

# Informational Public Meeting

## Managing Groundwater in the Indian Wells Valley



# Introductions

**Dale Schafer, Facilitator**



**Welcome**

**Peggy Breeden, Mayor**

**Mick Gleason, County Supervisor**

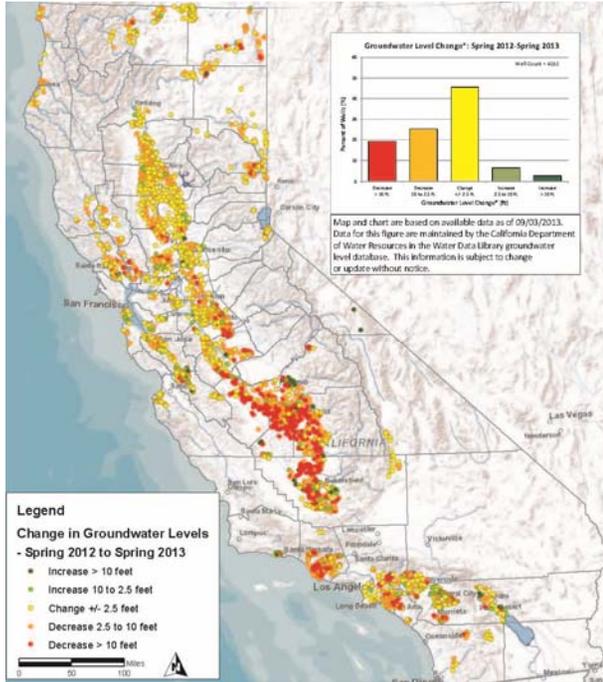


# Presentation

**David Gutierrez**

**Executive Program Director for Groundwater  
CA Department of Water Resources**





# Indian Wells Valley Groundwater Management Public Informational Meeting

## The Sustainable Groundwater Management Act

October 23, 2015

David Gutierrez and Tim Ross  
CA Department of Water Resources

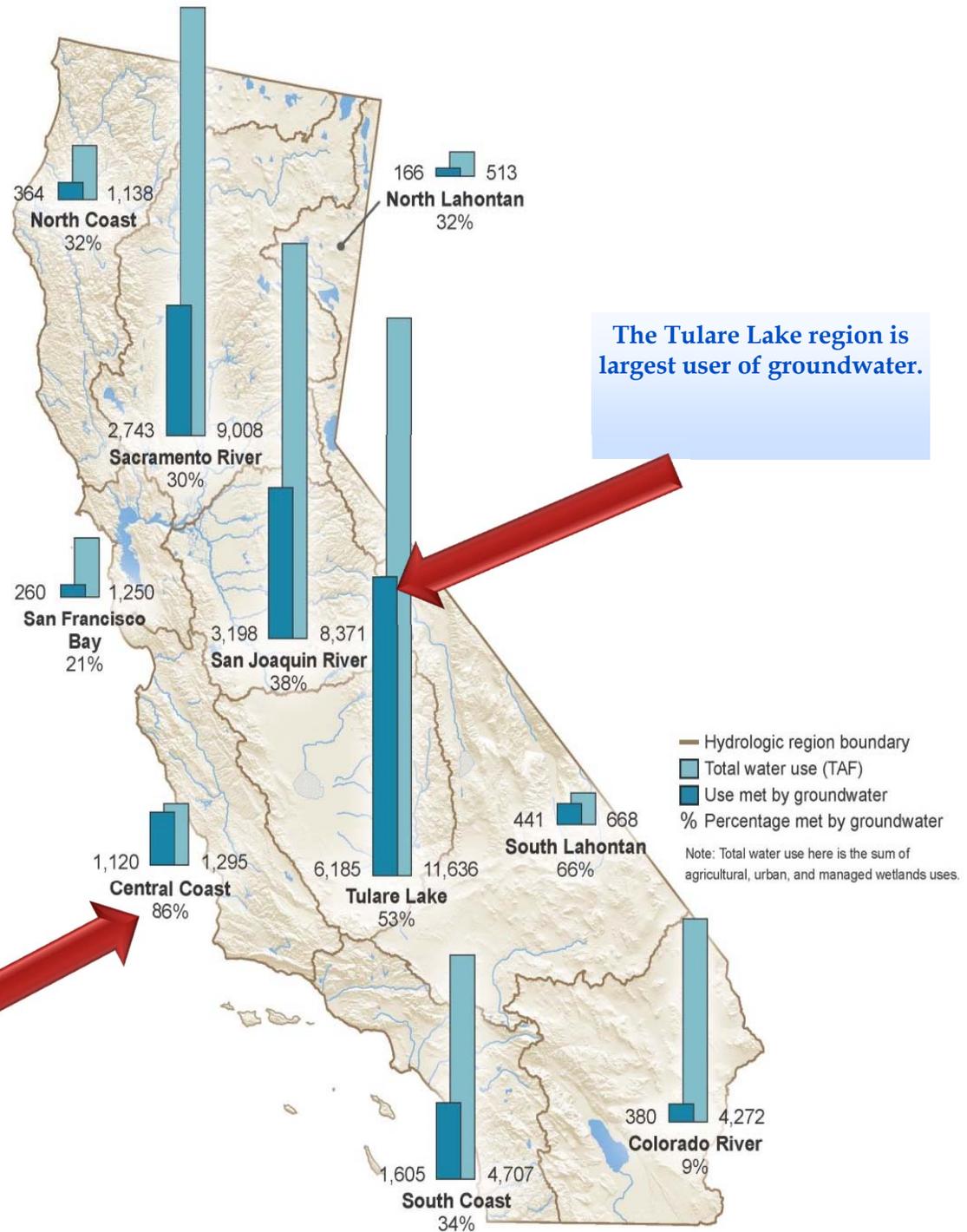


# Ground-water Supply in California

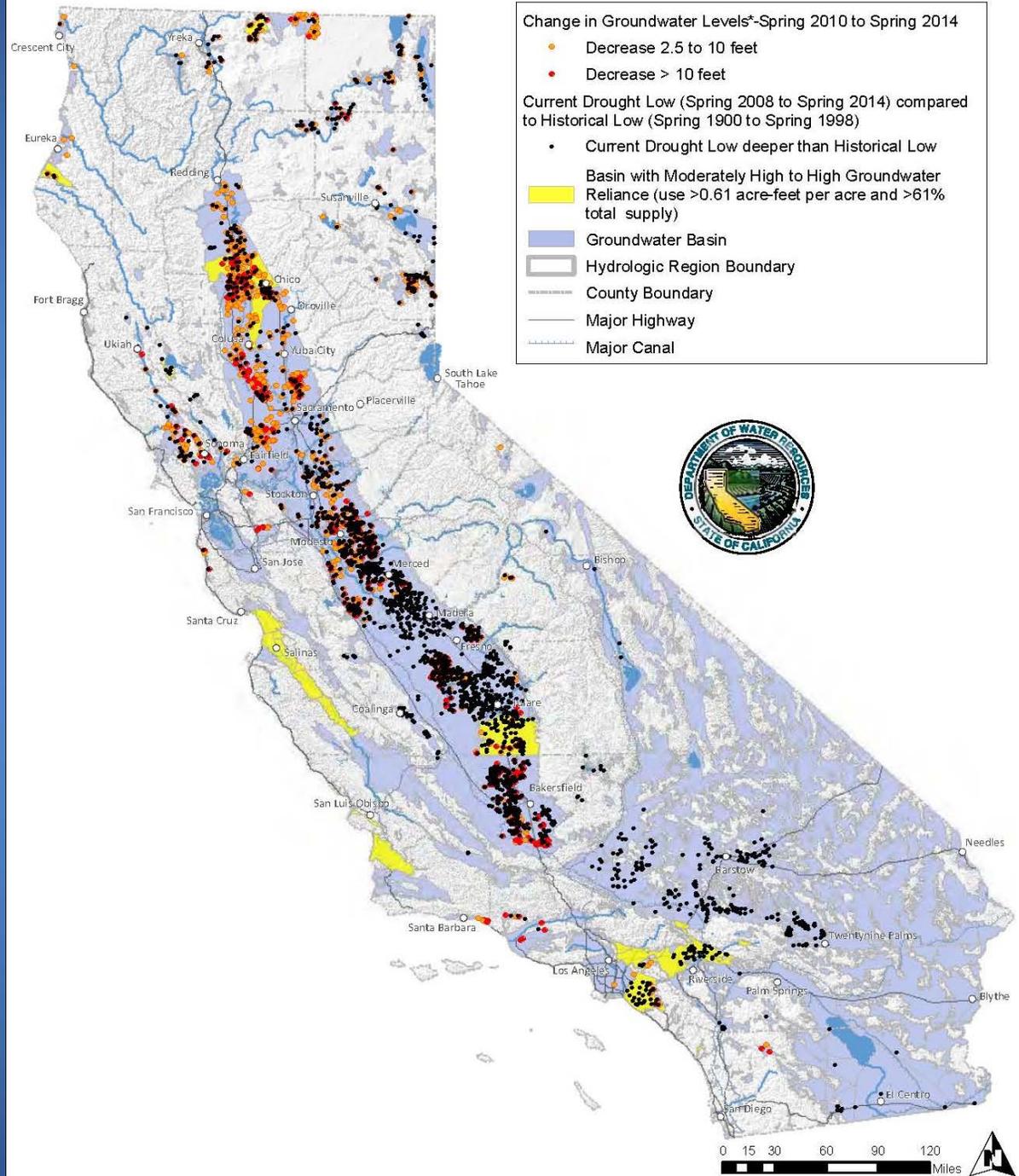
2005-10 Average

The Central Coast region is the most groundwater dependent.

The Tulare Lake region is largest user of groundwater.

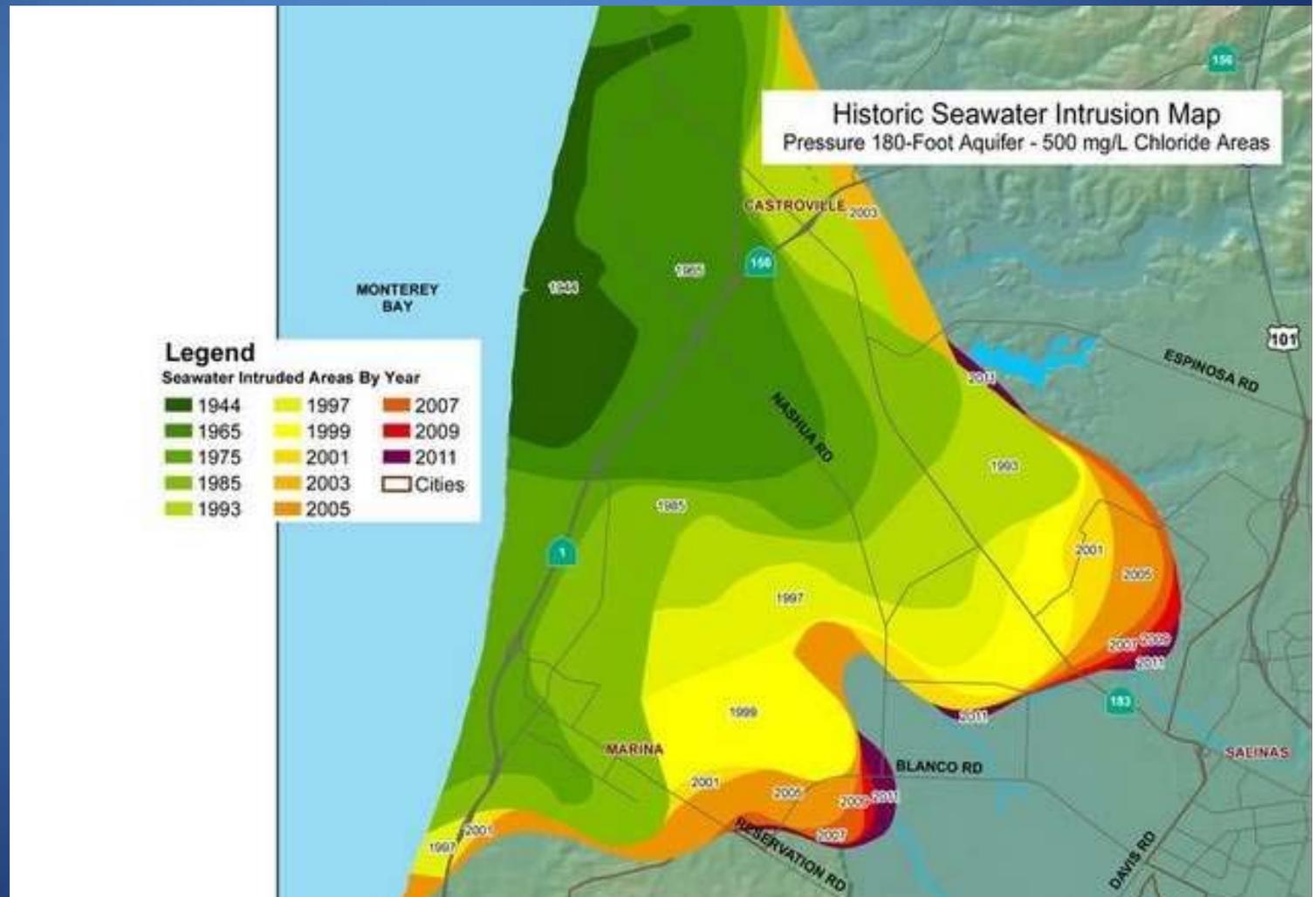


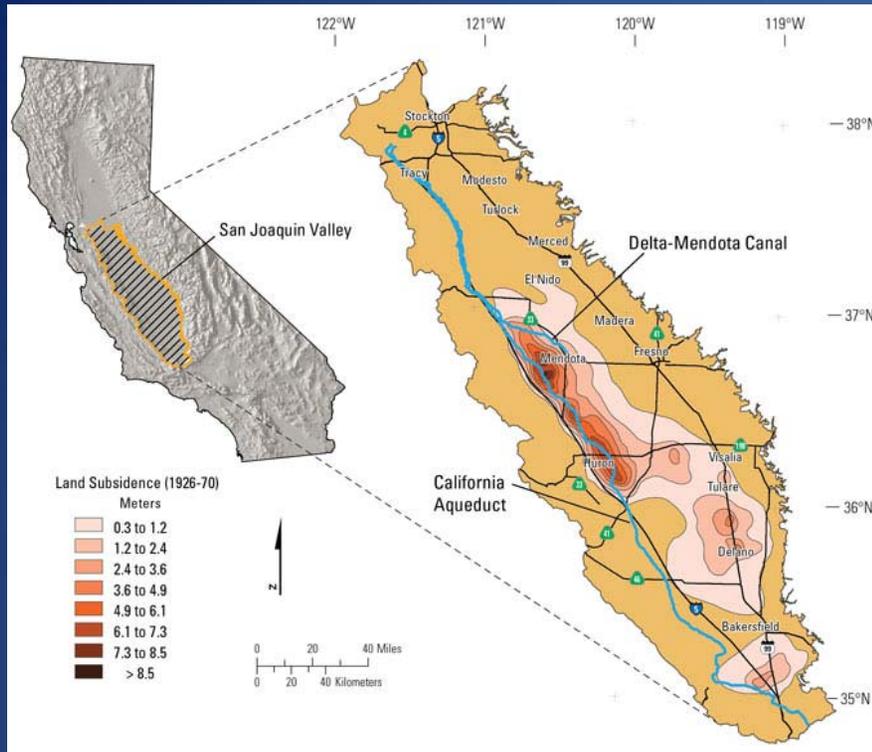
**Black Dots =  
Groundwater Level  
at Lowest Recorded**



# Water Quality

- Seawater intrusion in coastal areas

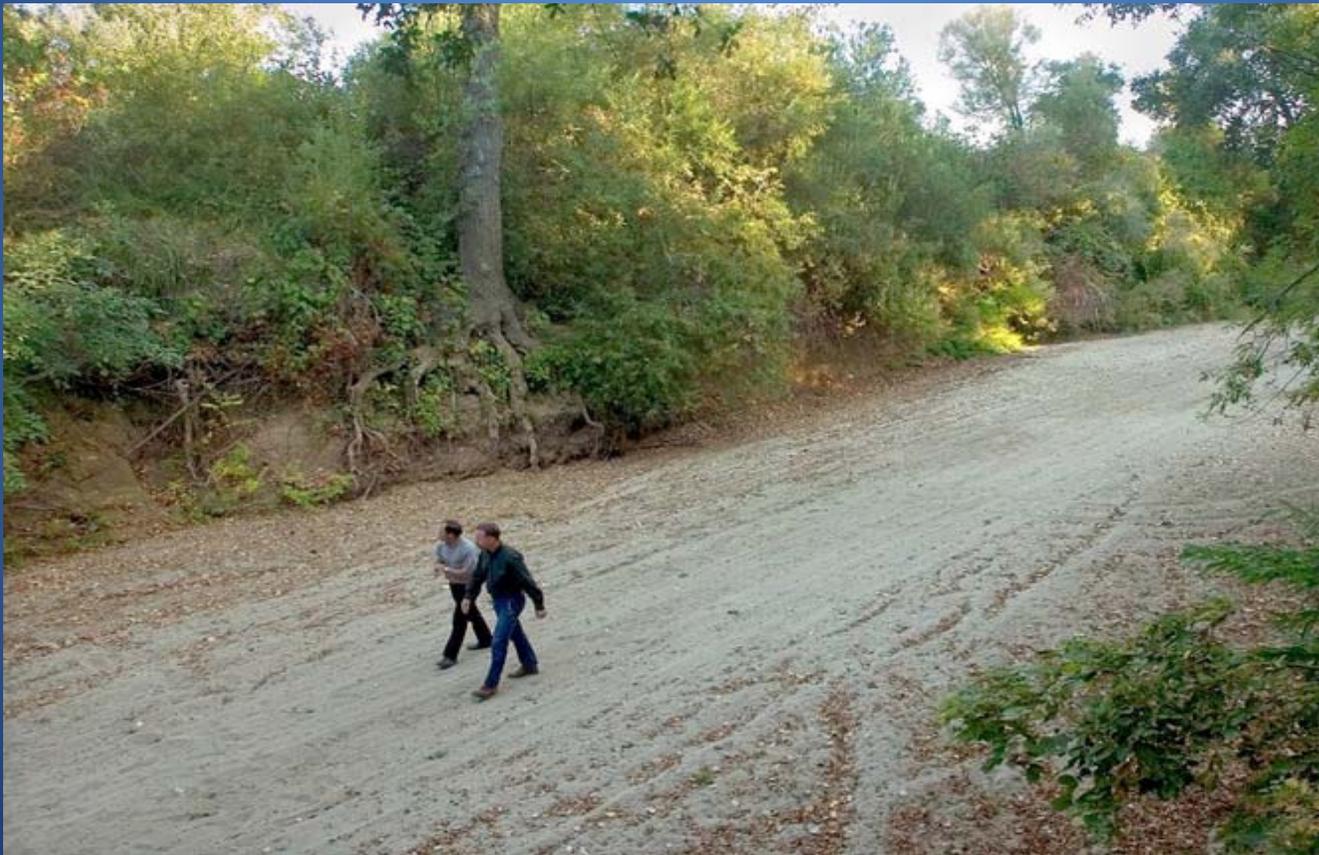




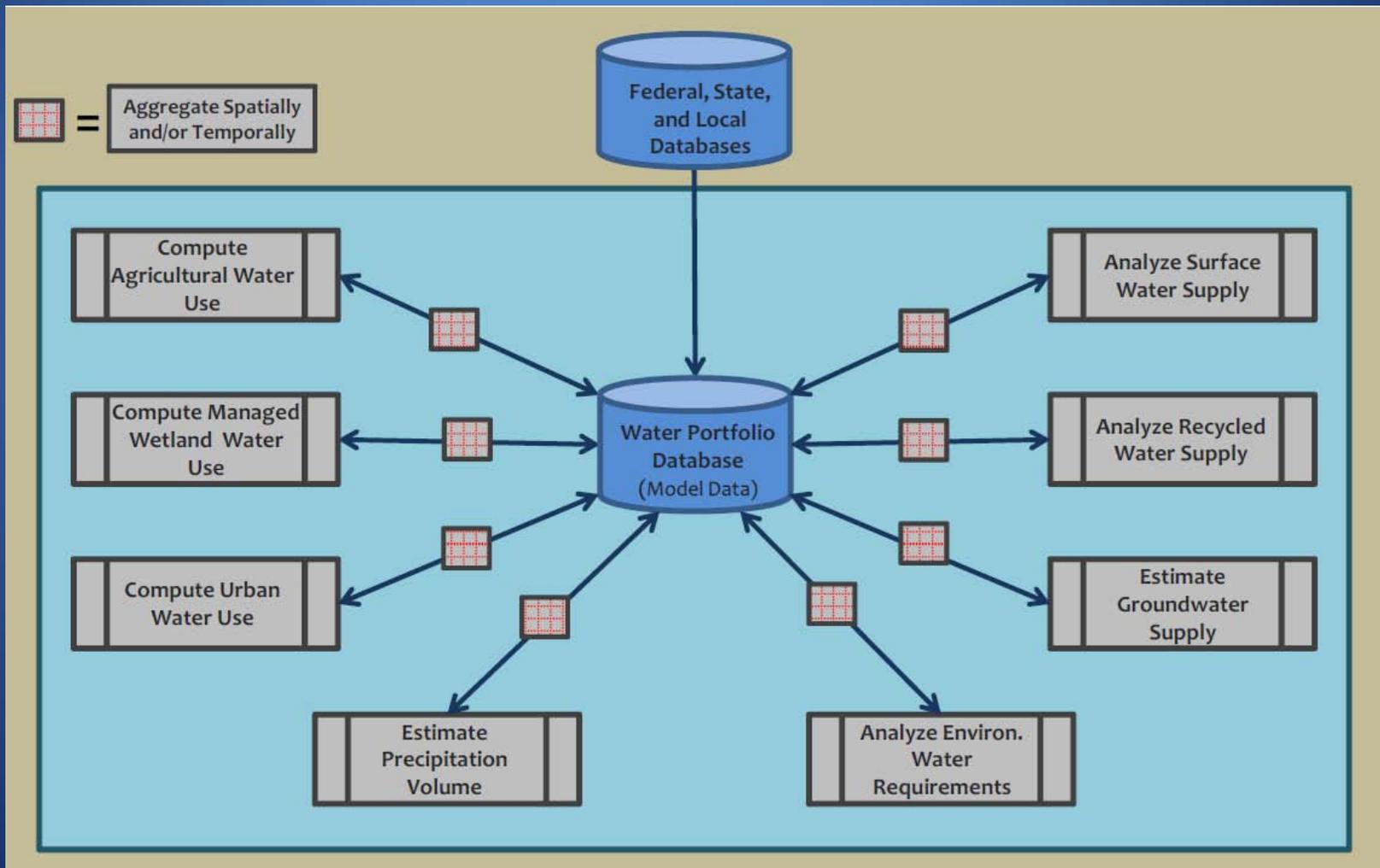
# Subsidence

- Permanent loss of water storage
- Damage to infrastructure and water delivery systems

# Ecosystem Impacts

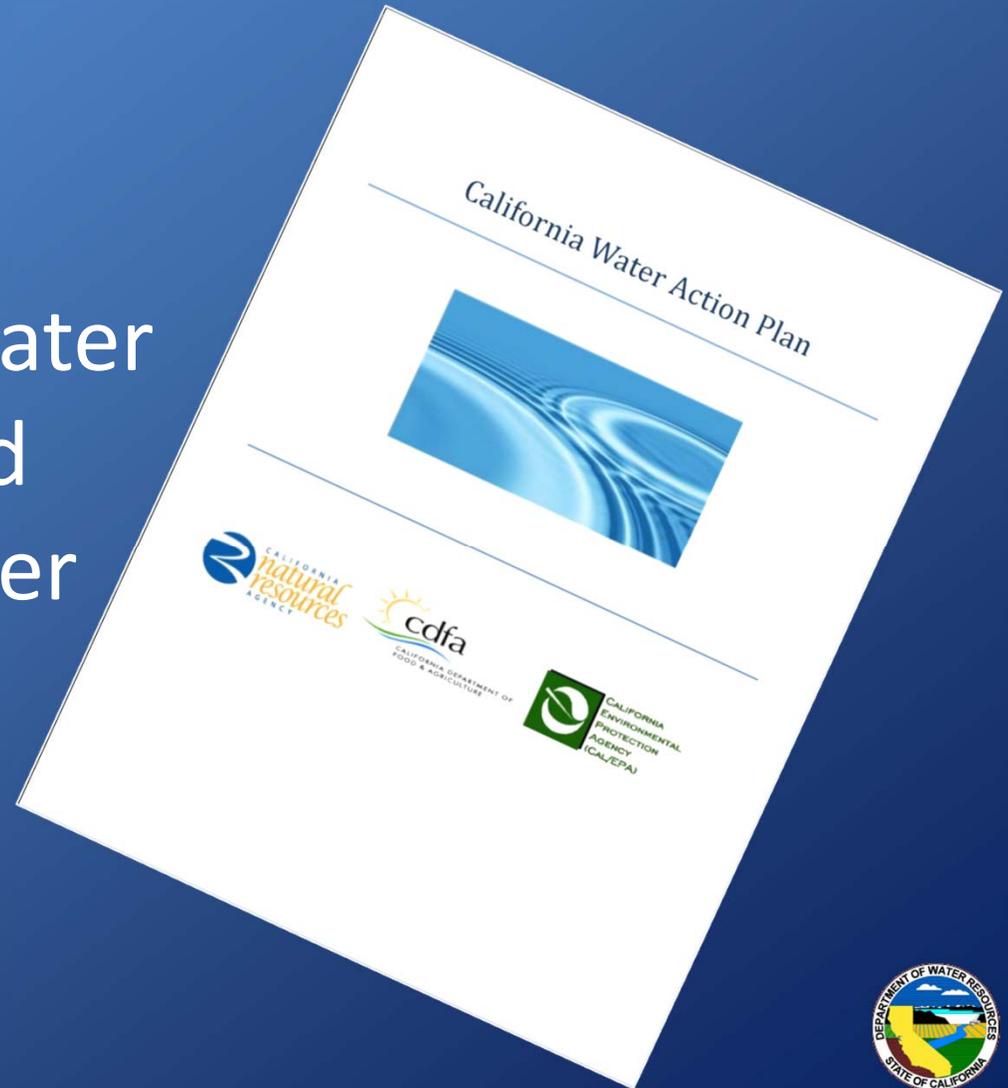


# Water Balance is essential for sustainability

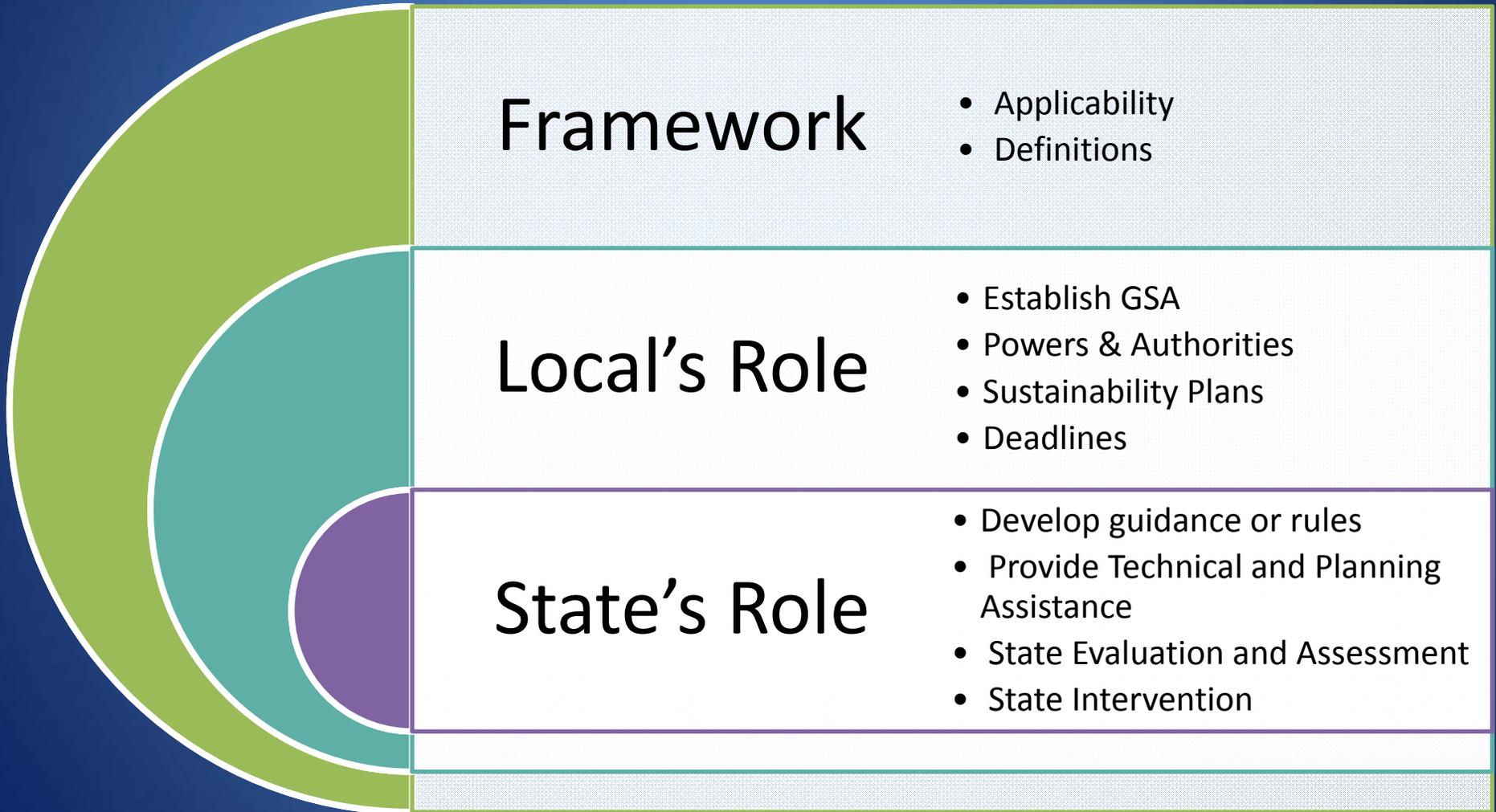


# California Water Action Plan

Action 6: Expand water storage capacity and improve groundwater management



# Sustainable Groundwater Management Act of 2014



# SGMA Milestones for Success

## Groundwater Sustainability Agencies

- Formation by June 30, 2017
- Only local agencies can be GSAs

## Groundwater Sustainability Plans

- January 31, 2020 for critically overdrafted basins
- January 31, 2022 for all other high and medium priority basins
- Multiple GSPs in a basin must coordinate

## Groundwater Sustainability

- 20-year implementation period
- 50-year planning horizon

## GSA Interactive Map

This interactive map shows the location of local agencies that have elected to become Groundwater Sustainability Agencies (GSAs). The boundaries of the GSAs are based on information submitted to DWR by those local agencies. While DWR makes every effort to provide accurate information, DWR has not reviewed the GSA boundary information contained in this map and makes no warranties as to the suitability of this map for any particular purpose. Where multiple local agencies have claimed the same portion of a groundwater basin, the areas of overlap are indicated by a darker color within the GSA boundaries.

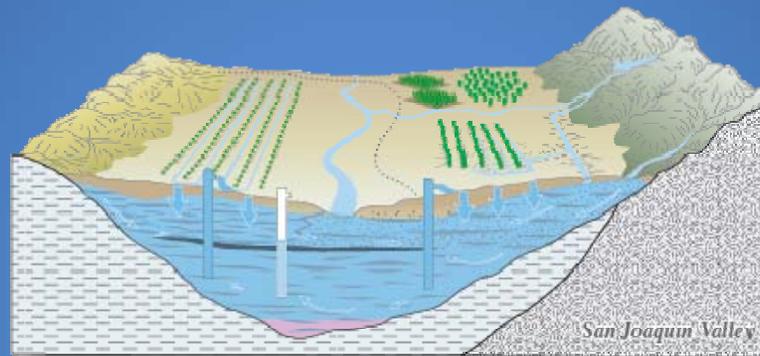
In addition to GSA boundaries, the interactive map application shows the following: (1) Bulletin 118-2003 groundwater basins; (2) CASGEM basin prioritization; (3) adjudicated areas listed in Water Code § 10720.8 (full list available soon); and (4) local agencies listed in Water Code § 10723(c) (available soon).

If you have questions related to GSAs or have comments related to the interactive map please contact Mark Nordberg at [Mark.Nordberg@water.ca.gov](mailto:Mark.Nordberg@water.ca.gov). The GSA Interactive Map was last updated on August 10th, 2015.

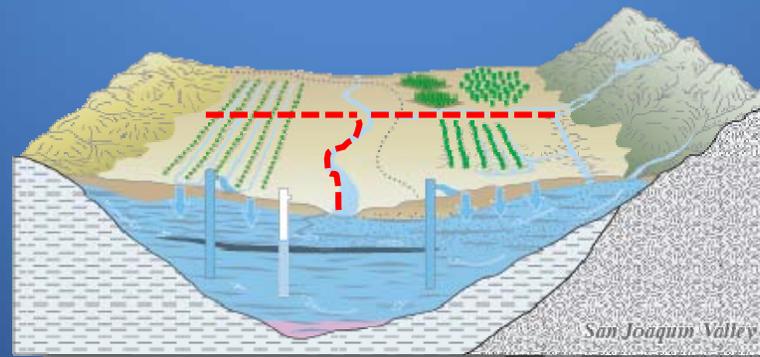


# Groundwater Basins and Subbasins

Scientific

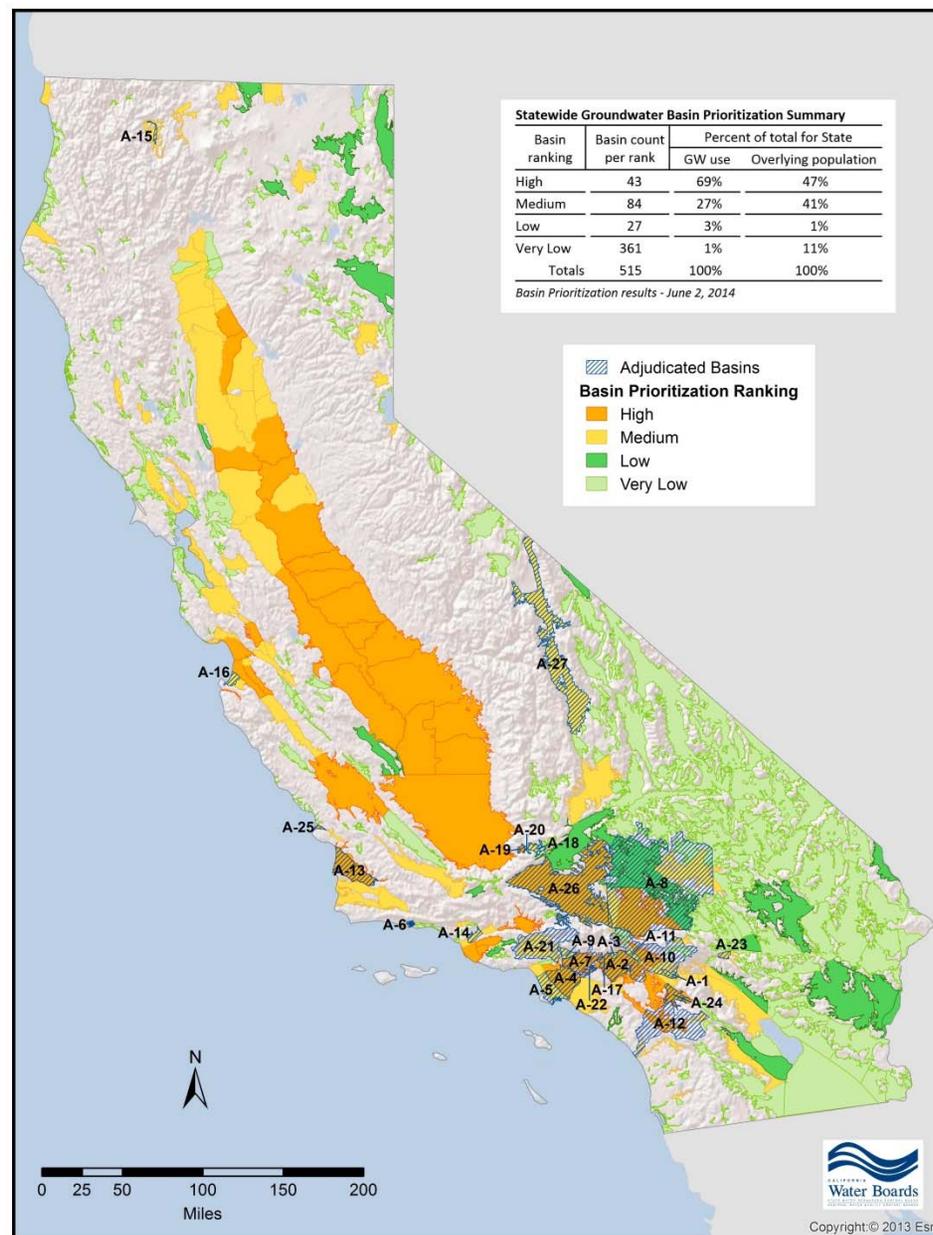


Jurisdictional



# Basin Prioritization

- Requires GW sustainability plans in high- and medium-priority basins
- Does not require adjudicated basins



# *Groundwater Sustainability*



*Undesirable Results:  
Significant and unreasonable...*

Lowering of  
Groundwater  
Levels

Reduction of  
Groundwater  
Storage

Seawater  
Intrusion

Water Quality  
Degradation

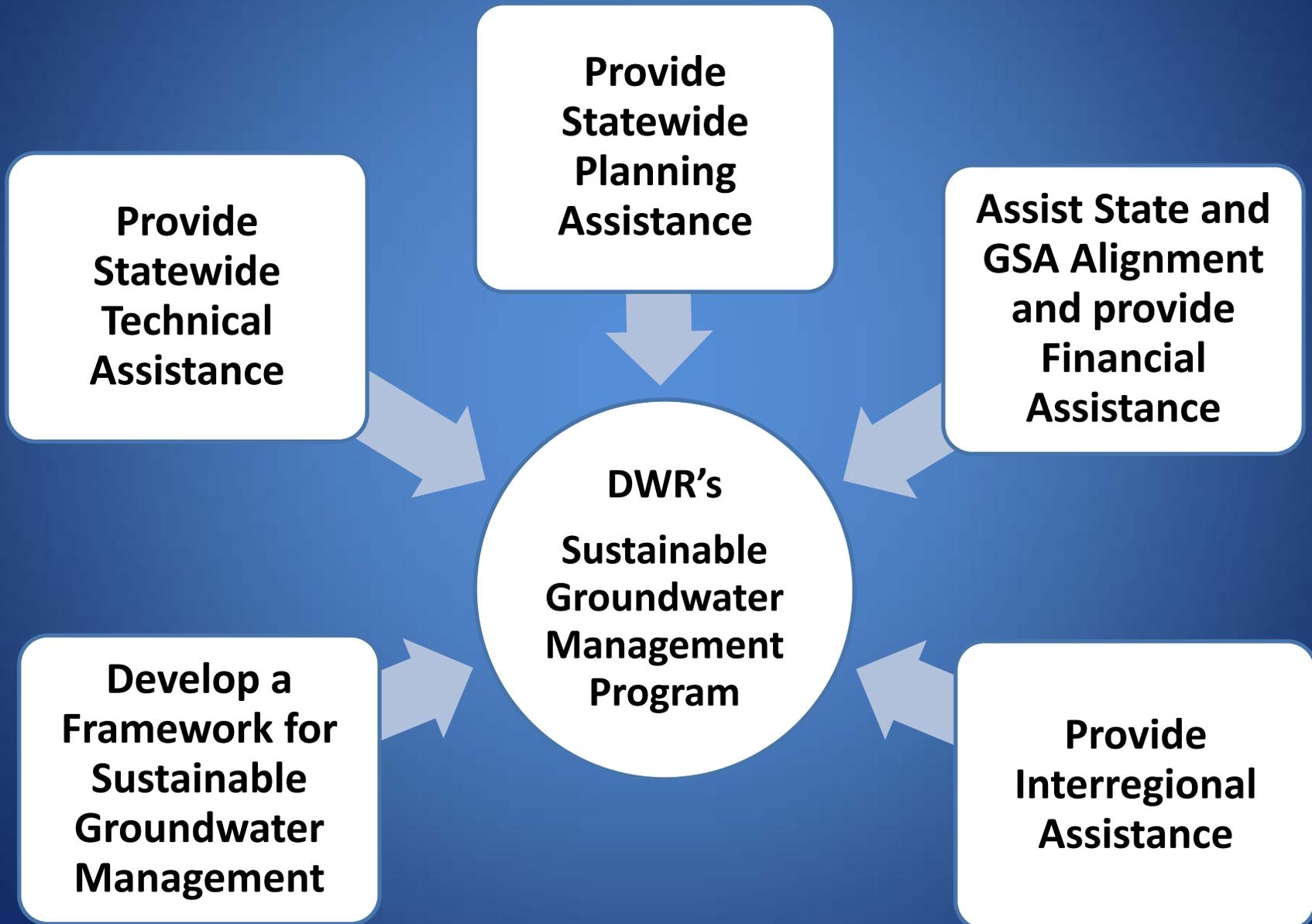
Land  
Subsidence

Depletions of  
Surface Water

# Key Principles

- Groundwater is best managed at the local or regional level, and local agencies should have the tools they need to sustainably manage their resources
- When local or regional agencies cannot or will not manage their groundwater sustainably, the State will intervene until the local agencies develop and implement sustainable groundwater management plans

# DWR's Sustainable Groundwater Management Program

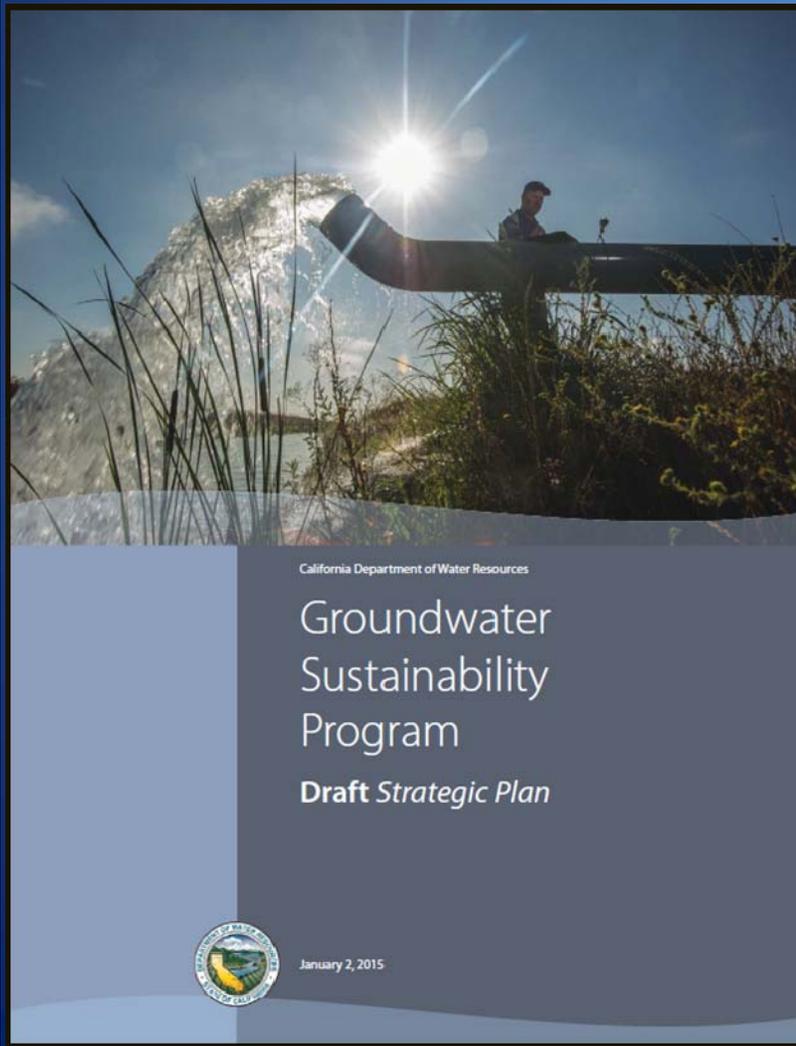


# DWR's Implementation of SGMA

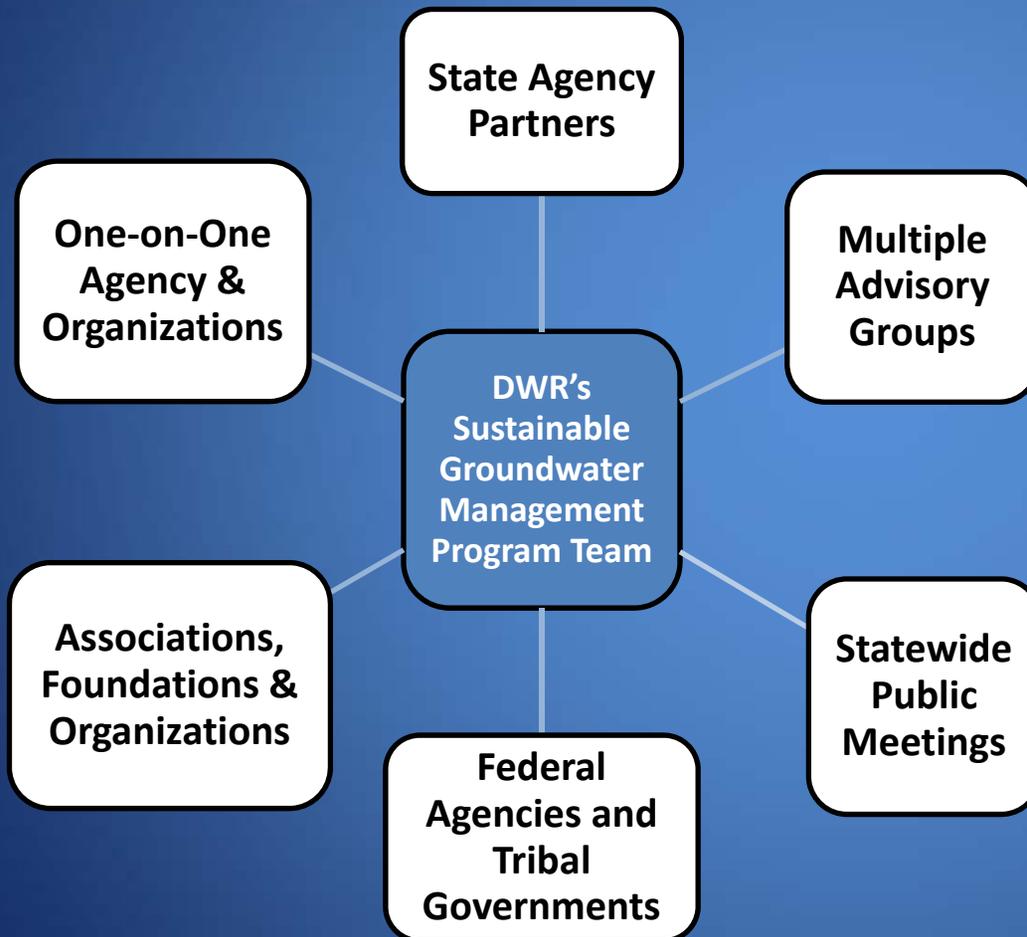
## SUSTAINABLE GROUNDWATER MANAGEMENT (SGM) PROGRAM

- Describes DWR's roles and responsibilities
- Outlines actions from the California Water Action Plan
- Presents DWR's groundwater sustainability goals, objectives, and actions

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



# SGM Communication and Outreach



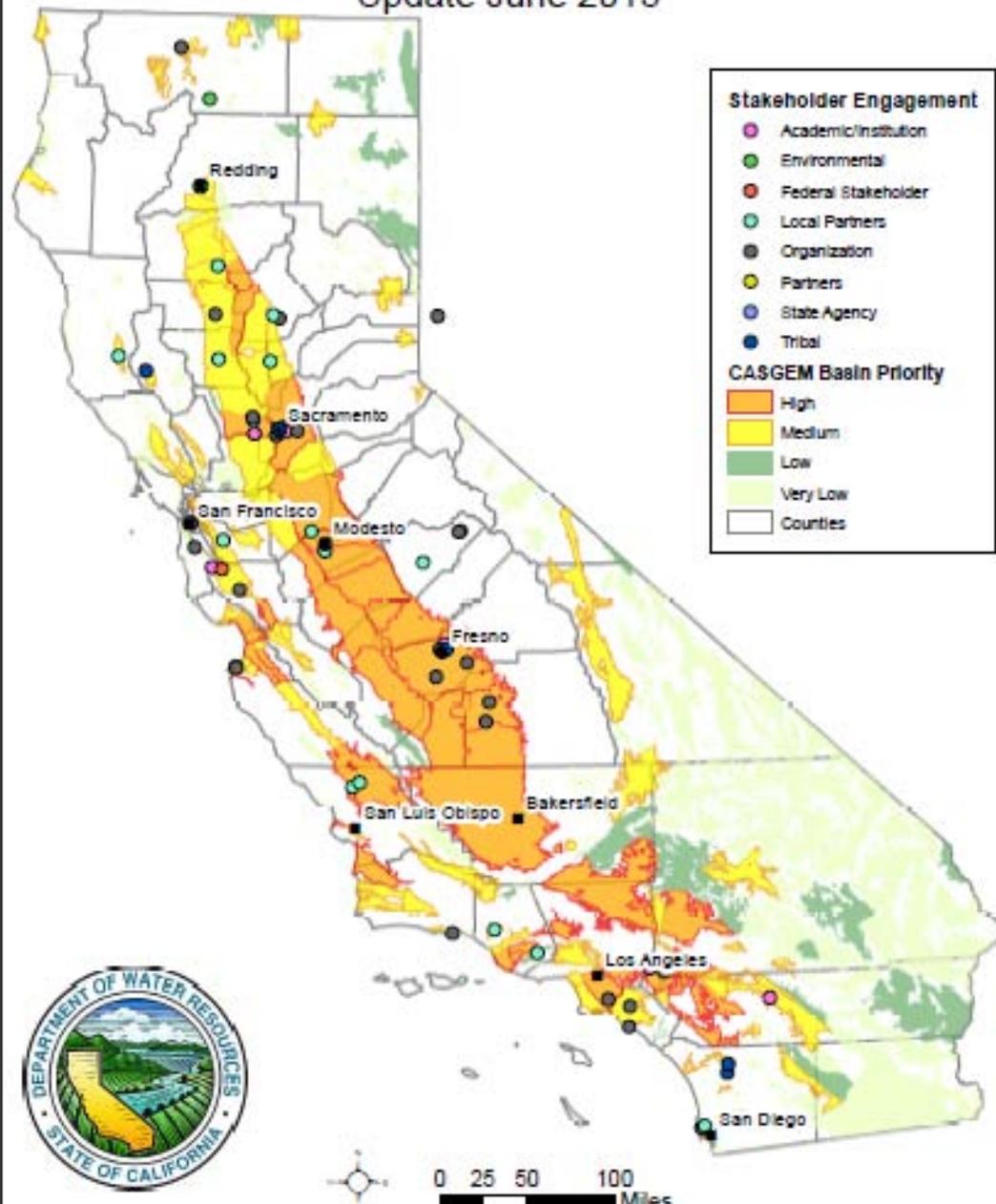
## ADVISORY GROUPS

- Practitioners Advisory Panel
- Tribal Advisory Group
- Non-Governmental Organizations
- Association of California Water Agencies
- Northern California Water Association
- San Joaquin Tributaries Authority
- San Luis & Delta Mendota Water Authority
- Central Coast Area
- RCRC & CSAC
- Agricultural Community
- Tulare Lake Hydrologic Group

More than  
100 events

# DWR Sustainable Groundwater Management Program Engagement

Update June 2015



SGMA 101

# Interagency Website DWR Website SWRCB Website

Communication & Outreach Tools



## Sustainable Groundwater Management



For the first time in California history, the Sustainable Groundwater Management Act (SGMA) requires groundwater management plans that are adopted by local agencies. This will provide a buffer against drought and ensure a reliable water supply, and sustainable groundwater management. The California Groundwater website offers links and news from

 SGMA Toolbox

## SGM Sustainable Groundwater Management

### Introduction

The Department of Water Resources (DWR) has developed the Sustainable Groundwater Management (SGM) Program. DWR's SGM Program responsibilities include: (1) developing regulations to manage groundwater resources; (2) identifying basins subject to critical conditions of overdraft; (3) evaluating and implementing Groundwater Sustainability Plans (GSPs); (4) identifying basins subject to critical conditions of overdraft; and (5) publishing best management practices.

#### Announcements

**NEW** Groundwater Sustainability Plan (GSP) Draft  
DWR has published Discussion Papers on all of the GSPs. The discussion papers can be submitted to [sgmps@dwr.ca.gov](mailto:sgmps@dwr.ca.gov). Information meetings are available [here](#).

**NEW** GSA notification received  
DWR has received a notification of formation of a Groundwater Sustainability Agency (GSA).

**Sustainable Groundwater Planning Grant Program**  
DWR has released draft Guidelines and Proposal Solicitation for the Sustainable Groundwater Planning Grant Program. Find more information [here](#).

**Groundwater Sustainability Program Draft**

[CA.gov](#) | [Help](#) | [Accessibility](#)



## 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 HOME

- SUSTAINABLE GROUNDWATER MANAGEMENT
- GROUNDWATER INFORMATION CENTER
- CASGEM
- BULLETIN 118



# SGM Immediate Actions

## Develop Emergency Regulations - Basin Boundary Revisions

Draft Regulations Posted (July 17, 2015)

Public Comments Closed (Sept 4, 2015)

Final Regulations Due - January 2016

## Identify Basins Subject to Critical Conditions of Overdraft

Draft list posted (Aug 19, 2015)

Public Comments Closed (Sept 25, 2015)

## Develop Emergency Regulations - (GSPs)

Working with advisory groups /public meetings

Draft Regulations Tentative (Dec '15/Jan '16)

Final Regulations Due - June 2016

## Update Basin Prioritization

Used existing - January 2015

Re-prioritization following basin boundary revisions in 2017

## Groundwater Sustainability Agency Formation

26 as of September 28, 2015

Senate Bill 13 – Requires Complete Notifications and No Overlapping GSAs

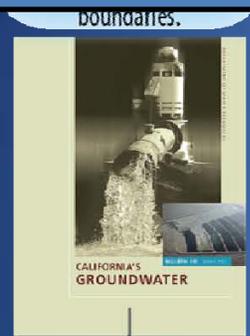
# Develop Emergency Regulations - Basin Boundary Revisions

Draft Regulations Posted (July 17, 2015)

Public Comments Closed (Sept 4, 2015)

Final Regulations Due - January 2016

Required Components of Submittal		
Information required is dependent upon type of modification.		
(1) Local Info	(2) Local Support	(3) Technical Information



Boundary modification desired by local agency?

YES

NO

Reason	Type of Modification	Agency Information and Resolution	Notification & Consultation	Affected Agencies and Systems	Majority of Affected Agencies	All Agencies in Existing Basin	Desc. of Basin Boundaries (Map, GIS data)	Existing Water Management in Basin	Hydrogeologic Conceptual Model	Historic and Current Conditions	Technical Study	Opportunity for Protest 1	DWR Review & Public Notification	CA Water Commission Review
Scientific	Hydrogeologic	✓	✓				✓	✓	✓			✓		
Jurisdictional	Internal	✓	✓	✓			✓	✓				✓		
	Consolidation	✓	✓		✓		✓	✓	✓			✓		
	Subdivision	✓	✓			✓	✓	✓	✓	✓		✓		

Local agencies may submit multiple modification types in a single request.

If any required components are missing, request may not be approved and original boundaries will be used.

Review process may determine modification is not acceptable.

If review process determines requested modification is acceptable, **Boundary Modification is Approved**

GSA/GSP formed in existing basin(s)

Approved Boundaries Published in *California's Groundwater Bulletin 118 2017 Update*

# Critically Overdrafted Basins

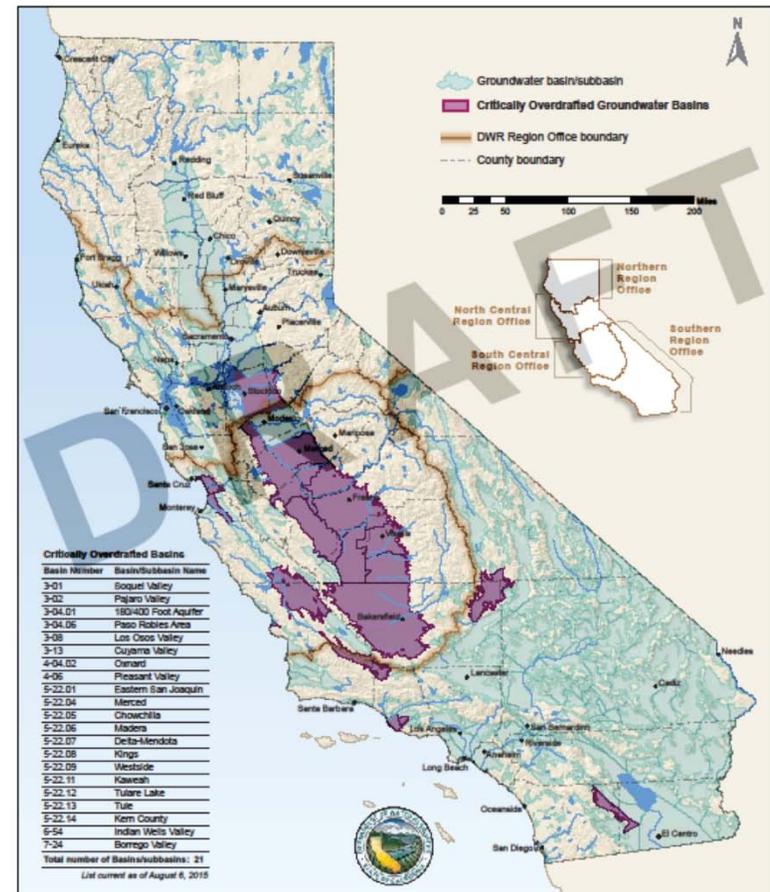
- GSPs required by 2020

## Identify Basins Subject to Critical Conditions of Overdraft

Draft list posted (Aug 19, 2015)

Public Comments Closed (Sept 25, 2015)

Critically Overdrafted Groundwater Basins – August 6, 2015 Draft



# SGMA Basin Prioritization

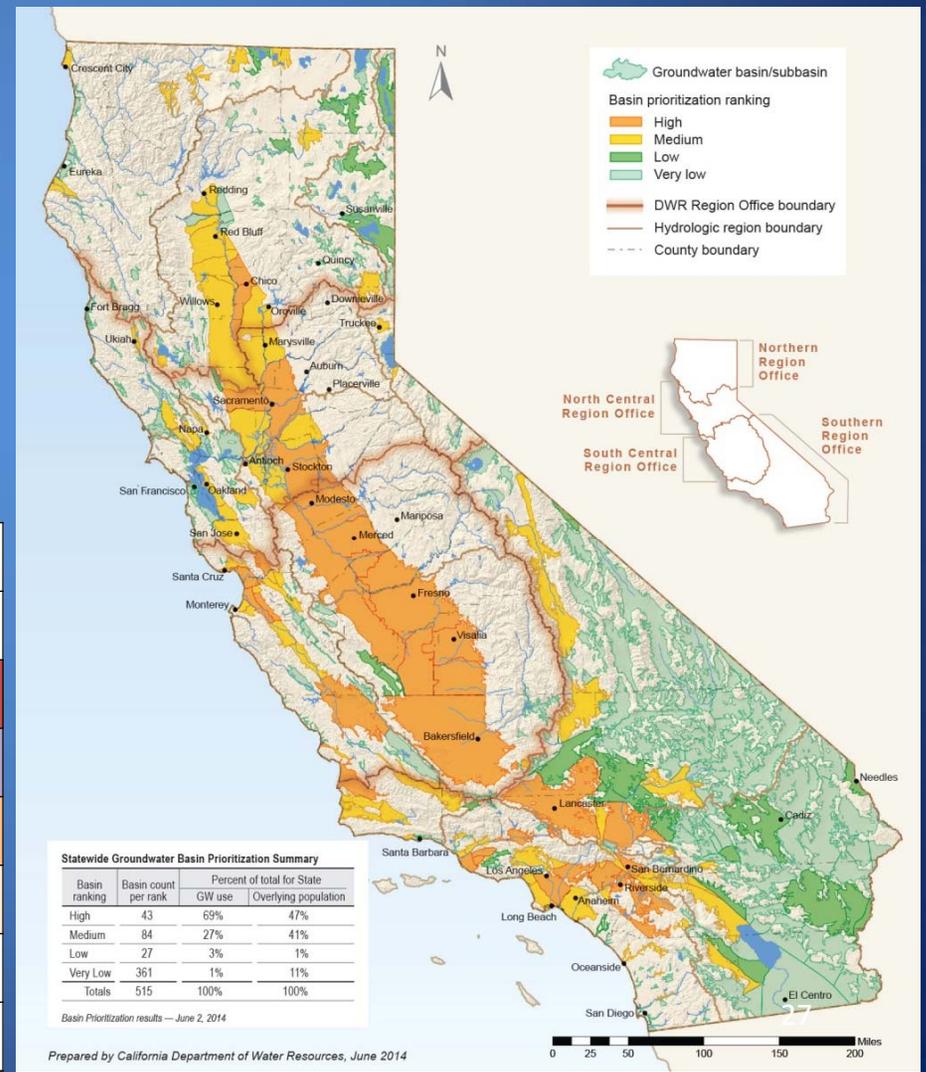
## Update Basin Prioritization

Used existing - January 2015

Re-prioritization following basin boundary revisions in 2017

BASIN RANKING	BASIN COUNT	PERCENT OF TOTAL	
		GW USE	POPULATION
High	43	69%	47%
Medium	84	27%	41%
Low	27	3%	1%
Very Low	361	1%	11%
<b>Totals</b>	<b>515</b>	<b>100%</b>	<b>100%</b>

Basin Prioritization Results – June 2, 2014



# Groundwater Sustainability Plans (GSPs) and Alternatives

## Develop Emergency Regulations - (GSPs)

Working with advisory groups /public meetings

Draft Regulations Tentative (Dec '15/Jan '16)

Final Regulations Due - June 2016



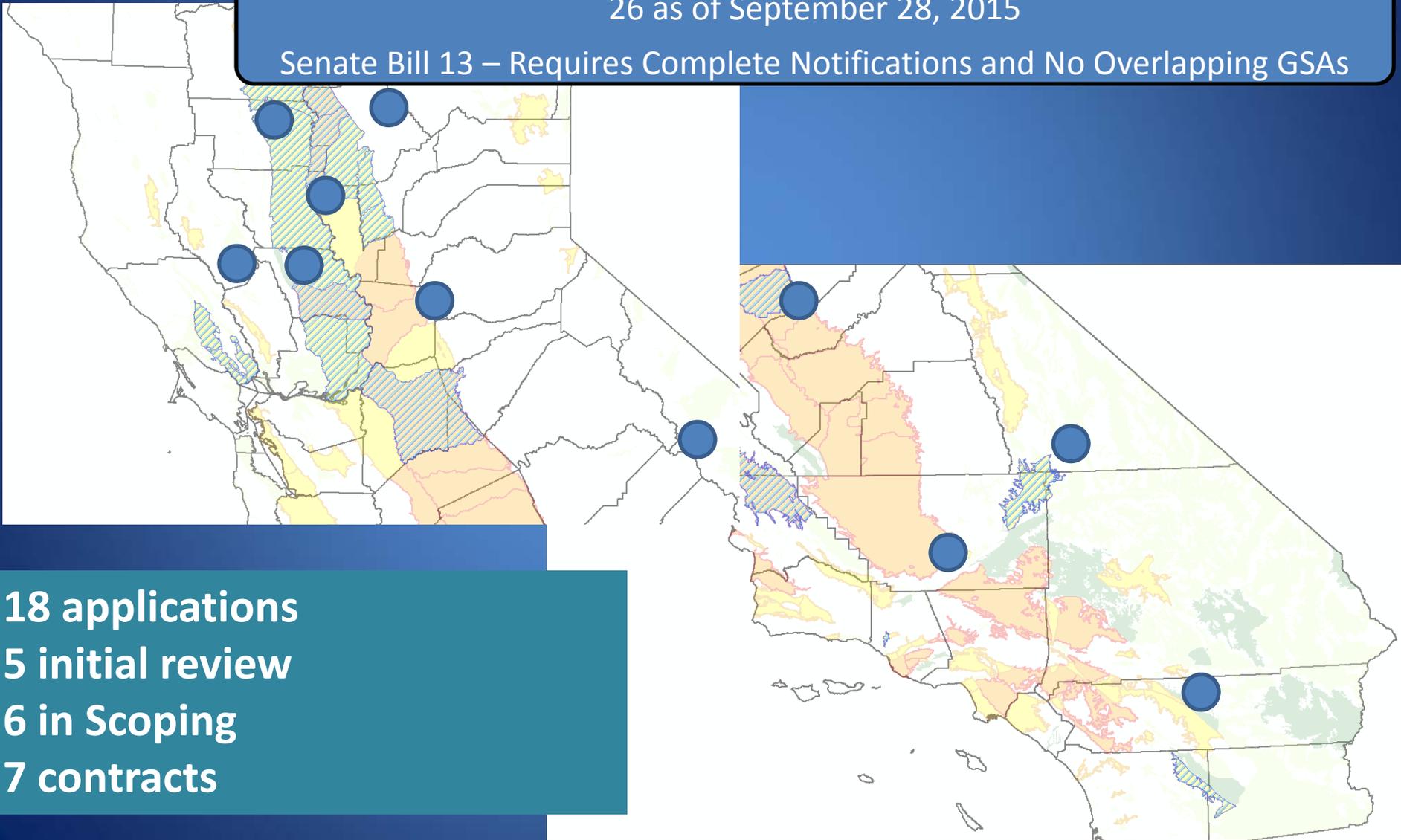
Assistance to Locals

# Facilitation Support Service

## Groundwater Sustainability Agency Formation

26 as of September 28, 2015

Senate Bill 13 – Requires Complete Notifications and No Overlapping GSAs



18 applications  
5 initial review  
6 in Scoping  
7 contracts

# The “Backstop” State Board Intervention

After	Intervention Trigger
June 30, 2017	Areas without a GSA begin reporting well locations and extraction data to SWRCB; can begin probationary basin designation 180 days later.
Jan. 31, 2020	Can begin probationary basin designation in critically overdrafted basins with no GSP or where DWR finds the GSP is inadequate
Jan. 31, 2022	Can begin probationary basin designation in other high/medium priority basins without a GSP or where DWR finds the GSP is inadequate
Jan. 31, 2025	Probationary basin designations where DWR finds GSP is inadequate and significant depletions of interconnected surface waters

**In all triggering events, intervention is the result of failure by locals to create a GSA or adopt and implement a GSP**

# State Board Can Act as a Basin Manager

Develop fees to support basin management

```
graph TD; A[Develop fees to support basin management] --> B[Designate probationary basins]; B --> C[Probationary basins lead to interim sustainability plans]; C --> D[Interim plans manage basins until local efforts come up to speed];
```

Designate probationary basins

Probationary basins lead to interim sustainability plans

Interim plans manage basins until local efforts come up to speed

# State Intervention Approach

- The State is required to recover costs incurred in administering the state backstop (§ 1529.5)
- The state can require technical or monitoring reports from groundwater pumpers (§10736.6); can require metering (§5203)
- The State can adopt an interim plan identifying actions that must be taken to correct conditions of long-term overdraft or significant depletions of surface water (§10735.8)

# State Intervention is Not The Final Step

- State intervention is temporary, and basin water users would still be required to develop their own plan for their basin.
- State intervention would focus on “demand management” with limited options for solving overdraft problems.
- After reimbursing the state, basin water users would still be required to fund their own solution for managing the basin.
- A basin adjudication after January 1, 2015 would still be required to comply with all the requirements of SGMA.

# Update Critically Overdrafted Basins

## Per Water Code Section 12924:

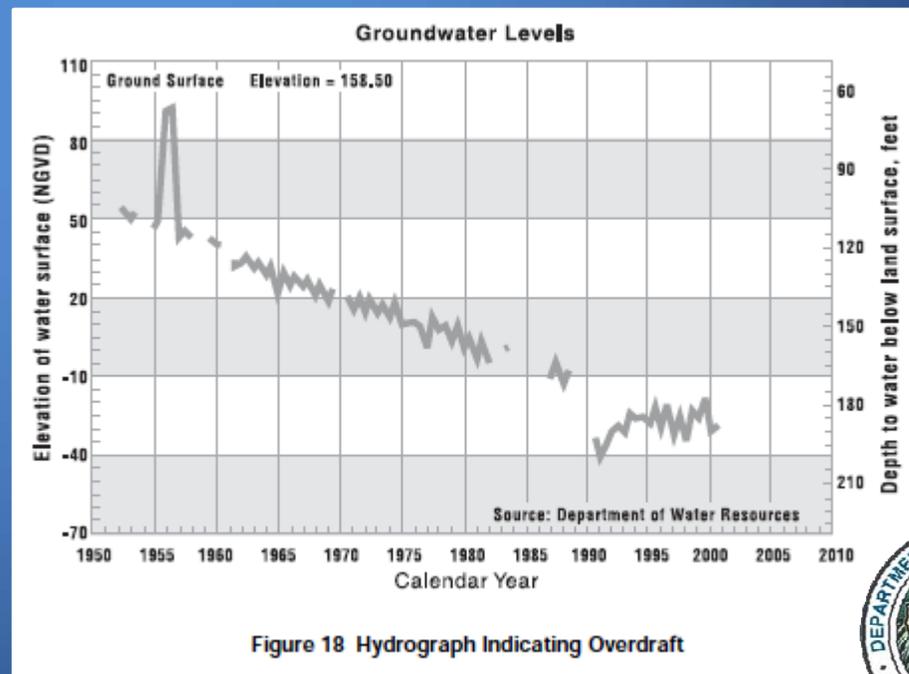
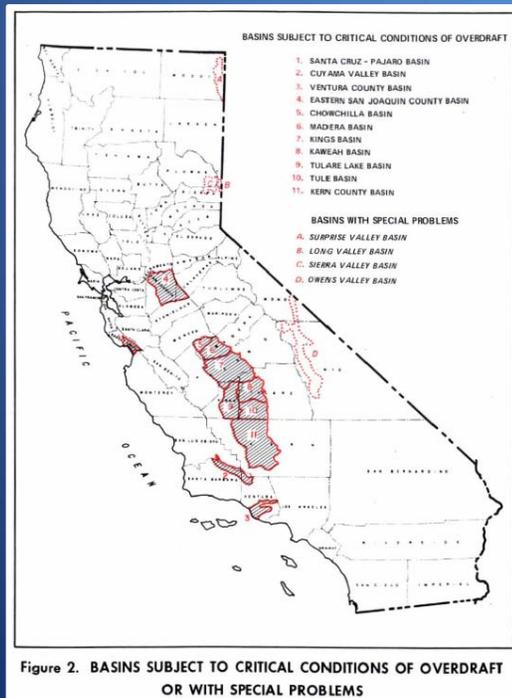
*“ (a) **The department**, in conjunction with other public agencies, **shall conduct an investigation of the state’s groundwater basins**. The department shall identify the state’s groundwater basins on the basis of geological and hydrological conditions and consideration of political boundary lines whenever practical. **The department shall also investigate** existing general patterns of groundwater extraction and groundwater recharge within those basins to the extent necessary to identify **basins that are subject to critical conditions of overdraft.**”*

-Results are published in Bulletin 118



# Bulletin 118-80 Critical Conditions of Overdraft

*“A basin is subject to critical conditions of overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts.”*



# Obvious Adverse Impacts

Chronic Lowering  
of Groundwater  
Levels

Reduction of  
Groundwater  
Storage

Seawater  
Intrusion

Water Quality  
Degradation

Land  
Subsidence

Depletion of  
Surface  
Water



# Groundwater Budget

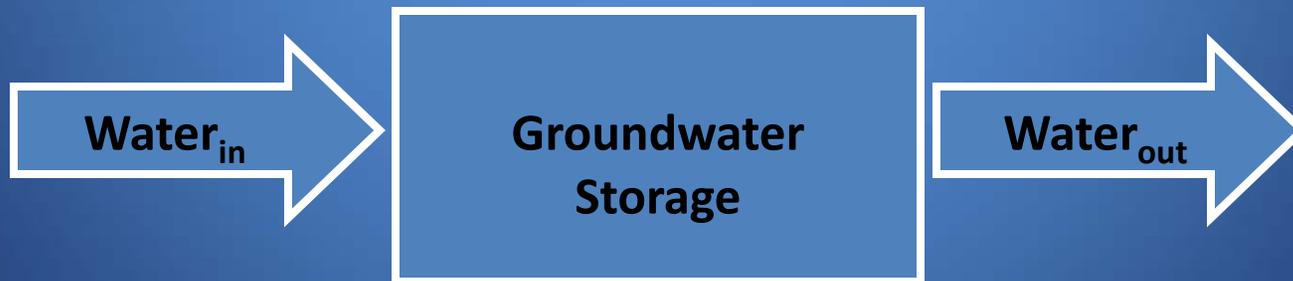
$$\text{Water}_{\text{in}} - \text{Water}_{\text{out}} = \Delta_{\text{storage}}$$

Recharge

Precipitation  
Surface Water In  
Subsurface Water In  
Recharge  
Return Flow

Discharge

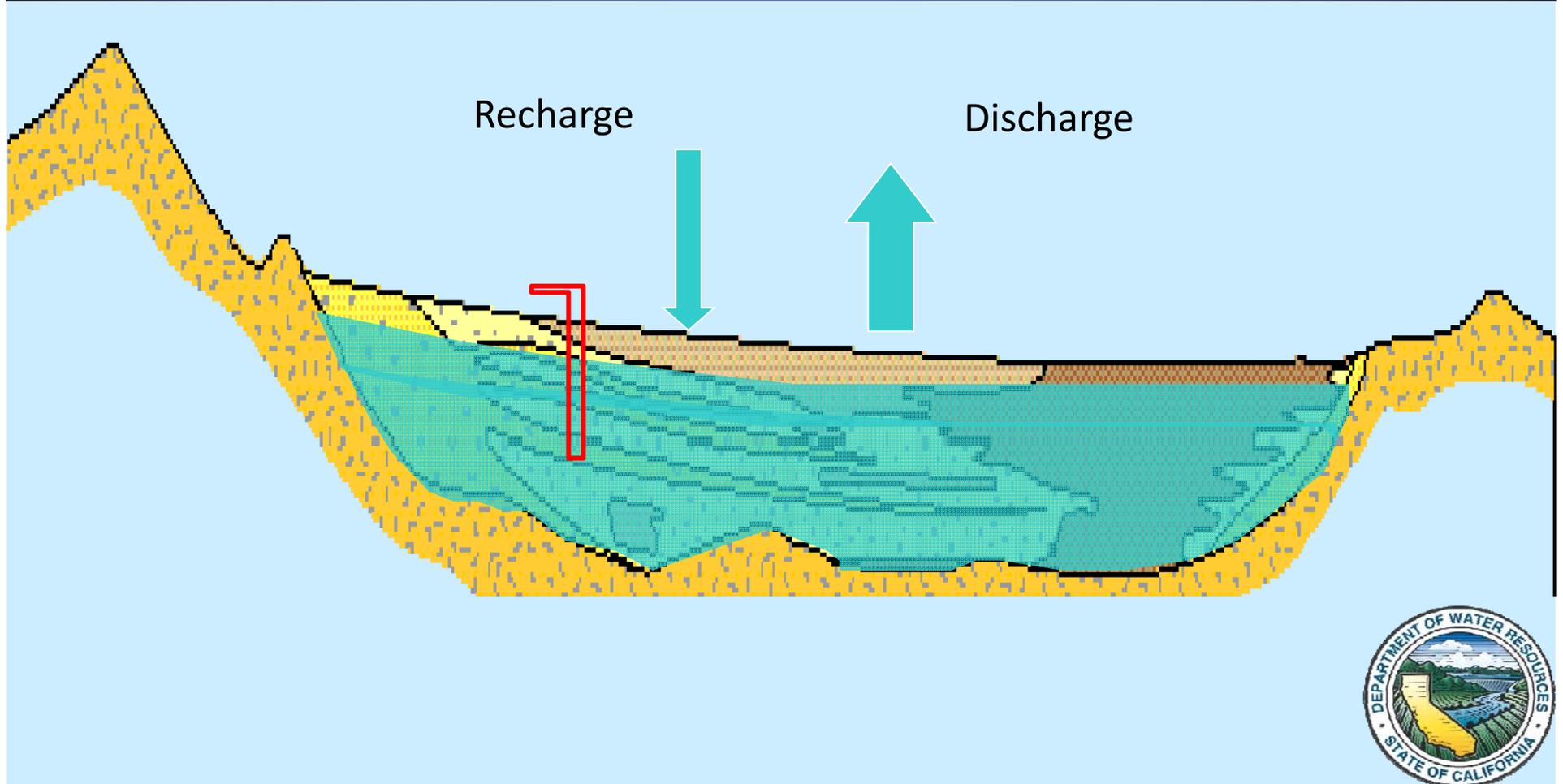
Surface Water Out  
Subsurface Water Out  
Pumping  
Evapotranspiration



Groundwater System



# Desert Groundwater Basin



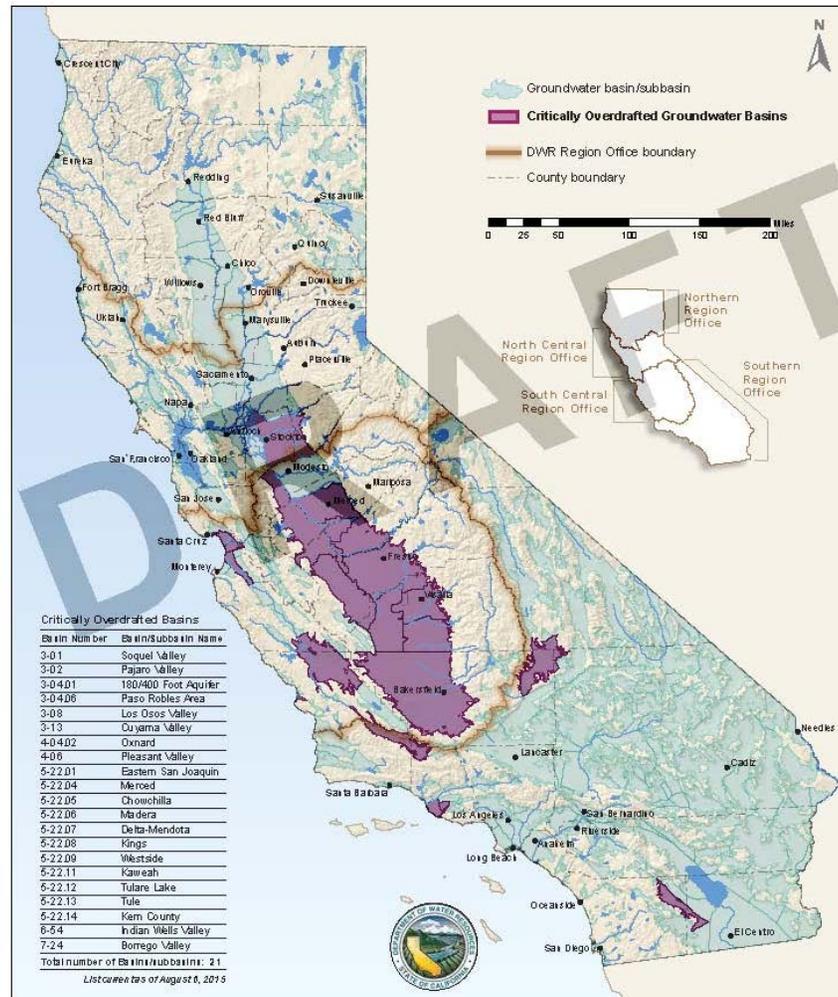
# Evaluation of Groundwater Basins

- Include all Bulletin 118-80 and Update 2003 critically overdrafted basins onto the 2015 preliminary list.
- Determined Base Period to be 1989-2009
- Conducted review of DWR reports, investigations, published reports, USGS reports, and local agency reports such as GWMPs and EIRs to identify basins with obvious evidence of adverse impacts.
- Invited local agencies to provide data and information to DWR to reevaluate and assist identification of additional basins or removal of basins.



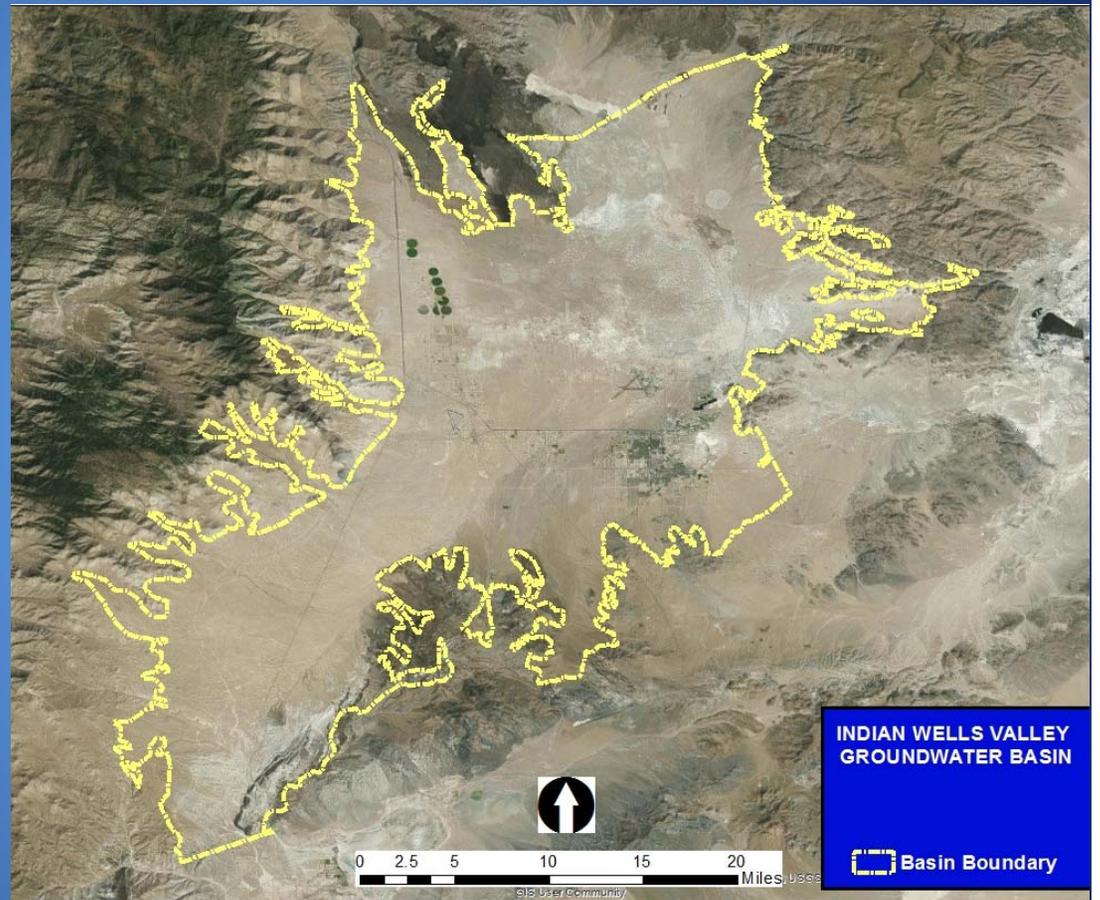
# Draft Results

Critically Overdrafted Groundwater Basins – August 6, 2015 Draft

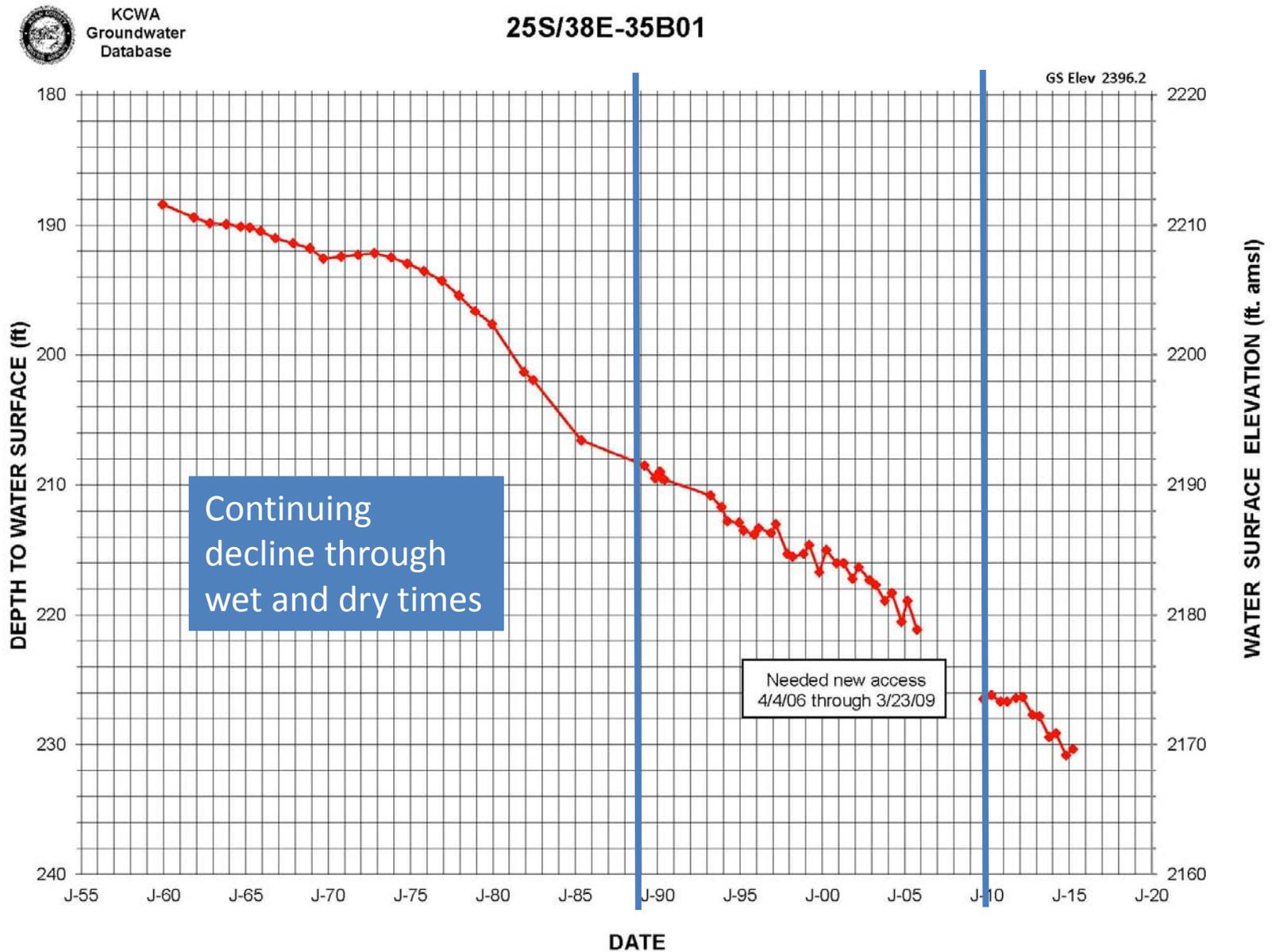


# Indian Wells Valley

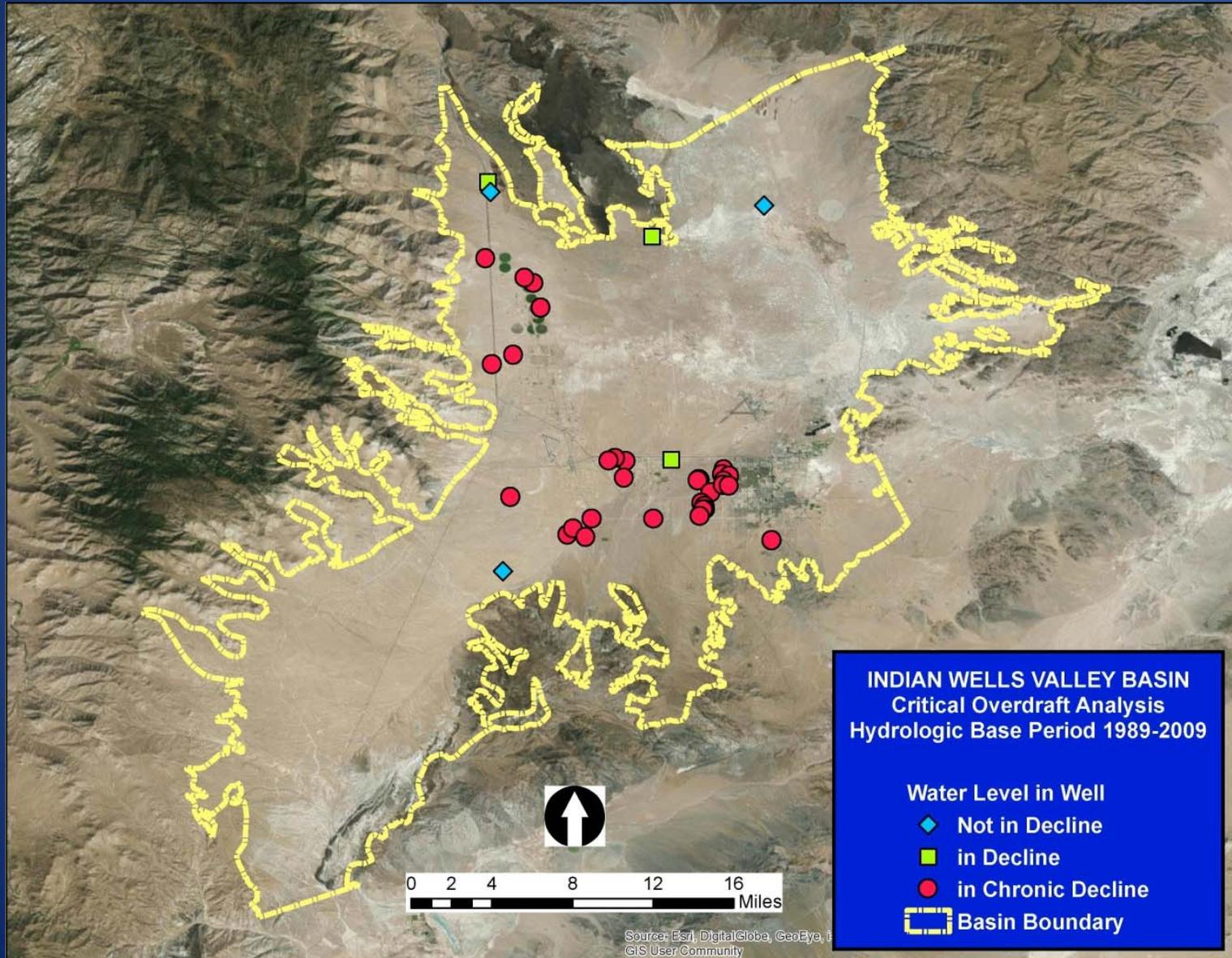
- Groundwater Level Hydrographs  
More than 30 hydrographs  
Evaluate for Chronic Decline
- Technical Reports  
Reviewed >20 technical reports  
Evaluate for chronic reduction  
of storage  
Evaluate for Water Quality  
Degradation

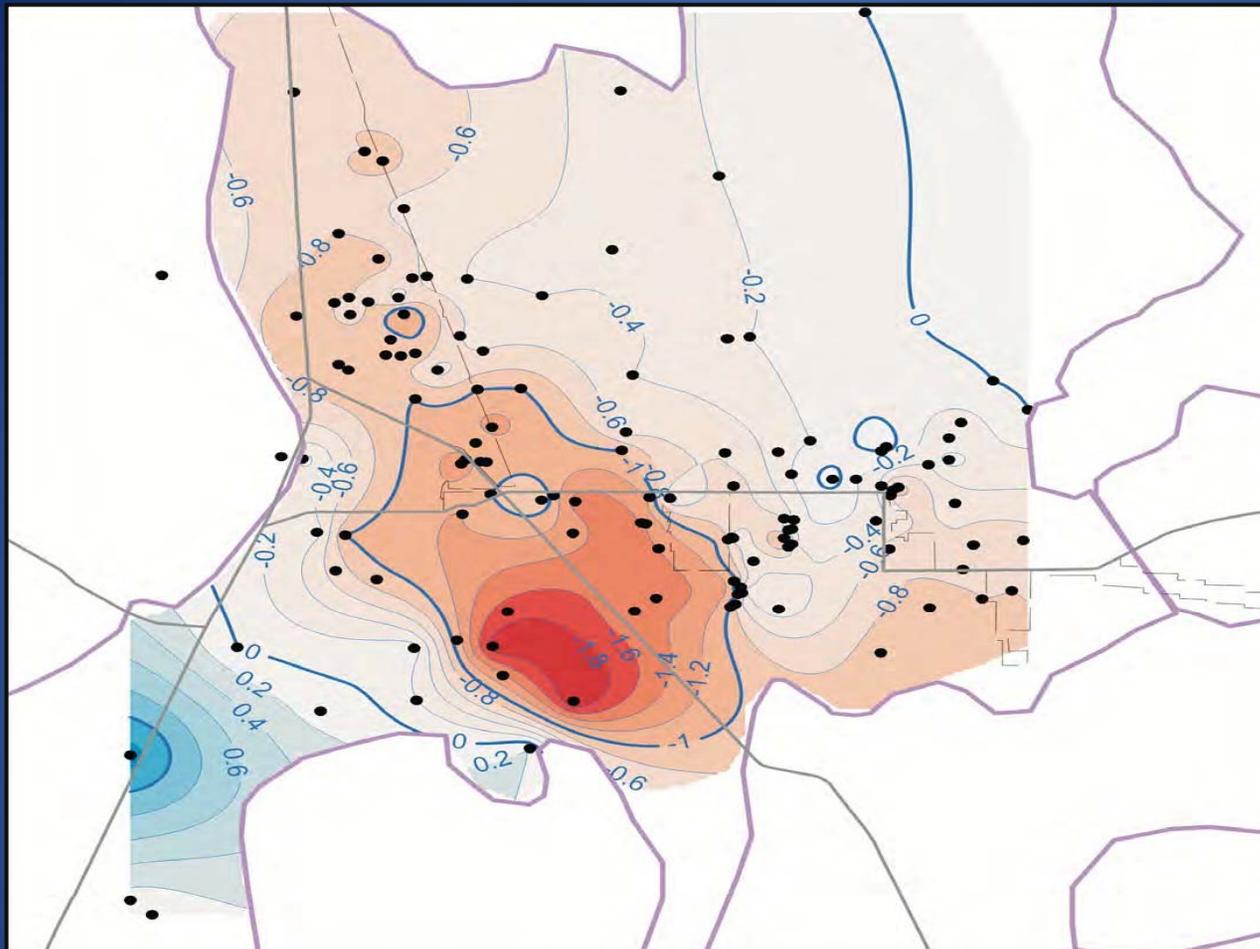


# Well Showing Chronic Decline in Water Levels



# Wells in Chronic Decline





**Legend**

- Well with water level trend data
- Contour of average annual change in groundwater level
- ▭ Basin boundary
- ▭ NAWS boundary

N  
↑

0      20,000

Scale in Feet

January 2014  
 TODD ENGINEERS  
 Alameda, California

Figure A-2  
 Annual Rate of  
 Water Level Change



# References reviewed:

## Overdraft, Water Level Declines

- 2015 – Kern County Draft EIR
- 2014 – Todd Engineers
- 2009 – Brown and Caldwell
- 2008 – Geochemical Technologies Corporation
- 2003 – Houghton HydroGeo-logic
- 2001 – Tetra Tech
- 1995 – Houghton (MS Thesis)
- 1994 – Berenbrock and Schroeder
- 1993 – US Bureau of Reclamation
- 1991 – Berenbrock and Martin
- 1989 – Bean
- 1989 – Lofgren
- 1987 – Berenbrock
- 1986 – St. Amand
- 1979 – Mallory
- 1974 – Banta
- 1973 – Banta
- 1969 – Kunkel and Chase
- 1963 – DWR Bulletin 91-9

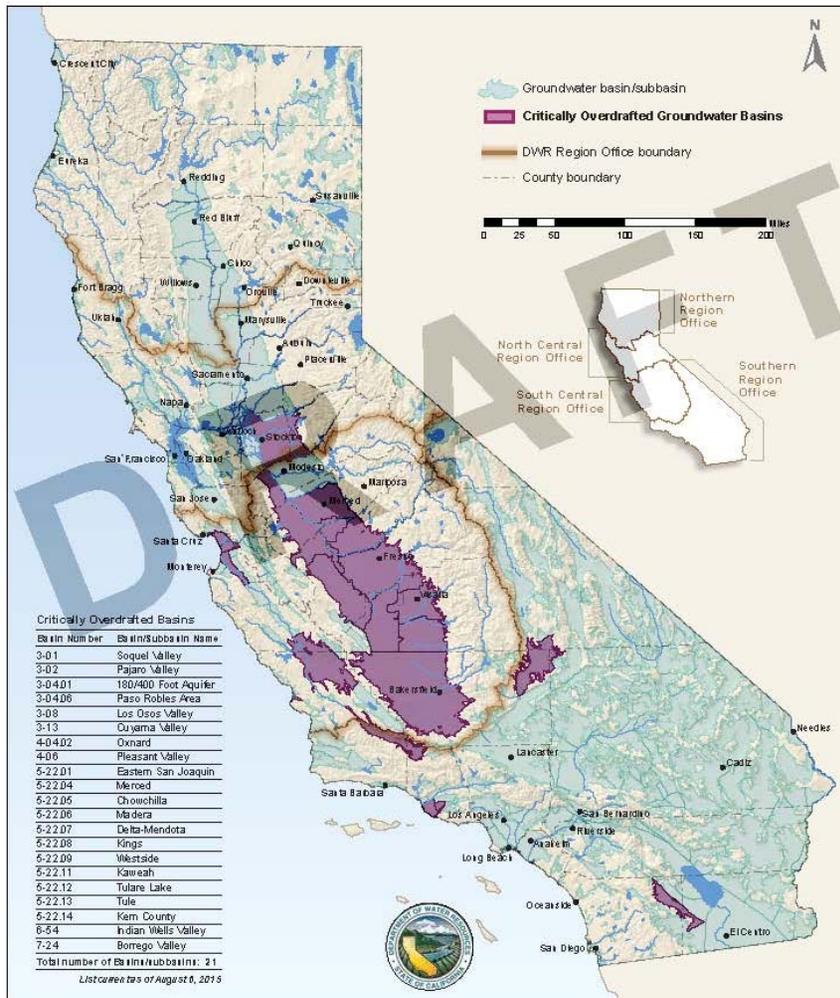
## Not Overdraft

- 1999 – Thyne, Gillespie, and Ostdick
- 1989 – Erskine
- 1989 – Whelan, Baskin, and Katzenstein
- 1988 – Austin



# Indian Wells Valley Groundwater Basin

Critically Overdrafted Groundwater Basins – August 6, 2015 Draft



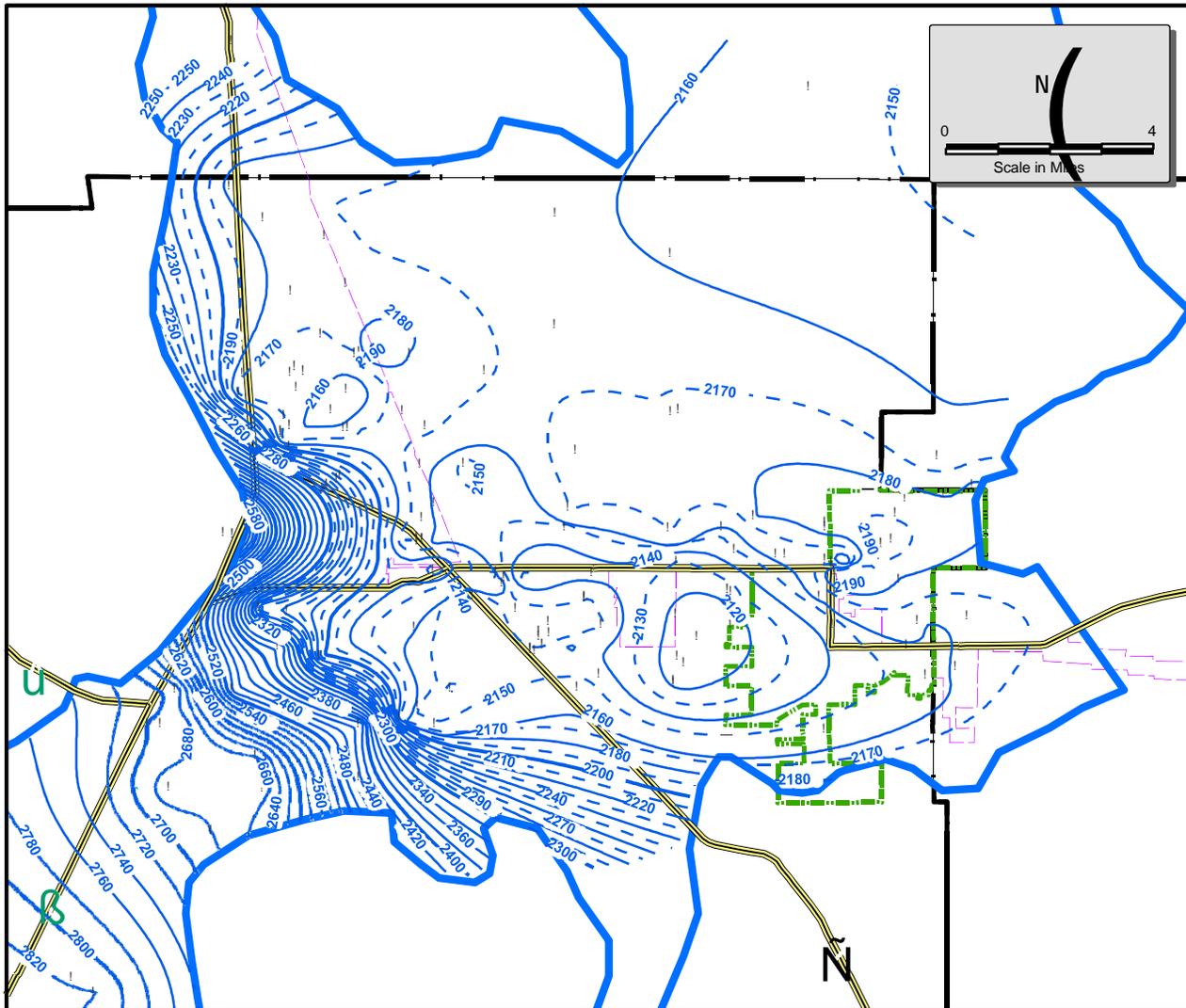
Critical Overdraft Based on:

Chronic Decline of Groundwater Levels  
 Prior to Base Period  
 During Base Period  
 Post Base Period

Reduction of Groundwater Storage  
 Prior to Base Period  
 During Base Period  
 Post Base Period

Water Quality Degradation





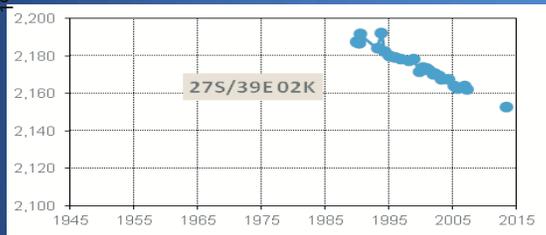
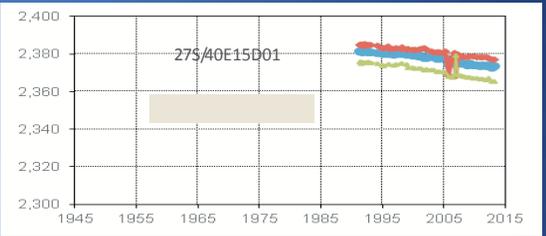
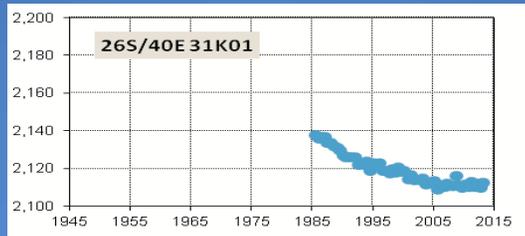
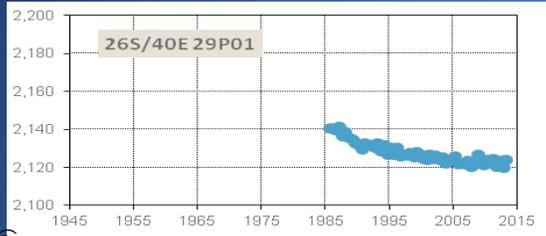
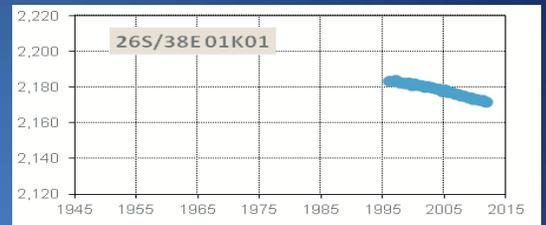
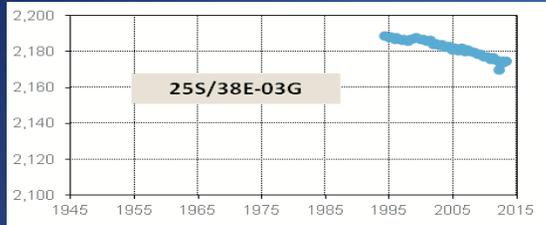
**LEGEND**

— Groundwater Elevation Contour, feet above MSL (NGVD, 1929)

January 2014  
 TODD ENGINEERS  
 Alameda, California

**Figure 3**  
**Contours of**  
**Groundwater Elevation in**  
**Spring 2013**

LEGEND

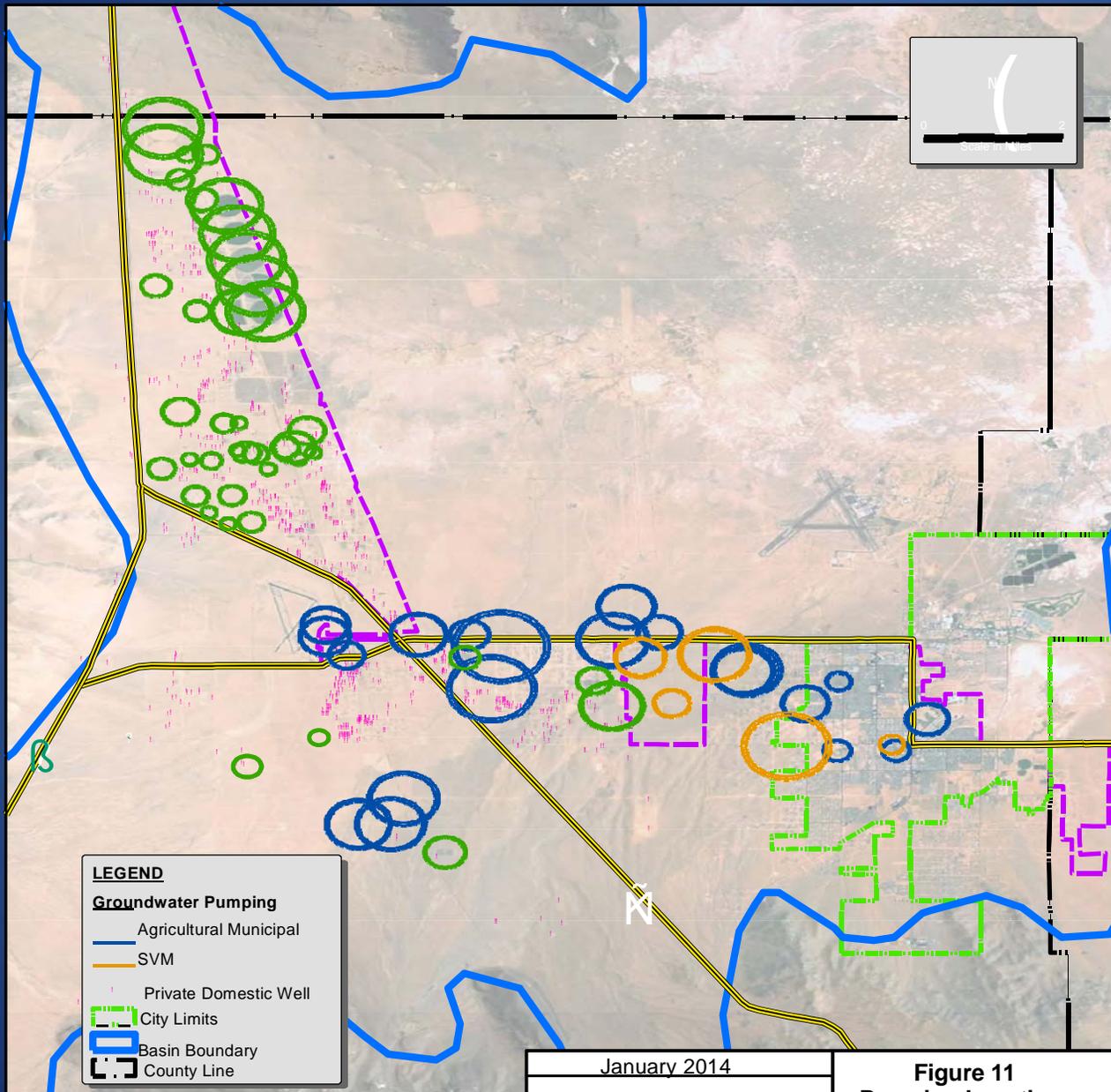


Groundwater Elevation (feet NGVD, 1929)



January 2014  
TODD ENGINEERS  
Alameda, California

Figure 4 Hydrographs  
of  
Groundwater Elevation

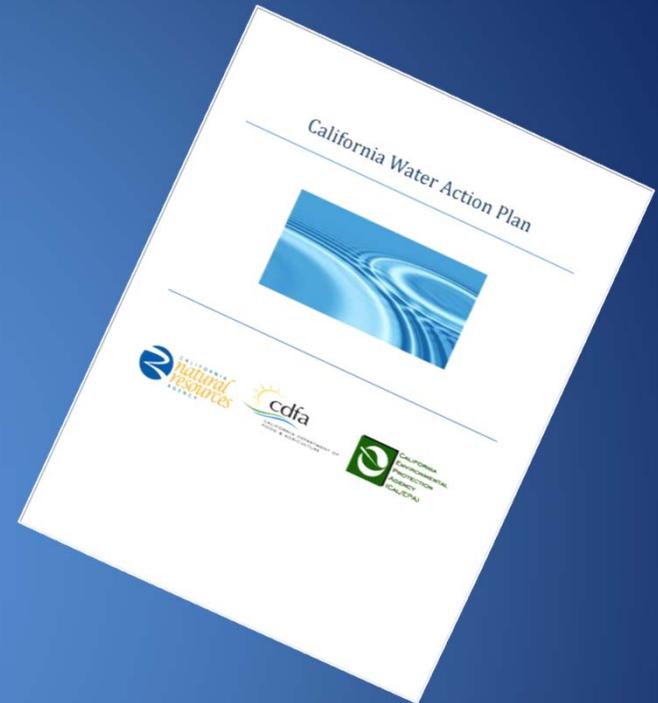


Notes:  
Circle area is proportional to annual production.

# Questions

*When properly managed, groundwater resources will help protect communities, farms, and the environment against the impacts of prolonged dry periods and climate change.*

California Water Action Plan 2014



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

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

SWRCB: [http://www.waterboards.ca.gov/water\\_issues/programs/gmp/](http://www.waterboards.ca.gov/water_issues/programs/gmp/)



# Groundwater Sustainability Agency Formation

**Plans and Next Steps**

**Supervisor Mick Gleason**



# SGMA Steps to Groundwater Sustainability

## Step one

Form  
Groundwater  
Sustainability  
Agency  
June 30, 2017

## Step two

Develop  
Groundwater  
Sustainability  
Plan  
January 31, 2020

## Step three

Achieve  
Sustainability  
20 years after  
adoption of  
plan\*

- DWR may grant up to two, five-year extensions on Implementation upon showing good cause and progress

# GSA-Eligible Agencies in Indian Wells Valley

- City of Ridgecrest
- County of Kern
- County of Inyo
- County of San Bernardino
- Indian Wells Valley Water District
- Inyokern Community Services District

# Federal Agencies and Tribes

- Naval Air Weapons Station
- Bureau of Land Management
- Tribes

*May participate voluntarily in GSA/GSP*

# Additional Private Interests

May join a GSA under a separate legal agreement:

- PUC regulated private water companies
  - Searles Minerals
- Mutual Water Companies
  - Many in the IWV

Note: These entities may not form a GSA

# Possible GSA Governance Options



- **One GSA with one Plan per Basin**

- Most direct, simplest form of representation
- Possible funding competition between basins
- Less efficient administration & regional issues

- **Centralized: One countywide GSA**

- Coordinate regional issues (e.g., land use, well permitting, data)
- Maximize administration efficiencies; reduce competition between basins
- Possibly cumbersome GSA board representation

- **Multiple GSAs per Basin**

- **Some Combination of the Above Options**

*Note: SGMA allows for multiple GSAs and for multiple GSPs for each basin, but requires DWR buy-in and “coordination and agreements”*

# Outreach and Input

“GSA shall consider interests of all beneficial uses and users of groundwater” including:

- Agriculture users
- Domestic users
- Public & private water systems
- Local land use planning agencies
- Federal government
- Tribes
- Environmental users
- Disadvantaged communities
- Surface water users





- Additional GSA-eligible agencies meetings
- Develop framework of principles for formation and start discussions on policies
- Hold GSA-Notification Public Meeting in the coming months
- Prepare and sign legal documents entering into GSA

Questions?



# Back Up Slides

# New Management Authorities Under SGMA

Groundwater Sustainability Agencies have authority to:

- Conduct studies
- Register & monitor wells
- Set well spacing requirement
- Require extraction reporting
- Implement capital projects
- Manage groundwater demand
- Assess fees to cover costs

*Some exemptions for smaller private well owners*

# Proposed Skeleton Structure Indian Wells Valley GSA & GSP

## \*GSA-eligible agencies include:

- City of Ridgecrest
- County of Kern
- County of Inyo
- County of San Bernardino
- Indian Wells Valley Water District
- Inyokern Community Services District



## \*Other GSA interests include:

### *Federal/Sovereign*

- Naval Air Weapons Station
- Bureau of Land Management
- Tribes

### *Private*

- PUC-Regulated private water companies
- Mutual Water Companies

# Coordination Efforts Required

- Data framework/management system
- Basin boundary adjustments
- Funding requests to external entities (such as the state)
- Any activities that impact the adjacent basin
- Communication with state and federal agencies (not always required, but often)

# Other Potential Coordination Activities

- Projects that cross basin boundaries
- Regulation development: information sharing and attention to jurisdictions
- Public outreach and stakeholder engagement
- Monitoring protocols and coordination with adjacent basins (timing, consistency of data collection, etc.)
- Well permitting
- Contracts with consultants, facilitators, etc.