Groundwater and Sustainability

Department of Water Resources

South Central Region Office

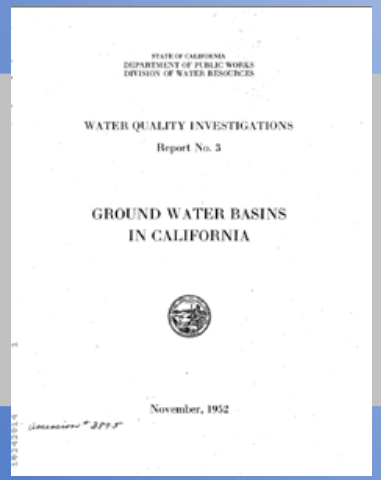
June 2016

Outline

- California Groundwater Overview
- Basin Priority
- Groundwater Use
- SGMA Overview/Update

Development of California Groundwater Basins and Subbasins

- Groundwater Basins & Subbasins Are Defined in DWR Bulletin 118 Using the Best Available Data
- Modifications to Basin Boundaries Have Occurred During B-118 Updates



1952

Bulletin 118
1975

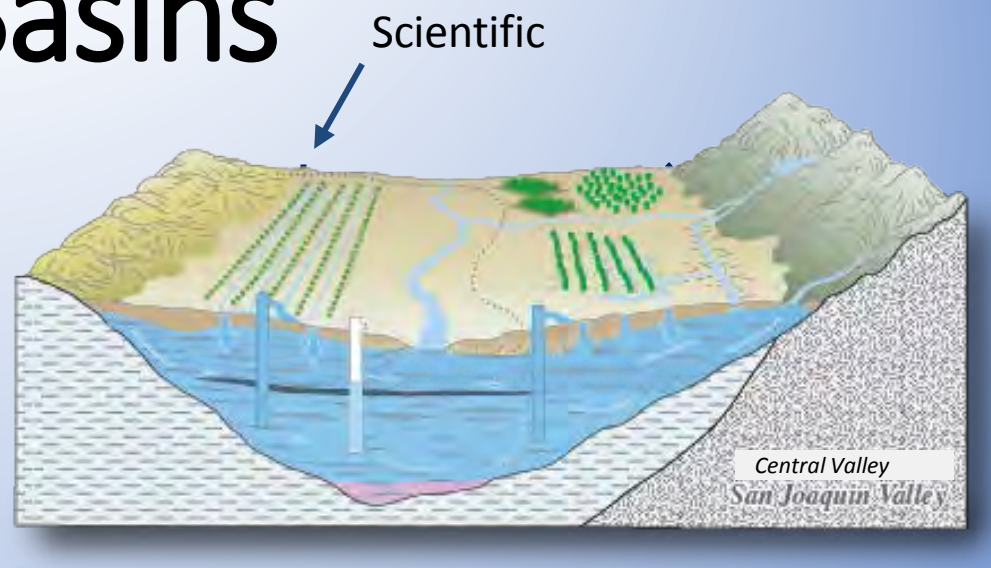
Bulletin 118
1980

Bulletin 118
2003

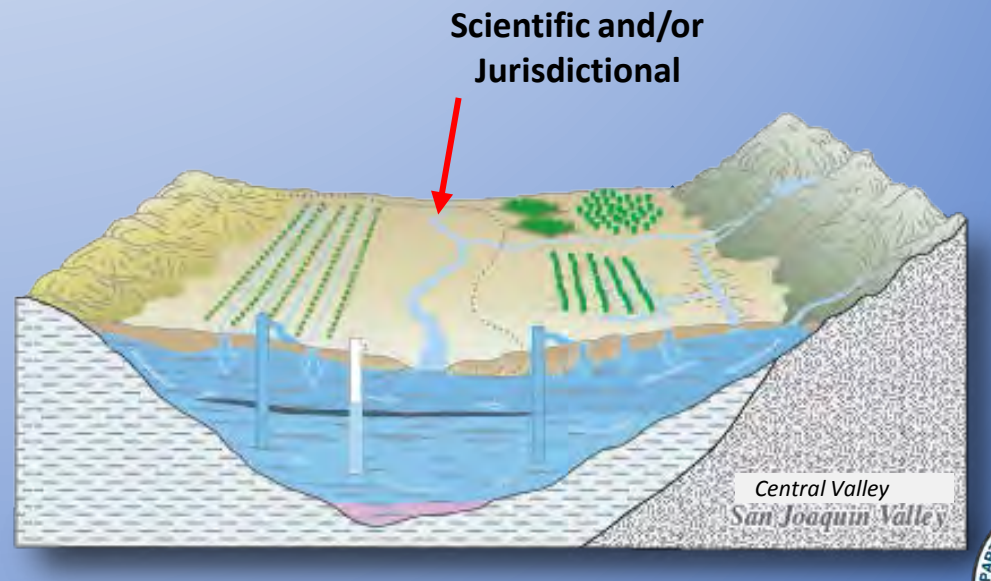
Alluvial Groundwater Basins

Groundwater Basin – An alluvial aquifer or a stacked series of alluvial aquifers with reasonably well-defined boundaries in a lateral direction and having a definable bottom

Groundwater Subbasin – A subbasin is created by dividing a groundwater basin into smaller units using geologic and hydrologic barriers or institutional boundaries



Modified from Faunt, 2009



Modified from Faunt, 2009

Crystalline-Rock Aquifers

- Consolidated “hard” rock
- Underlies mountainous & highland areas
- Only permeable where fractured
- Low yield

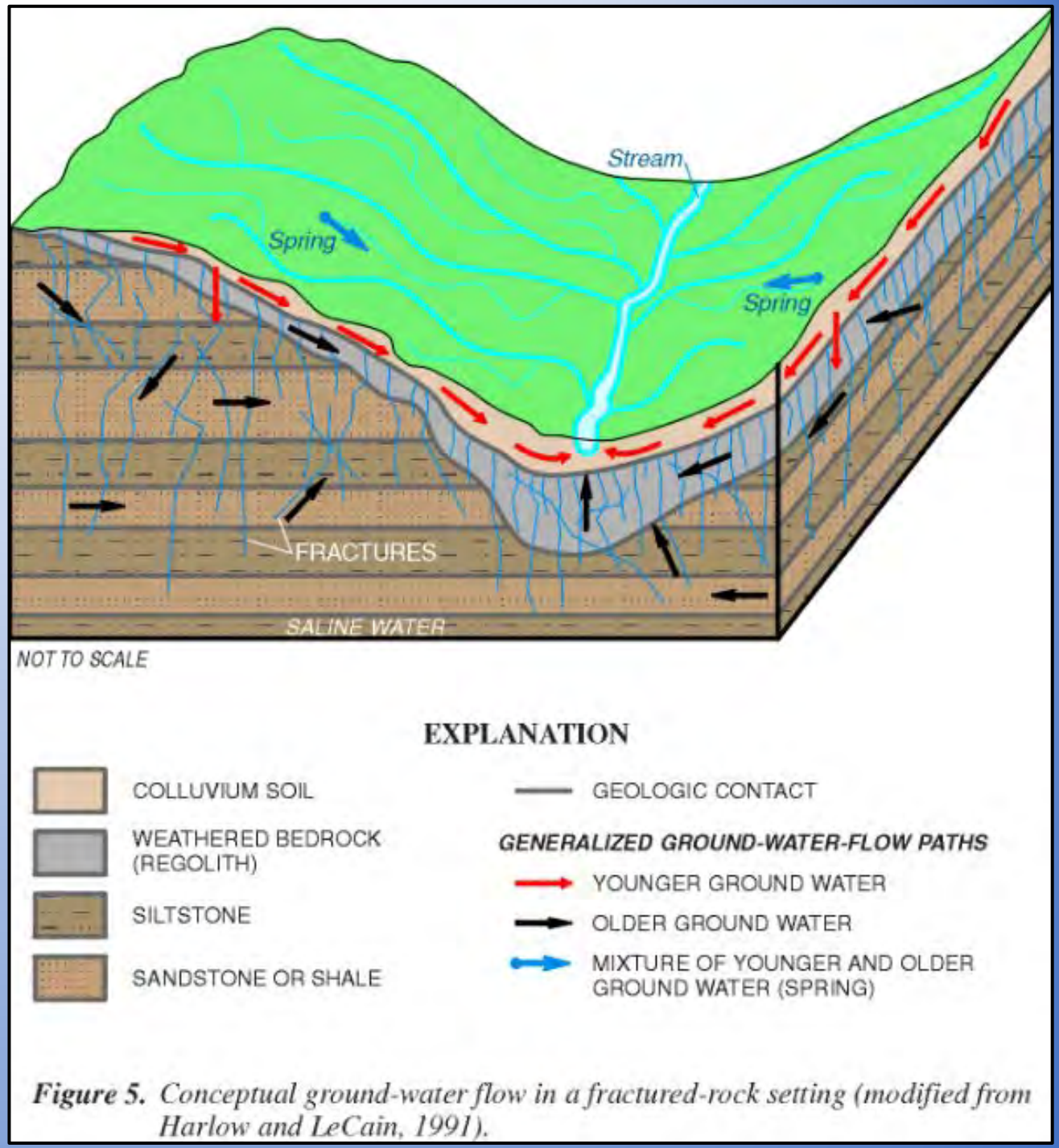
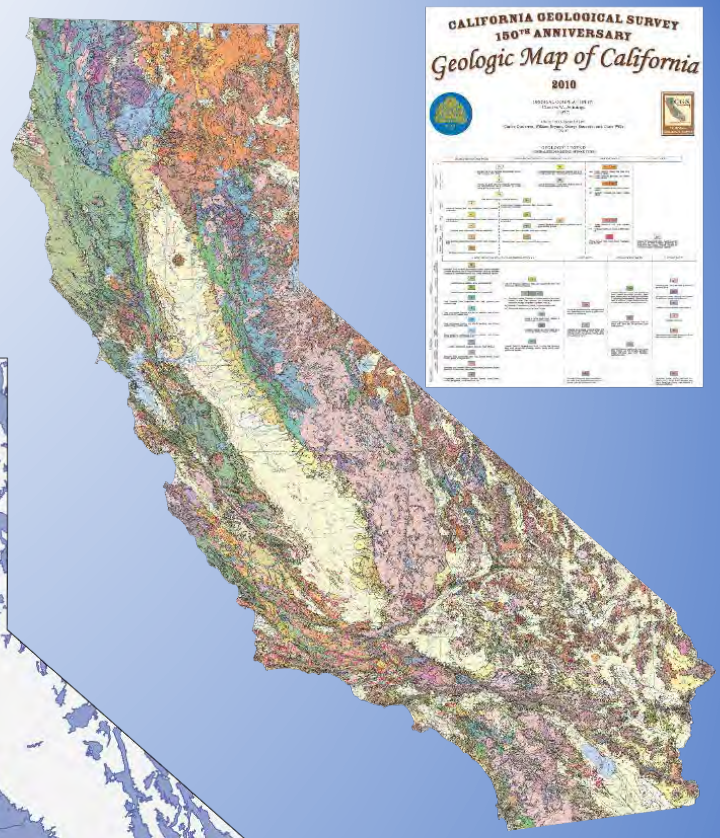


Figure 5. Conceptual ground-water flow in a fractured-rock setting (modified from Harlow and LeCain, 1991).

California Groundwater Basins

- 515 Groundwater Basins
- ~40% of groundwater use
- Varying level of detail in existing dataset



2003
B-118 Groundwater Basins

CASGEM Basin Prioritization

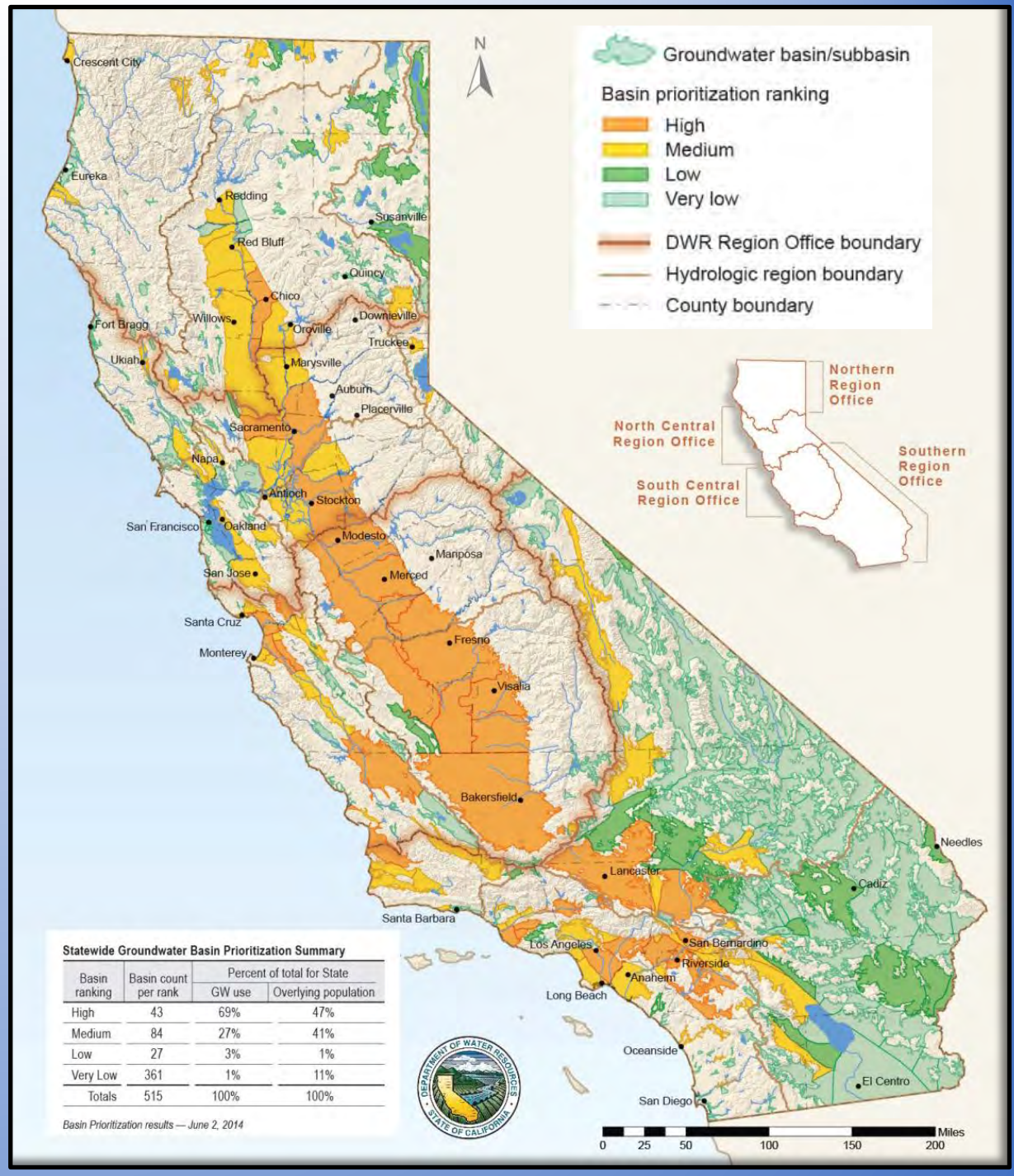
Statewide Breakdown

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/



Critically Overdrafted Basins/Subbasins

- Updated in 2016
- 7 new basins/subbasins
- 21 Total
- 11 in Central Valley

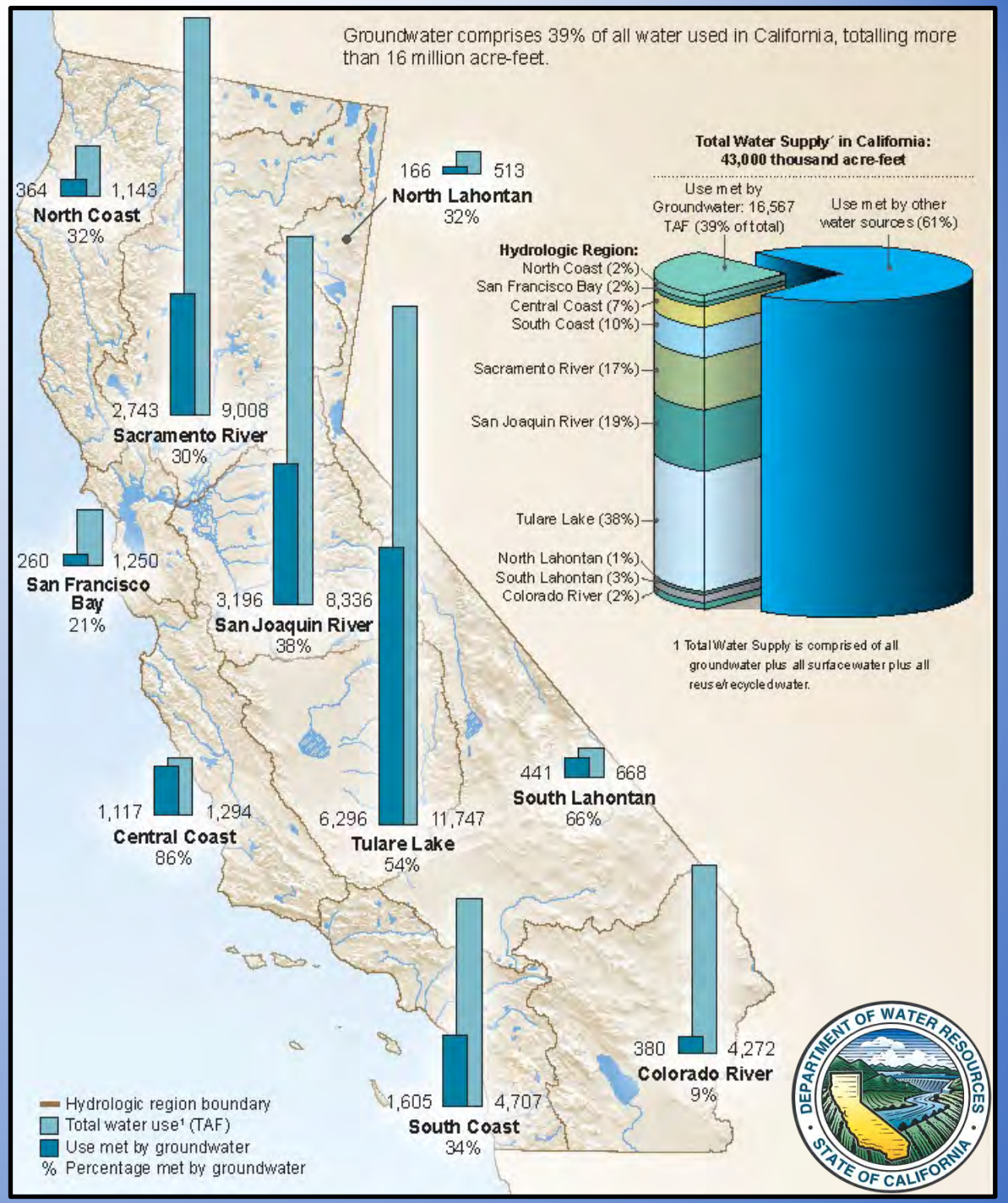
Statewide Groundwater Use

Regions with highest use:

(relative to statewide total)

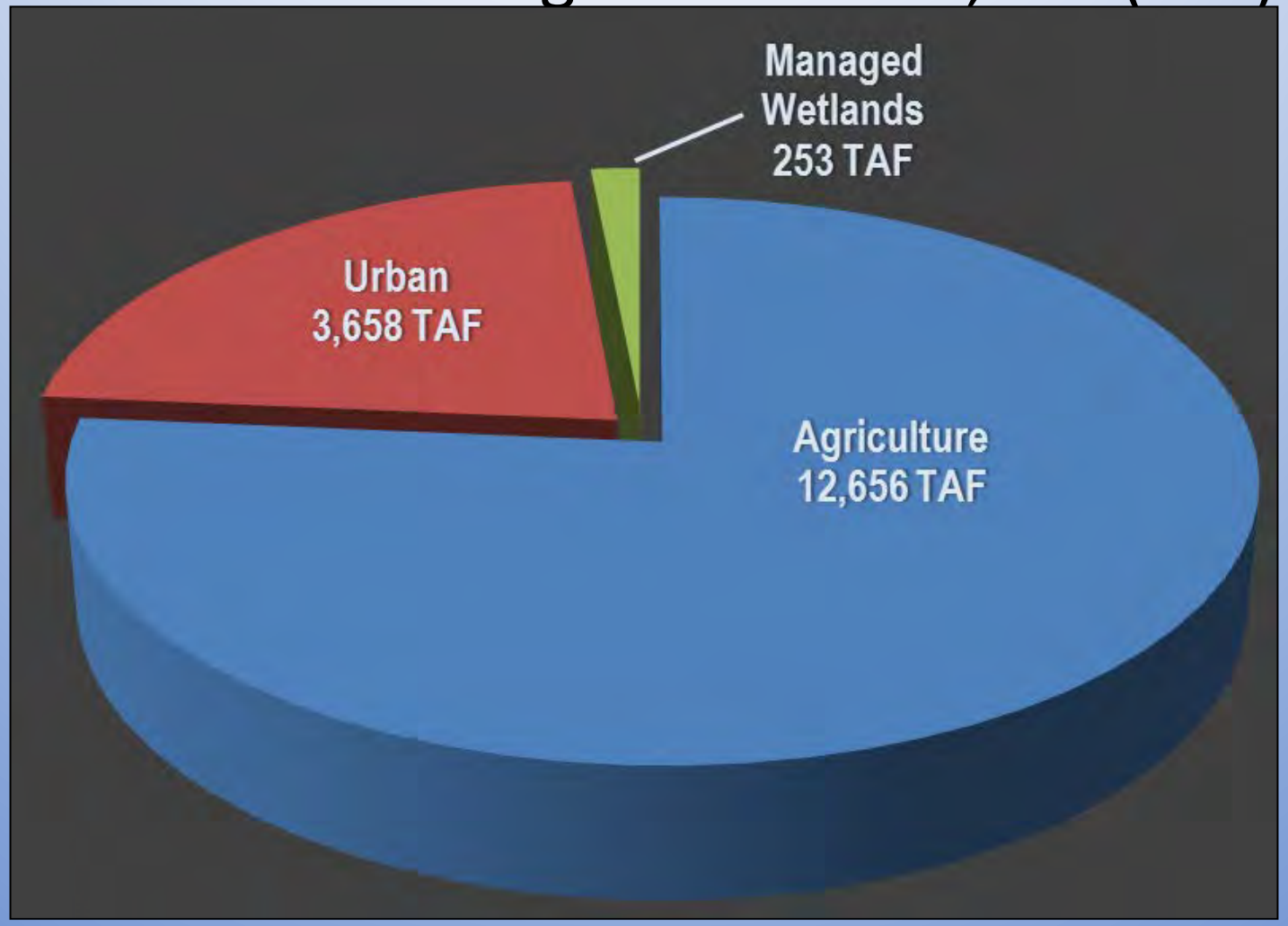
- Tulare Lake 38%
- San Joaquin River 19%
- Sacramento River 17%
- South Coast 10%

(2005 to 2010 Average Annual Data)



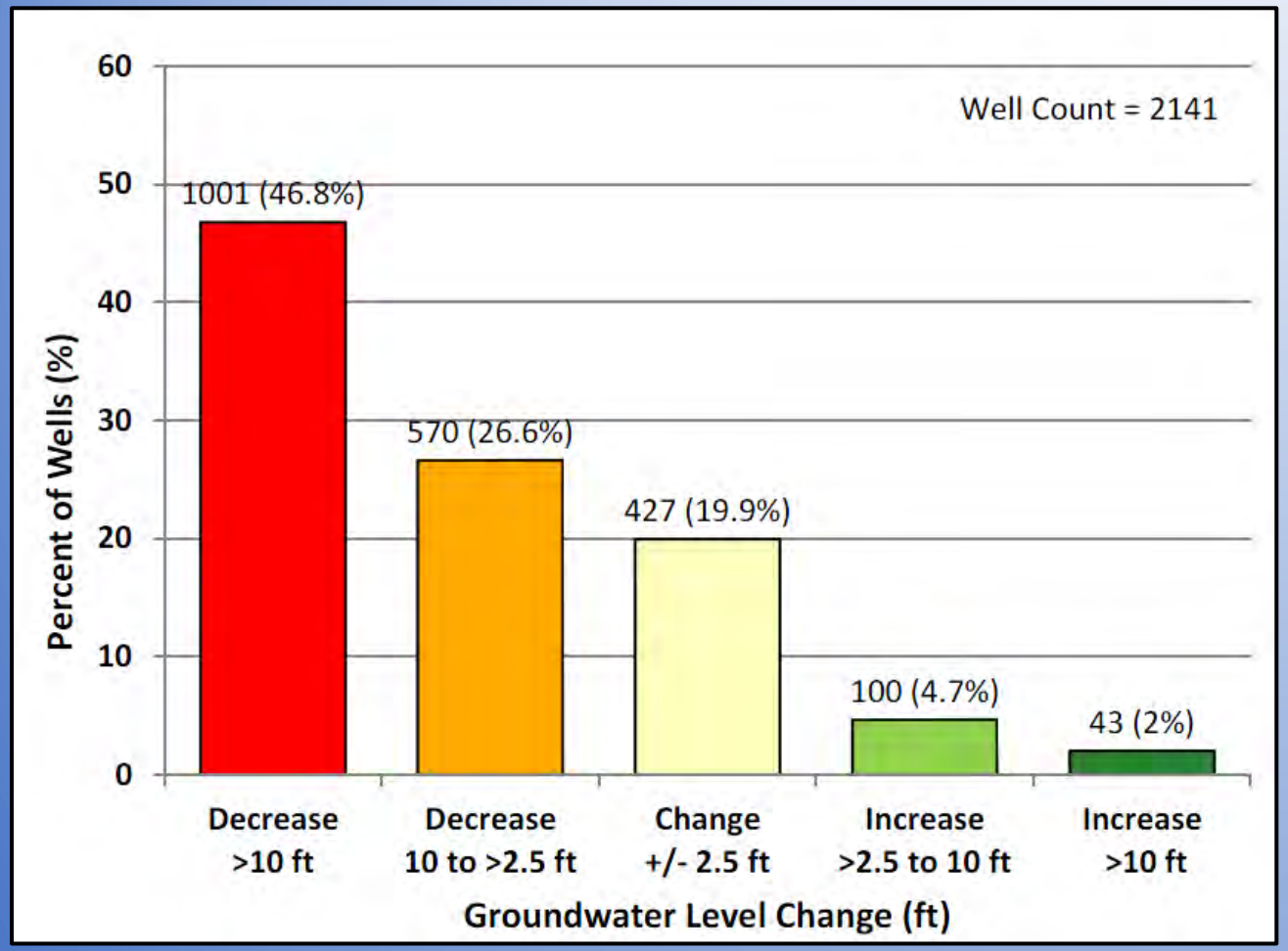
Statewide Groundwater Use

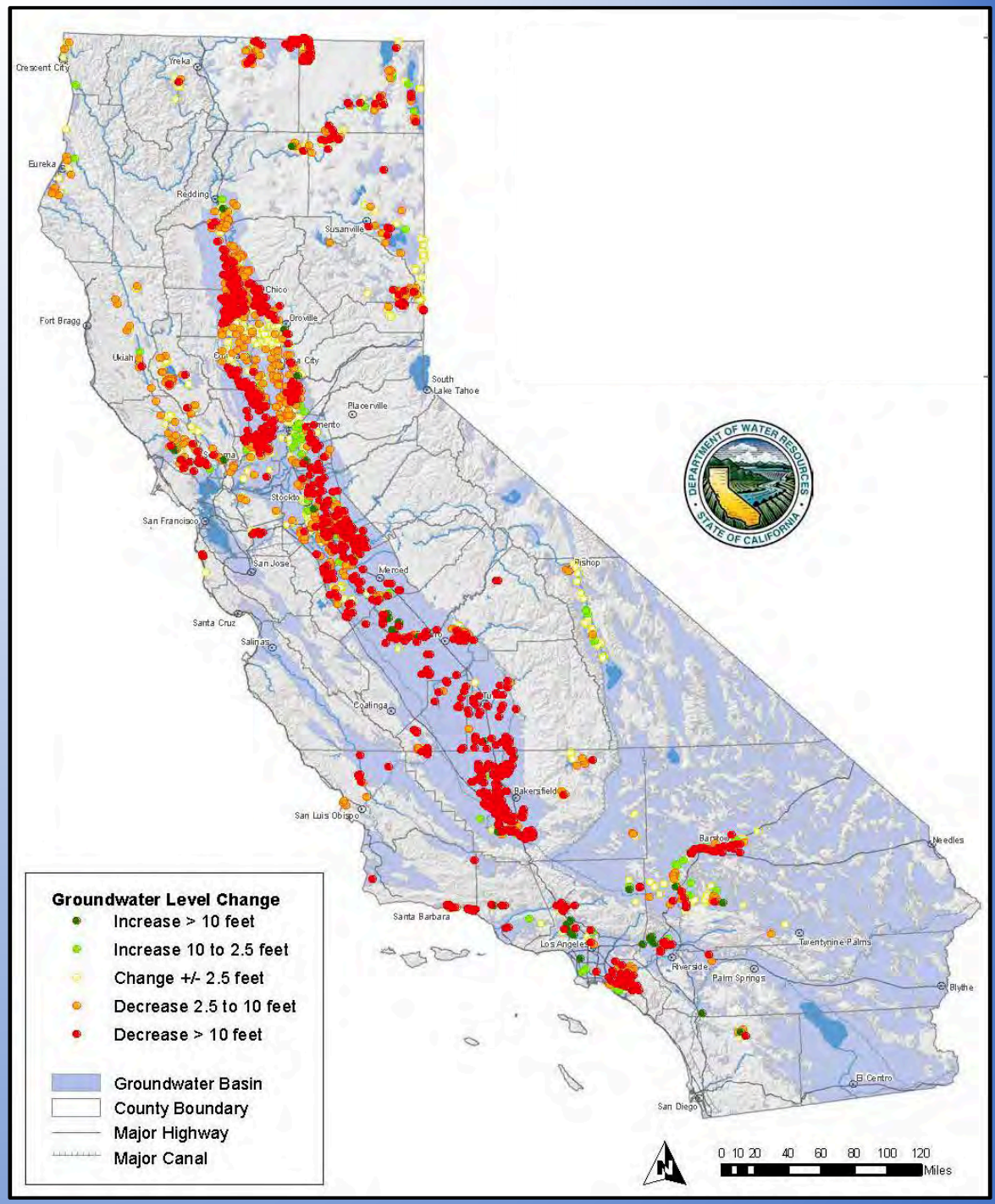
2005-2010 Average Annual: 16,567 (TAF)



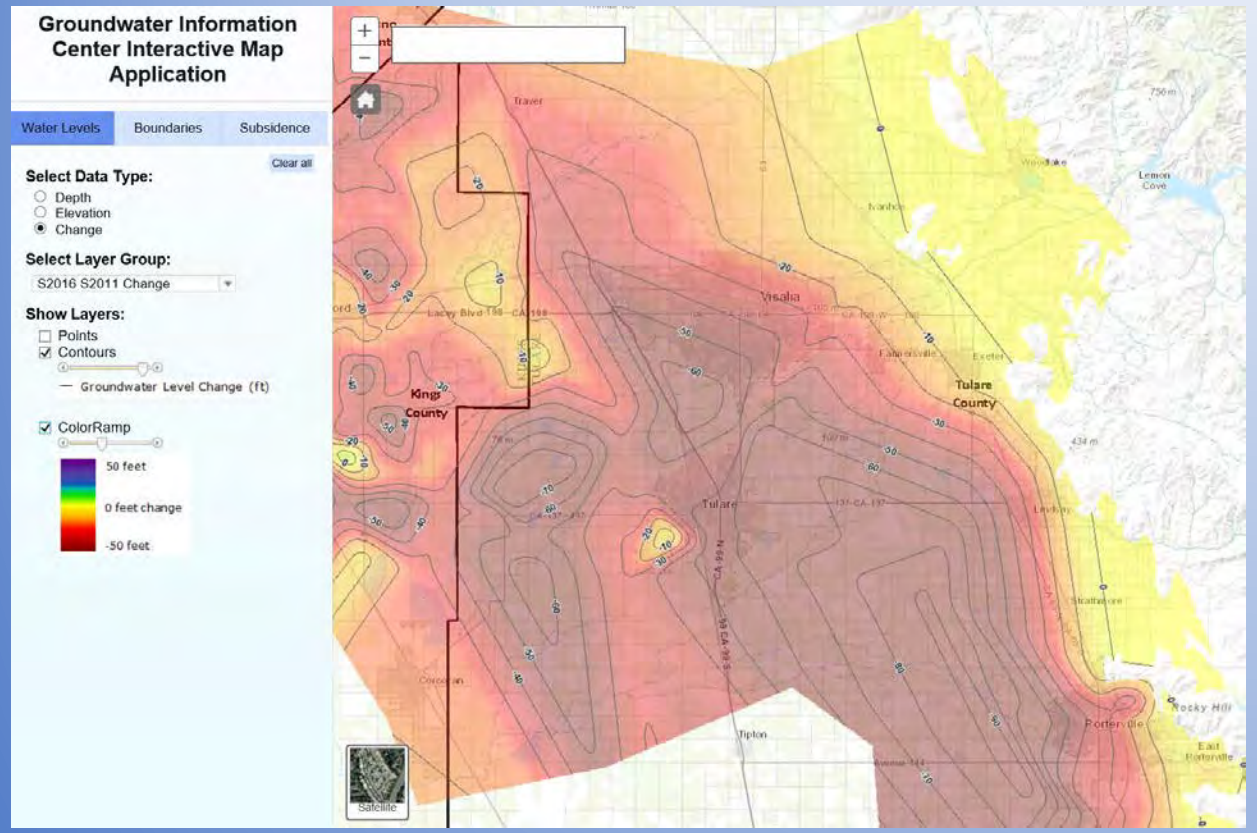
Source: California Water Plan Update 2013

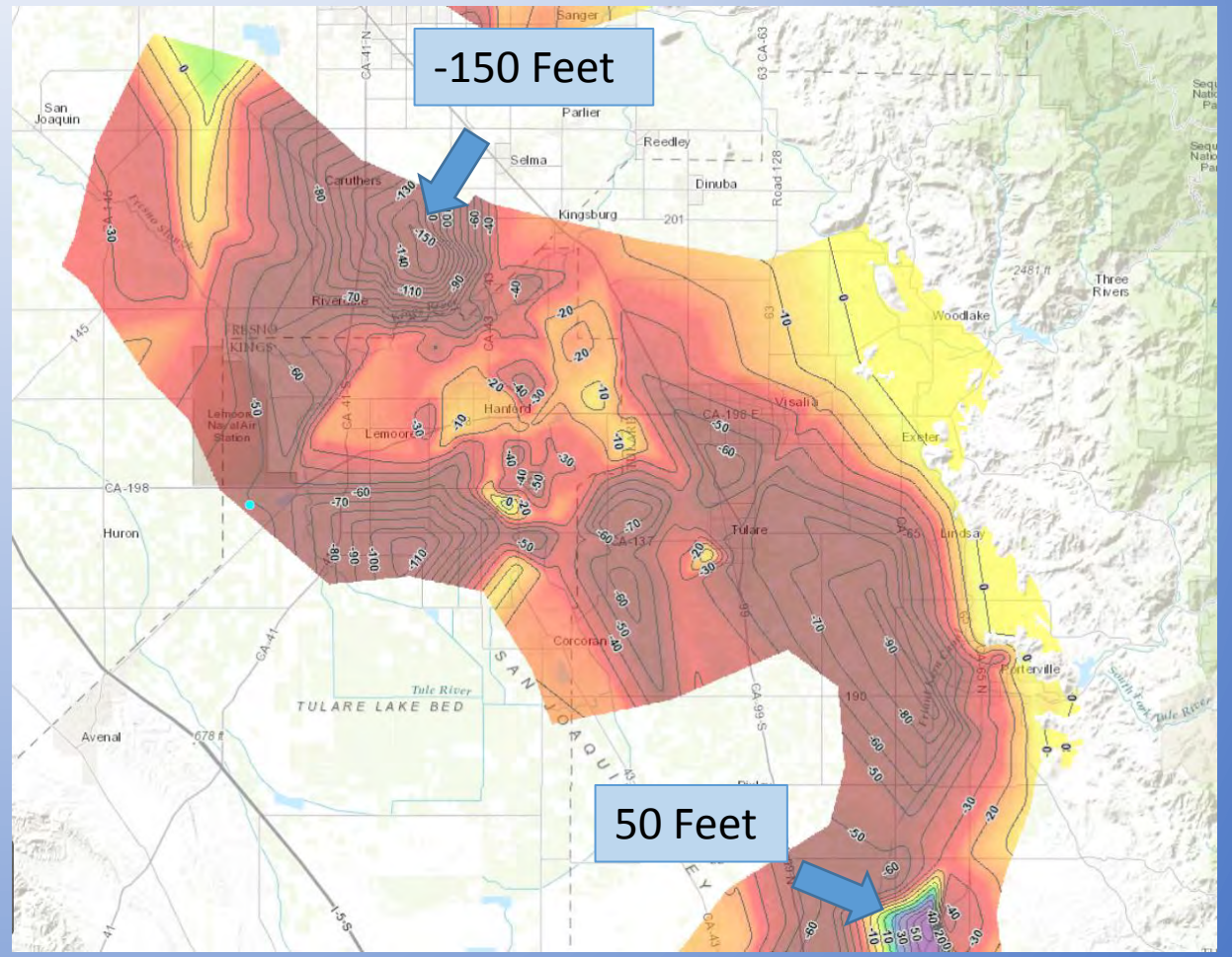
Groundwater Level Change: Spring 2005-2015





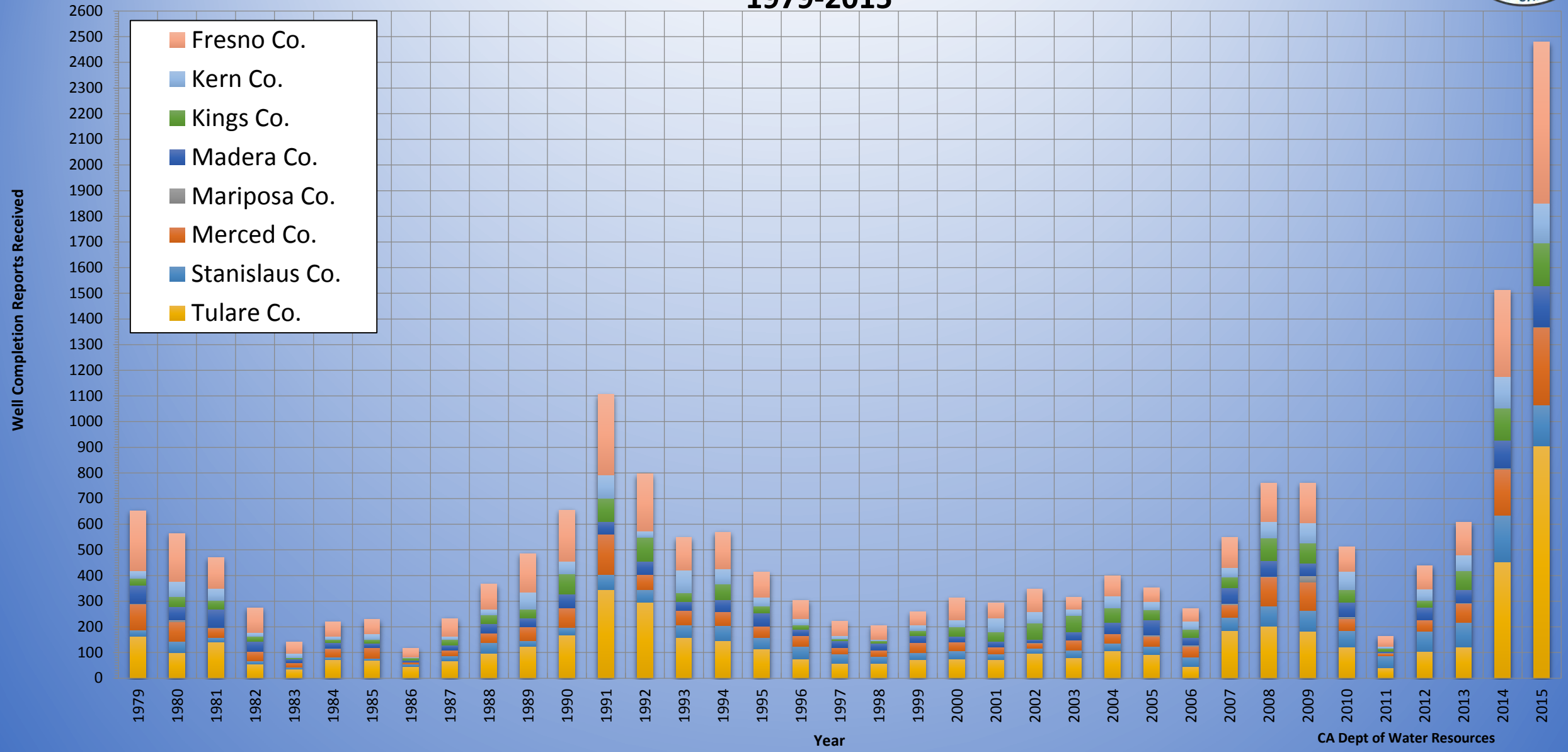
Spring 2011-2016 Change in GW Elevation – Kaweah, Tule, Tulare GW Basins





https://gis.water.ca.gov/app/gicima

New Irrigation Well Completion Reports Received
San Joaquin River and Tulare Lake Hydrologic Regions
1979-2015

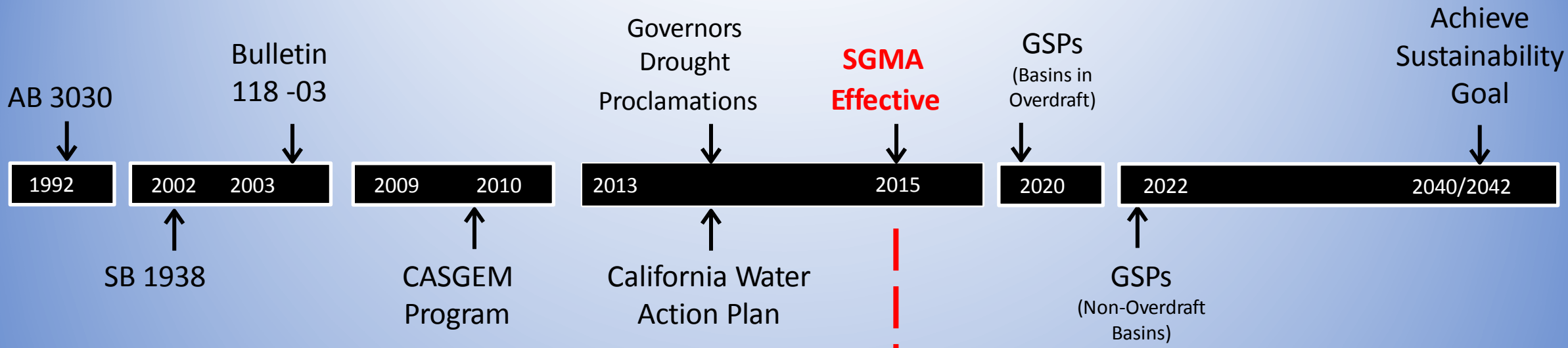


2014 Historic Groundwater Legislation

Sustainable Groundwater Management Act (SGMA)

- 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

California's Major Groundwater Milestones



Voluntary Groundwater Management

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

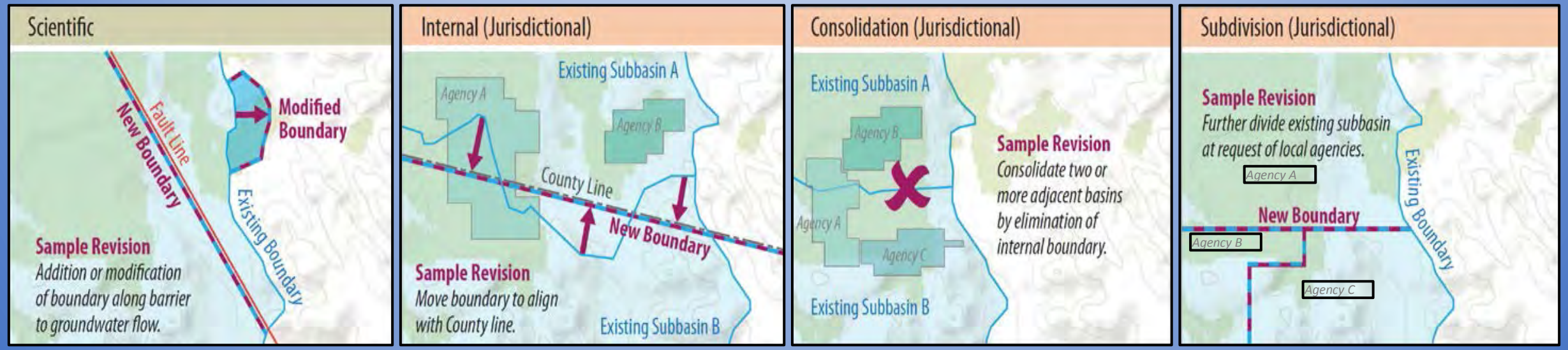
Required Groundwater Management

- Entire Basin Planning
- Required Implementation
- GSA Have New:
  - Authorities
  - Responsibilities
- State Backstop

Basin Boundary Modifications

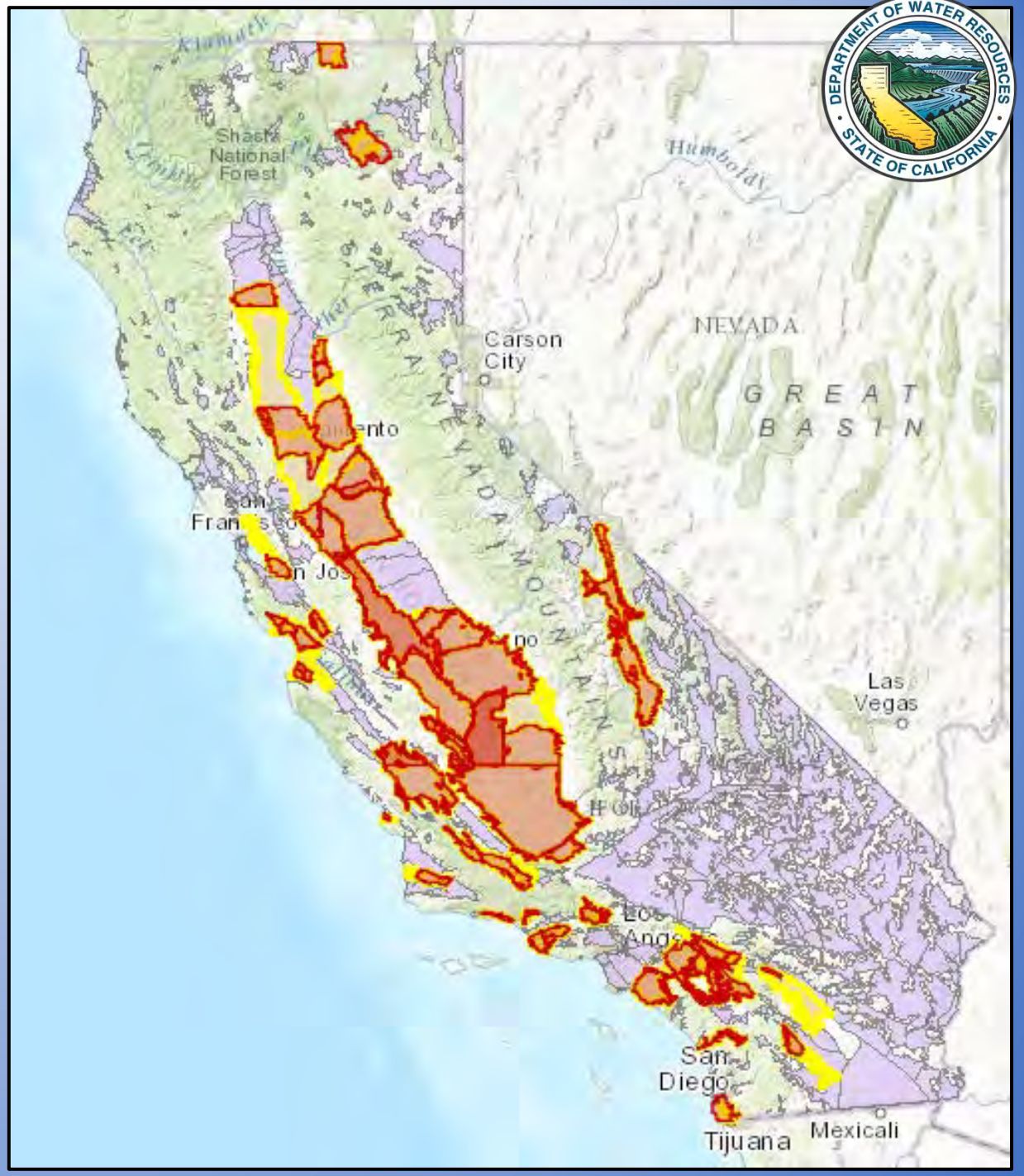
- Reviewing requests by local agencies to modify current groundwater basin/subbasin boundaries
- Requests are based on
  - Scientific Evidence
  - Jurisdictional Reasoning

Scientific	Jurisdictional



Basin Boundary Requests

- 55 Requests from local agencies to modify a basin/subbasin
- Potential for 50 basins/subbasins to change
- DWR making additional modification based on latest available science



Groundwater Sustainability Agencies

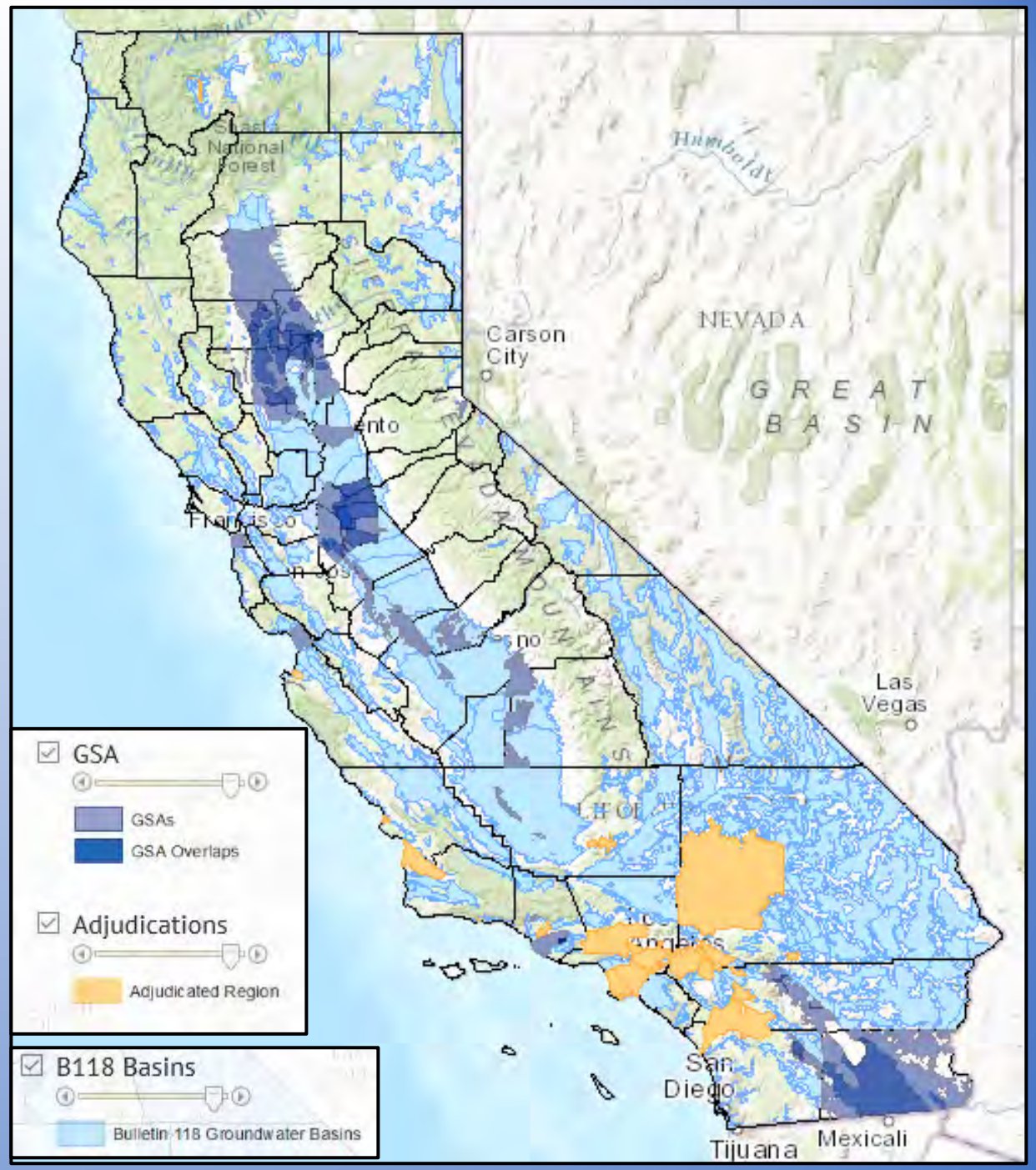
Groundwater Sustainability Agency - means one or more local agencies that may impose fees or take other actions to develop and enforce a groundwater sustainability plan

Local Agency – A local public agency that has water supply, water management, or land use responsibilities within a groundwater basin

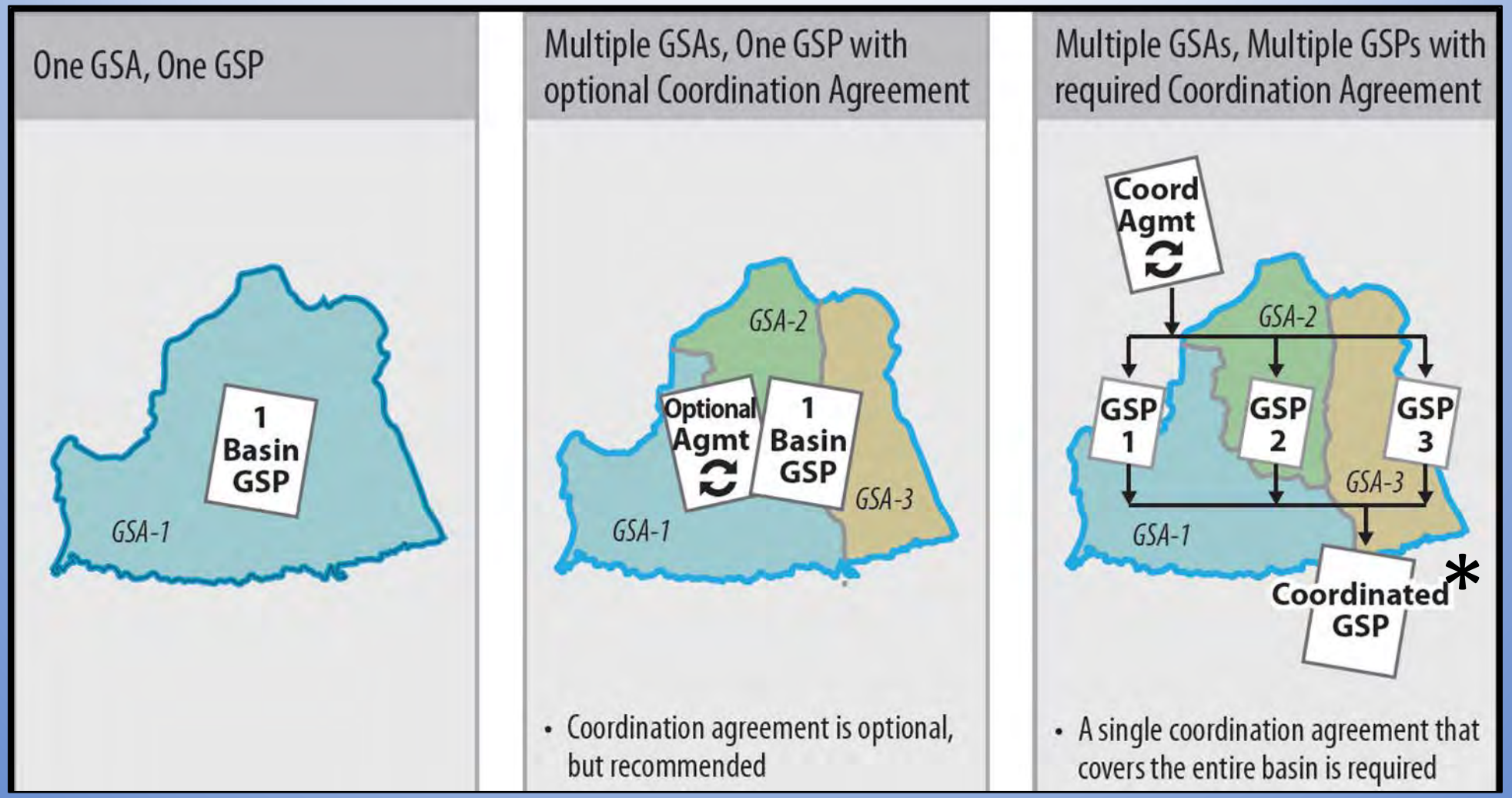
**May be one or more GSA's within each basin or subbasin but must coordinate together*

GSAs by the Numbers

- 78 Total GSA Notices
- 49 GSA's experiencing overlap
- 19 "Exclusive" GSA's
- 9 GSA notices in 90-day period
- 5 GSA notices incomplete
- 37 (H&M) basins/subbasins with GSA's formed
- 25 counties with GSA



GSP Possibilities Within a Basin/Subbasin

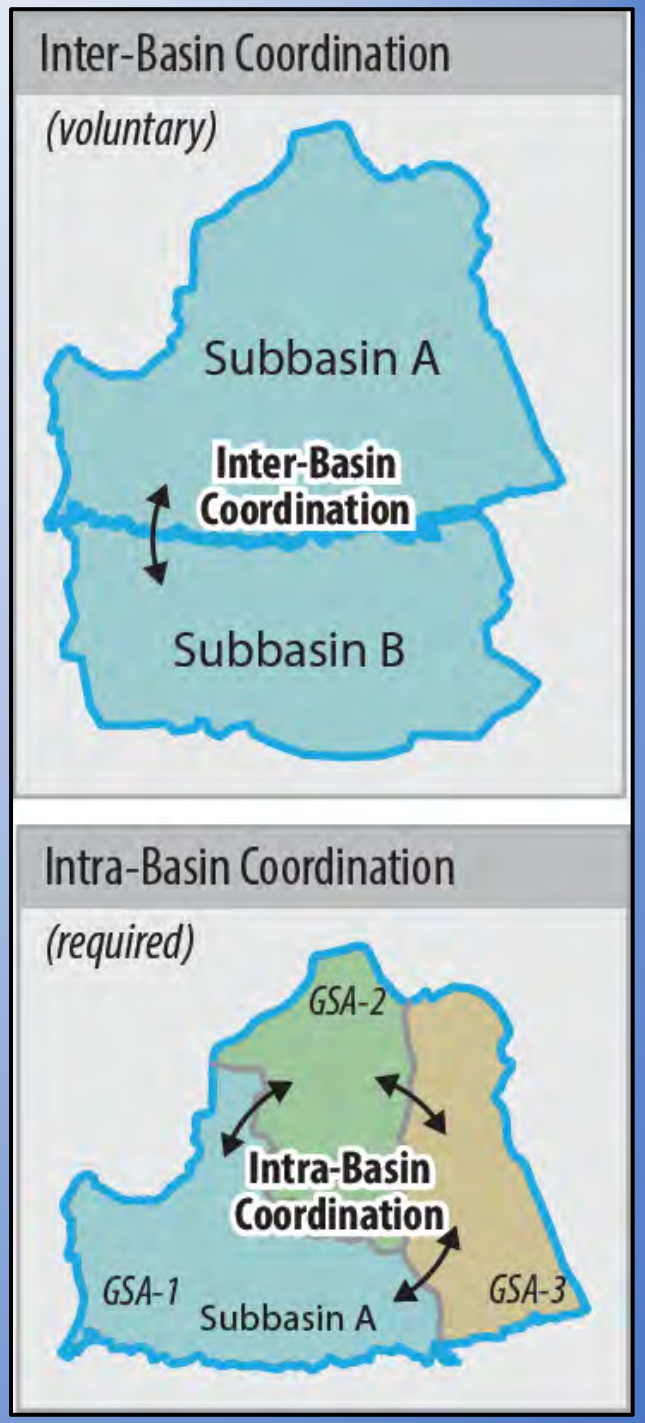


*Possible revision to draft GSP Regulations

Required Coordination for Multiple GSA's

1. **Inter-Basin Coordination:** Voluntary coordination between two or more basins that are hydraulically connected

2. **Intra-Basin Coordination:** Required coordination for basins with multiple GSPs and recommended for basins with multiple GSAs preparing a Single GSP



Overview of Groundwater Sustainability Plans

- Article 1. Introductory Provisions
- Article 2. Definitions
- Article 3. Technical and Reporting Standards
- Article 4. Procedures
- Article 5. Plan Content
- Article 6. Evaluation and Assessment
- Article 7. Reports, Assessments, and Amendments
- Article 8. Coordination Agreements
- Article 9. Alternatives and Adjudicated Areas

Groundwater Sustainability Plans

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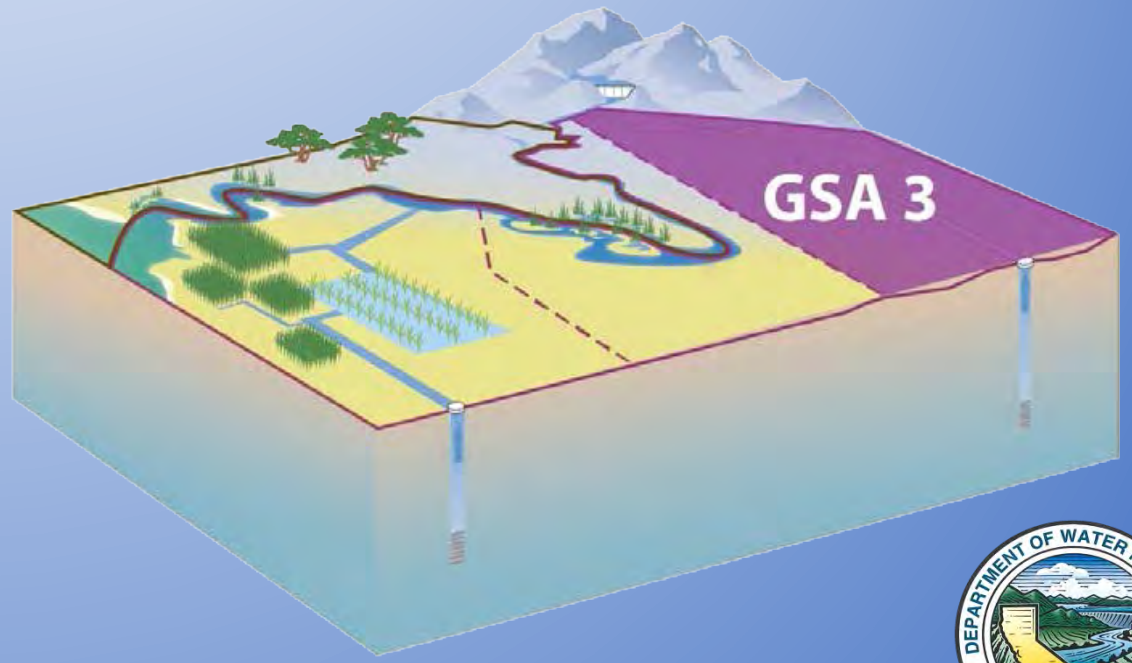
Article 5. Subarticle 1. Administrative Information

Executive Summary

Agency Information

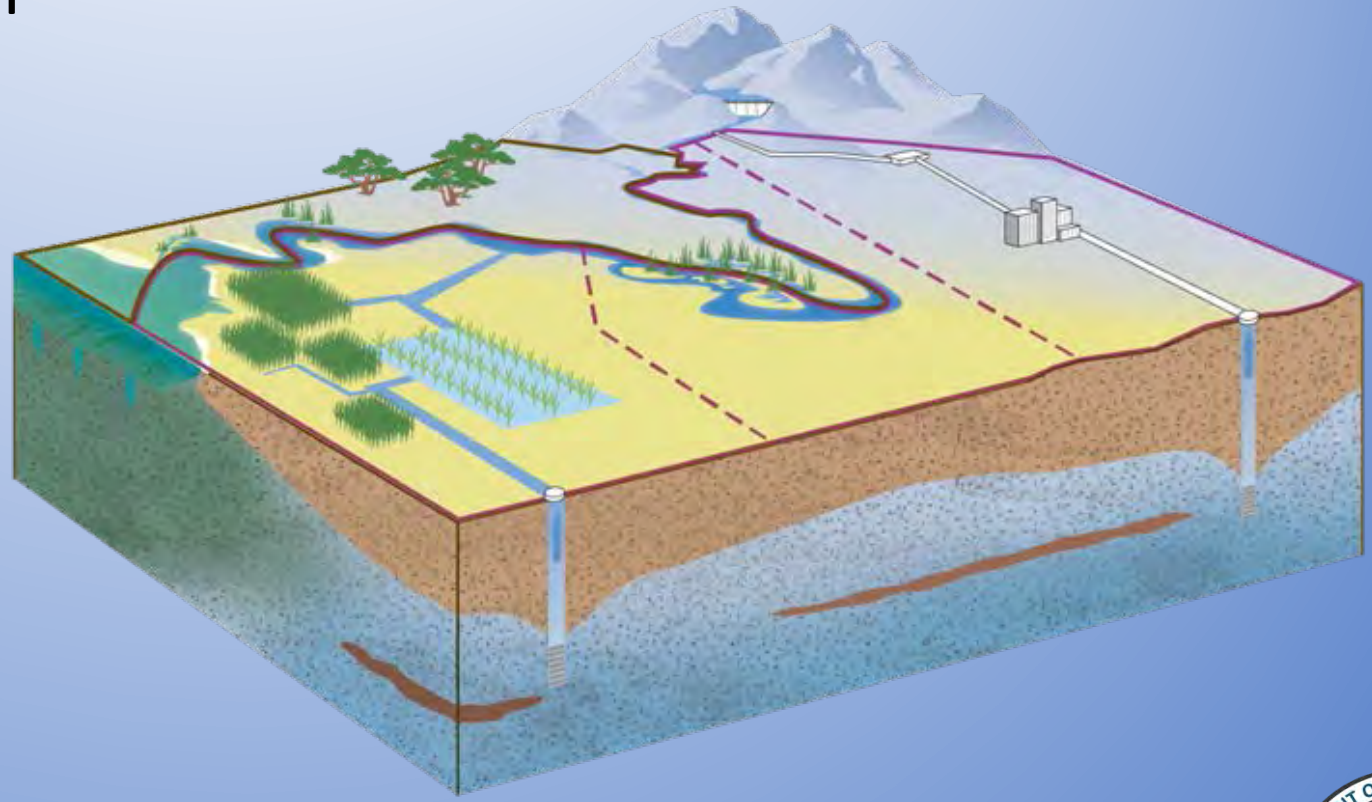
Description of Plan Area

- Jurisdictional Boundaries
- Delineation of Land Uses
- Well Distribution
- Existing Monitoring and Management Programs
- Summary of Land Use Plans



Article 5. Subarticle 2.
Basin Setting

- Hydrogeologic Conceptual Model
- Basin Conditions
- Water Budget
- Management Areas



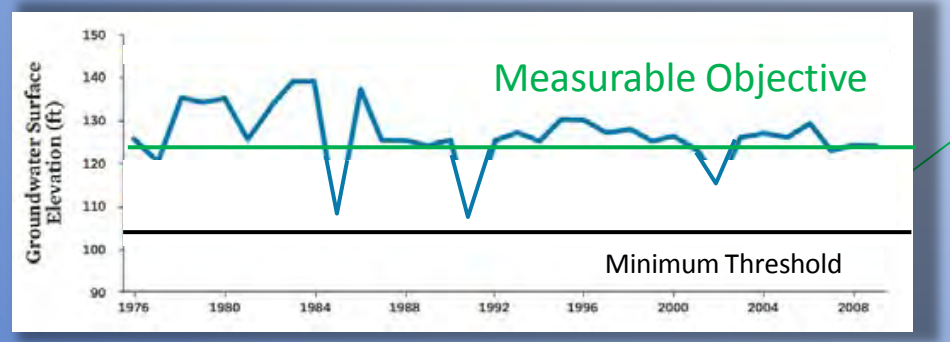
Article 5. Subarticle 3.
Sustainable Management Criteria

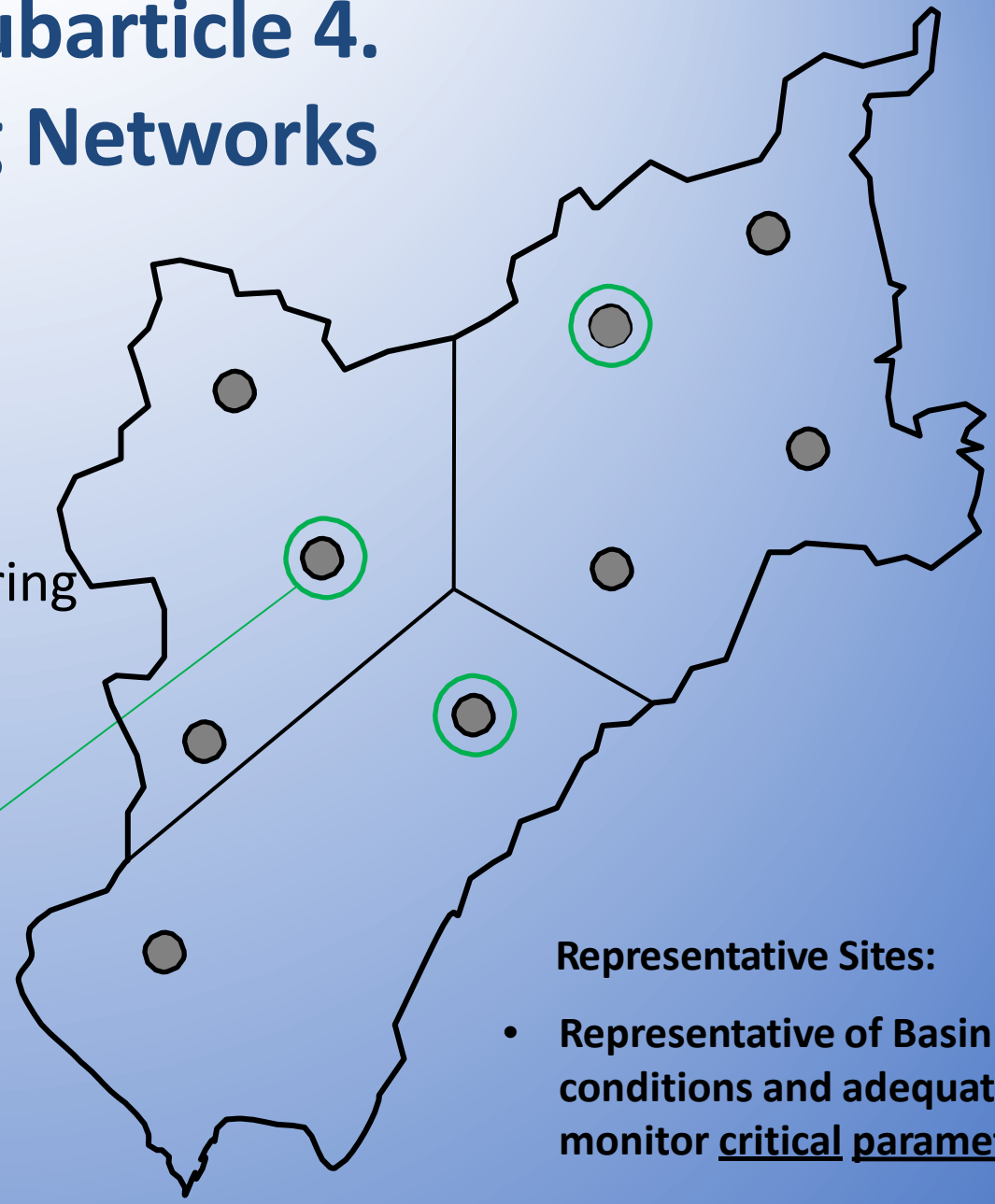
- Sustainability Goal ***(Basin Wide – Goal)***
- Undesirable Results ***(Basin Wide - Impacts)***
- Minimum Thresholds ***(Site Specific - Impacts)***
- Measurable Objectives ***(Measures Taken to Achieve Goal)***

Sustainability Goal	•Basin wide Goal •Achieved by 2040/2042
Sustainable Groundwater Management	•During Plan Implementation •Avoid Undesirable Results
Sustainable Yield	•Basin wide Sustainable Yield •Achieved by 2040/2042 •Avoid Undesirable Results

Article 5. Subarticle 4. Monitoring Networks

- Monitoring Network
- Representative Monitoring
- Assessment and Improvement of Monitoring Network



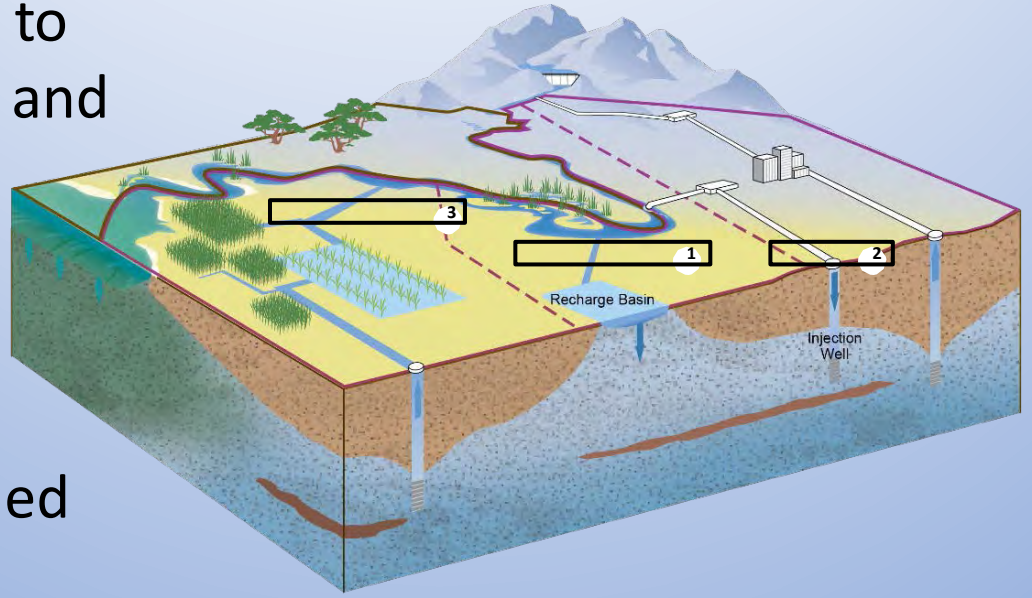


Representative Sites:

- **Representative of Basin conditions and adequate to monitor <u>critical</u> <u>parameters</u>**

Article 5. Subarticle 5.
Projects and Management Actions

- GSP developed and adopted to meet measurable objectives and prevent undesirable results
- Contingency projects or actions that would be triggered if groundwater conditions have not responded to previous management actions
  - Supported by available scientific data, analytical methods, and groundwater models, if available



DWR Groundwater

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