

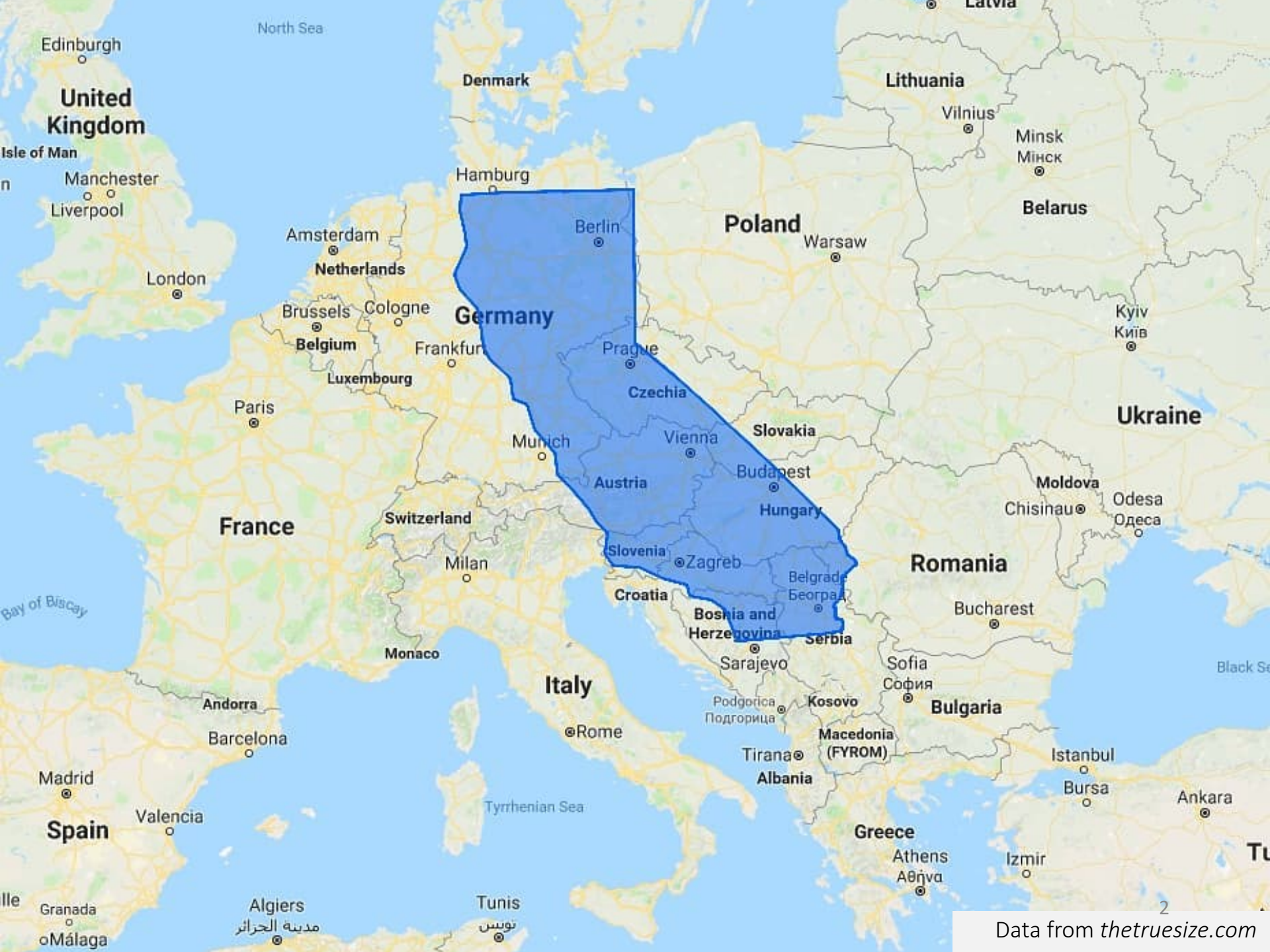
# SGMA Implementation: General Issues, Challenges, & Solutions

*Sustainable Groundwater Management  
and Conflict Resolution*

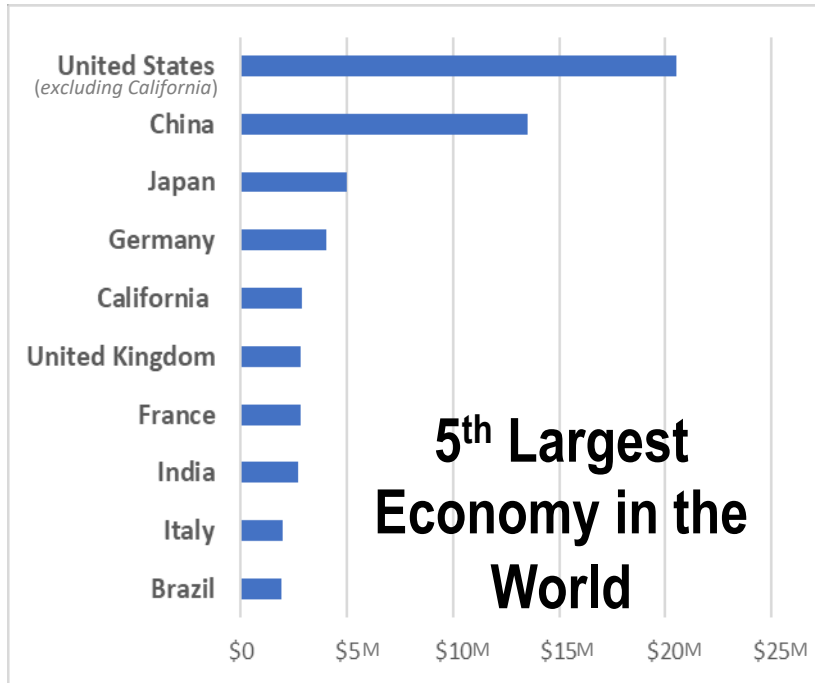
*A California-European Union Joint Workshop*

*June 24, 2019*



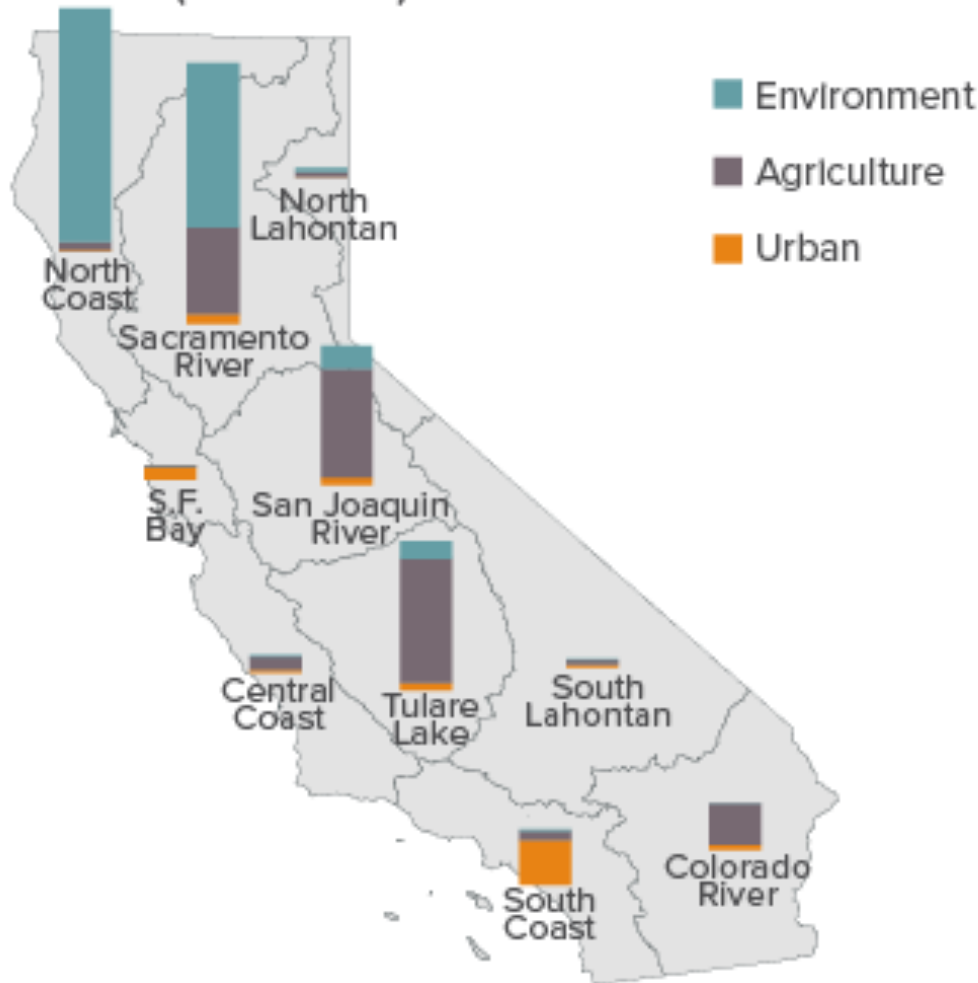


# California's Water Use

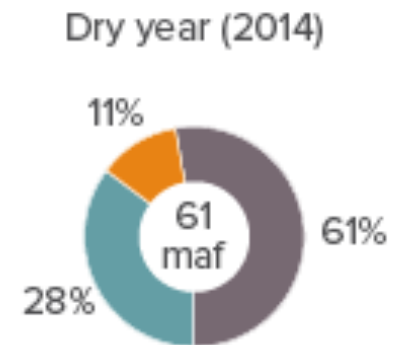
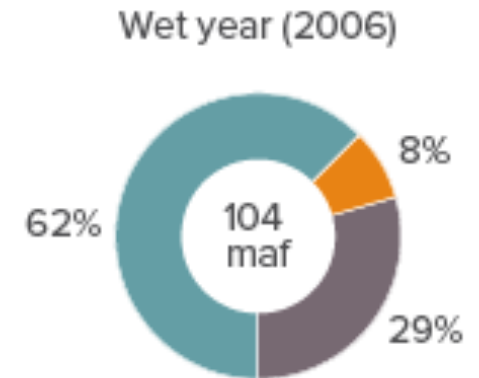


# California's Water Use

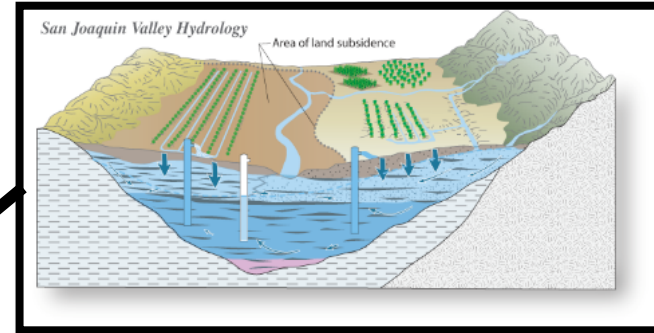
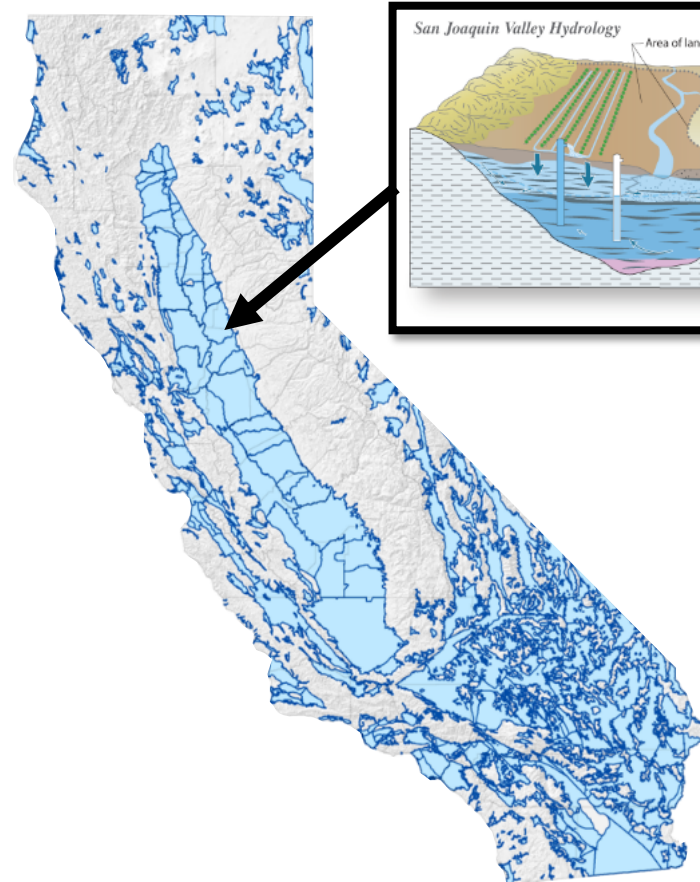
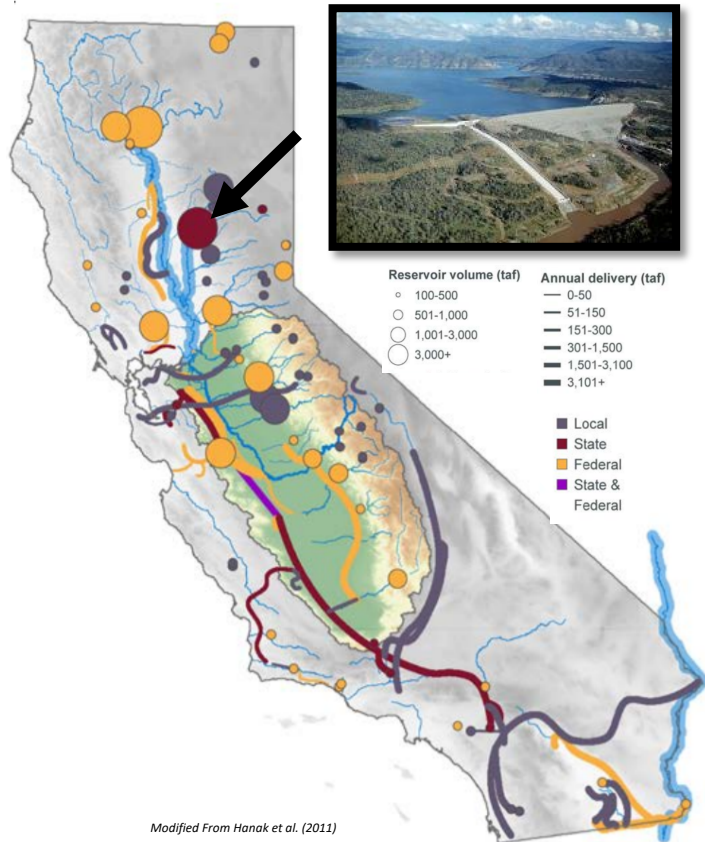
Average annual applied water use  
(1998–2015)



Statewide applied water use,  
millions of acre-feet (maf)



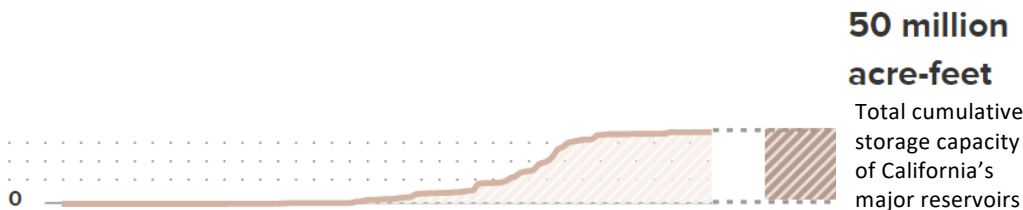
# California Surface Water vs. Groundwater Storage Capacity



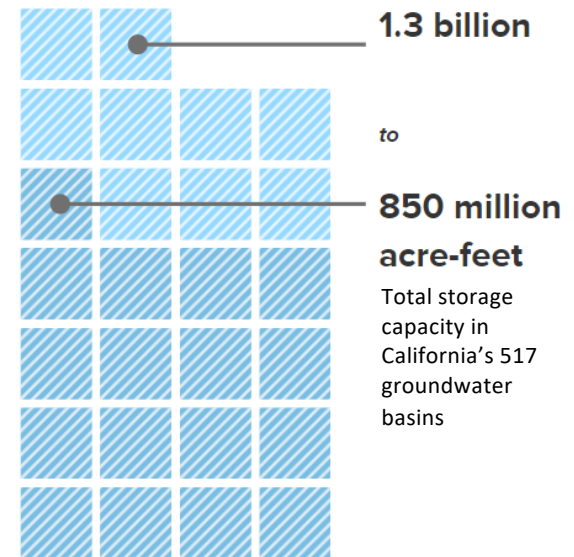
Modified From Hanak et al. (2011)

# California Surface Water vs. Groundwater Storage Capacity

**Reservoir Capacity**  
>100 years of regulation



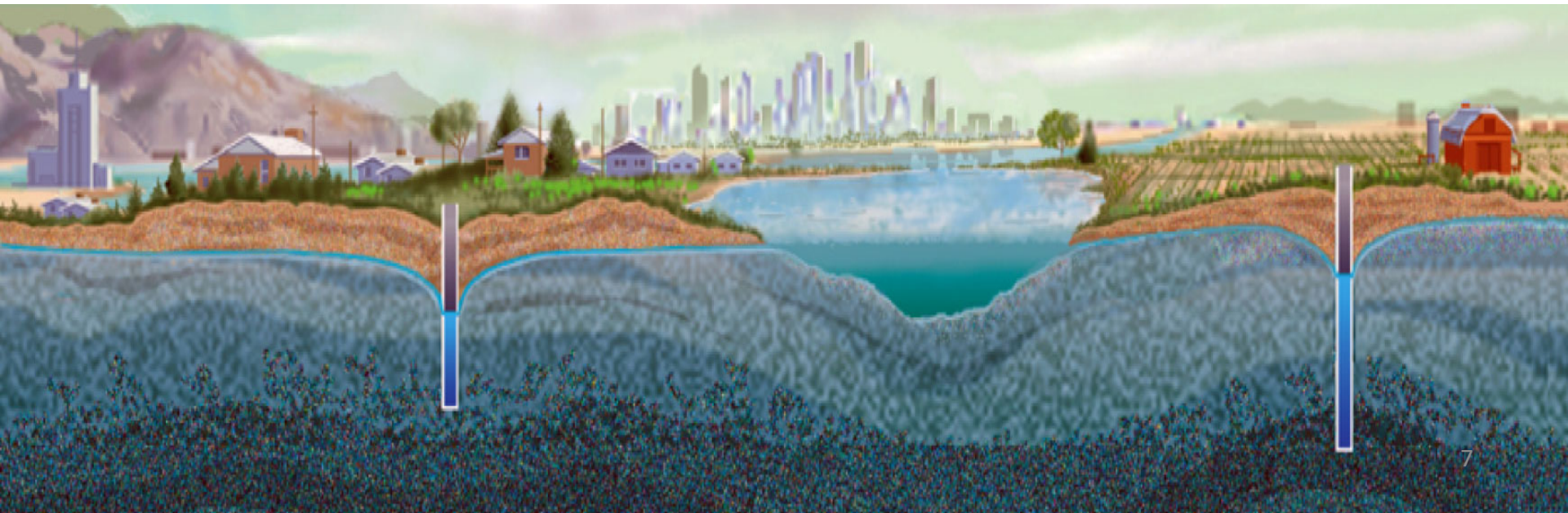
**Groundwater Basin Capacity**  
4 years of regulation



In an average year,  
**almost**

**40%**

**of California's  
supply comes from  
GROUNDWATER**





In dry years,  
up to

60%

of California's  
supply comes from  
**GROUNDWATER**





85

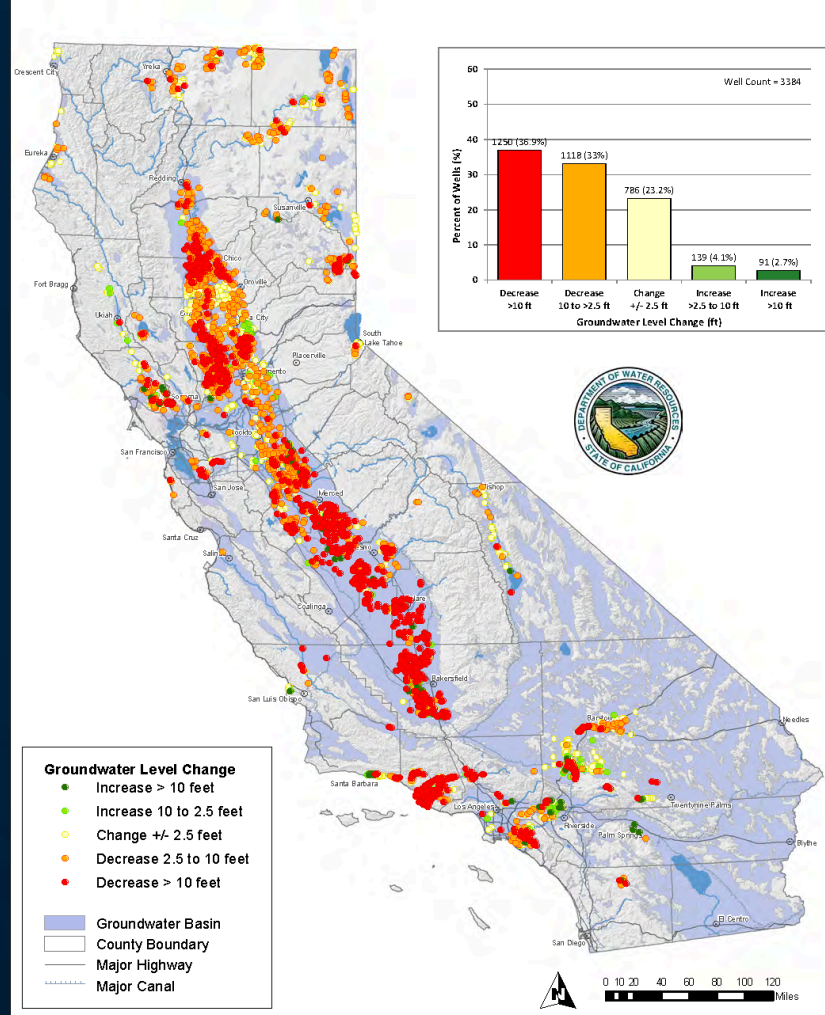
%

of Californians  
rely on groundwater

# California's 2011-2017 Drought

Oct. 2011-Mar. 2014  
 Driest 30-month period  
 on record since 1895  
 (National Climatic Data  
 Center)

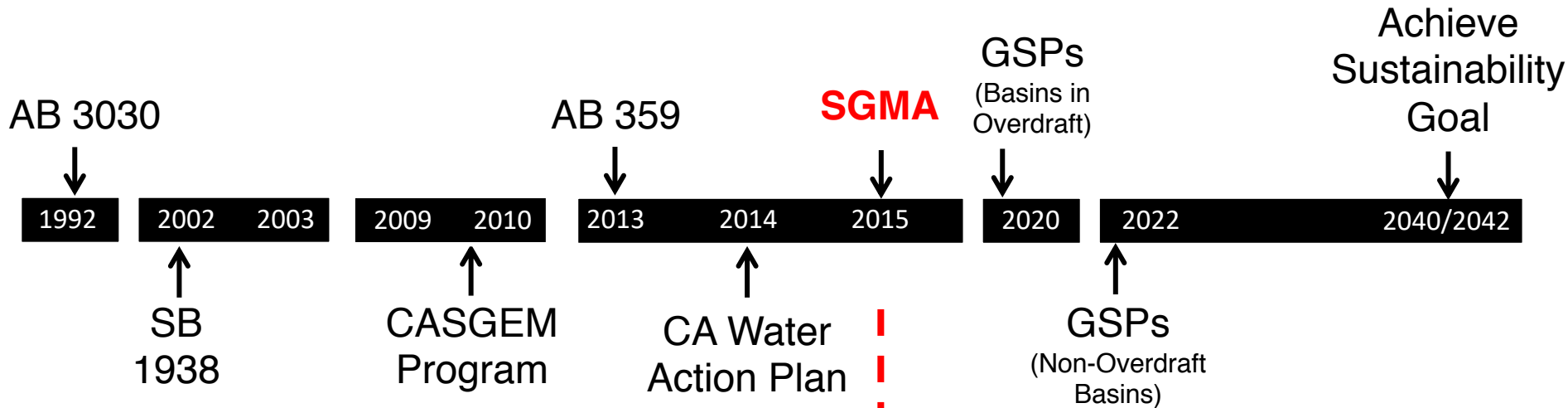
Groundwater Level Change\* - Spring 2011 to Spring 2014



Water Year 2014  
 Third driest on record  
 (critical)



# California's Groundwater Management Milestones



## Voluntary Groundwater Management (Non-Regulatory)

- Service Area Planning
- Variable Levels of Implementation
- Variable Authority
- Grant Incentives

## Required Groundwater Management (Regulatory)

- Entire Basin Planning
- Required Implementation
- New GSA Authorities
- State Backstop (SWRCB)

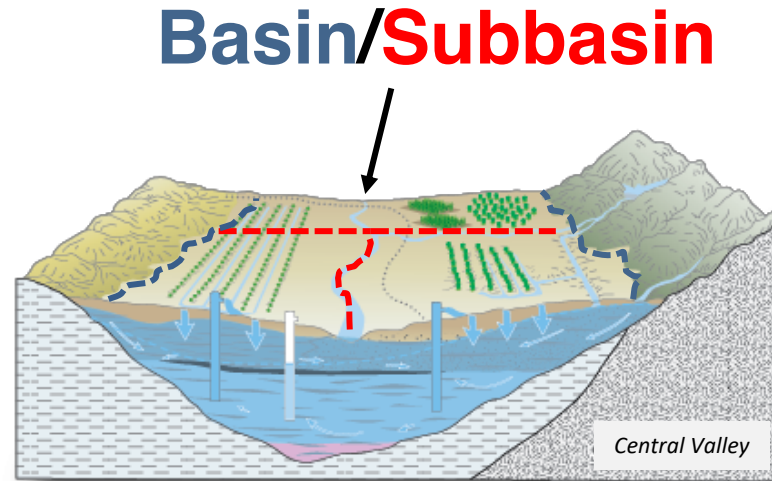
# Where Does SGMA Apply

## 515 Basins/Subbasins

- GW Pumping: 20.5 MAF
- Population: 30.4 M
- Irrigated Acres: 7.5 M



■ Groundwater Basins



# Where Does SGMA Apply

## 515 Basins

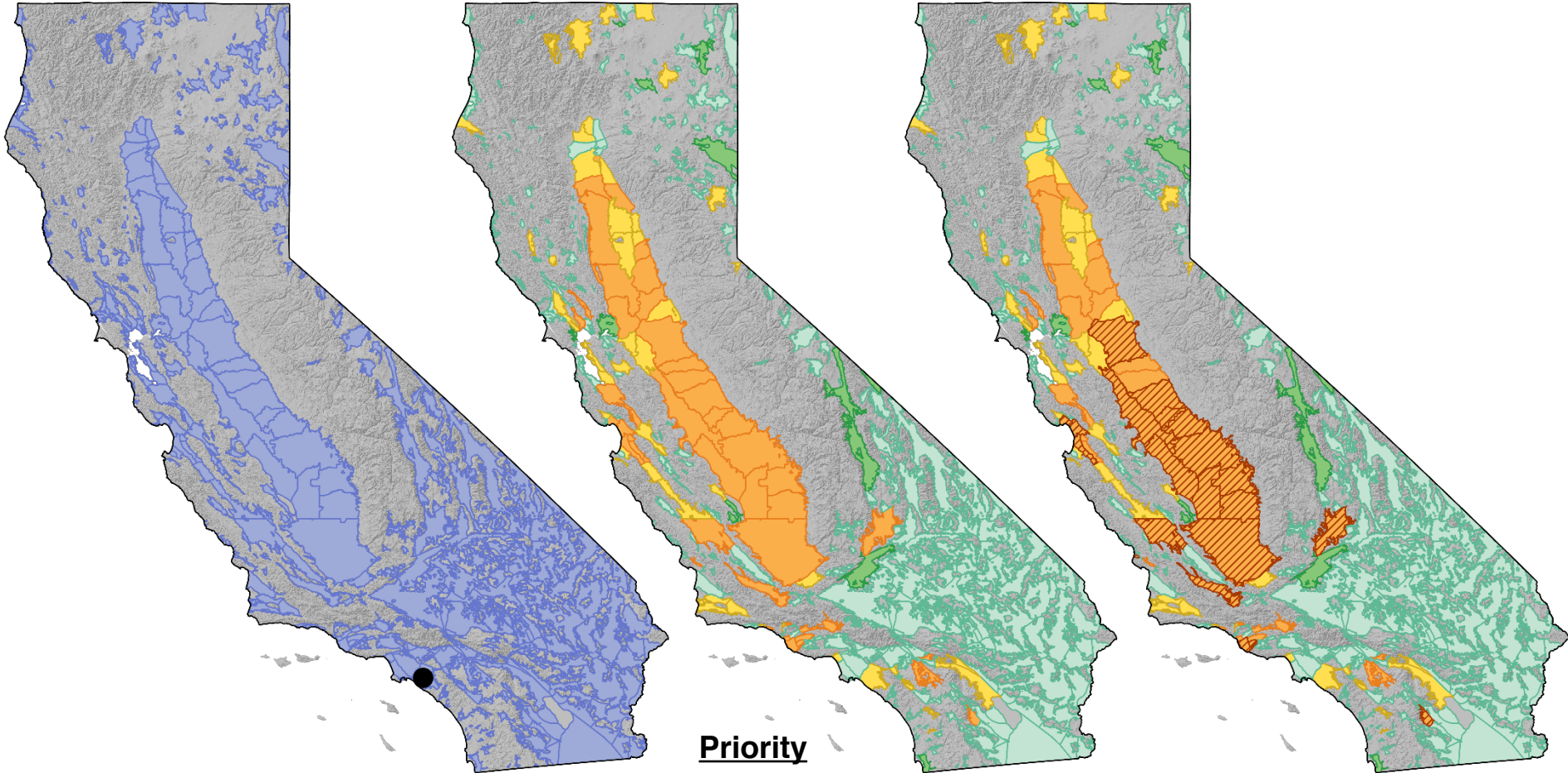
- GW Pumping: 20.5 MAF
- Population: 30.4 M
- Irrigated Acres: 7.5 M

## 94 SGMA Required Basins

- GW Pumping: 18.3 MAF (90%)
- Population: 15.4 M (51%)
- Irrigated Acres: 6.7 M (88%)

## 21 Critically Overdrafted Basins

- GW Pumping: 12.8 MAF (62%)
- Population: 3.7 M (12%)
- Irrigated Acres: 4 M (53%)



Groundwater Basins

### Priority

High Medium  
Low Very-Low

Critically Overdrafted Basins

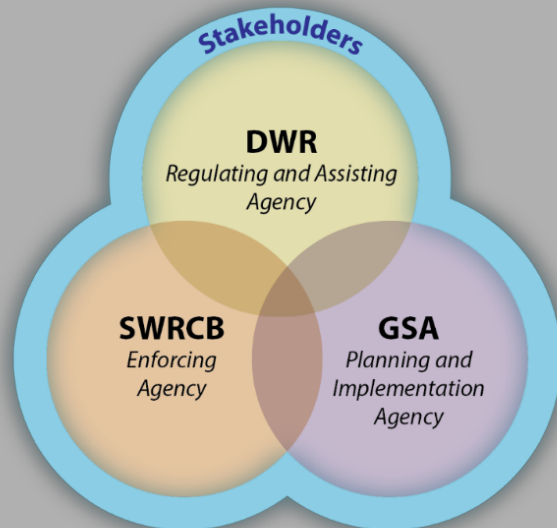
# SGMA Overview

## Local Control



*“Groundwater management in California is best accomplished locally.”*

Governor Jerry Brown, September 2014



## Sustainability

*Avoid Six Undesirable Results*



Lowering  
GW Levels



Reduction  
of Storage



Seawater  
Intrusion



Degraded  
Quality



Land  
Subsidence



Surface Water  
Depletion

# SGMA Steps

1. Form  
GSA

June 2017

2. Develop  
GSP

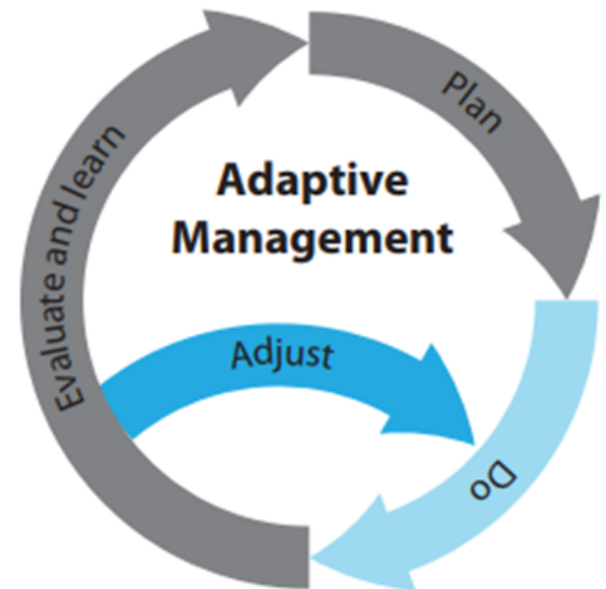
Jan 2020/22

3. Implement  
GSP

Over 20 yrs

4. Achieve  
Sustainability

2040/42

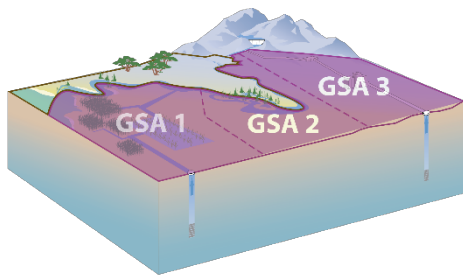


\*As of June 2019

# GSP Components

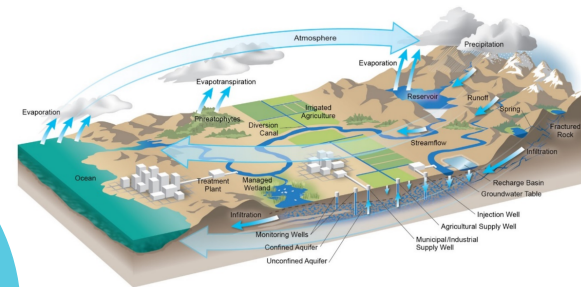
## Who

- Administrative Information -



## What

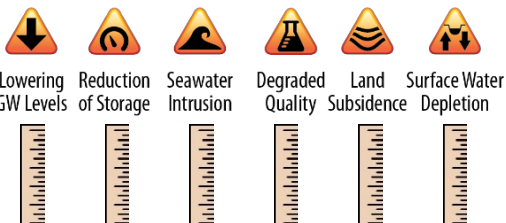
- Basin Setting -



**GSP**

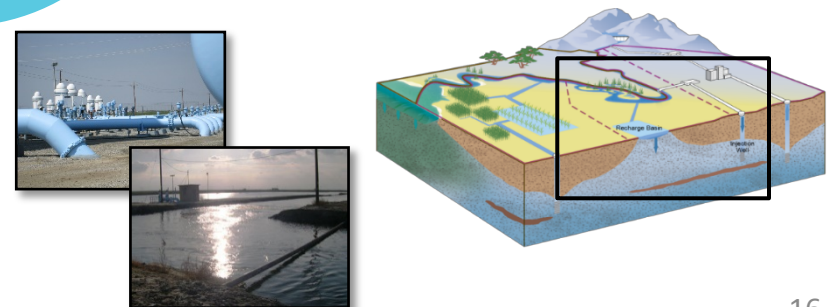
## Where

- Sustainable Management Criteria -  
- Monitoring Network -



## How

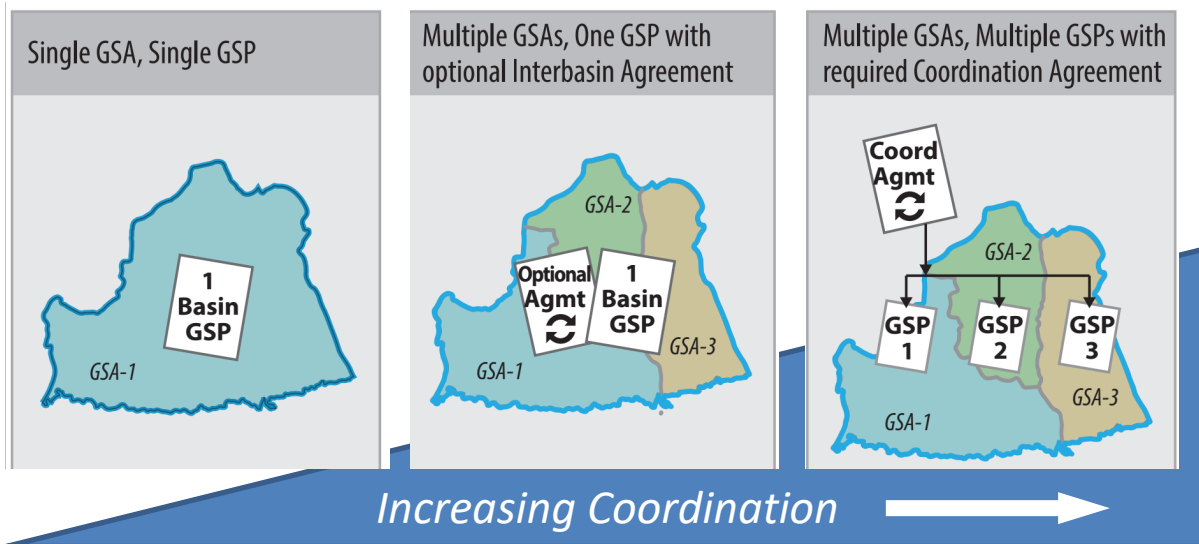
- Projects & Management Actions -



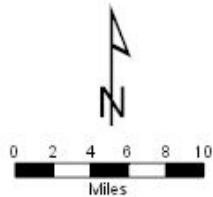


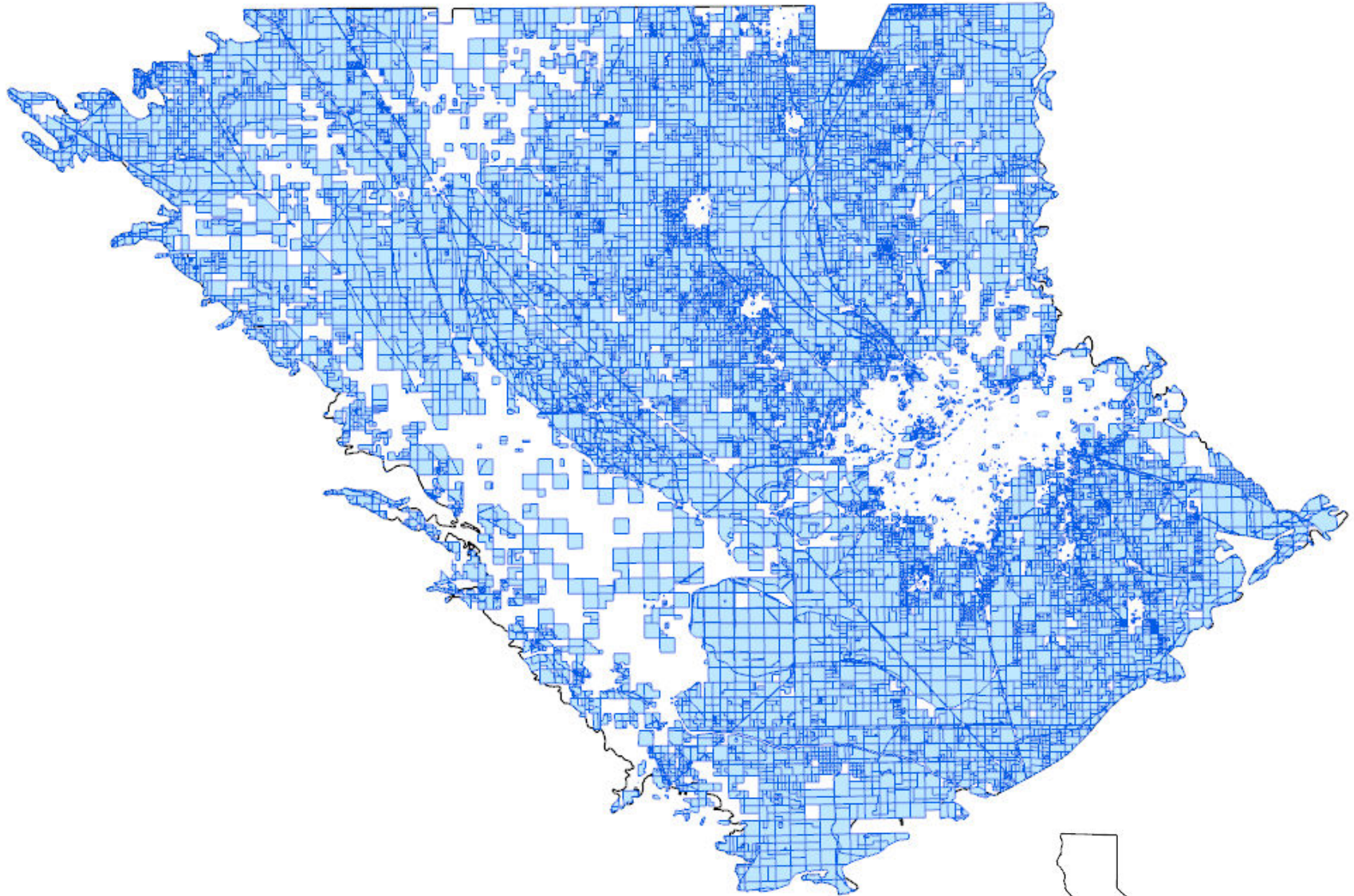
# Governance & Management Challenges

- New Governance and Management Structures
- Local and Regional Coordination
- Balancing Competing Interests
- Sustainable Funding

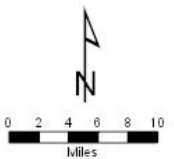


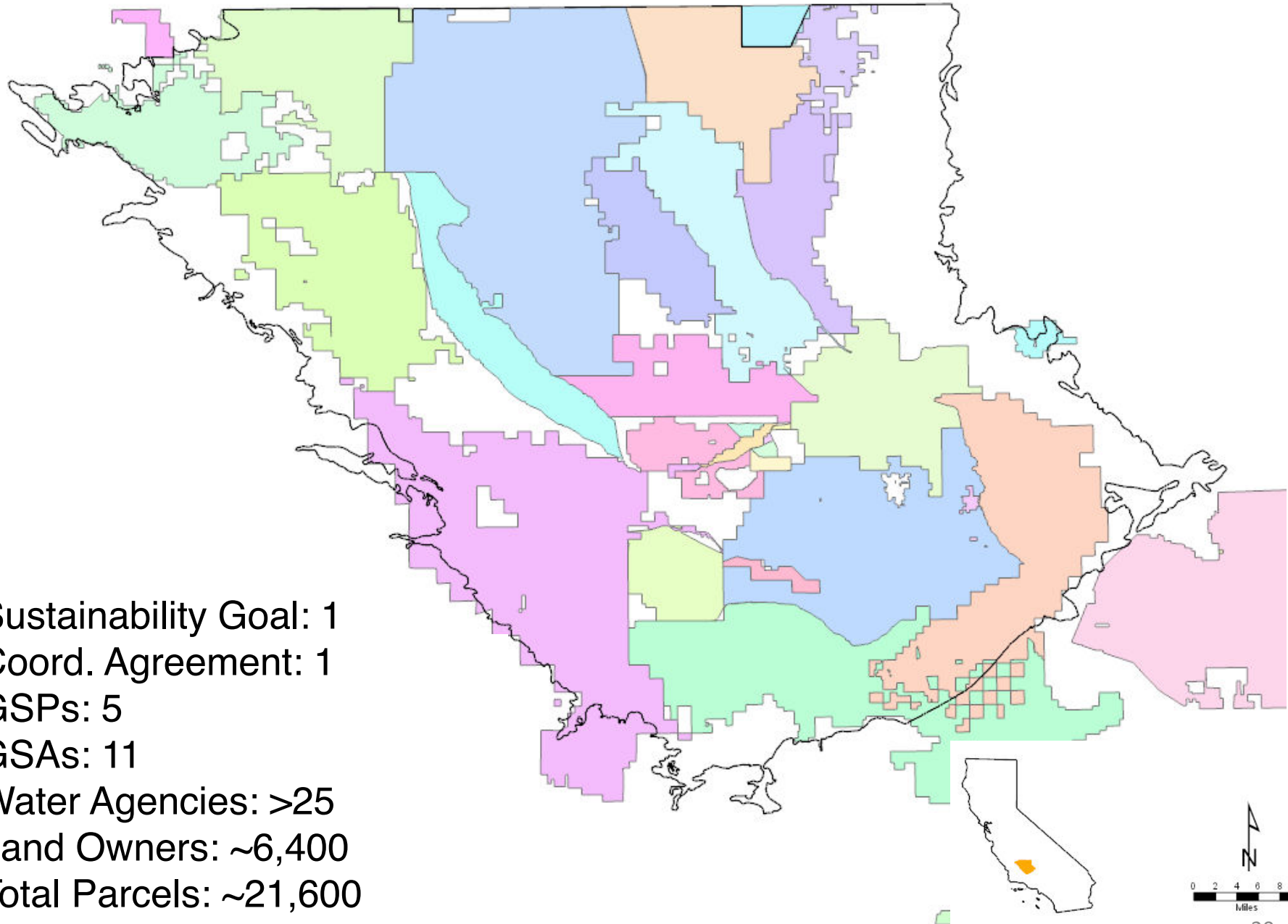
# Example





Land Owners: ~6,400  
Total Parcels: ~21,600





Sustainability Goal: 1  
Coord. Agreement: 1  
GSPs: 5  
GSAs: 11  
Water Agencies: >25  
Land Owners: ~6,400  
Total Parcels: ~21,600

# Quantity Challenges

- Balancing Water Budgets
- Allocations & Markets
- Hydrologic Variability & Climate Change



# Quality Challenges

- SGMA Water Quality Focus
  - Use of Groundwater
  - Projects and Management Actions Implemented as Part of the GSP
- Integration with Existing Water Quality Regulatory Programs and Laws



# Existing Water Quality Programs

**Irrigated lands regulatory program coalitions**  
(13)



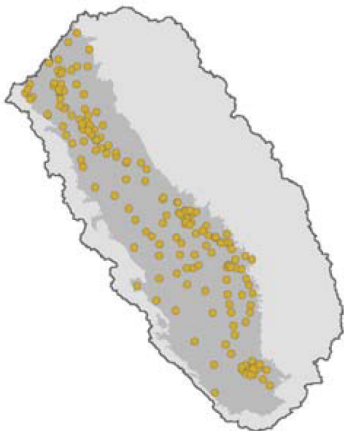
**Nitrate management zones**  
(17+)



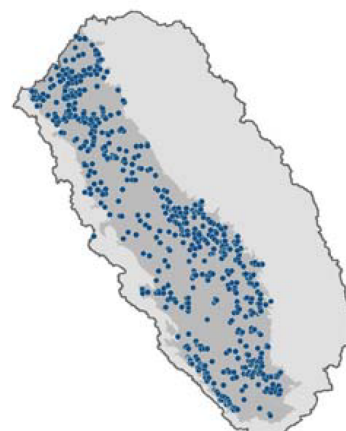
**Groundwater sustainability agencies**  
(121)



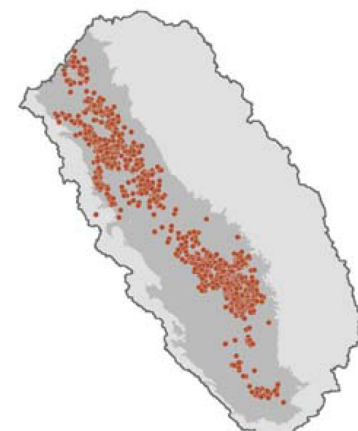
**Community water systems subject to SDWA**  
(485)



**Facilities with discharge permits**  
(~800)



**Dairies subject to dairy order**  
(~1,200)



# Solutions

Long Term

*Funding*

Near Term

*Data*

*Innovation*

*Change Management*

*Coordination*

*Investment*

*Tools*

*Monitoring*

*Public Engagement*



“ Groundwater **management**  
in California is best  
accomplished **locally.** ”

Former Governor Jerry Brown



**DWR Groundwater Management Program**  
<https://water.ca.gov/Programs/Groundwater-Management>