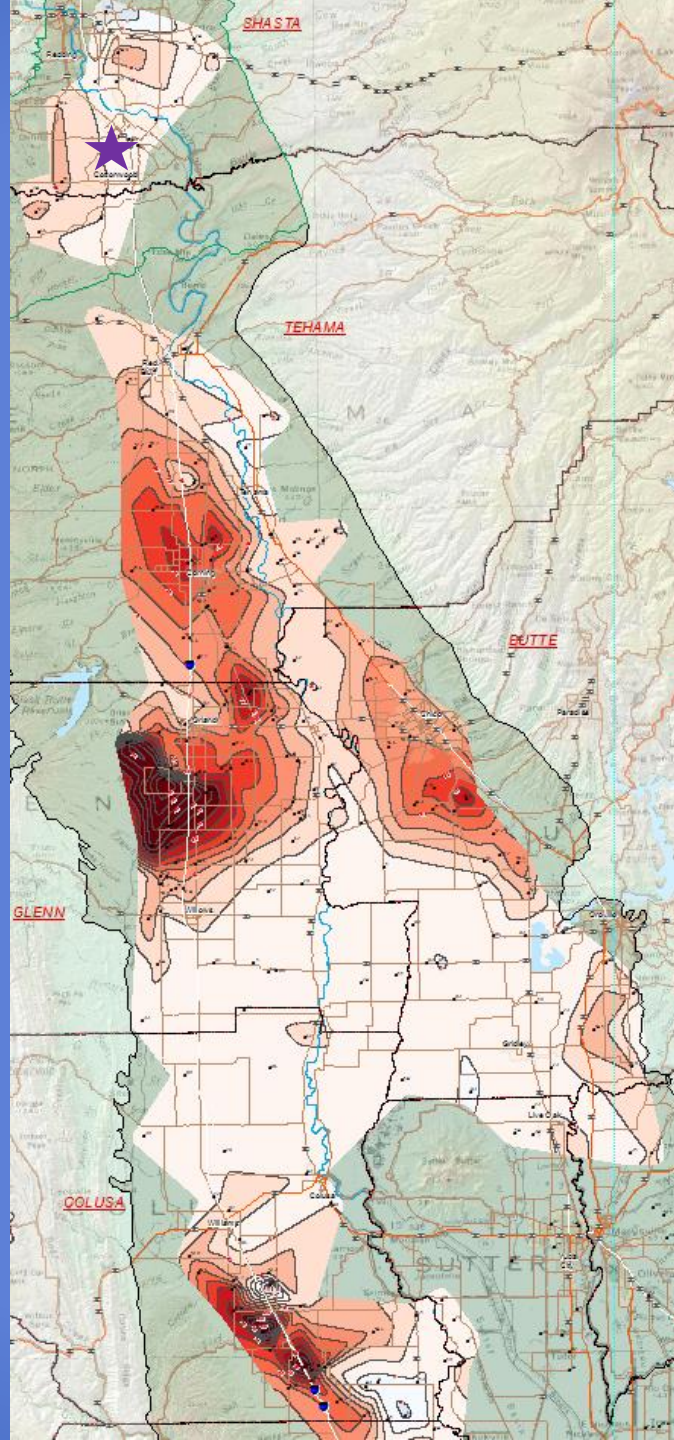
Groundwater Level Hydrograph Locations

Spring 2004 to 2015

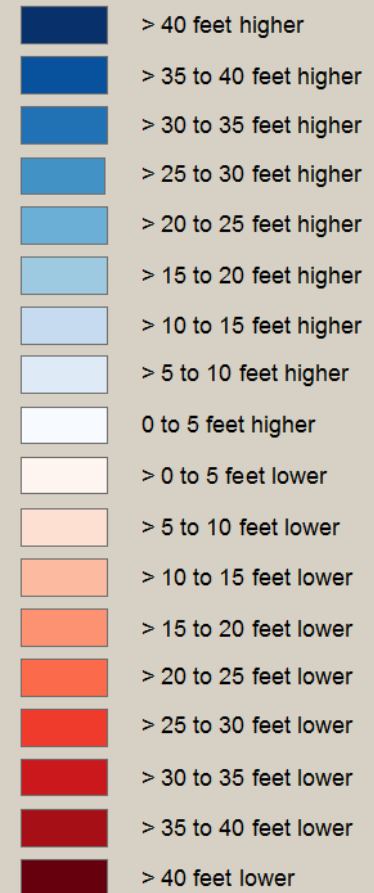
Average Well Depths:
100 to 450 feet
below ground surface

Sacramento Valley and
Redding Groundwater
Basins

Average Change: -13.2 ft.



Groundwater Elevation Change

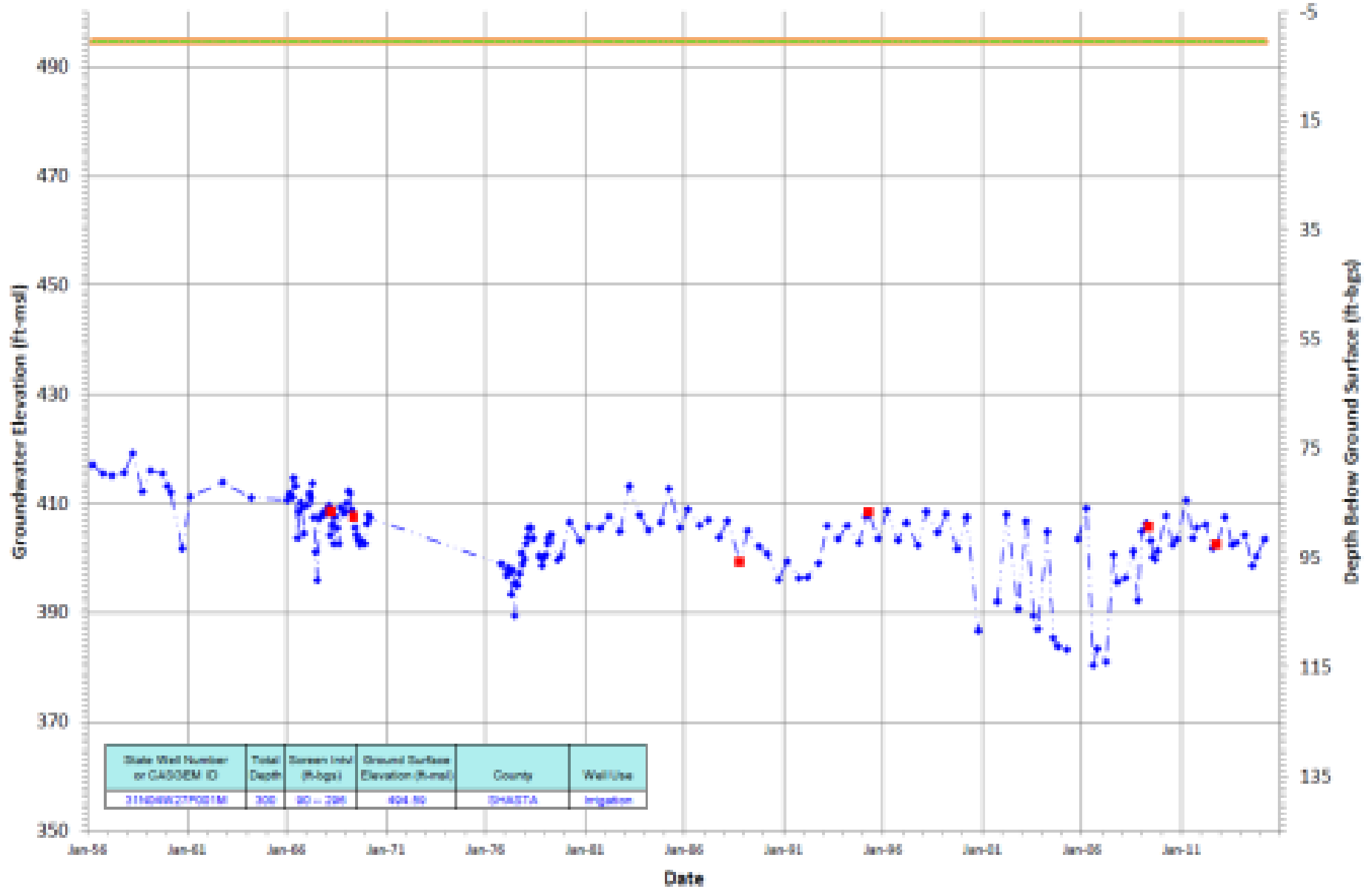


31ND4W27P001M

Period Of Record: 04/05/1956 to 03/17/2015

Hydrograph Criteria

State Well Number contains "31nd4w27p001"



— Ground Surface Elev
 - - - SP Elev
 — + — Periodic Measurements
 ■ Questionable Measurements

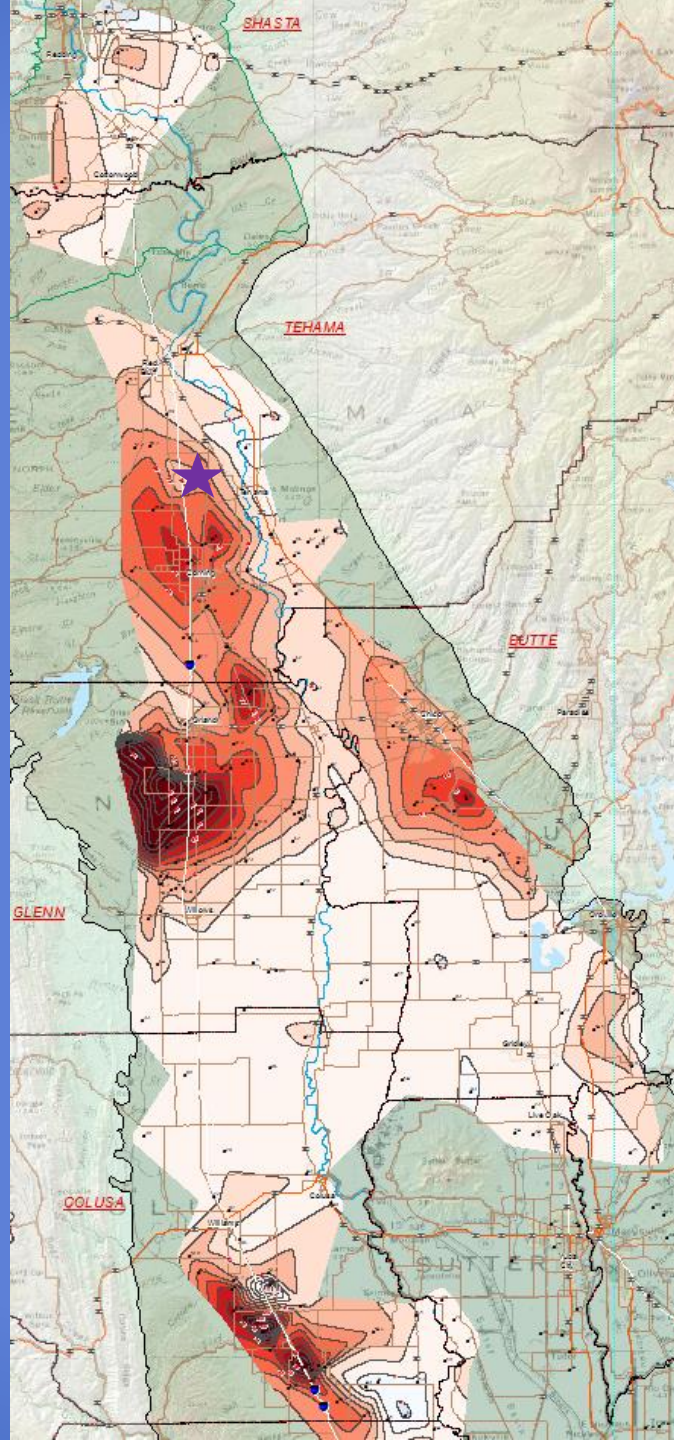
Groundwater Level Hydrograph Locations

Spring 2004 to 2015

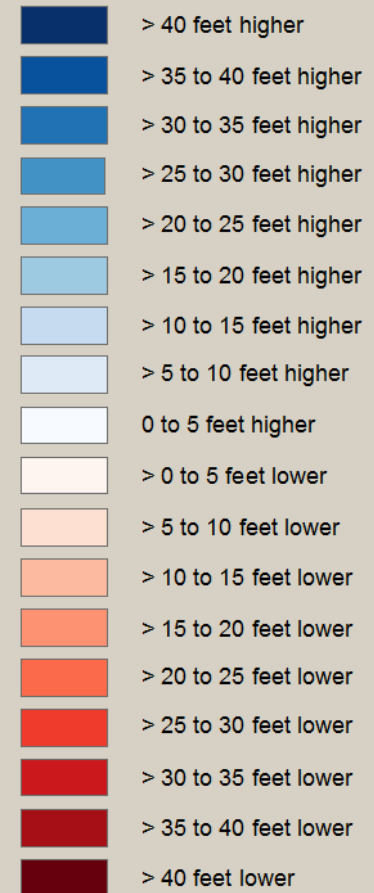
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below ground surface

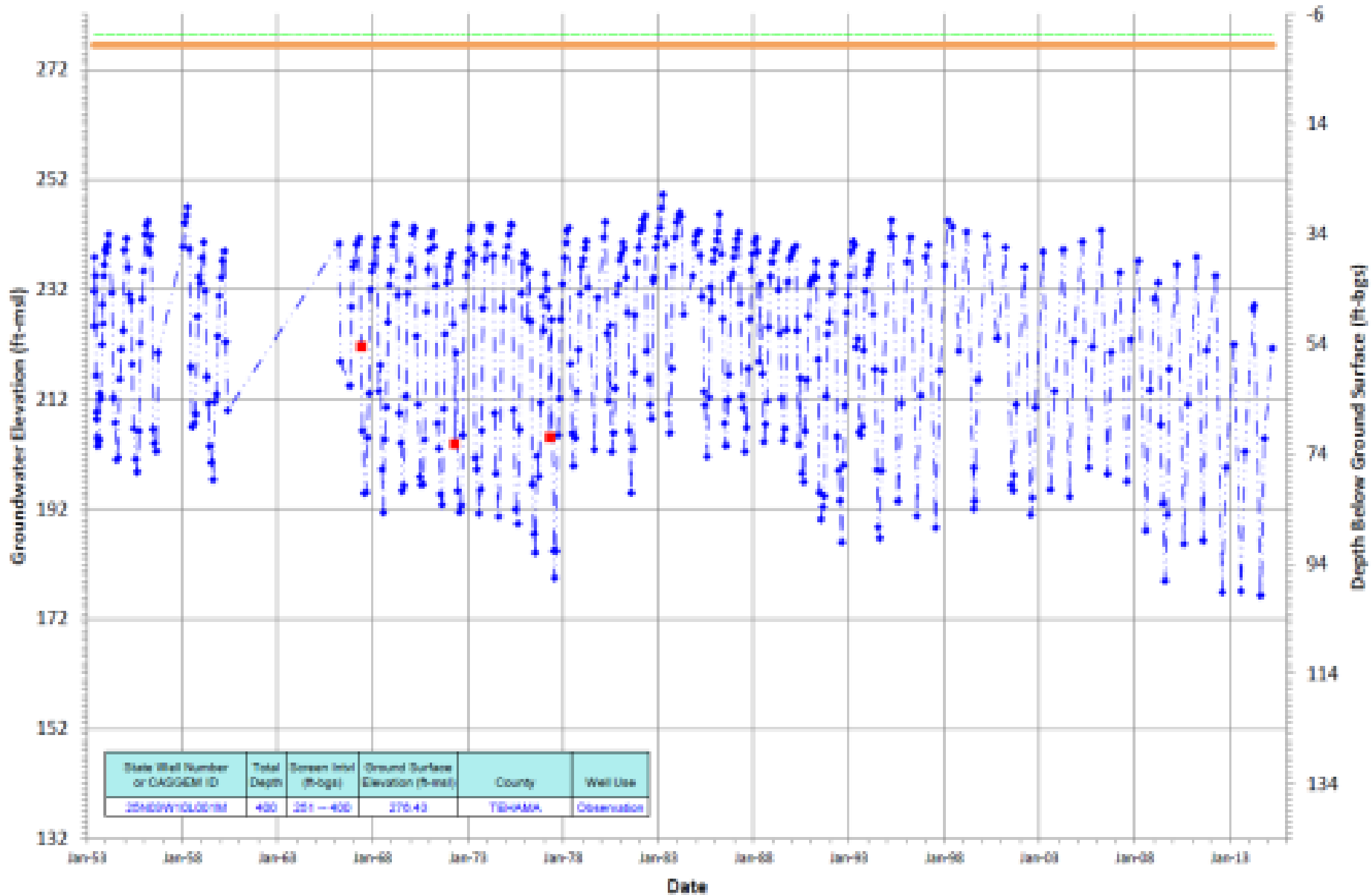
Sacramento Valley and
Redding Groundwater
Basins

Average Change: -13.2 ft.



Groundwater Elevation Change





— Ground Surface Elev - - - - RP Elev - - - - Periodic Measurements ■ Questionable Measurements

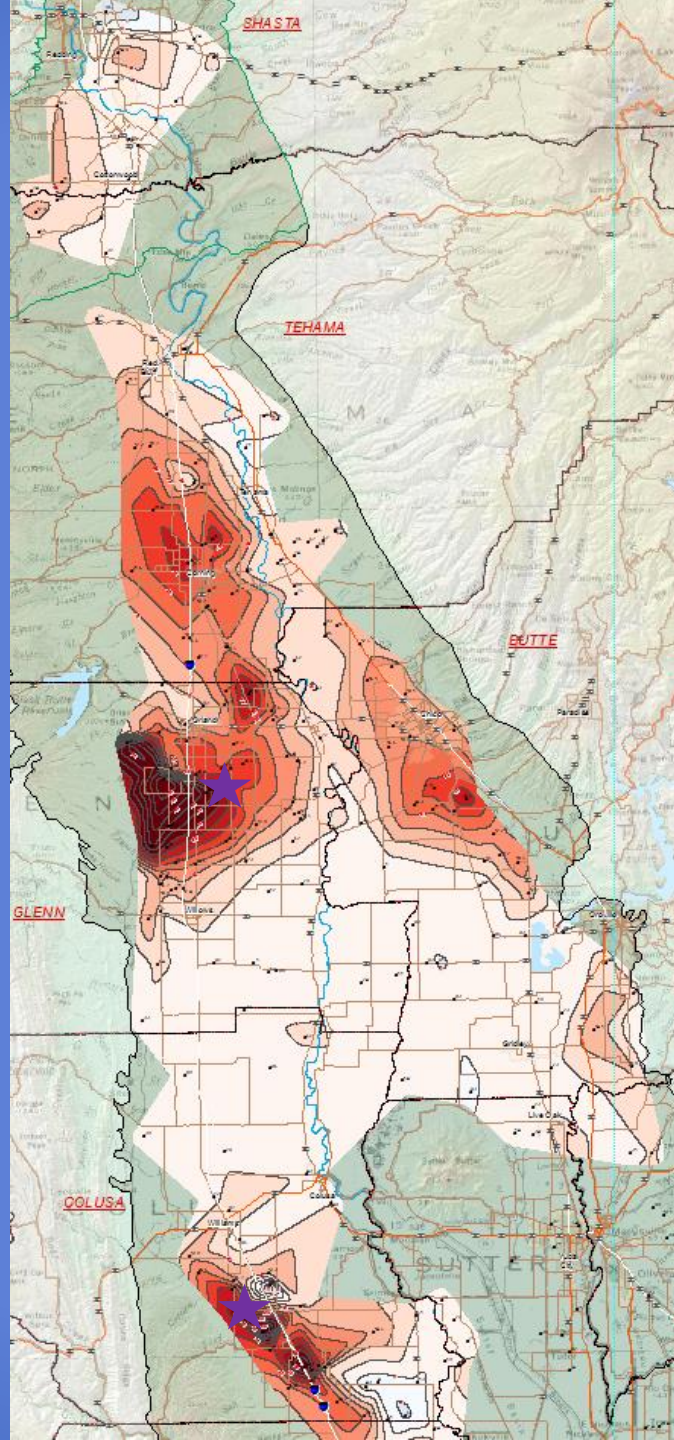
Groundwater Level Hydrograph Locations

Spring 2004 to 2015

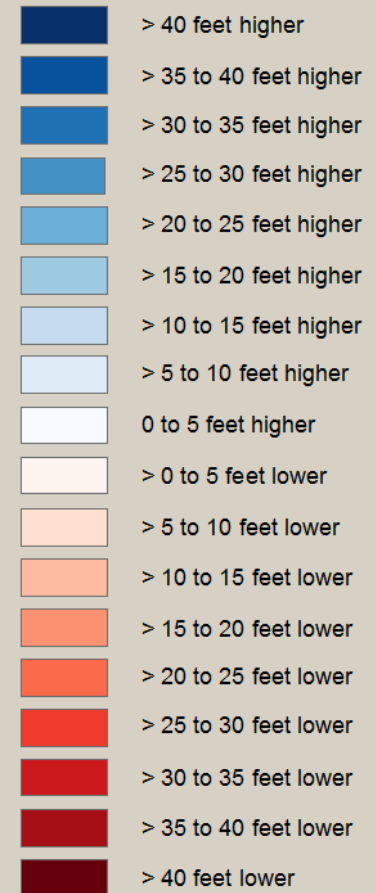
Average Well Depths:
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Sacramento Valley and
Redding Groundwater
Basins

Average Change: -13.2 ft.



Groundwater Elevation Change

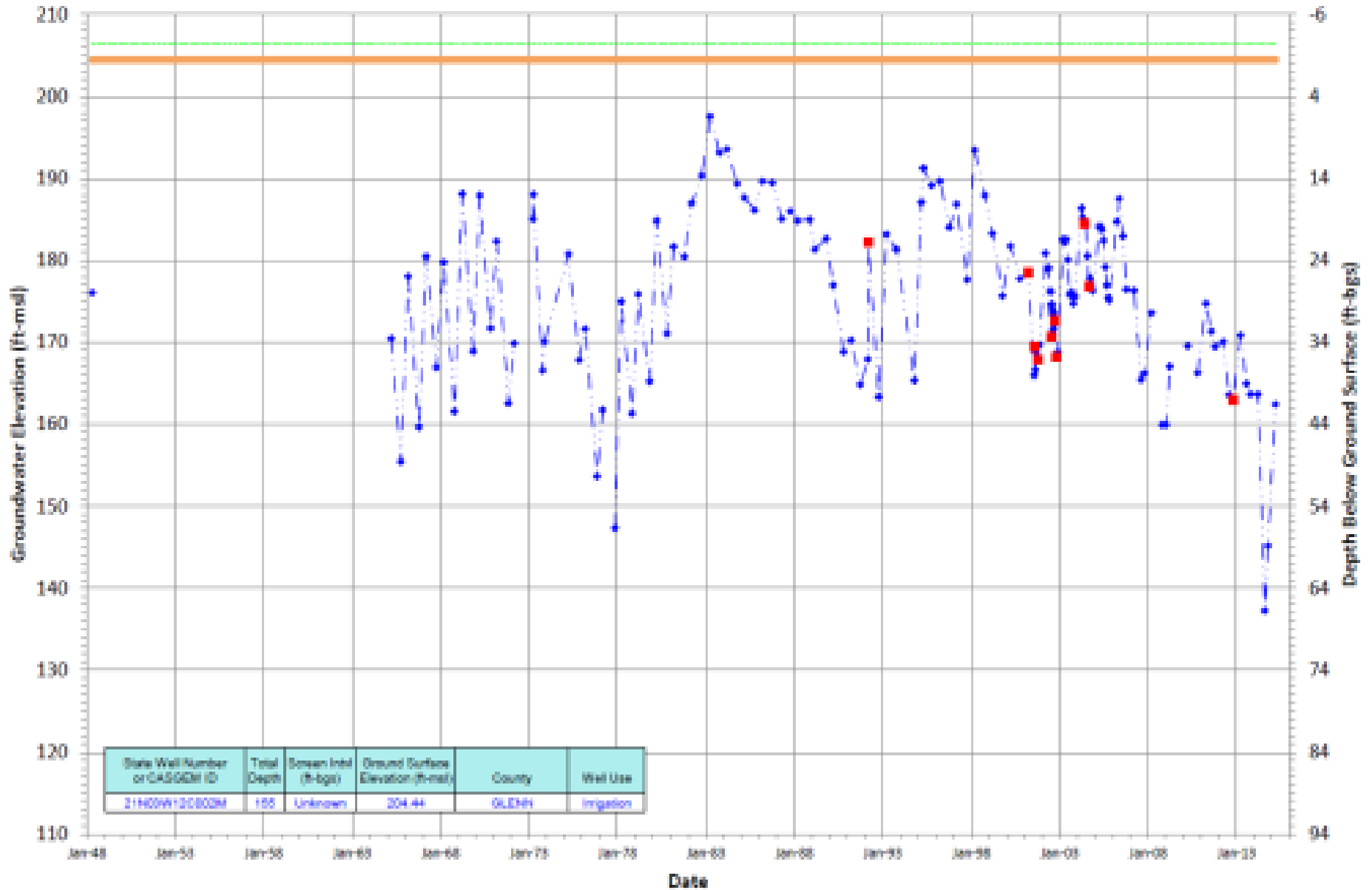


21N03W12C002M

Period Of Record: 04/22/1948 to 03/18/2015

Hydrograph Criteria

State Well Number contains '21n03w12c002'



— Ground Surface Elev
 - - - SP Elev
 - - - ◆ - - - Periodic Measurements
 ■ Questionable Measurements

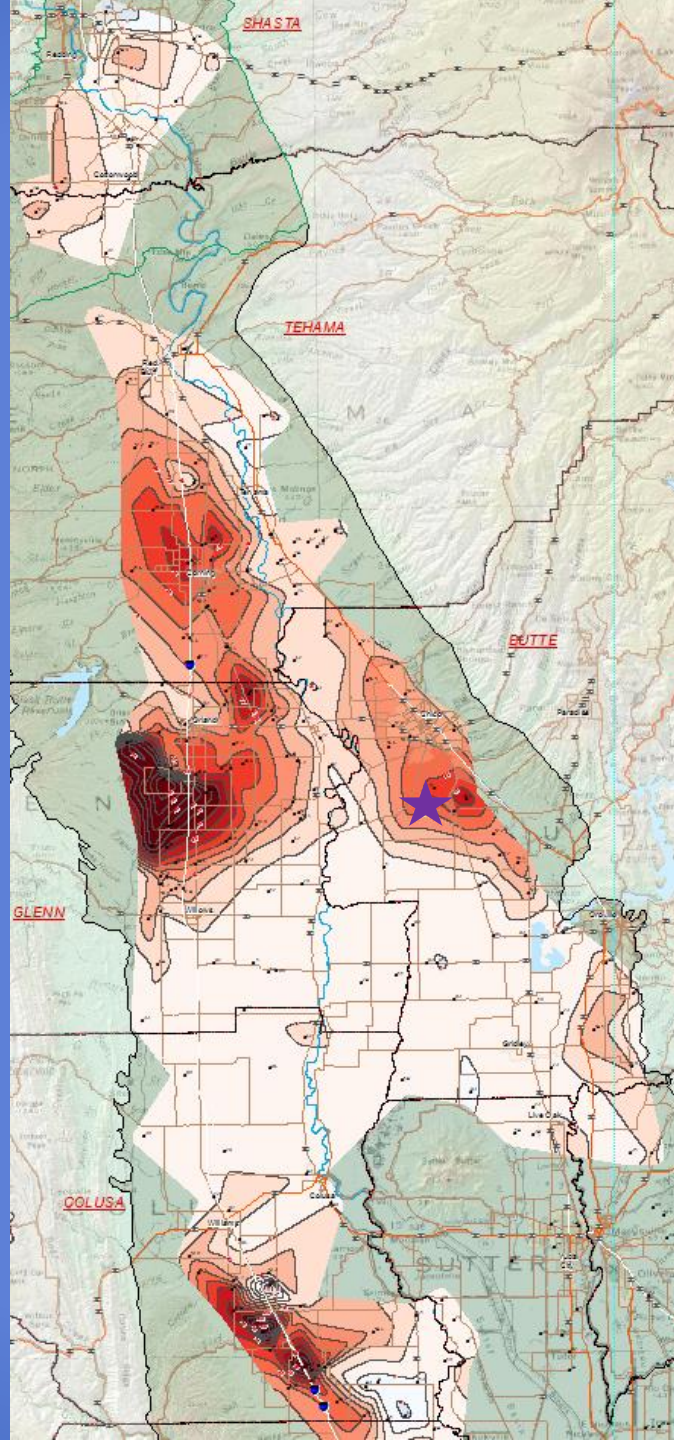
Groundwater Level Hydrograph Locations

Spring 2004 to 2015

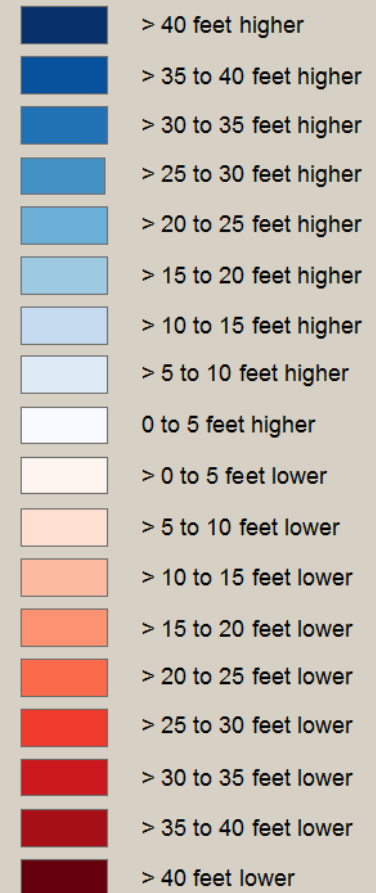
Average Well Depths:
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Sacramento Valley and
Redding Groundwater
Basins

Average Change: -13.2 ft.



Groundwater Elevation Change

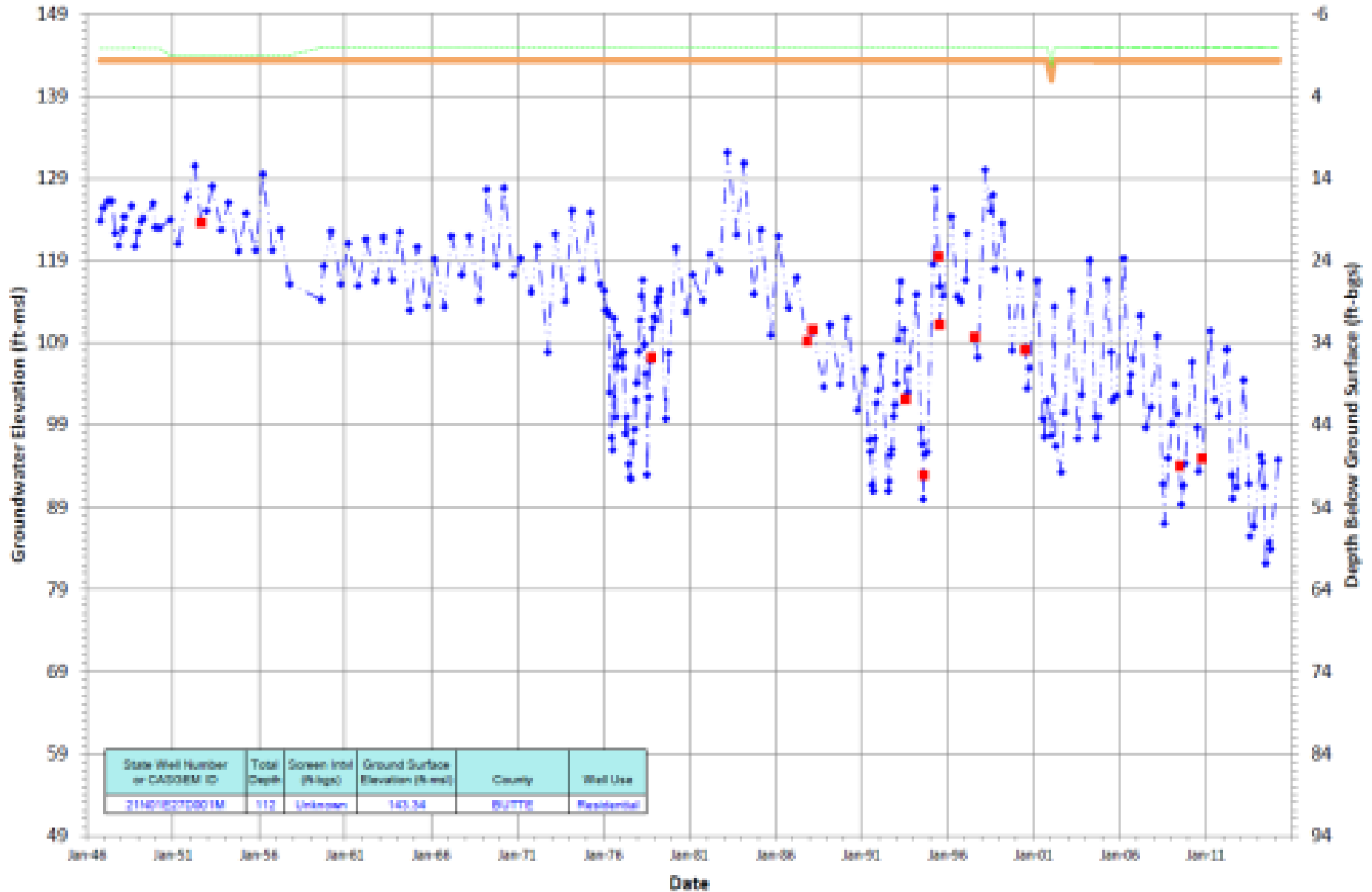


21N01E27D0001M

Period Of Record: 10/09/1946 to 03/19/2015

Hydrograph Criteria

State Well Number contains '21n01e27d'



Ground Surface Elev RP Elev Periodic Measurements Questionable Measurements

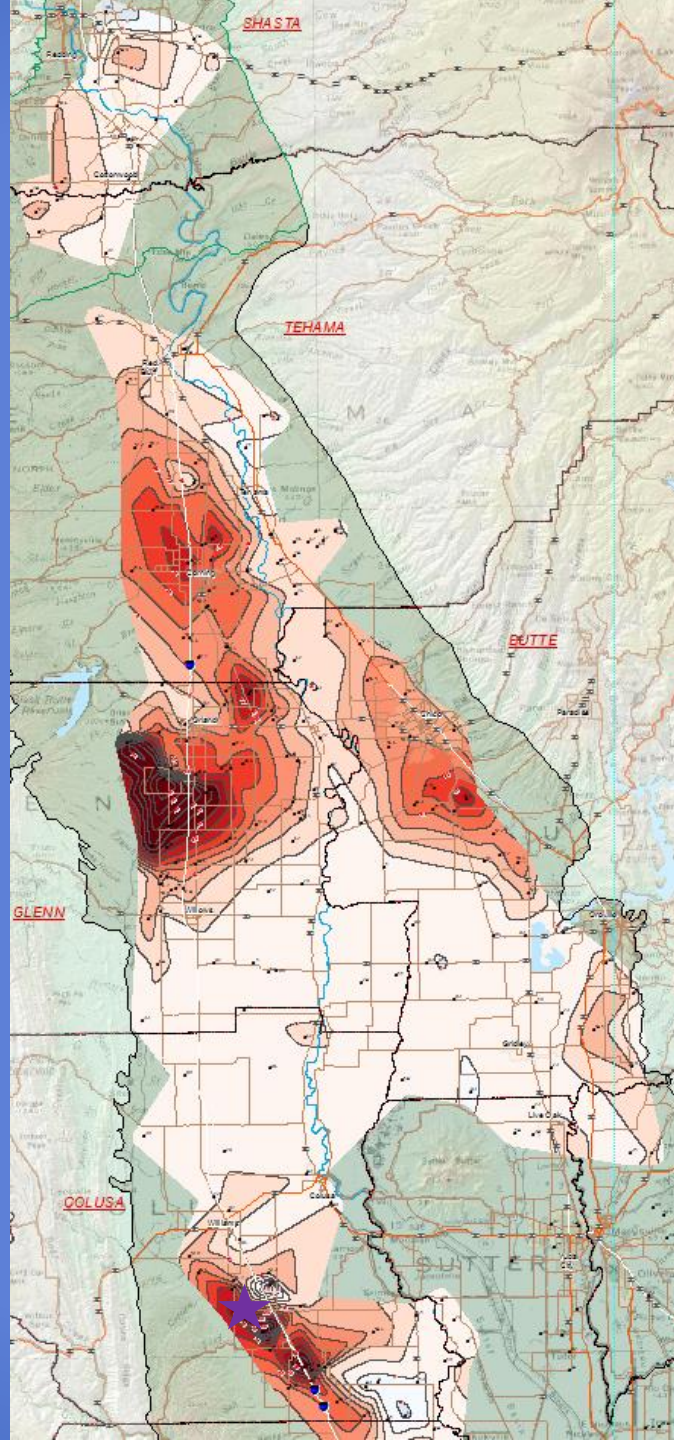
Groundwater Level Hydrograph Locations

Spring 2004 to 2015

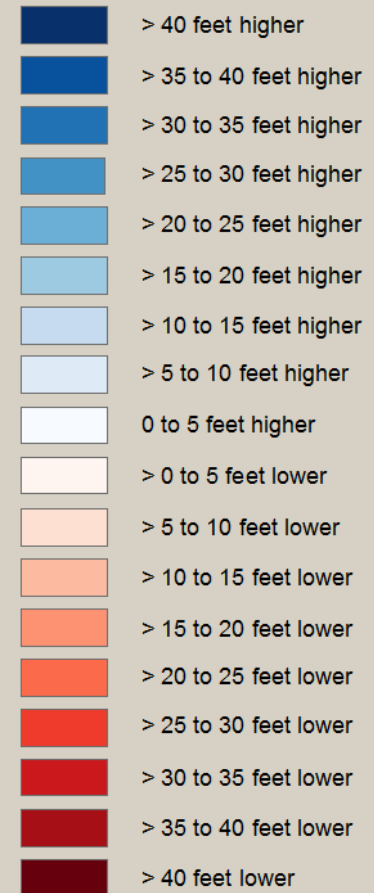
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Sacramento Valley and
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Basins

Average Change: -13.2 ft.



Groundwater Elevation Change





Ground Surface Elev BP Elev Periodic Measurements Questionable Measurements

You can access all this data from our new Groundwater Information Center website

Just “Google” *DWR Groundwater Information Center*

The screenshot shows the homepage of the California Department of Water Resources (DWR) Groundwater Information Center. The header includes the CA.GOV logo, the text 'CALIFORNIA DEPARTMENT OF WATER RESOURCES', and navigation links for HOME, NEWSROOM & EVENTS, ISSUES, and ABOUT US. A search bar and location selector (DWR, California) are also present. The main heading is 'Groundwater Information Center'. The content area features an 'Introduction' section with two paragraphs and a map titled 'Water Management Planning Tool'. A right-hand sidebar contains a 'GROUNDWATER HOME' section with a 'GROUNDWATER INFORMATION CENTER' sub-section, listing various resources like 'Groundwater Basics', 'Maps and Reports', 'Groundwater Management', 'Groundwater Well Information', 'Monitoring and Data Collection', 'GIC Interactive Map Application', 'Contacts', 'SUSTAINABLE GROUNDWATER MANAGEMENT', and 'BULLETIN 118'. A 'Highlights' section at the bottom of the sidebar lists 'Water Mgmt. Planning Tool' and 'Initial Basin Prioritization for SGM'. The 'Maps and Reports' link in the sidebar is circled in blue.

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DWR California

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 **Water Management Planning Tool** internally while also providing a beta version to the public.

New Groundwater and Sustainable Groundwater Management websites

As a result of the recent groundwater legislation, DWR has created two new websites relating to groundwater: "Groundwater" and "Sustainable Groundwater Management". The **new DWR Groundwater website** provides a central hub to California's major groundwater programs that DWR is responsible for, including Sustainable Groundwater Management, California Statewide Groundwater Elevation Monitoring (CASGEM), and Bulletin 118. The **new DWR Sustainable Groundwater Management website** provides information related to DWR's

GROUNDWATER HOME

GROUNDWATER INFORMATION CENTER

- Groundwater Basics
- » Maps and Reports
- Groundwater Management
 - » Groundwater Well Information
 - » Well Inquiries
- » Monitoring and Data Collection
 - » CASGEM
 - » Water Data Library
- » GIC Interactive Map Application
- » Contacts
- » SUSTAINABLE GROUNDWATER MANAGEMENT
 - » CASGEM
 - » BULLETIN 118

Highlights

- » Water Mgmt. Planning Tool
- » Initial Basin Prioritization for SGM

5. Summary

- Groundwater levels in the Sacramento Valley are on a decline
- We could be starting to see land subsidence in the Sacramento Valley due to over pumping of groundwater
- New legislation requires sustainable groundwater levels and steps must be taken for sustainable groundwater management

The diagram illustrates the water cycle with various components: a sun in the top right, a cloud labeled 'Water Vapor' at the top, a cloud labeled 'Rain & Snow (Precipitation)' on the left with rain falling, a forest on a green hill with a pink arrow labeled 'Evaporation' pointing up, a blue lake labeled 'Lakes & Streams' on the right, a pink arrow labeled 'Infiltration' pointing down into the ground, and a blue layer labeled 'Ground Water' at the bottom. A pink arrow labeled 'Transpiration' points up from the trees. The central text reads: ***Groundwater is a renewable resource and CAN be managed sustainably***

Groundwater is a renewable resource and CAN be managed sustainably

Questions? Comments?

Thank You

<http://water.ca.gov/groundwater/>