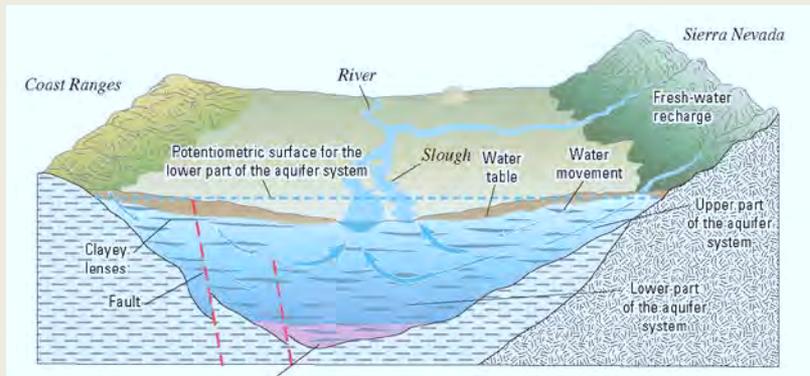


Presentation Overview:

- *DWR Sources of Groundwater Information*
- *Water Year Conditions*
- *Regional Groundwater Level Changes*
- *Local Groundwater Response Since Fall 2015*



Source: USGS PP 1788 Central Valley Aquifer Report



Groundwater

Introduction

Groundwater resources play a vital role in maintaining California's economic and environmental sustainability. During an average year, California's 515 alluvial groundwater basins and subbasins contribute approximately 38 percent toward the State's total water supply. During dry years, groundwater contributes up to 46 percent (or more) of the statewide annual supply, and serves as a critical buffer against the impacts of drought and climate change. Many municipal, agricultural, and disadvantaged communities rely on groundwater for up to 100 percent of their water supply needs. Groundwater extraction in excess of natural and managed recharge has caused historically-low groundwater elevations in many regions of California.

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 statewide groundwater management practices. In addition, DWR is responsible for implementing the Sustainable Groundwater Management Act (SGMA), the California Statewide Groundwater Elevation Monitoring (CASGEM) Program, and characterizing California's groundwater basins through updates to Bulletin 118.

The Sustainable Groundwater Management (SGM) Program

To implement the increased responsibilities given to DWR by the 2014 Sustainable Groundwater Management Act (SGMA), DWR has expanded its existing local assistance programs in the Division of Integrated Regional Water Management (DIRWM) and has developed a Strategic Plan for the Sustainable Groundwater Management (SGM) Program. [More info...](#)

Groundwater Information Center (GIC)

The Groundwater Information Center (GIC) is DWR's portal for groundwater basics, technical groundwater information, groundwater management plans, water well basics, and statewide reports, maps, and figures. [More info...](#)

California Statewide Groundwater Elevation Monitoring (CASGEM) Program

Senate Bill X7 6 (SBX7 6) in 2009 added provisions for groundwater monitoring to the California Water Code and authorized DWR to establish permanent and locally-managed groundwater elevation monitoring and reporting in all of California's 515 alluvial groundwater basins. To implement SBX7 6, DWR developed the CASGEM Program. [More info...](#)

Bulletin 118

The DWR has long recognized the need for collection, summary, and evaluation of groundwater data as essential tools in planning for the optimal use of the groundwater resource. An example of this is DWR's Bulletin 118 series, which presents the results of groundwater basin evaluations and defines the boundaries of California's 515 alluvial groundwater basins. [More info...](#)

GROUNDWATER HOME

- ▶ SUSTAINABLE GROUNDWATER MANAGEMENT
- ▶ GROUNDWATER INFORMATION CENTER
- ▶ CASGEM
- ▶ BULLETIN 118
- ▶ NASA Subsidence Report



DWR Groundwater Homepage

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

▶ Sustainable Groundwater Management Program

▶ **Groundwater Information Center**

▶ CASGEM

▶ Bulletin

Groundwater Information Center

Introduction

The Groundwater Information Center is DWR's portal for groundwater information, groundwater management plans, water well basins, 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.

Recent Announcements



Draft Groundwater Sustainability Plan Emergency Regulations Posted
The legislative intent of the 2014 Sustainable Groundwater Management Act (SGMA) is for groundwater basins in California to be managed and regulated by local public agencies and groundwater sustainability agencies (GSAs). In the basins designated by the Department of Water Resources (DWR) as medium and high priority, local public agencies and GSAs are required to develop and implement groundwater sustainability plans (GSPs) or alternatives to GSPs (Alternatives). Pursuant to Water Code Section 10733.2, DWR is required to draft and adopt emergency regulations for the evaluation of GSPs and Alternatives, the implementation of GSPs and Alternatives, and coordination agreements by June 1, 2016...[More Info](#)



SGMA Basin Boundary Regulations
DWR implemented new basin boundary regulations on November 16, 2015. Establishment of the regulations comes well in advance of the January 1, 2016 SGMA deadline, effectively giving local agencies an additional six weeks to prepare their requests for any basin boundary modifications. DWR will accept basin boundary modification requests from January 1, 2016 through March 31, 2016. A copy of the regulations can be found [here](#).



OSWCR: Online System for Well Completion Reports is Ready for Use
OSWCR ("Oscar") allows water well contractors to submit their well completion reports to DWR using a web based system. This replaces the paper-based system used for the last 60+ years. If you are interested in receiving information about OSWCR, please subscribe to our [mailing list](#) to keep up to date on scheduled training sessions...

[More Info](#)

GROUNDWATER HOME

GROUNDWATER INFORMATION CENTER

- » Groundwater Basics
- » Maps and Reports
- » GIC Interactive Map Application
- » Groundwater Management
- » Groundwater Well Information
 - » DWR Well Inquiry Contacts
 - » Well Completion Reports
 - » OSWCR
 - » Local Permitting Agencies
- » Monitoring and Data Collection
 - » CASGEM
 - » Water Data Library
- » Groundwater Contacts

SUSTAINABLE GROUNDWATER MANAGEMENT

- » CASGEM
- » BULLETIN 118

Highlights

- » NASA Subsidence Report
- » Water Mgmt. Planning Tool
- » Initial Basin Prioritization for SGM
- » Geology of the Northern Sacramento Valley



DWR Groundwater Information Center

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

- *Groundwater Basics*
- *Maps and Reports*
- *Interactive Map Application*
- *Groundwater Management*
- *Well Information*
 - *Well Logs*
 - *OSWCR*
- *Monitoring & Data*
 - *CASGEM*
 - *WDL*
- *SGMA Program*

Groundwater Information Center

Maps and Reports

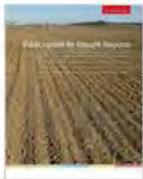
Groundwater data and related information can be reported in a variety of formats, including maps, figures, and written reports.

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

- + Spring Groundwater Level Change Maps (click here to view)
- + Fall Groundwater Level Change Maps (click here to view)

Statewide and Regional Reports



Public Update for Drought Response - November 30, 2014
Groundwater Basins with Potential Water Shortages, Gaps in Groundwater Monitoring, Monitoring of Land Subsidence, and Agricultural Land Fallowing

+ Selected Report Figures (click here to view)



Summary of Recent, Historical, and Estimated Potential for Future Land Subsidence in California - 2014



Geology of the Northern Sacramento Valley, California, June 2014

GROUNDWATER HOME

GROUNDWATER INFORMATION CENTER

- » Groundwater Basics
- » Maps and Reports
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- » Groundwater Management
- » Groundwater Well Information
 - » DWR Well Inquiry Contacts
 - » Well Completion Reports
 - » OSWCR
 - » Local Permitting Agencies
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- » SUSTAINABLE GROUNDWATER MANAGEMENT
 - » CASGEM
 - » BULLETIN 118

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DWR Groundwater Information Center

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

Maps and Reports

- Spring GW Level Change Maps
- Fall GW Level Change Maps
- Drought Reports
- Subsidence Reports
- Reports by Region Offices
- Download Geospatial Data

DWR Groundwater Information



California's Groundwater Update 2013



California's Groundwater Update 2013: A Compilation of Enhanced Content for California Water Plan Update 2013 compiles and analyzes readily-available groundwater information to characterize California's groundwater basins, aquifers, and well infrastructure.

Although previous California Water Plan Updates had included groundwater-related resource management strategies, feedback from advisory committees and other stakeholder groups highlighted the lack of hydrologic region-specific groundwater information in the California Water Plan.

The Update expands and enhances baseline groundwater information on a regional scale, identifies challenges associated with sustainable groundwater management and helps guide implementation of diverse resource management strategies. Statewide and regional findings, data gaps and recommendations to improve groundwater management also are

included.

The report is organized into the following components:

» California's Groundwater Update

- Front Cover
- Director's Foreword
- Front Matter and Table of Contents
- Statewide Findings, Data Gaps and Recommendations
- Introduction, Scope and Future Directions (Chapter 1)
- Statewide Groundwater Update (Chapter 2)
- Back Cover

» Hydrologic Region Groundwater Update

- North Coast Hydrologic Region (Chapter 3)
- San Francisco Bay Hydrologic Region (Chapter 4)
- Central Coast Hydrologic Region (Chapter 5)
- South Coast Hydrologic Region (Chapter 6)
- Sacramento River Hydrologic Region (Chapter 7)
- San Joaquin River Hydrologic Region (Chapter 8)
- Tulare Lake Hydrologic Region (Chapter 9)
- North Lahontan Hydrologic Region (Chapter 10)
- South Lahontan Hydrologic Region (Chapter 11)
- Colorado River Hydrologic Region (Chapter 12)



» Appendices:

- Front Cover
- Appendix A: Methods and Assumptions
- Appendix B: California Statewide Groundwater Elevation Monitoring (CASGEM) Basin Prioritization
- Appendix C: Groundwater Use Data
- Appendix D: Conjunctive Management Survey
- Appendix E: Change in Groundwater in Storage
- Appendix F: Land Subsidence
- Back Cover

California's Groundwater Update 2013

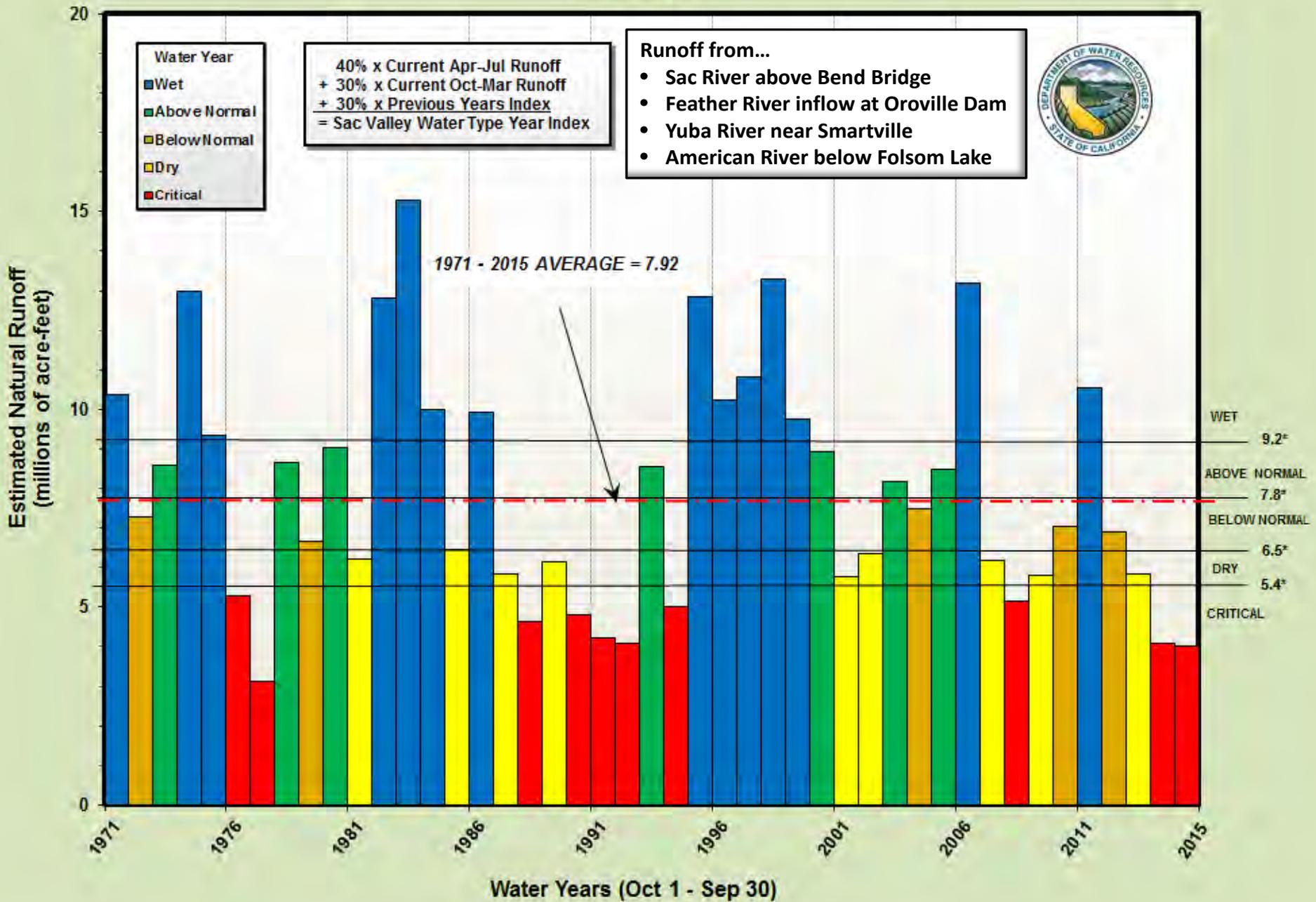
Available Online At:

<http://www.waterplan.water.ca.gov/topics/groundwater/index.cfm>

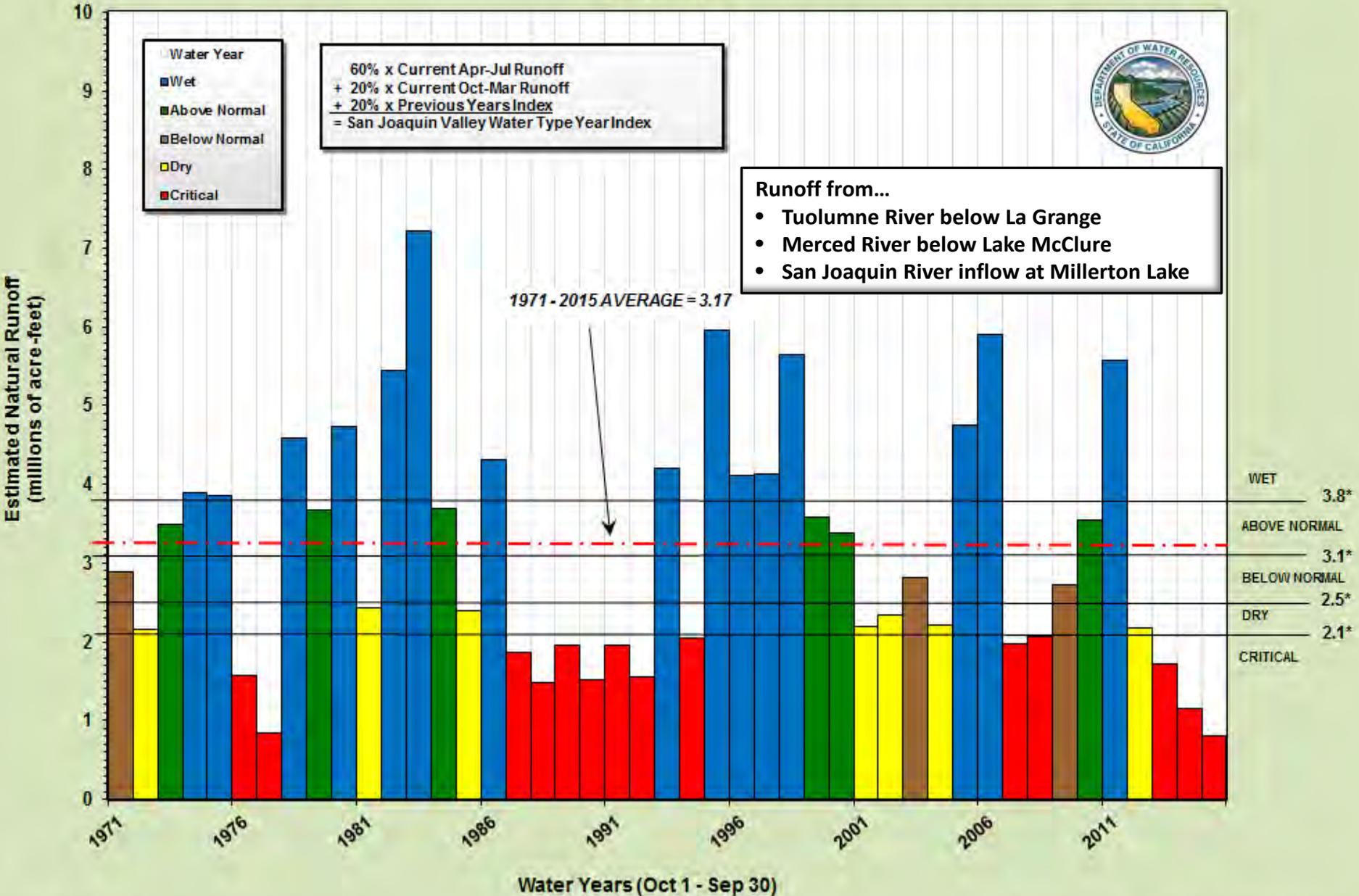


Water Year Conditions

SACRAMENTO VALLEY WATER YEAR TYPE INDEX 1971-2015



SAN JOAQUIN VALLEY WATER YEAR TYPE INDEX 1971 - 2015





Groundwater Monitoring



California Groundwater Level Monitoring Network

Statewide groundwater (GW) well monitoring summary by well entity¹

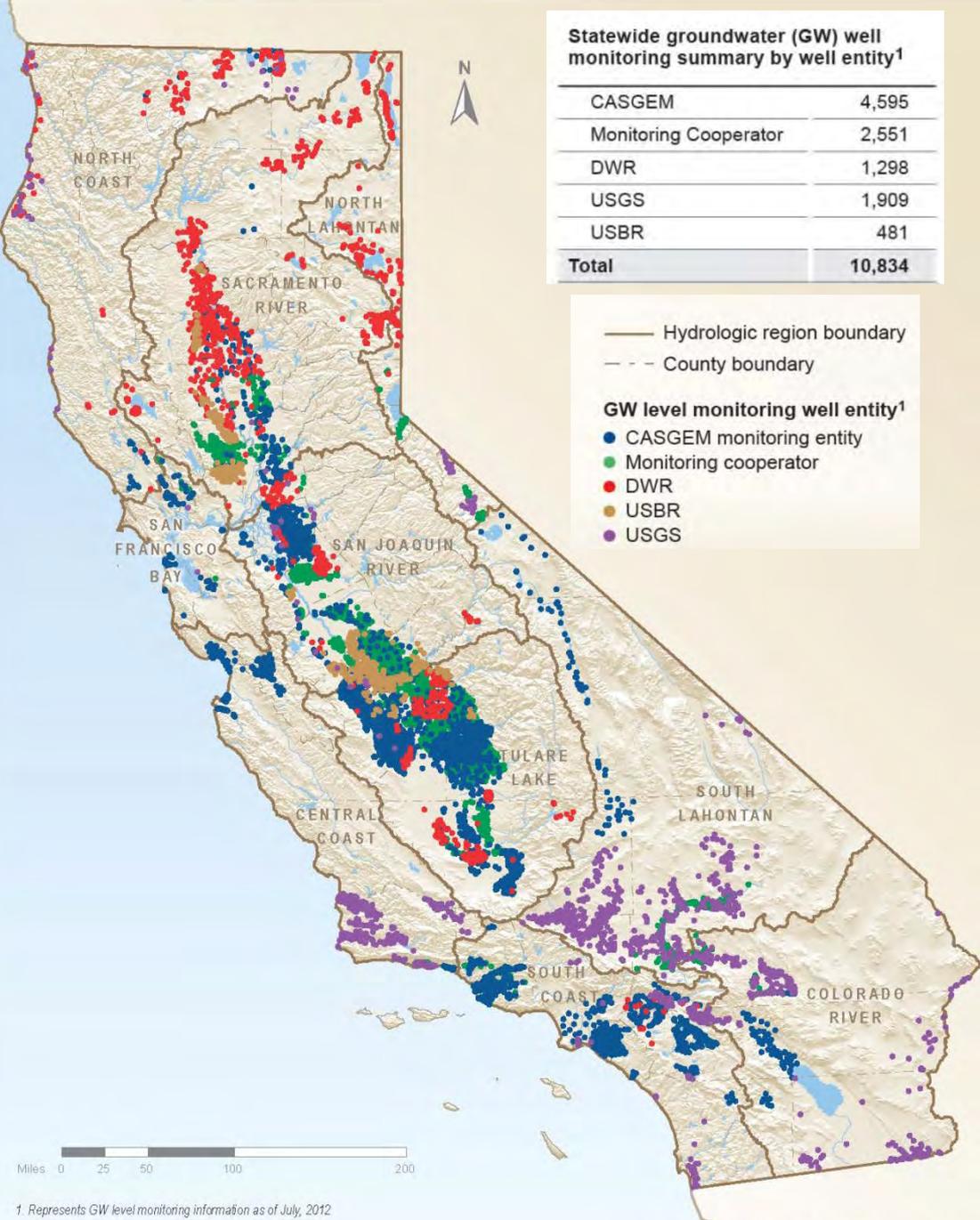
CASGEM	4,595
Monitoring Cooperator	2,551
DWR	1,298
USGS	1,909
USBR	481
Total	10,834

- Hydrologic region boundary
- - - County boundary
- GW level monitoring well entity¹**
- CASGEM monitoring entity
- Monitoring cooperator
- DWR
- USBR
- USGS

Statewide groundwater (GW) well monitoring summary by well entity¹

CASGEM	4,595
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- Hydrologic region boundary
- - - County boundary
- GW level monitoring well entity¹**
- CASGEM monitoring entity
- Monitoring cooperator
- DWR
- USBR
- USGS



¹ Represents GW level monitoring information as of July, 2012

As of July 2012



Groundwater Level Data

➤ **Collected**...at wells using steel tapes or electric tapes (sounders).



➤ “Continuous” data collected using data loggers.

➤ **Recorded**...with Qualification if necessary.

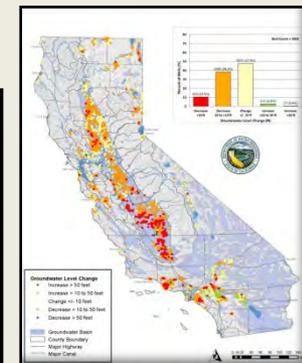
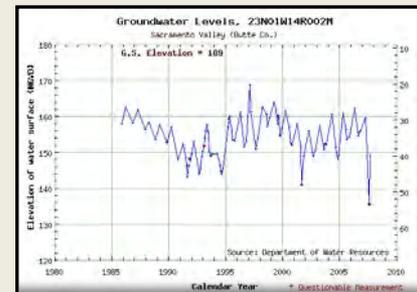


➤ **Available**...through CASGEM, Water Data Library, Groundwater Information Center as hydrographs, contours, tabular data and reports.

NO MEASUREMENT		QUESTIONABLE MEASUREMENT	
Measurement discontinued		Caved or dewatered	
1. Pumping		1. Pumping	
2. Pump house locked		2. Nearby pump operating	
3. Tape hung up		3. Casing leaking or wet	
4. Can't get tape in casing		4. Pumped recently	
5. Unable to locate well		5. Air or pressure gauge measurement	
6. Well has been destroyed		6. Other	
7. Special		7. Recharge operation at or nearby well	
8. Casing leaking or wet		8. Oil in casing	
9. Temporarily inaccessible			

DATE	N	O	TAPE	R. P.	ELEVATION	OBSERVER
Mo. Day Yr.	M	M	READING AT R.P.	TO W.S.	OF W.S.	INITIALS
05/09/01			46.0	12.5	33.5	SWL

➤ **Analyzed**...by creating GW Hydrographs, Contour Elevation Maps, Change Maps, Data tables, and Dot Maps.

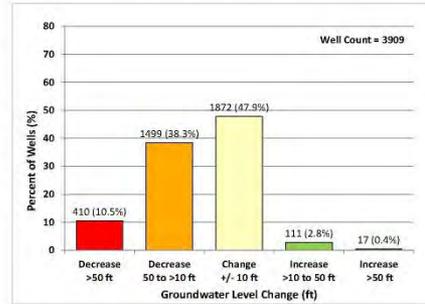
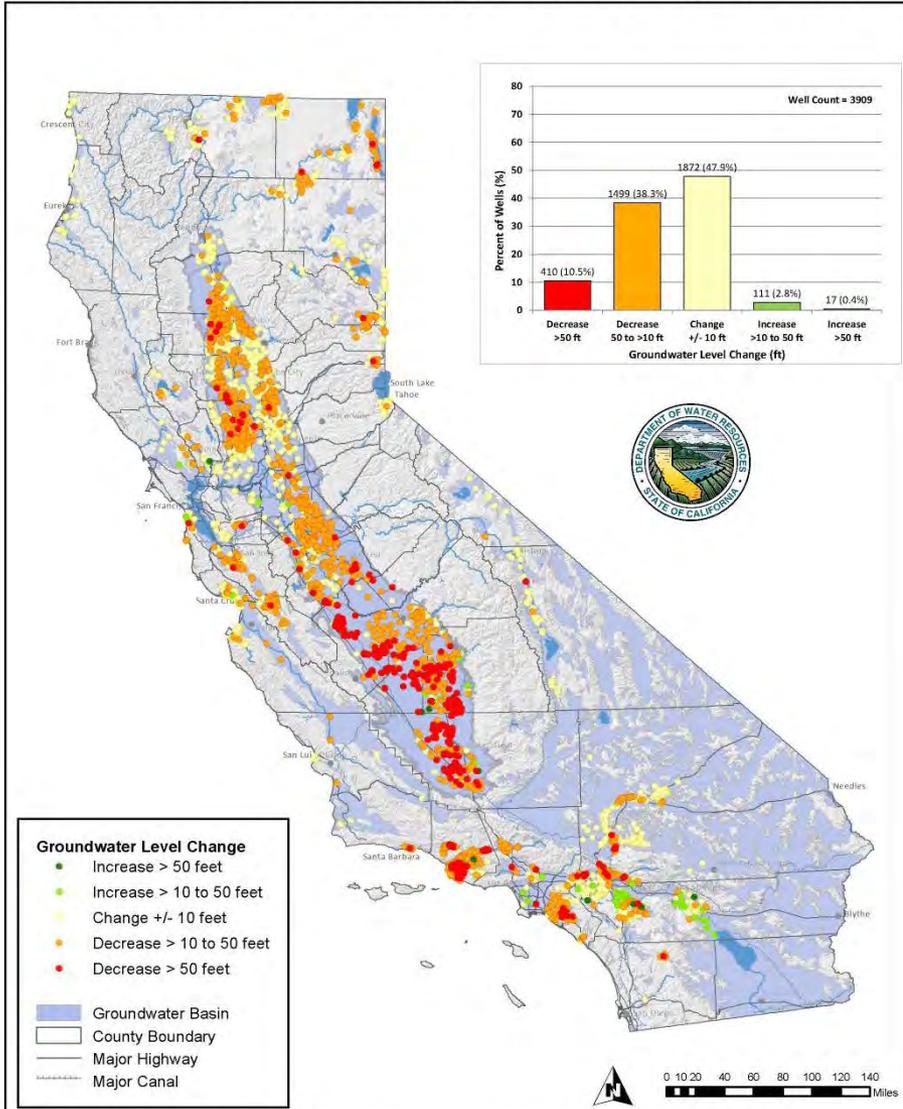




Statewide Groundwater Conditions

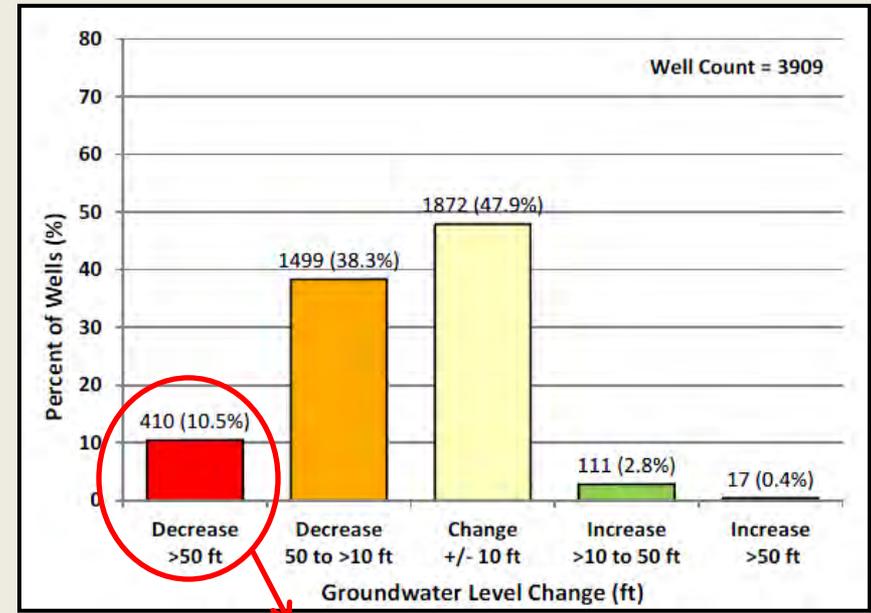


Groundwater Level Change* - Fall 2011 to Fall 2015



Groundwater Level Changes

Fall 2011 to Fall 2015 *(Wet to Critical Water Year)*



**119 of these 410 MWs had
Fall 2011-Fall 2015
Groundwater declines > 100'**

*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 12/31/2015. Document Name: DOTMAP_F1511_JJ_50 Updated: 2/1/2016 Data subject to change without notice.

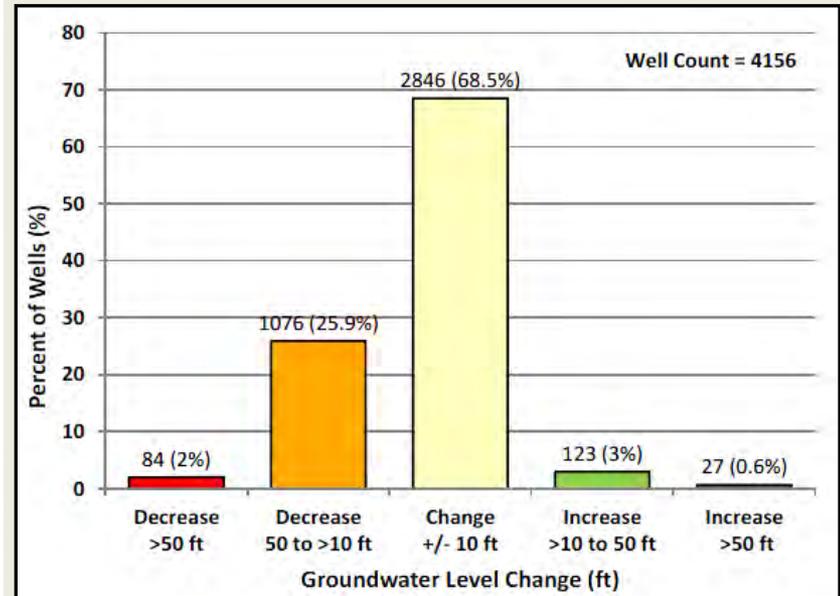
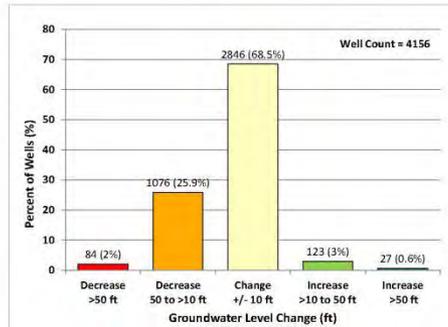
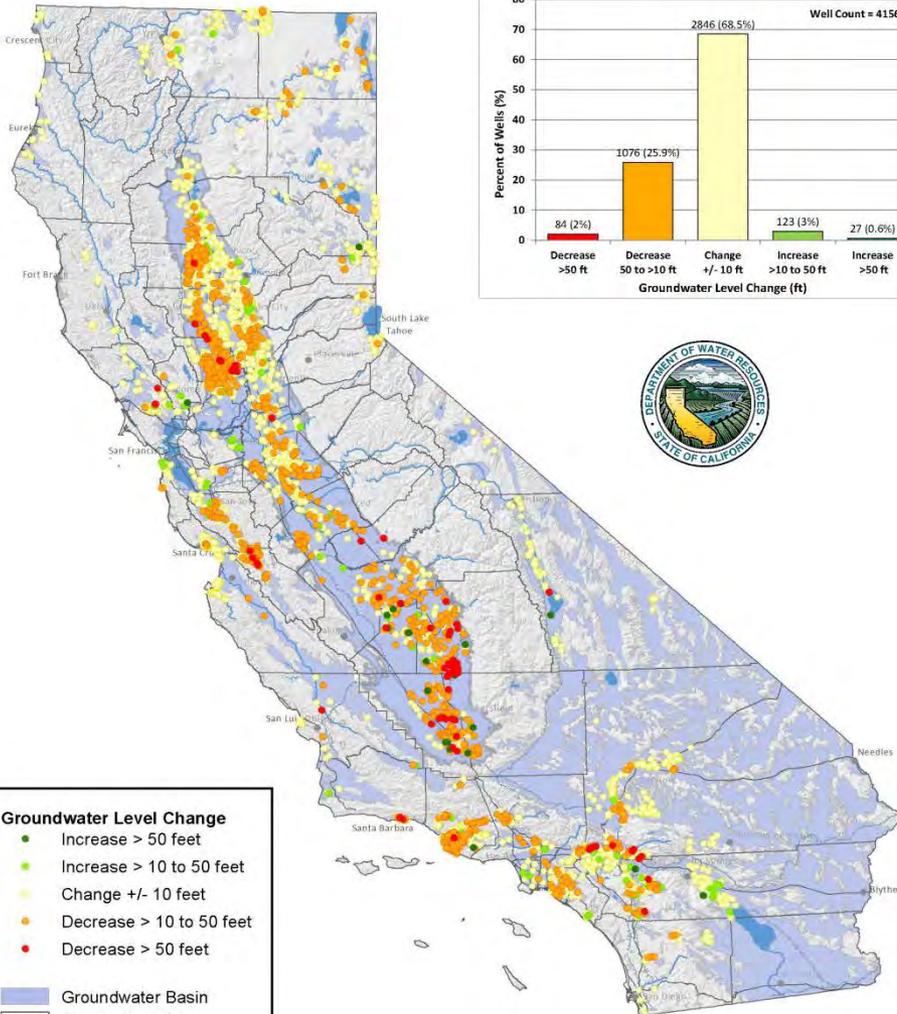
Groundwater Level Change* - Fall 2013 to Fall 2015



Groundwater Level Changes

Fall 2013 to Fall 2015

(Dry/Critical to Critical Water Year)



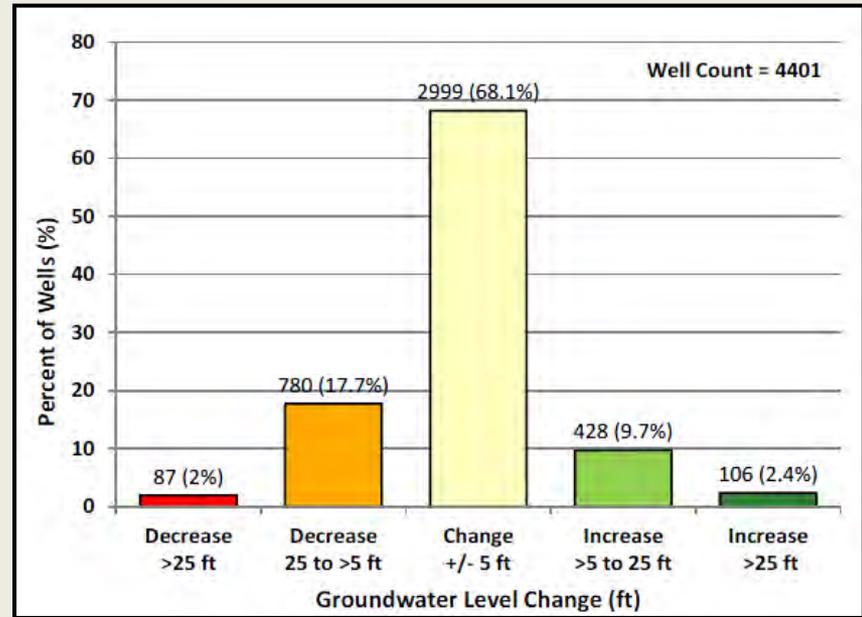
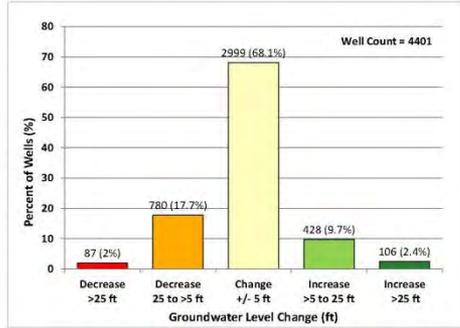
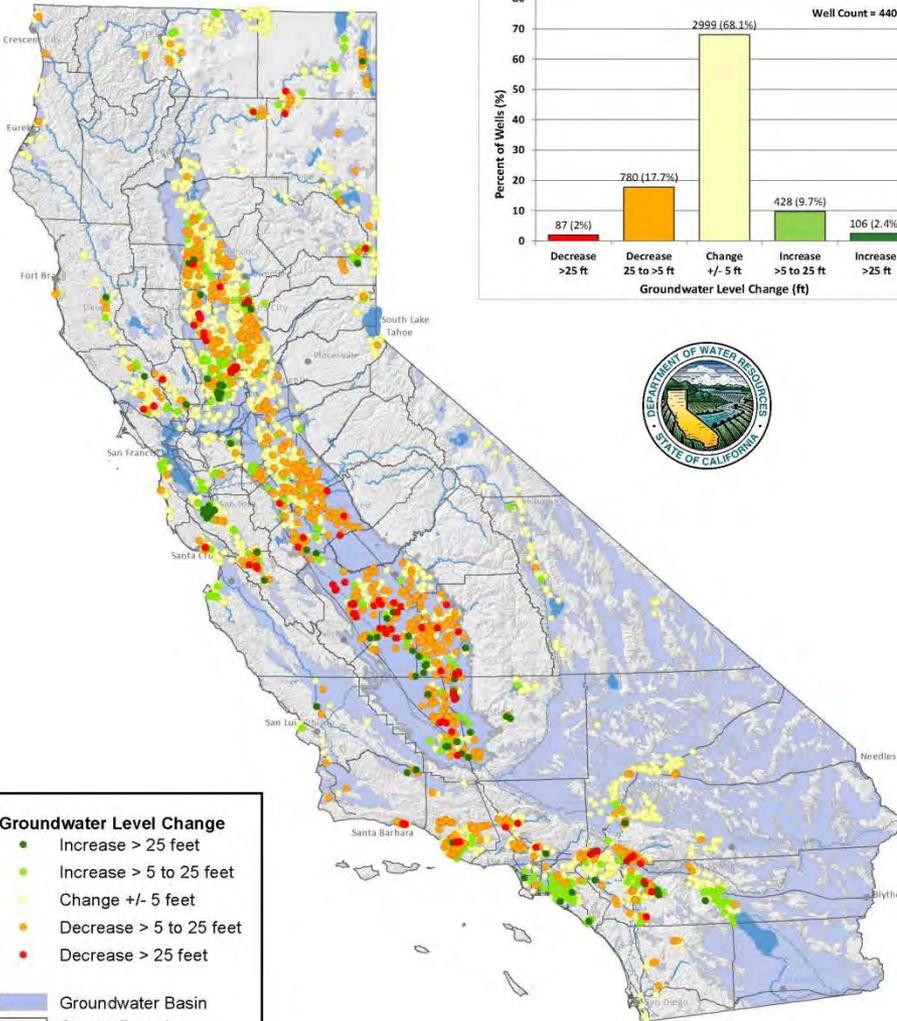
*Groundwater level change determined from water level measurements in wells. Map and chart based on available data from the DWR Water Data Library as of 12/31/2015. Document Name: DOTMAP_F1513_JJ Updated: 2/1/2016 Data subject to change without notice.

Groundwater Level Change* - Fall 2014 to Fall 2015

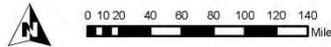


Groundwater Level Changes

Fall 2014 to Fall 2015 (Critical to Critical Water Year)



- Groundwater Level Change**
- Increase > 25 feet
 - Increase > 5 to 25 feet
 - Change +/- 5 feet
 - Decrease > 5 to 25 feet
 - Decrease > 25 feet
- Groundwater Basin
 County Boundary
 Major Highway
 Major Canal

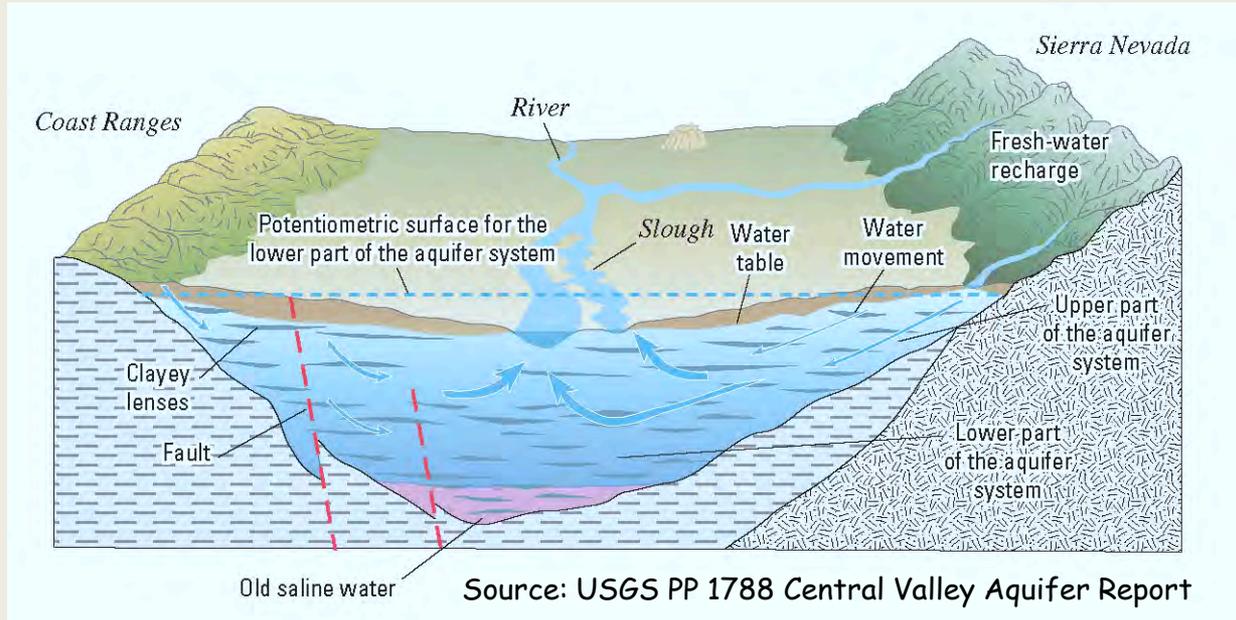


*Groundwater level change determined from water level measurements in wells. Map and chart based on available data from the DWR Water Data Library as of 12/31/2015. Document Name: DOTMAP_F1514_JJ Updated: 2/1/2016 Data subject to change without notice.

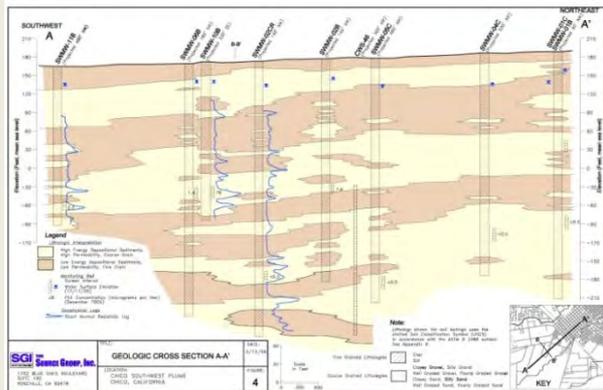


Regional Groundwater Conditions

Northern Sacramento Valley Groundwater Basin Alluvial Aquifer



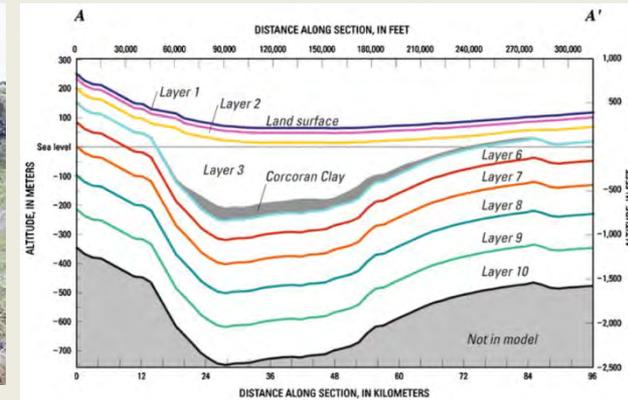
Central Valley Aquifers Include both Coarse & Fine Grained Sediments



Texture Mapping Sac Valley:
Source: SGI SW Chico Plume Study

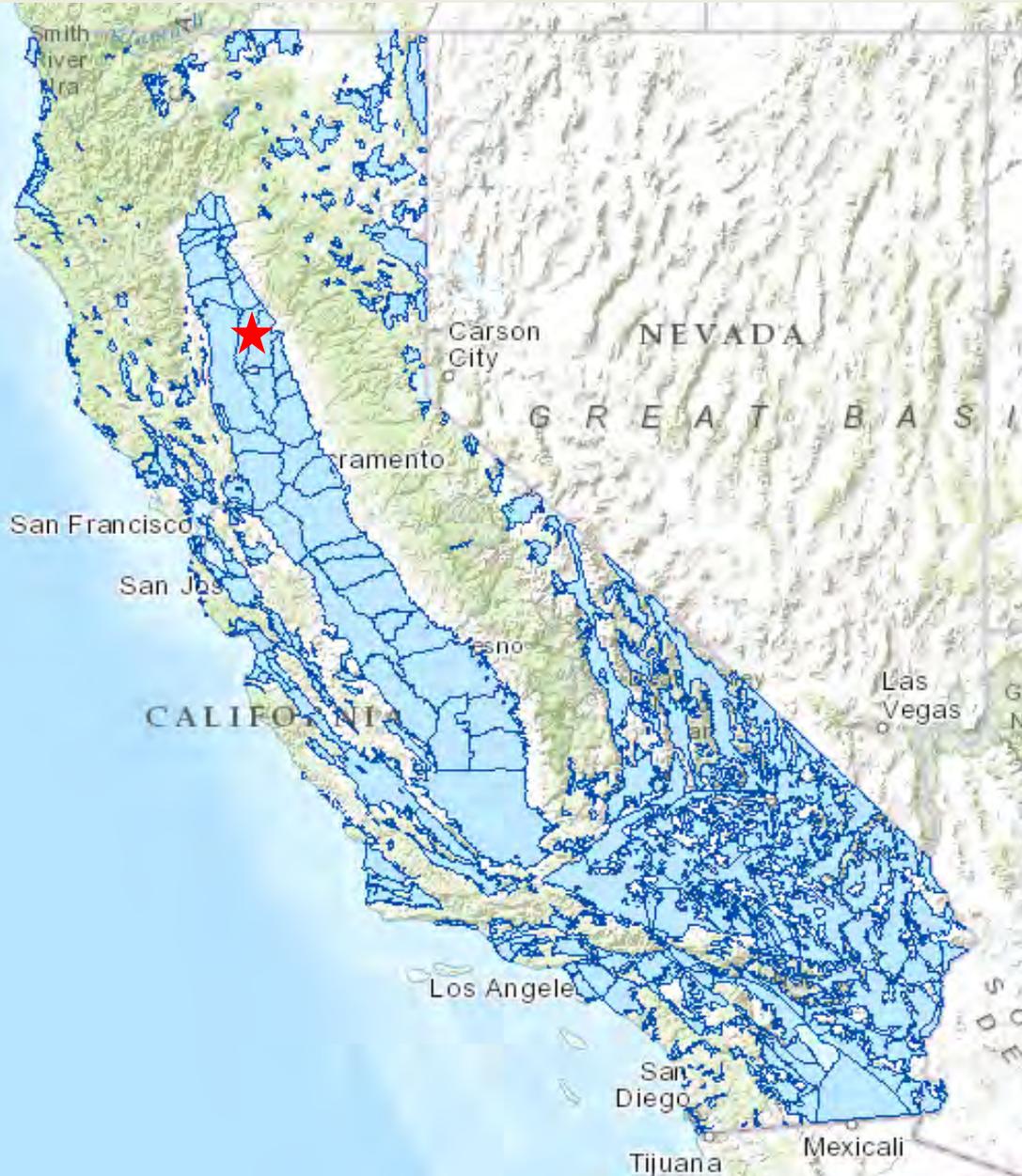


Confining Beds
Tuscan Lahars



Corcoran Clay: source USGS

Regional Groundwater Hydrographs



Butte County

California Department of Water Resources

HYPLOT V133 Output 02/19/2016

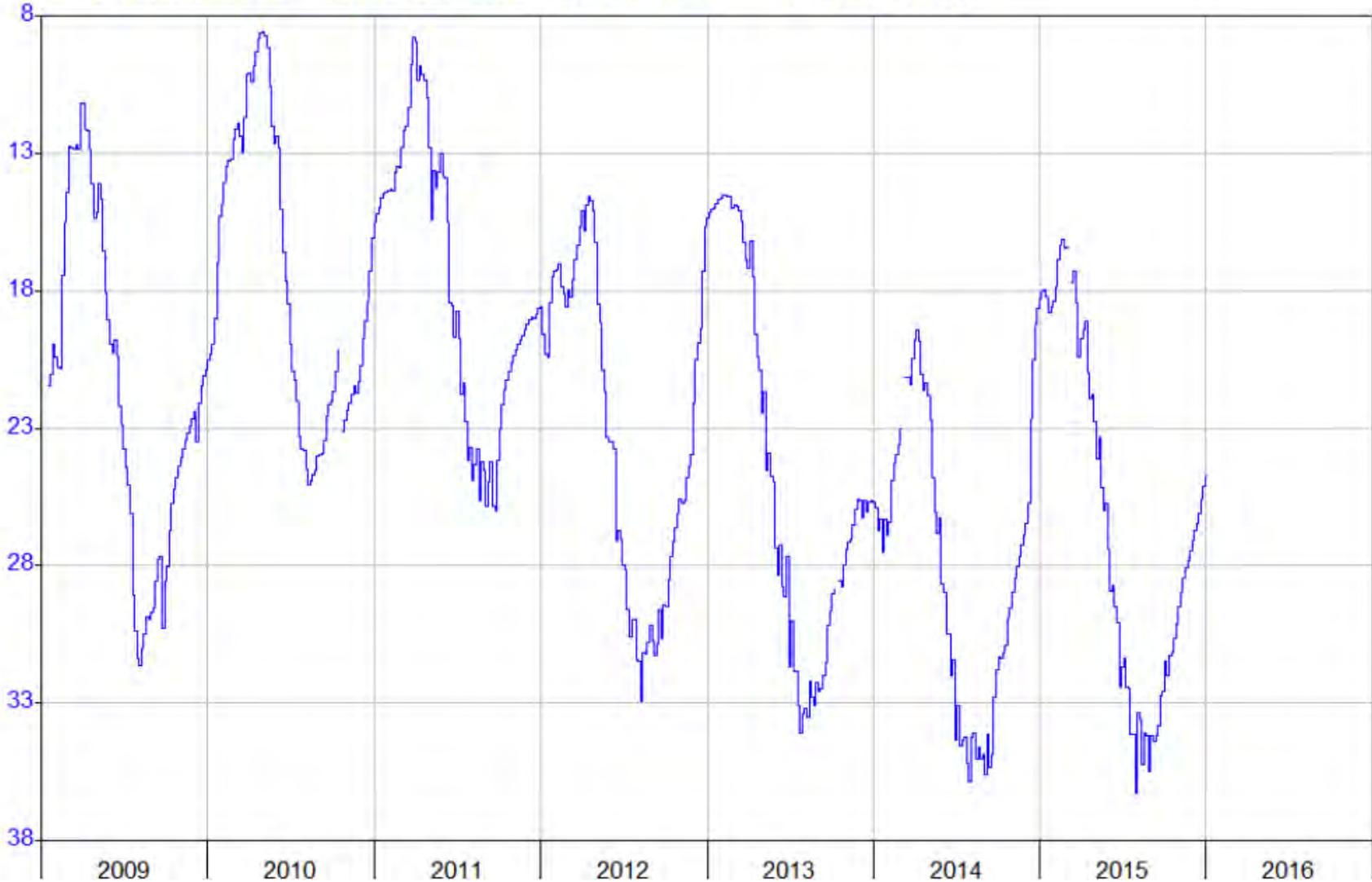


Period 8 Year Plot Start 00:00_01/01/2009

2009-17

Interval 5 Day Plot End 00:00_01/01/2017

— 23N01W28M004M Screen: 120-165 ft 111.00 Mean GW below GS (ft)





California Department of Water Resources

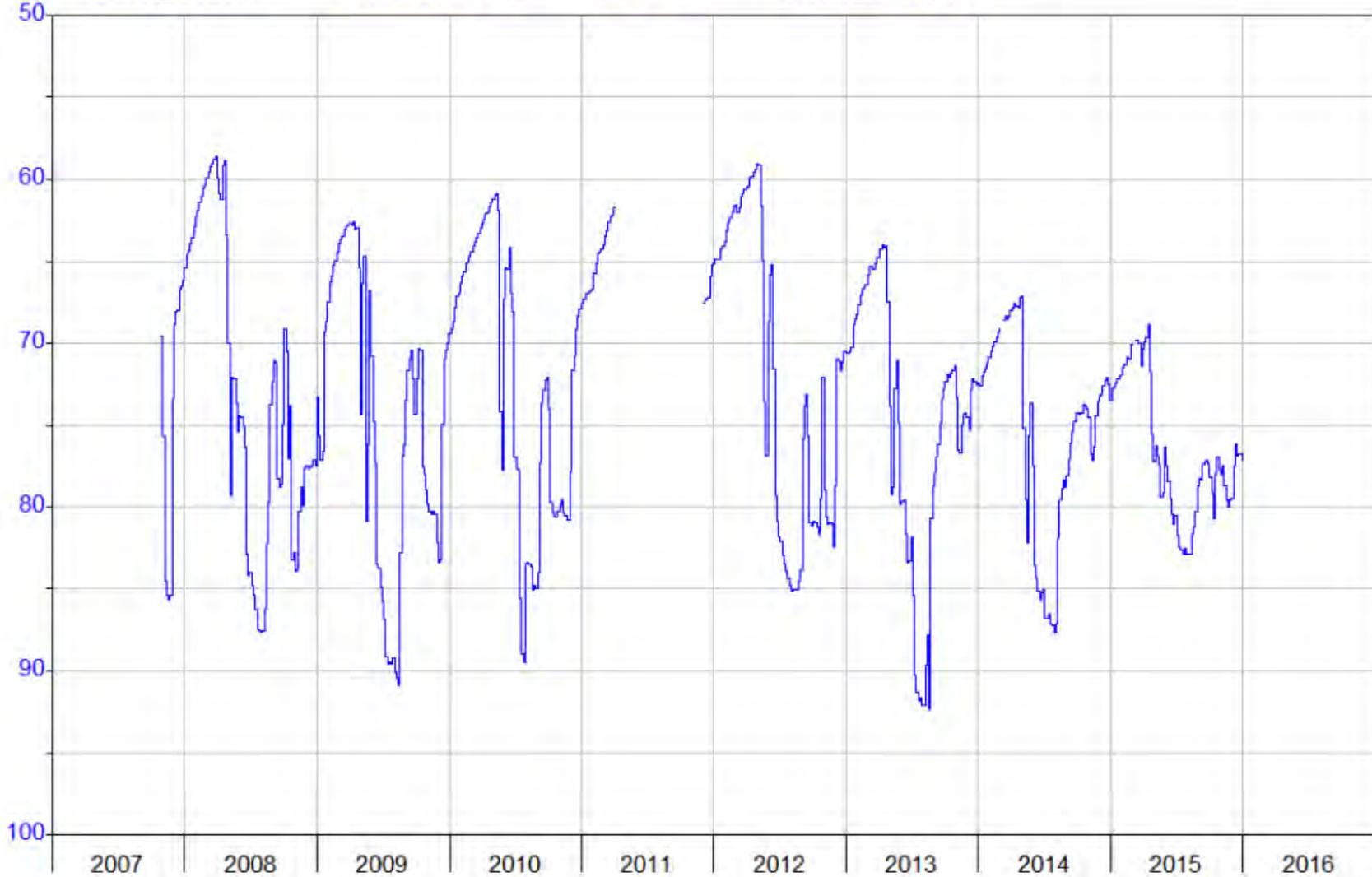
HYPLOT V133 Output 02/19/2016

Period 10 Year Plot Start 00:00_01/01/2007

2007-17

Interval 5 Day Plot End 00:00_01/01/2017

— 21N02E26E005M Screen: 265-290 ft 111.00 Mean GW below GS (ft)



Regional Groundwater Hydrographs



Colusa County



California Department of Water Resources

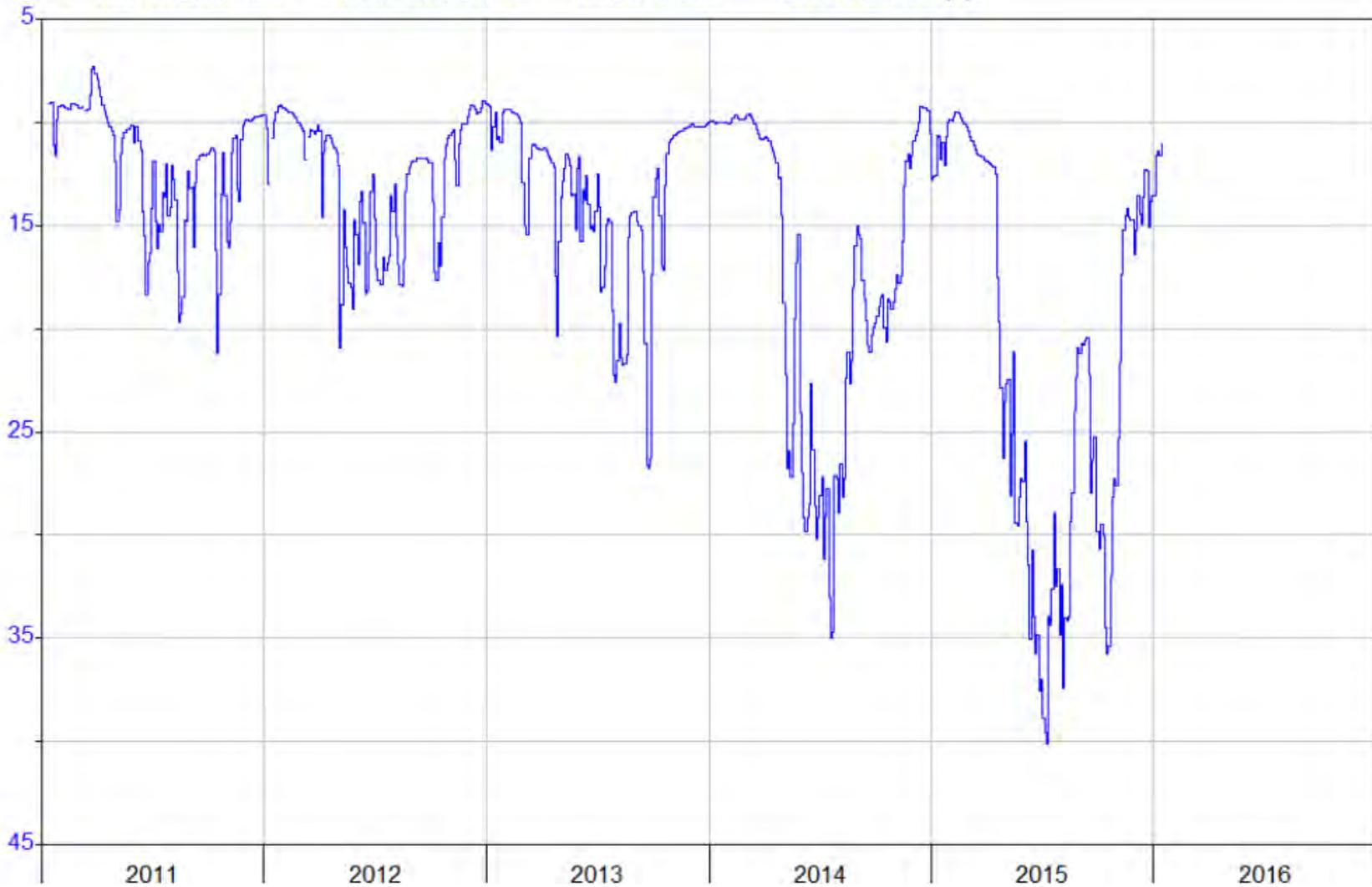
HYPLOT V133 Output 02/19/2016

Period 6 Year Plot Start 00:00_01/01/2011

2011-17

Interval 3 Day Plot End 00:00_01/01/2017

— 17N01W27A002M Screen: 260-270 ft 111.00 Mean GW below GS (ft)



California Department of Water Resources

HYPLOT V133 Output 02/19/2016



Period 7 Year Plot Start 00:00_01/01/2010

2010-17

Interval 5 Day Plot End 00:00_01/01/2017

— 14N01E35P003M Screen: 135-225 ft 111.00 Mean GW below GS (ft)



Regional Groundwater Hydrographs



Sutter County

California Department of Water Resources

HYPLOT V133 Output 01/15/2016

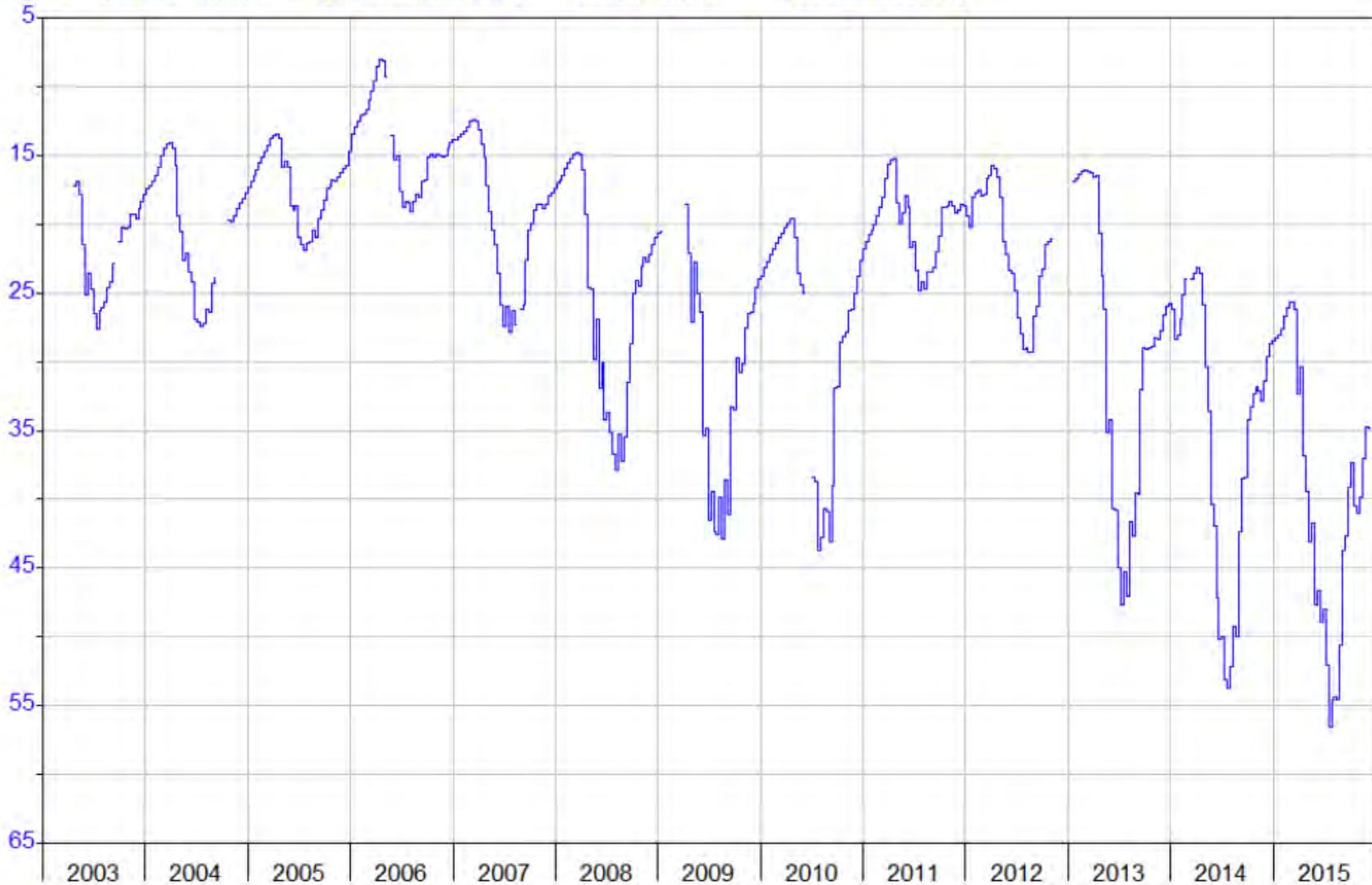


Period 13 Year Plot Start 00:00_01/01/2003

2003-16

Interval 10 Day Plot End 00:00_01/01/2016

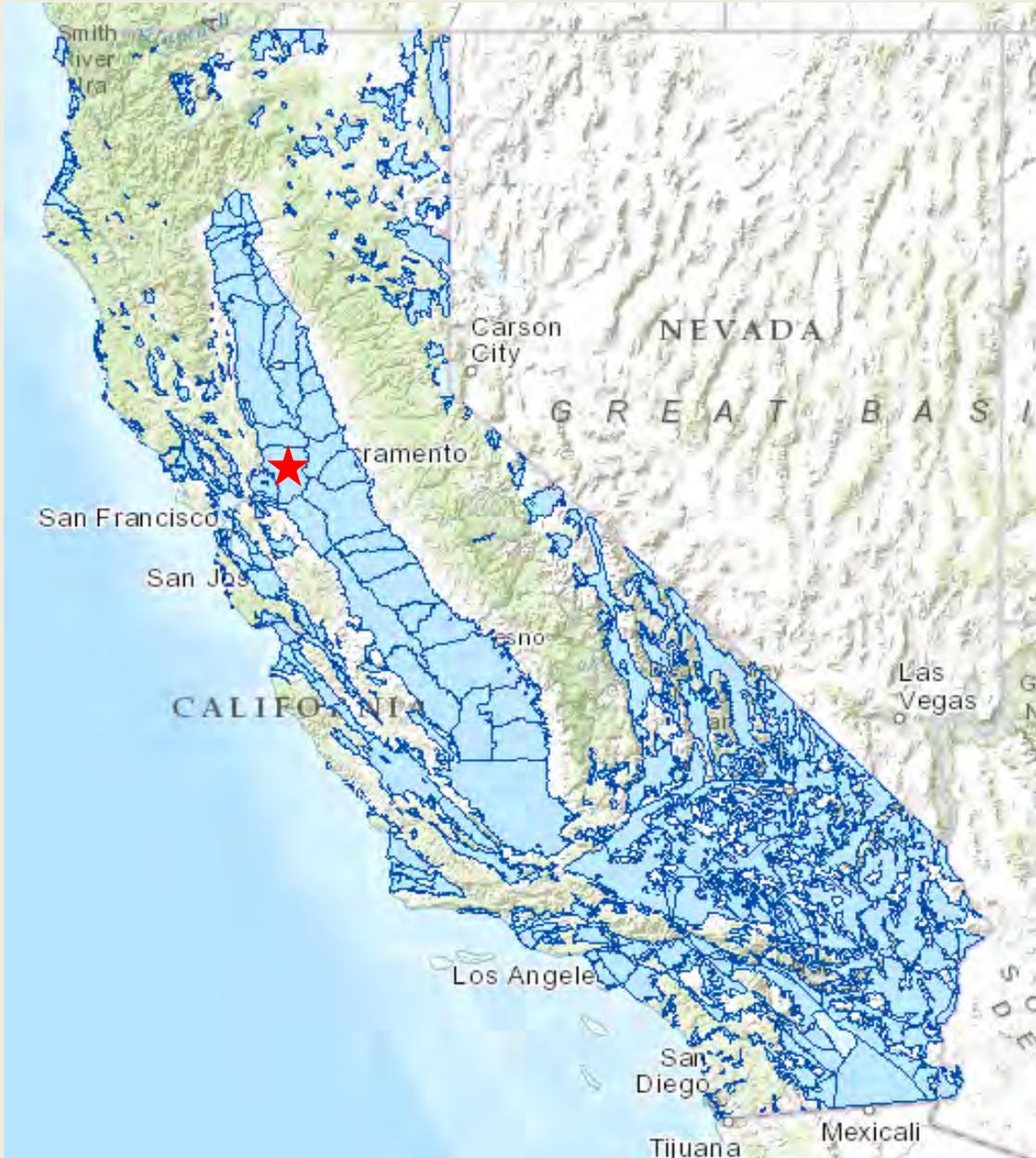
— 13N04E11R003M BR-1C middle-deep 111.00 Mean GW below GS (ft)



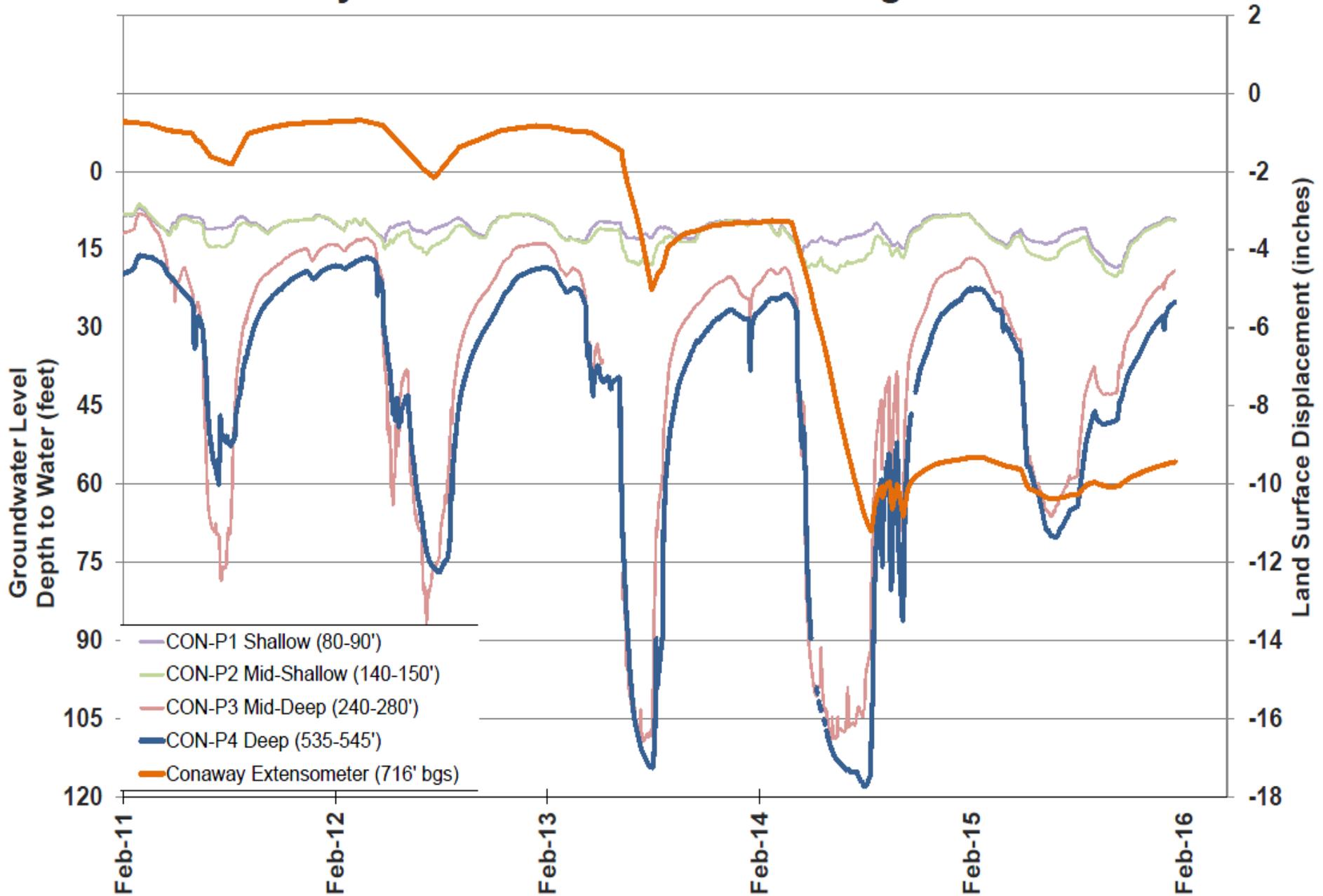
Regional Groundwater Hydrographs



Yolo County



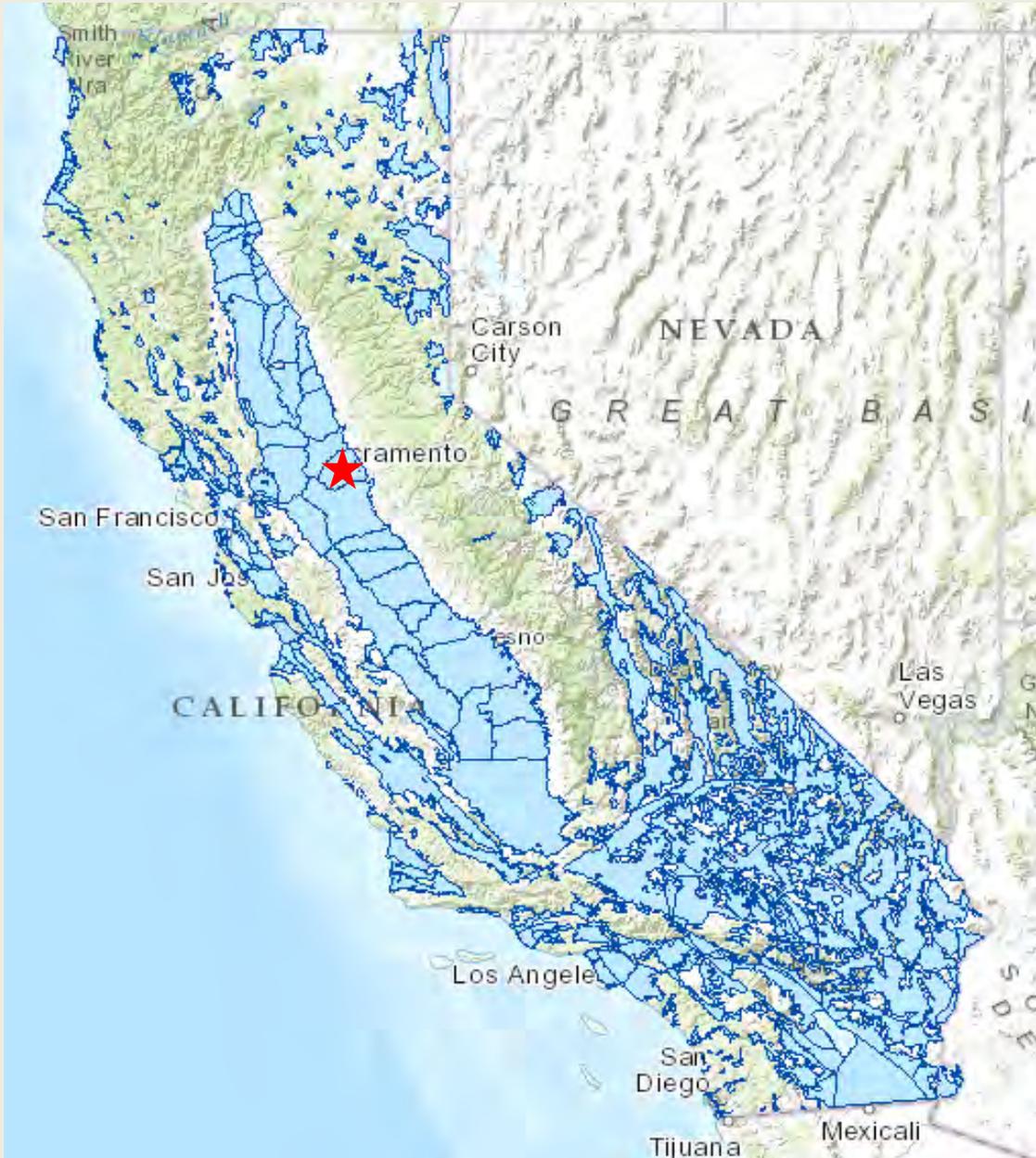
Conaway Extensometer Chart Showing Last 5 Years



Regional Groundwater Hydrographs



Sacramento County



California Department of Water Resources

HYPLOT V133 Output 01/15/2016

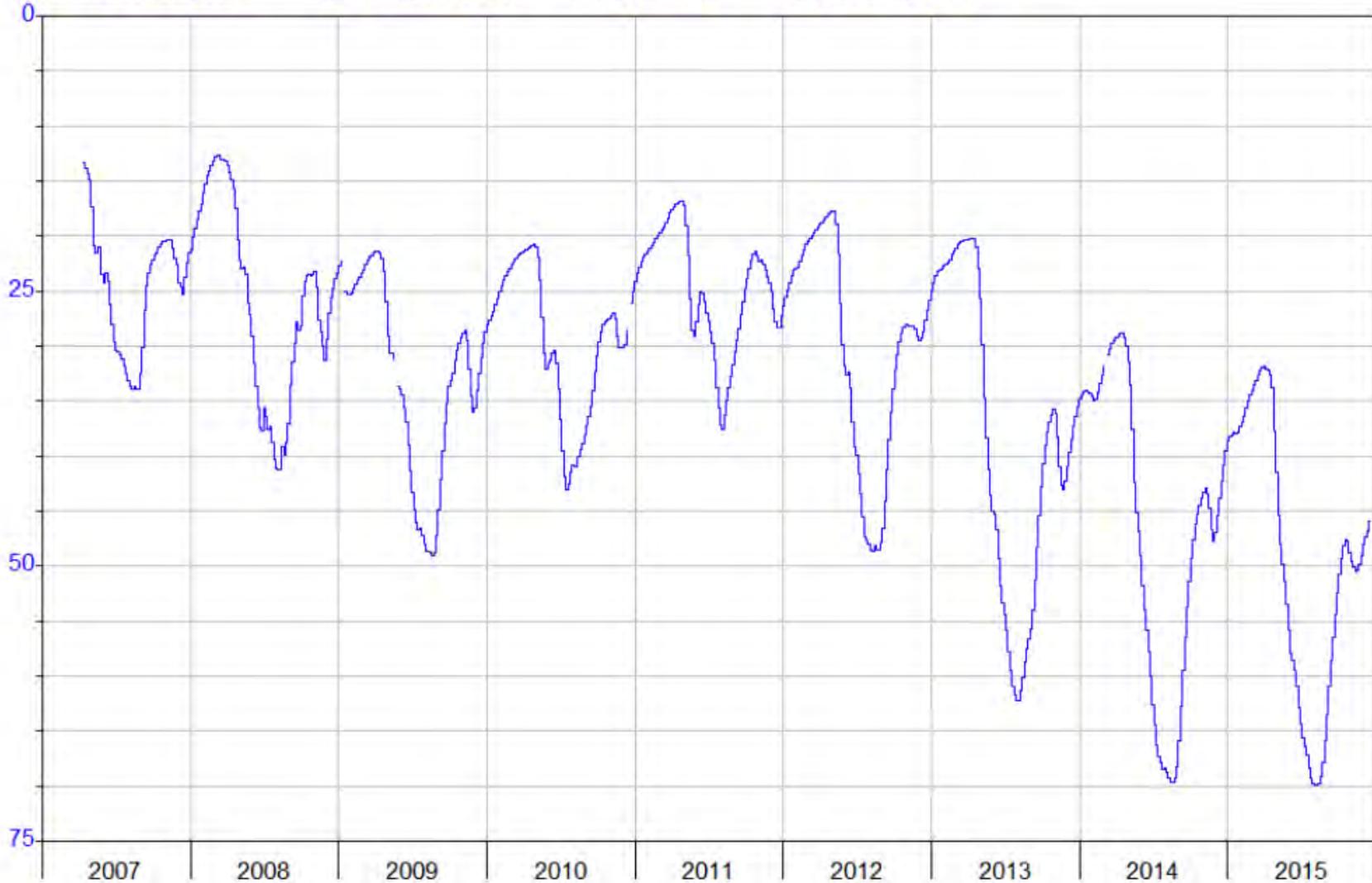


Period 9 Year Plot Start 00:00_01/01/2007

2007-16

Interval 5 Day Plot End 00:00_01/01/2016

— 12N04E03N002M AB-1 Middle-Deep 111.00 Mean GW below GS (ft)



California Department of Water Resources

HYPLOT V133 Output 01/15/2016

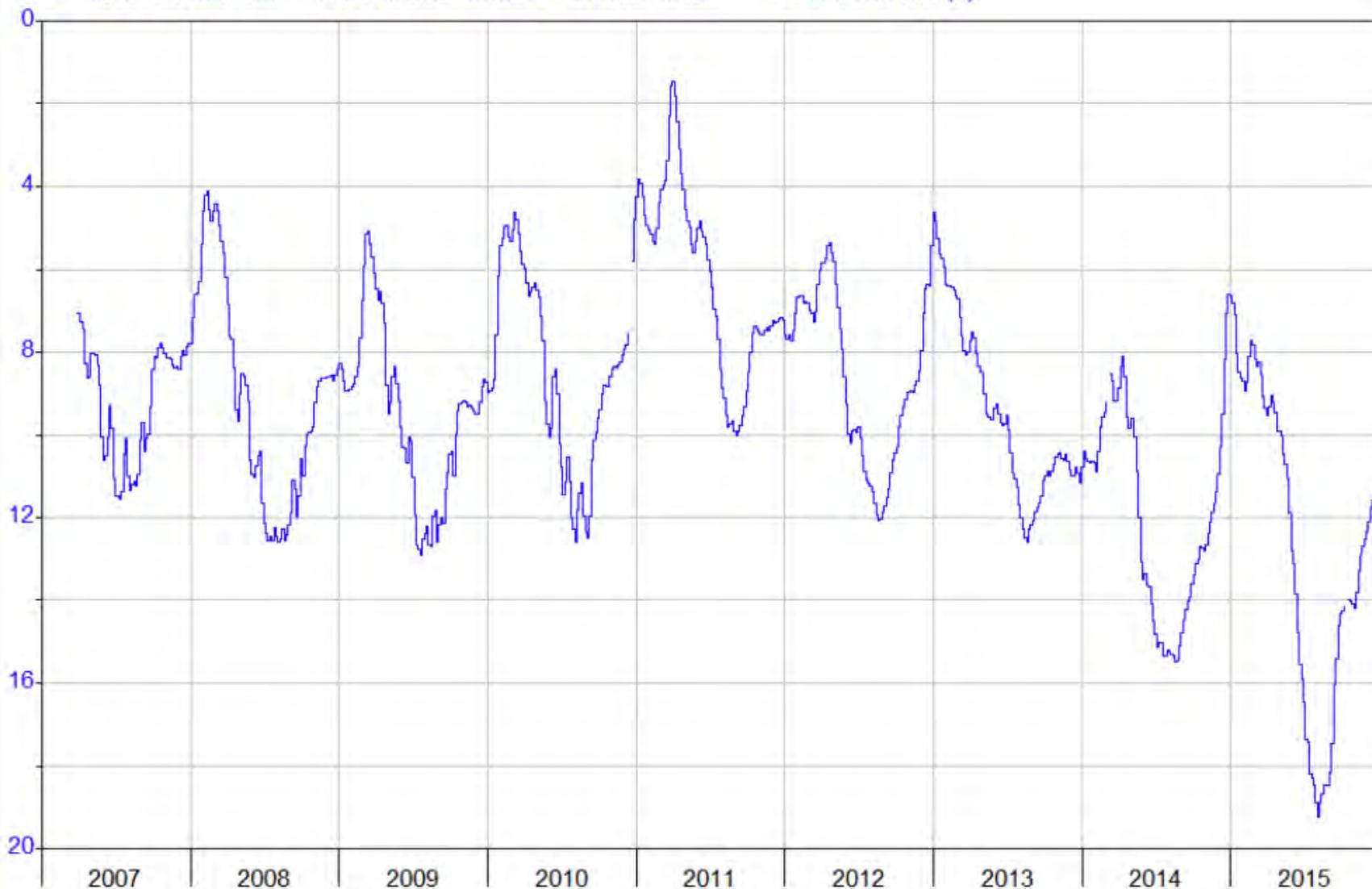


Period 9 Year Plot Start 00:00_01/01/2007

2007-16

Interval 5 Day Plot End 00:00_01/01/2016

— 10N04E31M003M AB-4 Middle-Shallow 111.00 Mean GW below GS (ft)



Regional Groundwater Hydrographs



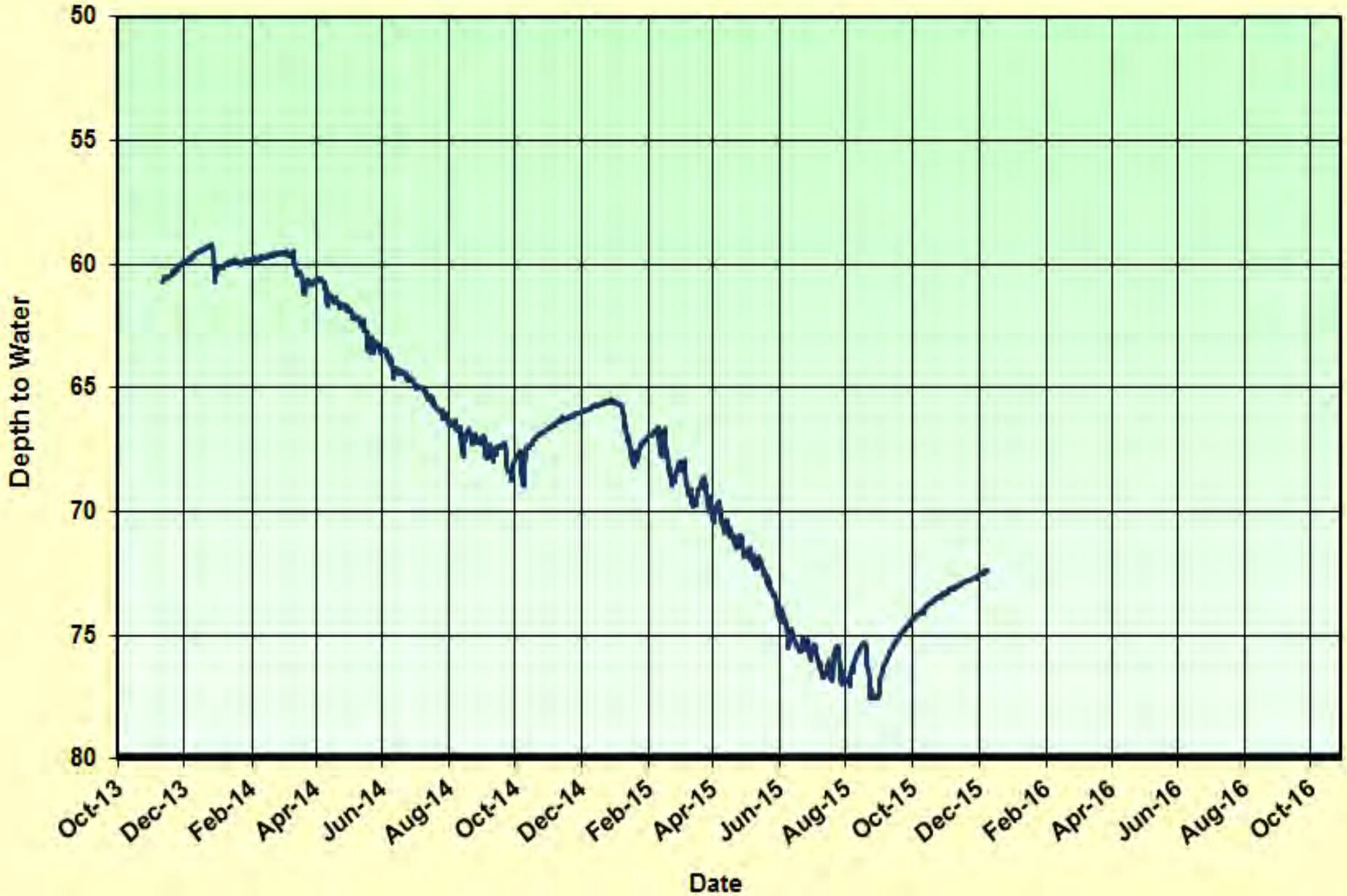
Fresno & Kings County --- Kings River Conservation District



KINGS RIVER CONSERVATION DISTRICT
Monitoring Well KB-4



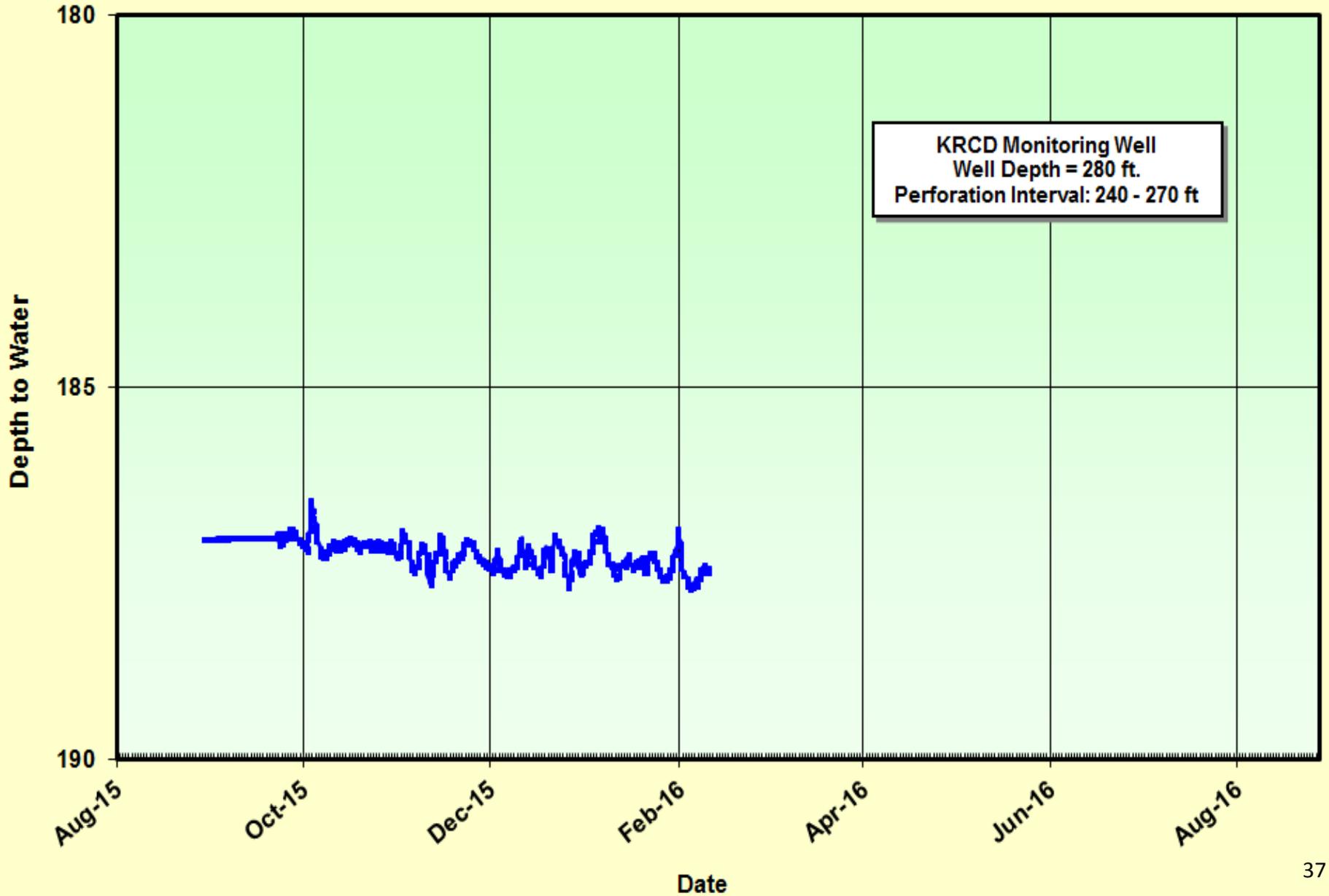
KINGS RIVER CONSERVATION DISTRICT
Monitoring Well KB-8



KINGS RIVER CONSERVATION DISTRICT

SWN: 16S14E25__

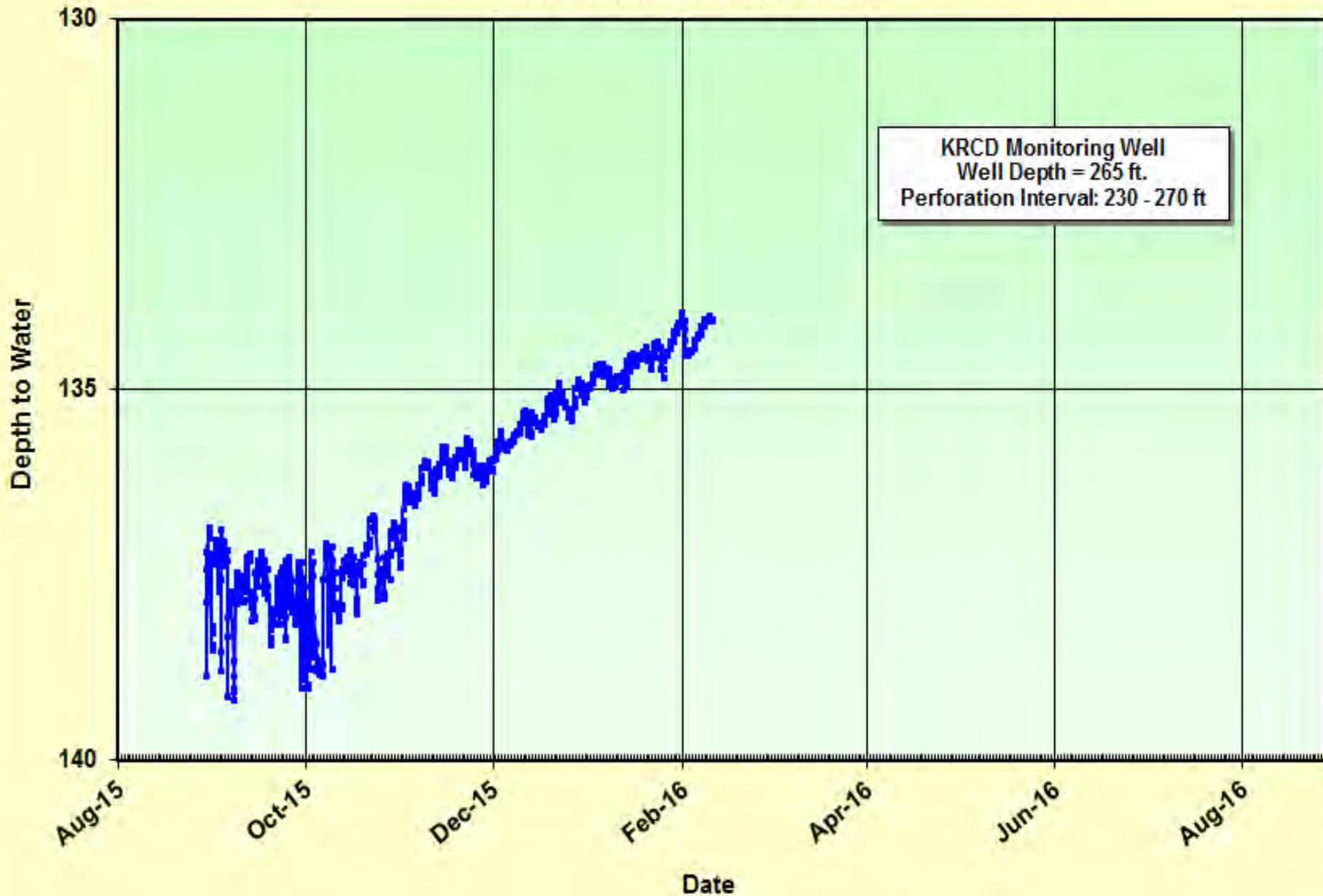
West Conejo and Brawley



KINGS RIVER CONSERVATION DISTRICT

SWN: 16S20E36__

South Cedar & East Clarkson





Thank You



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