

The Intersection of SGMA and Groundwater Quality Management in the Sacramento Valley



Groundwater Sustainability



*Undesirable Results:
Significant and Unreasonable...*

Surface Water Depletion	Reduction of Storage	Degraded Quality	Seawater Intrusion	Land Subsidence	Lowering GW Levels

Overview

- *Quick* look at Geography of regulation
- Flyover of Irrigated Lands Regulatory Program
 - Sacramento Valley Water Quality Coalition
- Groundwater Quality
- Liability, Litigation and Safe Drinking Water

State Water Board

Provides oversight of 9 semi-autonomous regional water boards

- Reviews petitions filed against regional water boards
- Rules on petitions with Orders directing regional water board action



Central Valley Water Board

Mission: Protect quality of Region's waters for all beneficial uses

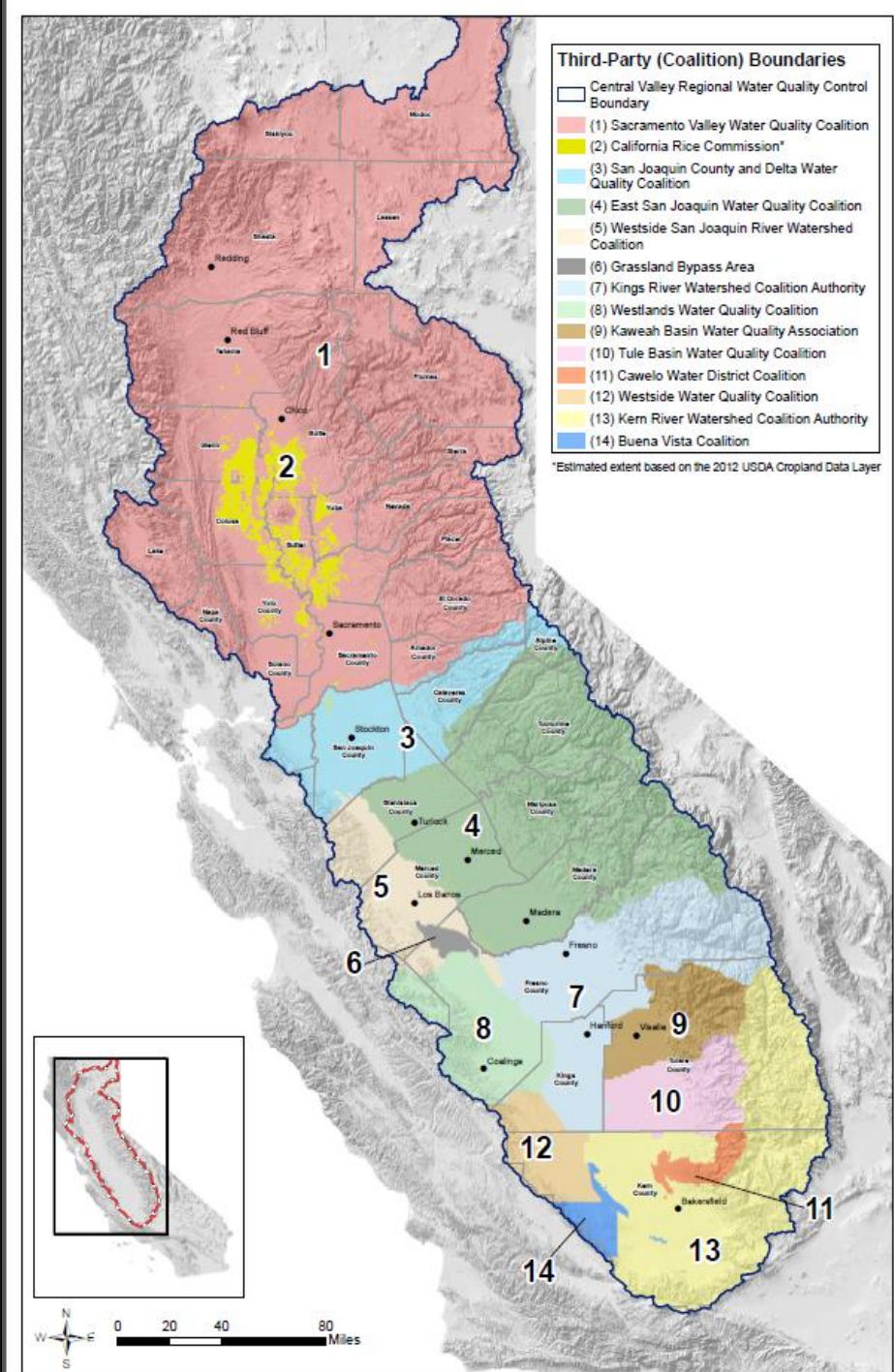
- Region 5 - largest of 9
- ~ 40% of State's area
- ~20% of State's population
- 2/3 of State's drinking water



Irrigated Lands Regulatory Program

Goal: Ensure irrigated lands discharges don't impact water quality

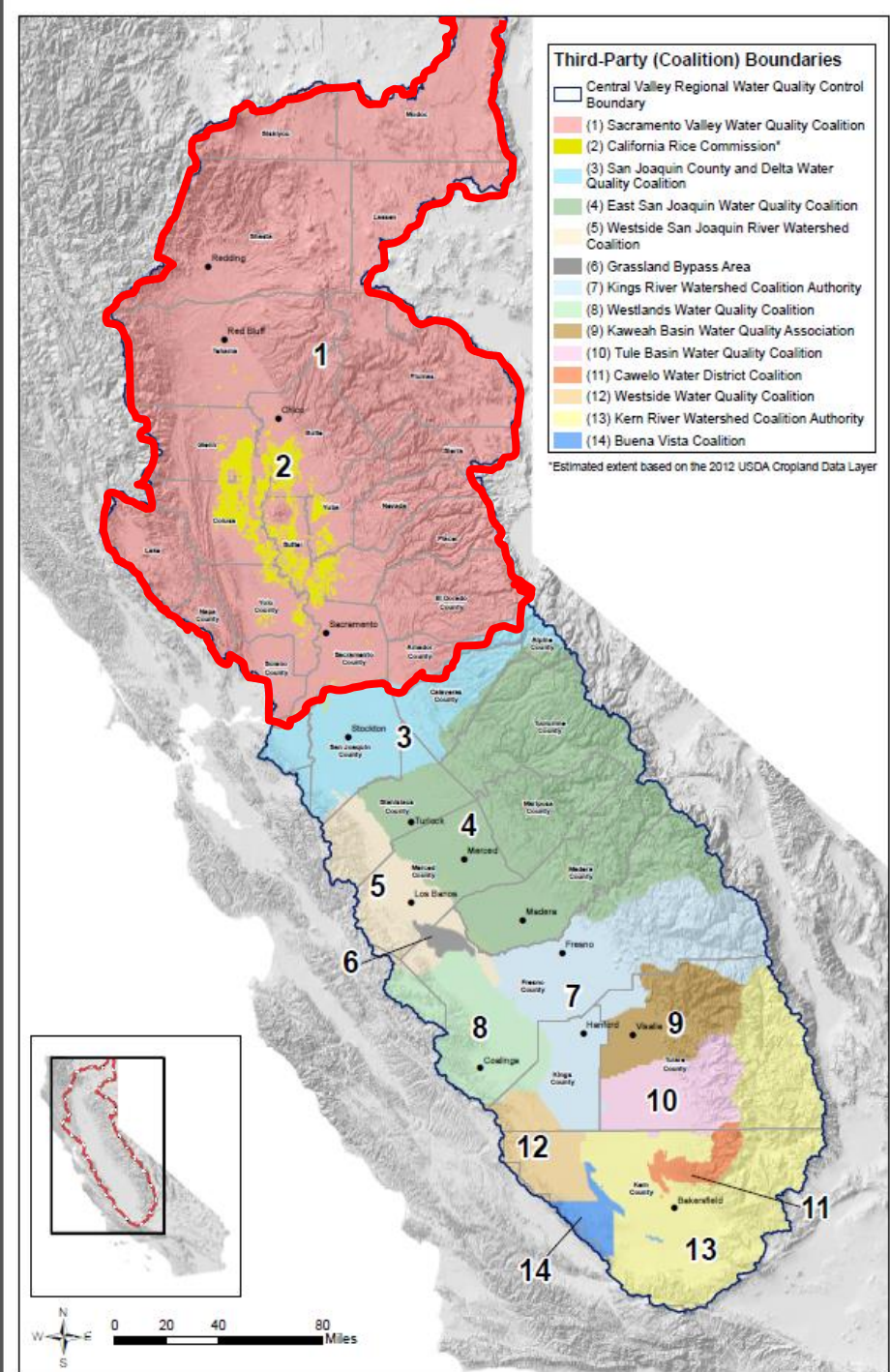
- ~75% CA irrigated ag
- ~7 million acres
- 9 General WDRs
- 14 Coalitions



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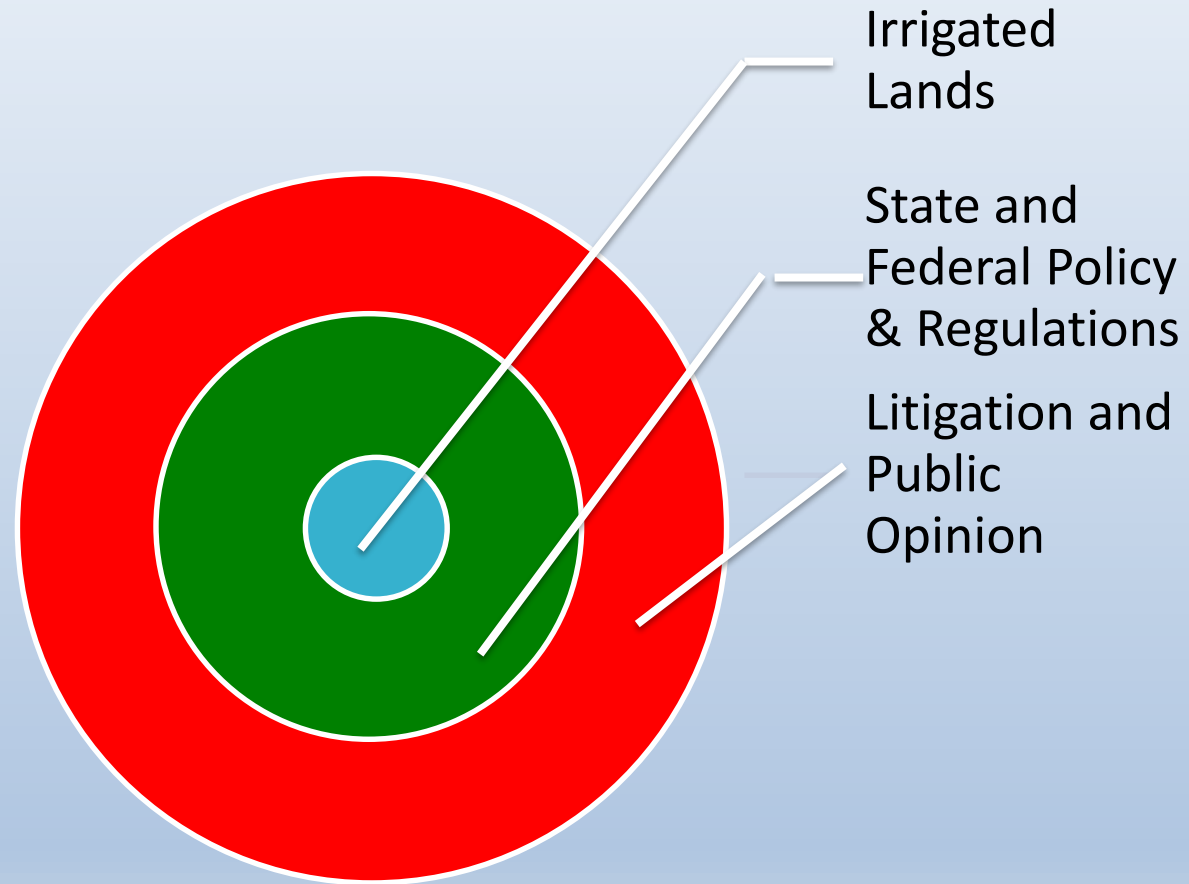
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Language of Water Quality



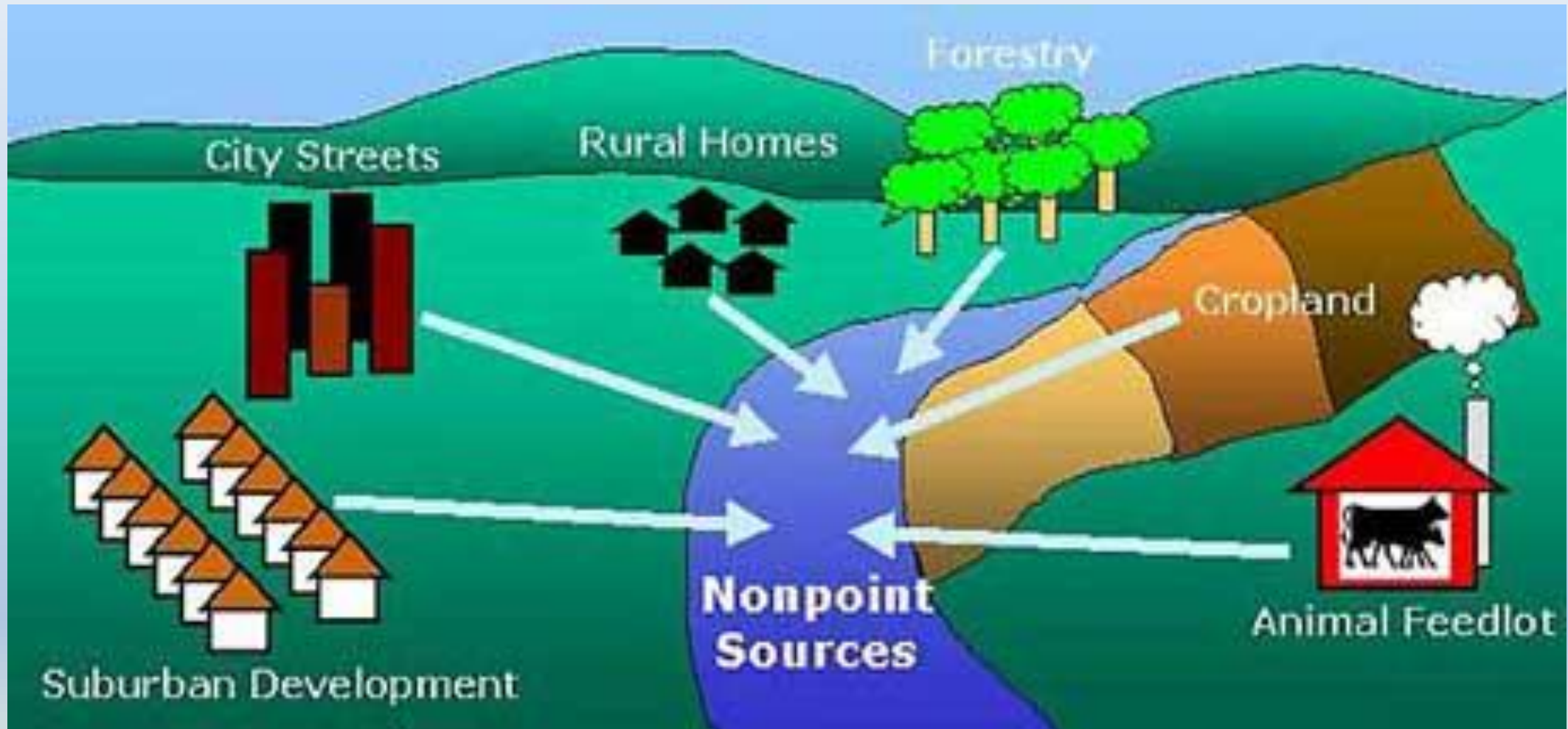
Water Quality Landscape



Who is currently being regulated? Why ?

- Discharges of water from variety of point and nonpoint sources that may ultimately enter surface or ground waters of the state
- Protection of Beneficial Uses
- Stormwater, irrigated agriculture, food processors, wastewater treatment

Sources of Surface Water discharge



When did regulation of Irrigated Lands begin?

- In 1972, U.S. Congress defined discharges from irrigated lands as non-point sources
- Irrigated lands initially exempt from federal regulation
- Reserved non-point source regulation for state and local governments using management plans
- In 1987, U.S. Congress recognized the complexity of non-point source control and qualified requirements by stating practices should be selected that reduce pollution to “the maximum extent possible”

Regulatory change in the new Century (~2000 – present)

- Catalyst for change passage of SB 390 (1999) gave the Regional Board and stakeholders three years to establish policies
- Form of regulation strongly contested
 - Many Regional Board workshops, hearings, and rulings
 - State Board appeal
 - Litigation in Sacramento Superior Court
 - Effort to pass new State Legislation
 - Surface water, not groundwater
 - SVWQC Formed

Water Quality is Measured in Many Ways



Beneficial Uses

- **Municipal and Domestic Supply (MUN)** Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.
- **Agricultural Supply (AGR)** Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.

As Important to Agriculture Yield



Public Health - Drinking Water Standards



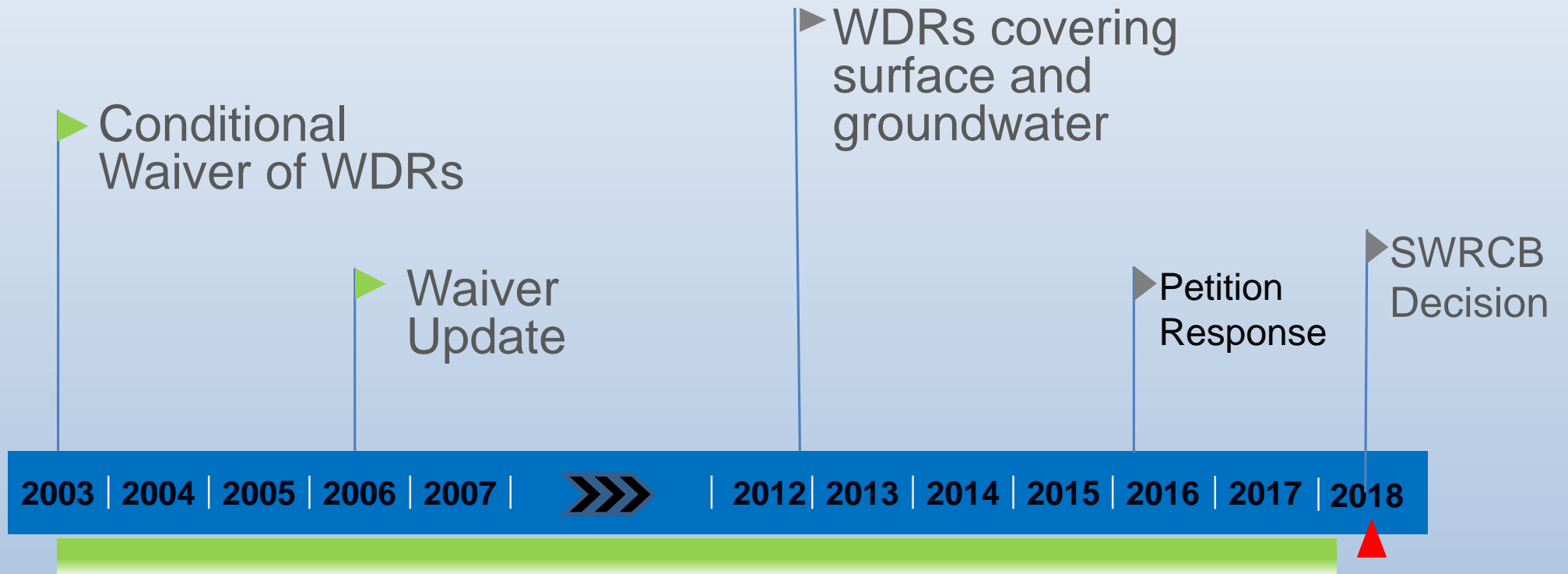
As it is to Aquatic Habitat



Evolving Water Quality Program

- Porter-Cologne Water Quality Control Act
 - Central Valley Regional Board
 - **Waste Discharge Requirements (WDRs)**
 - **Conditional Waivers (up to 5 Years)**
 - Basin Plan for Sacramento River Basin
 - Total Maximum Daily Loads (TMDLs)

Irrigated Lands Regulatory Program Development – Central Valley

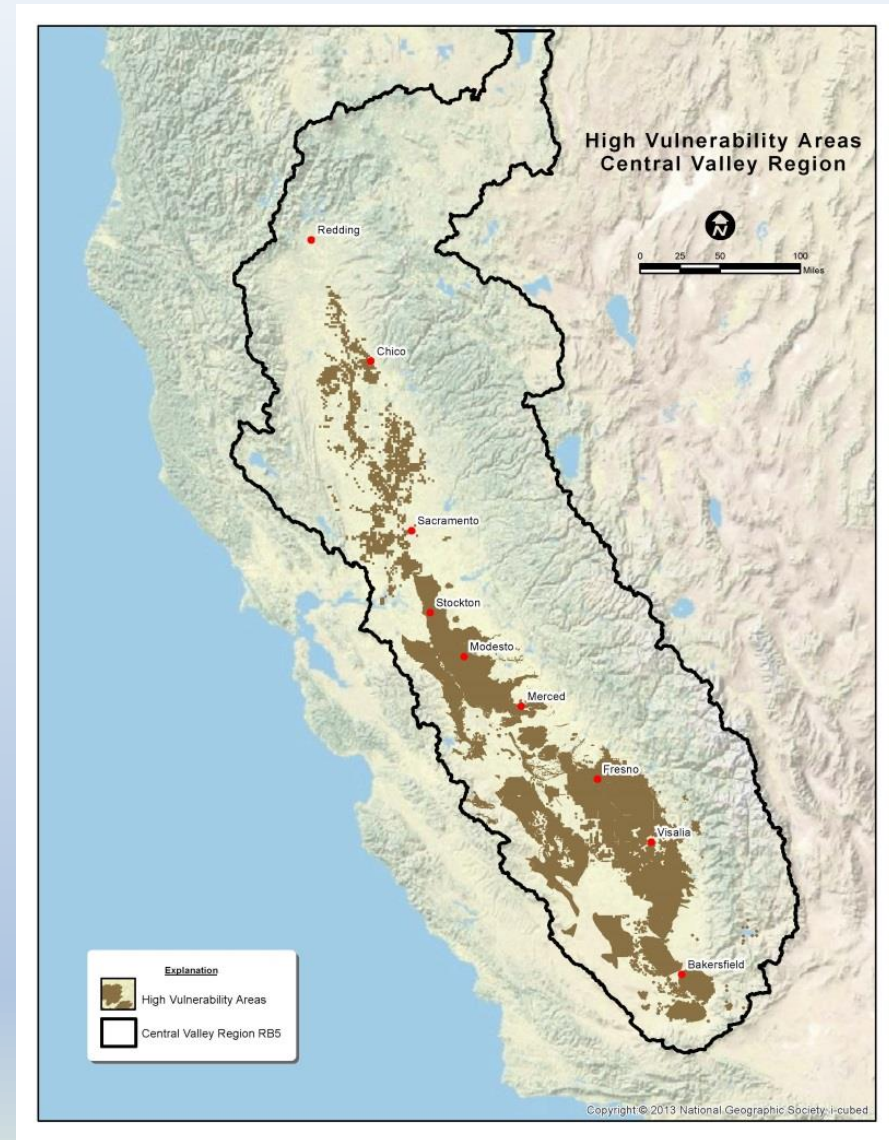


Expanded Focus/New Requirements in ILRP

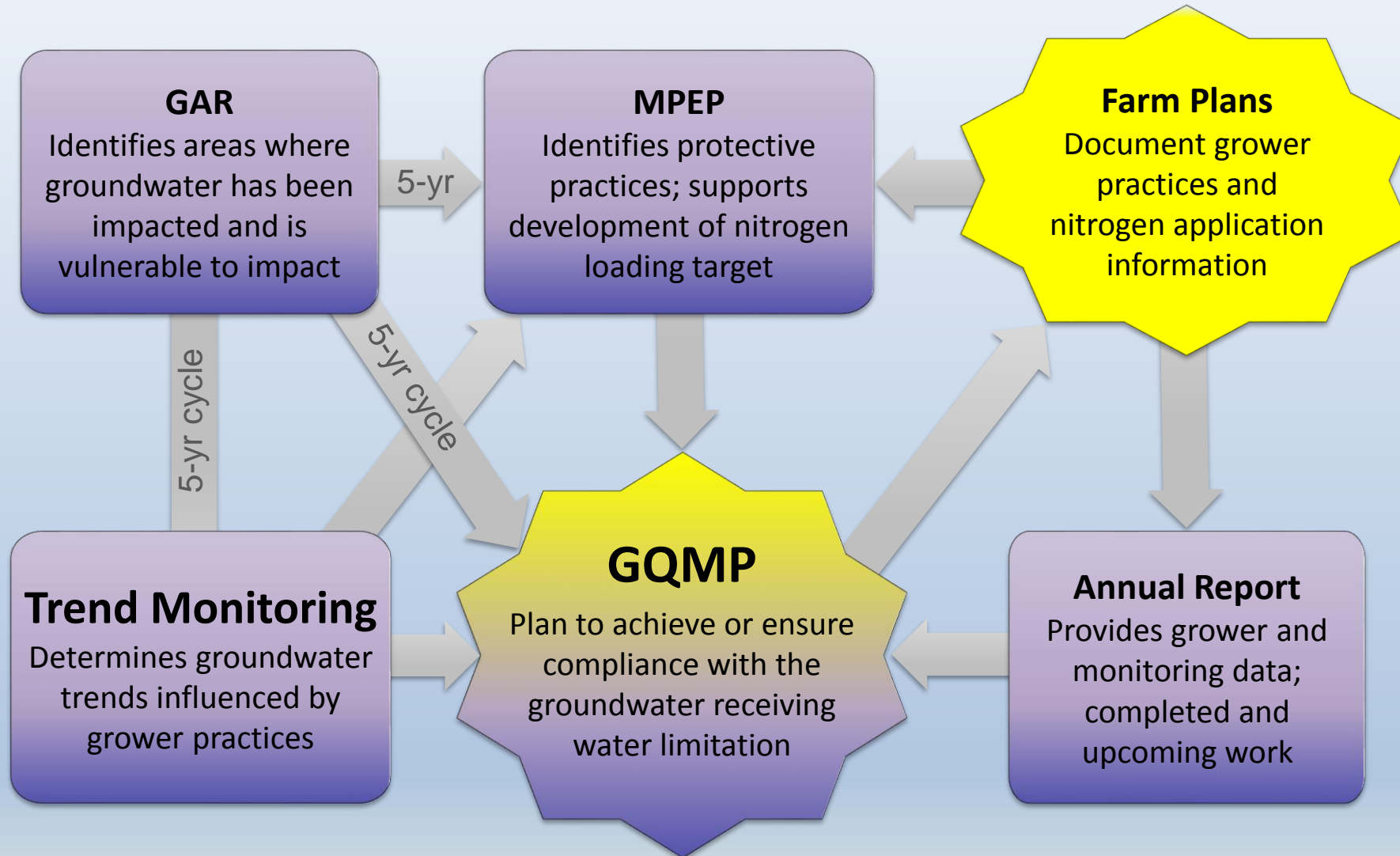
- New Waste Discharge Requirements (WDR) and Monitoring Reporting Program (MRP) have groundwater quality component
- New grower and Coalition reporting requirements on Nitrogen Management
- Identify areas where groundwater quality is impacted by developing a Groundwater Quality Assessment Report
- Trend Monitoring - baseline
- Monitoring/Management Practices Effectiveness Program

Groundwater Protection

- Management Plans
- Farm Evaluation
- Nitrogen Management
- Protective Practices
- Metric for groundwater protection

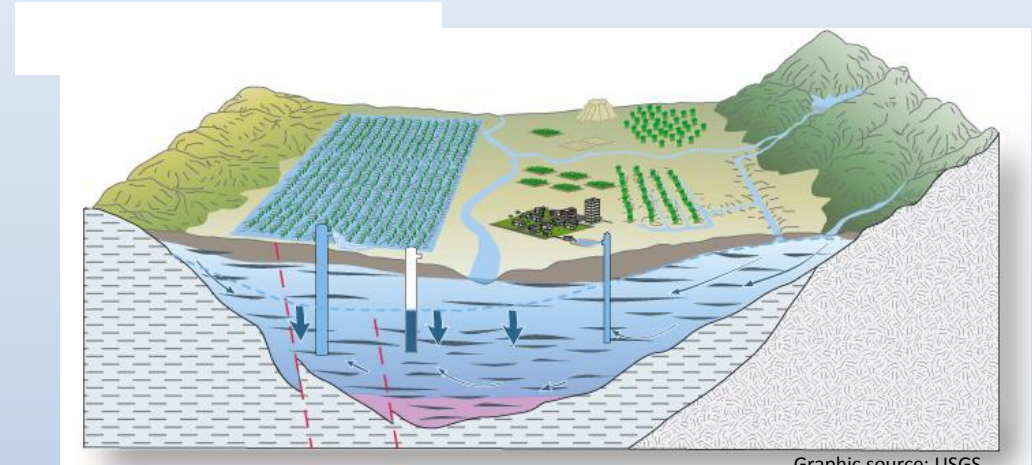


ILRP Groundwater Protection Strategy



Source: Central Valley Water Board

Sacramento River Watershed Groundwater Quality Assessment



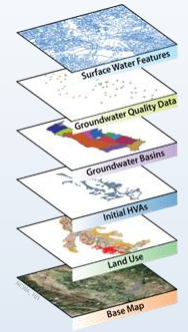
Graphic source: USGS

LISA PORTA, PE/CH2M

Groundwater Quality Assessment Report

- The general purpose of the Groundwater Quality Assessment Report is to
 - analyze existing monitoring data and
 - provide the foundation for designing the Management Practices Evaluation Program and the Groundwater Quality Trend Monitoring Program,
 - as well as identifying high vulnerability groundwater areas where a groundwater quality management plan must be developed and implemented.

Methodology Overview



Potential Vulnerability (susceptibility) Indicators

Hydrogeology

(SACFEM and DRASTIC*)

Soils
Geology
Hydrogeology

Agronomic/Soils

(NHI)

- Crop type
- Irrigation method
- Soil texture

Vulnerability Indicators

Observed Water Quality**

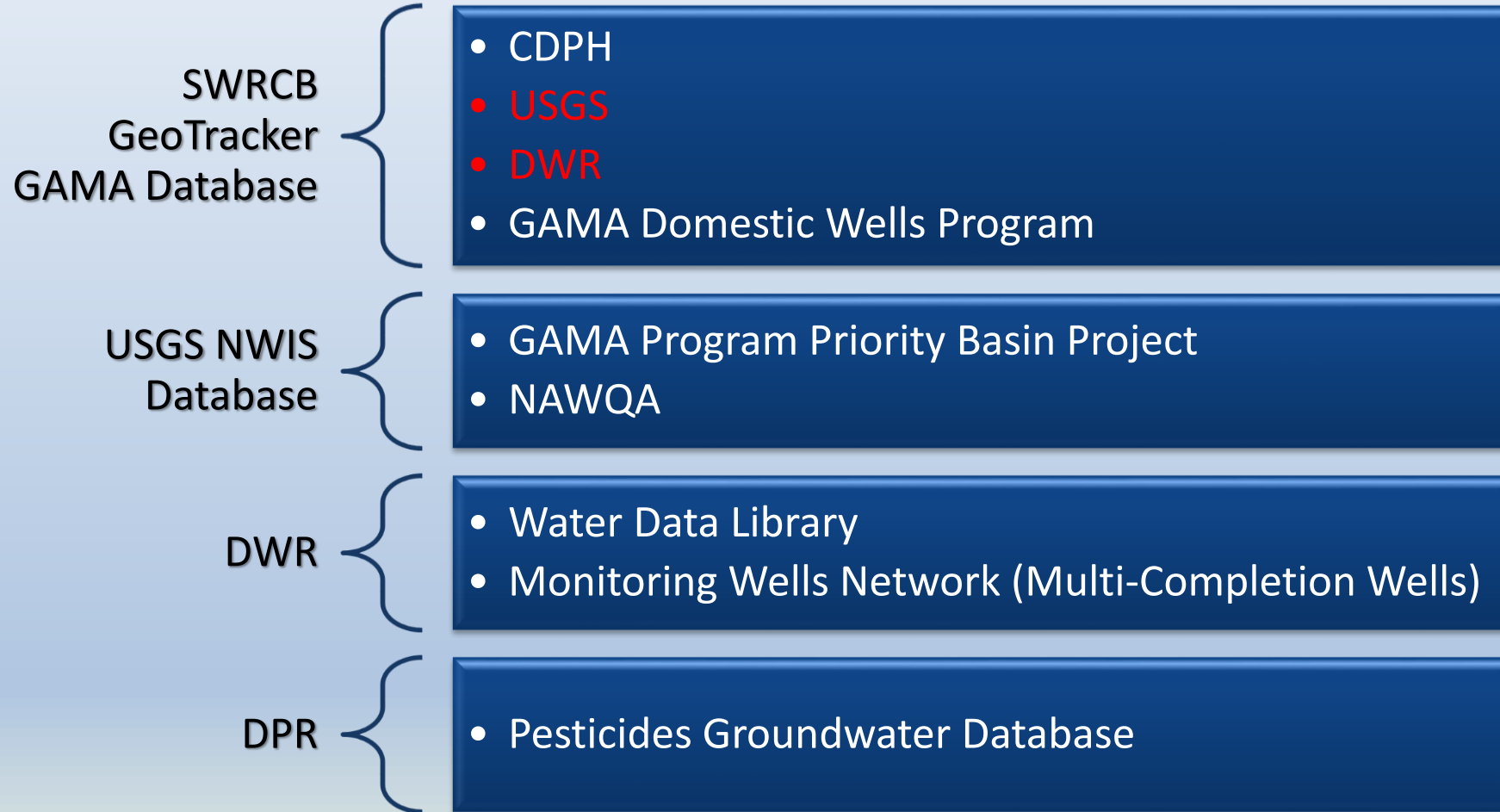
(USGS, DWR, GAMA, CDPH, DPR, other)

- Nitrate
- Salinity
- Pesticides
- Other

*Valley floor only – at the section scale for all data

** Most recent and trends, where available

Water Quality Datasets



Wells Used in Water Quality Analysis

SACFEM AREA - Most recent Nitrate as NO3 results at each well

Agency	Total Number of wells with NO3 result	# wells less than 250 ft deep	# wells more than 250 ft deep	# wells with unknown depth	# of wells above 0.5MCL	# of wells above MCL	Min value (mg/L)	Max value (mg/L)	Average value (mg/L)	Median value (mg/L)	Range of most recent data
USGS (NWIS and GAMA)	130	99	29	2	10 (8%)	2 (1%)	0	81	8.2	6.6	1981-2012
DWR (all)*	1299	92	87	1120	201 (15%)	76 (6%)	0	363	12.5	5.5	1935-2013
SWRCB-GAMA (Yuba/Tehama Co)	159			159	10 (6%)	2 (1%)	0	60	9.2	8	2002-2005
CDPH	994			994	187 (19%)	45 (4%)	0	132	12.5	7.1	1984-2012
Local databases**	63	7	31	25	10 (16%)	2 (3%)	0	63	13	9.6	1960-2009
Total	2645	198	147	2300	418 (15%)	127 (5%)	0	363	11.1	7.1	

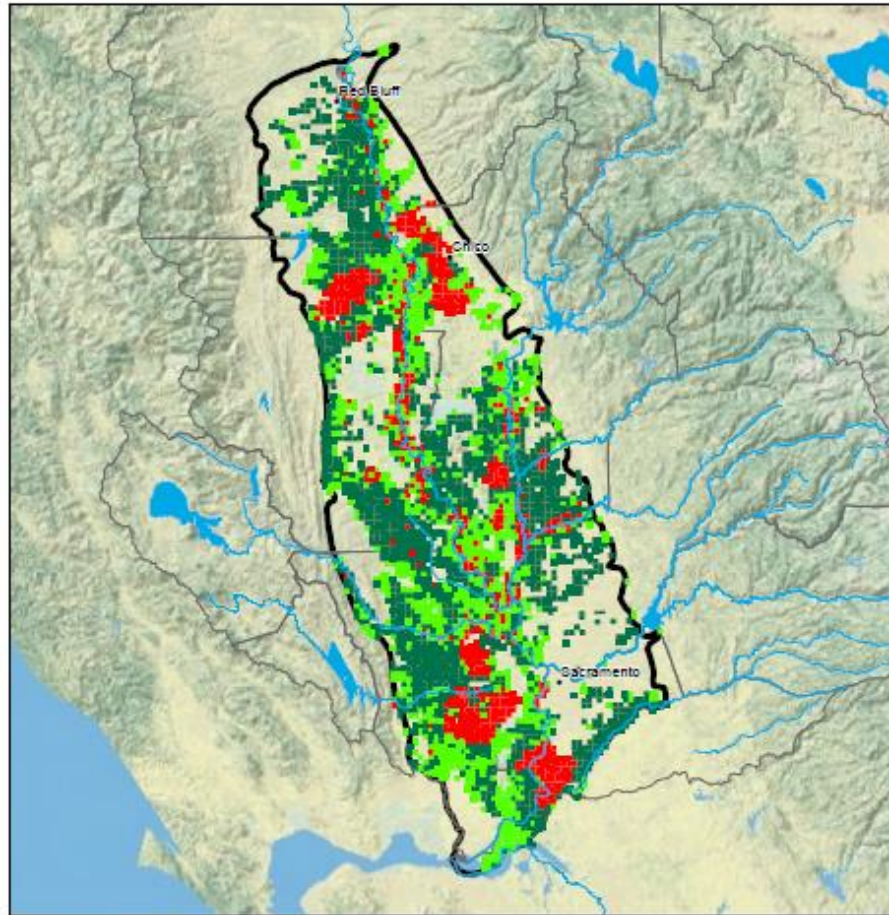
* depth is either total well depth or sample depth

** local databases: YCFCWCD and SCWA

NOTE: less than 11 mg/L is considered “relative background concentration” for areas with low human development (per USGS)

GAR will include these summaries for each Subwatershed (for NO3 and TDS)

Valley-scale Vulnerability



Source: Subwatersheds, Watershed (SVWQC 2013); Basemap, County, City, Highway, River (ESRI 2011).

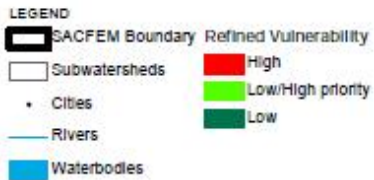
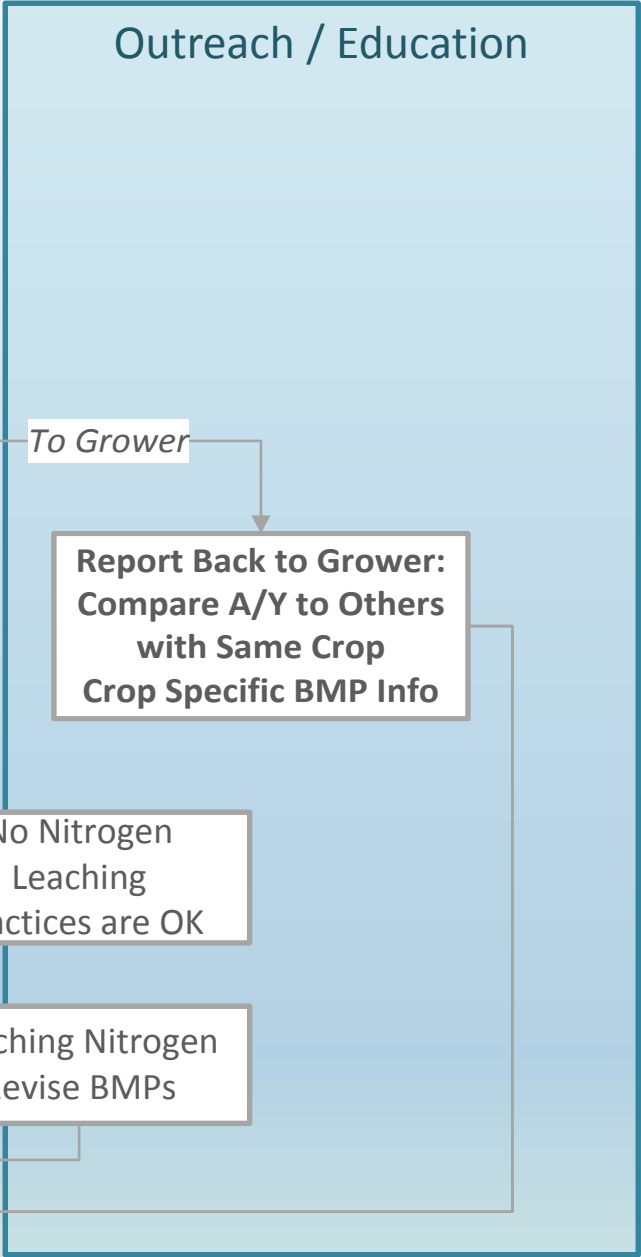
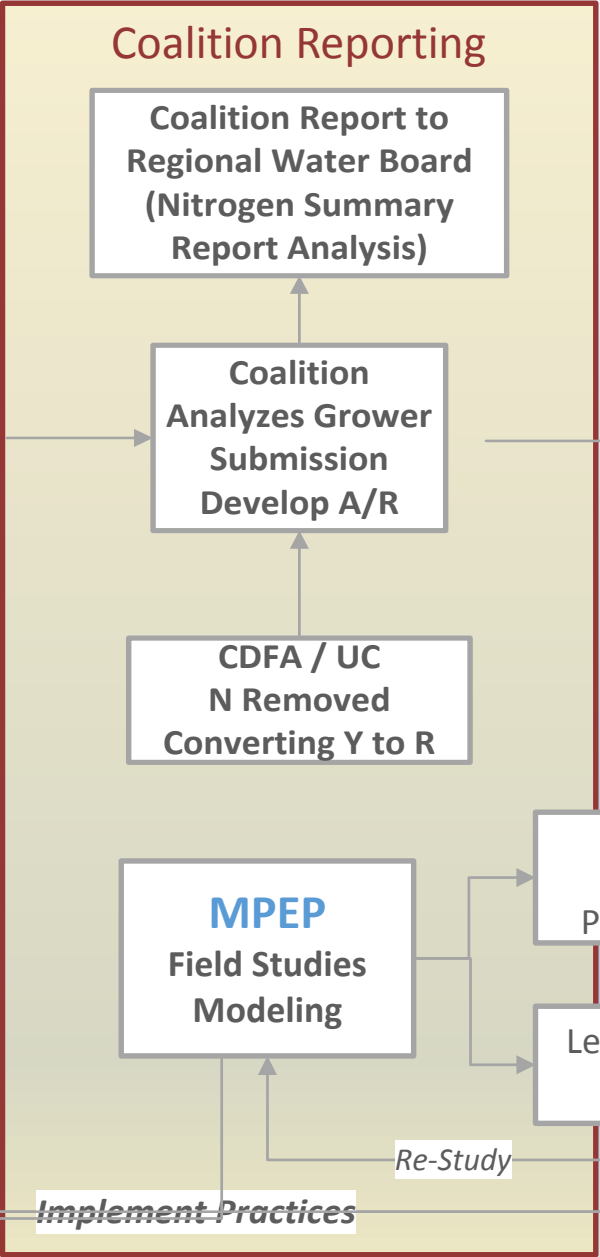
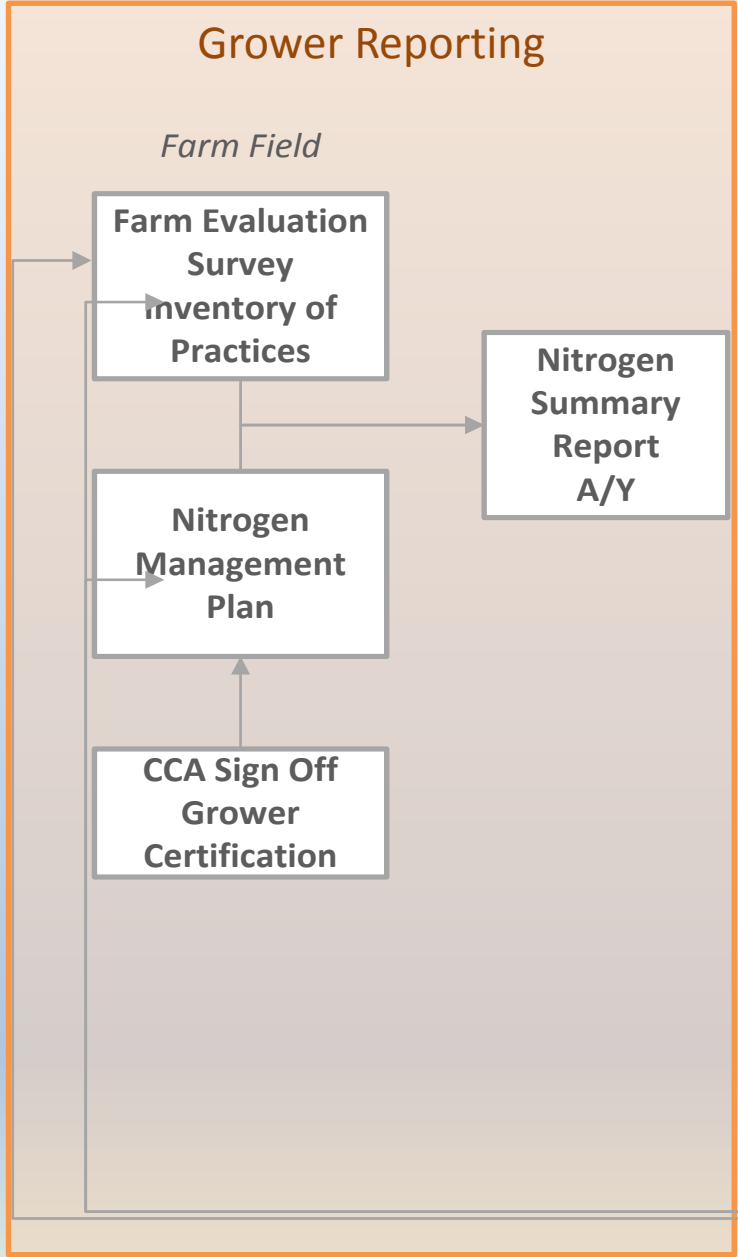
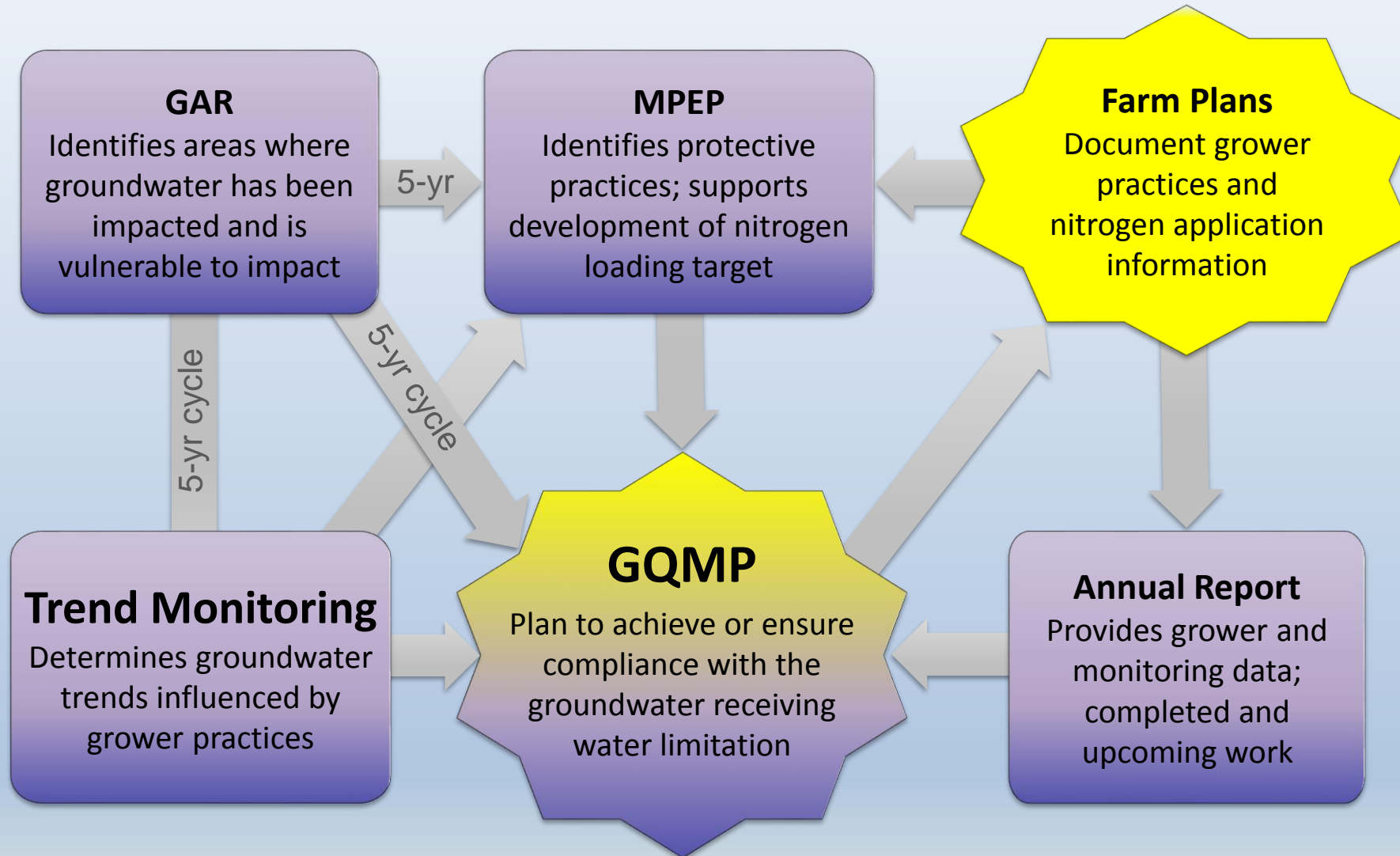


FIGURE 18-1
Sacramento Valley Floor Vulnerability Designation
Groundwater Quality Assessment Report



ILRP Groundwater Protection Strategy

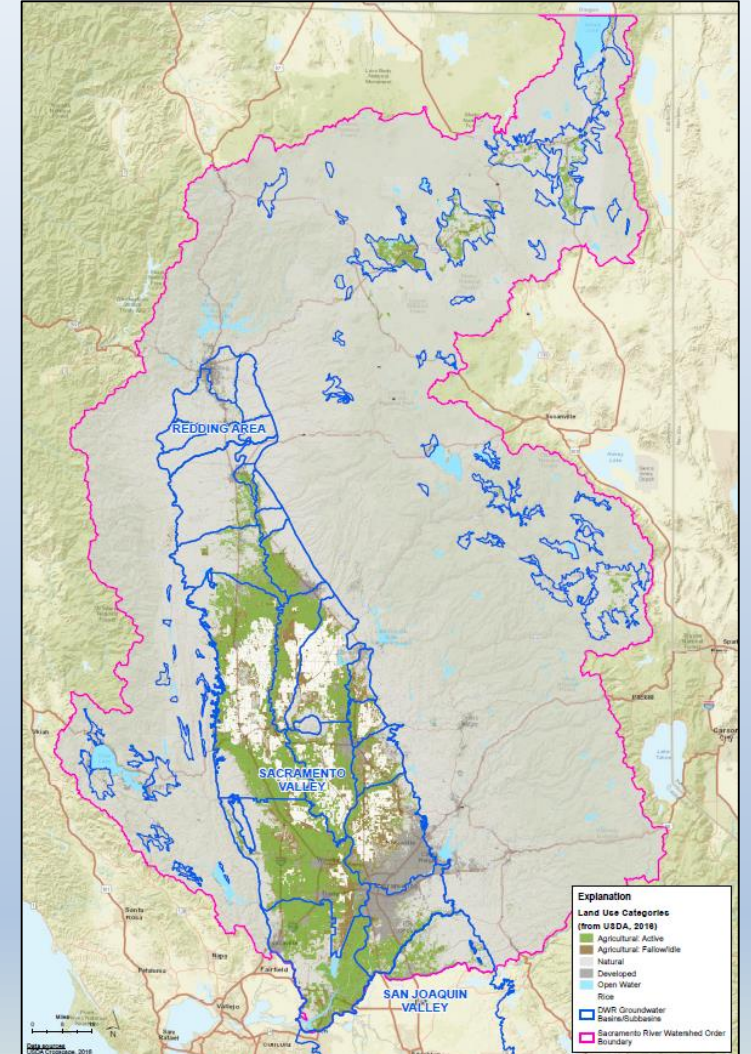


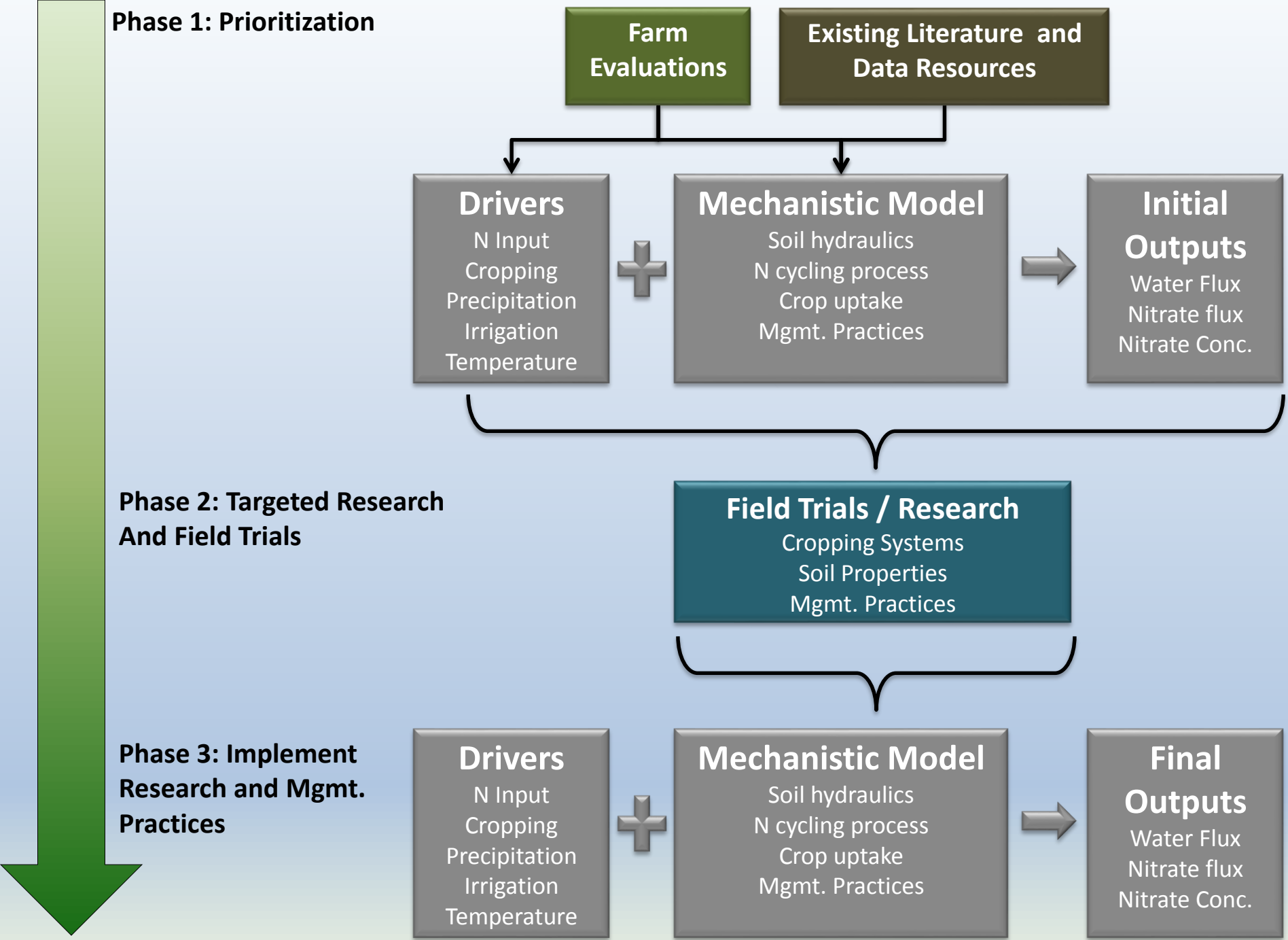
Source: Central Valley Water Board

Irrigated Lands Regulatory Program

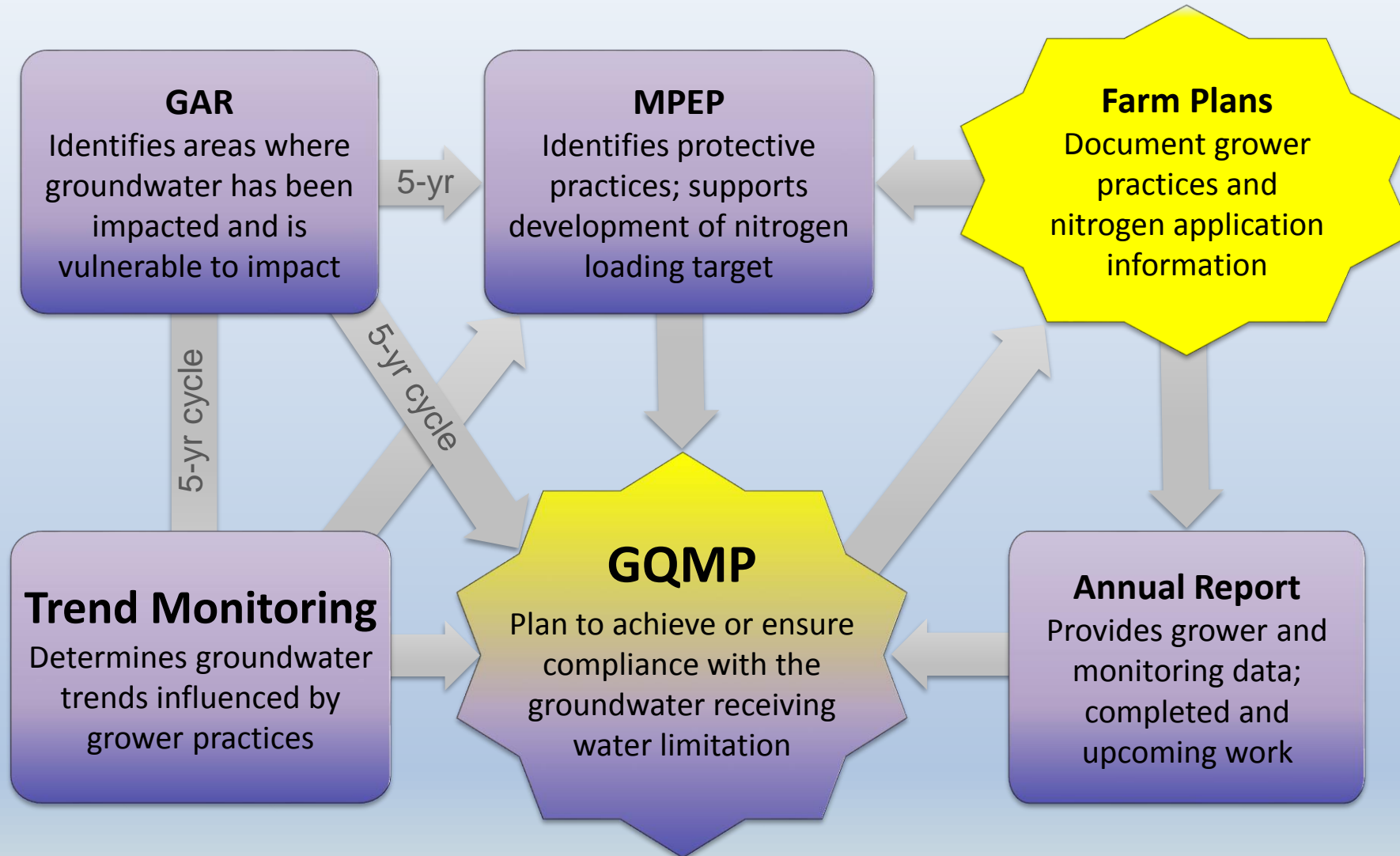
➤ WDRs for Sacramento River Watershed

- Regulation of discharges irrigated agriculture
- Discharges to groundwater
- **WDR groundwater requirements**
 - Groundwater Quality Report (GAR)
 - Groundwater Quality Management Plan
 - **Management Practices Evaluation Program (MPEP)**
 - Groundwater Quality Trend Monitoring (GQTM)





ILRP Groundwater Protection Strategy

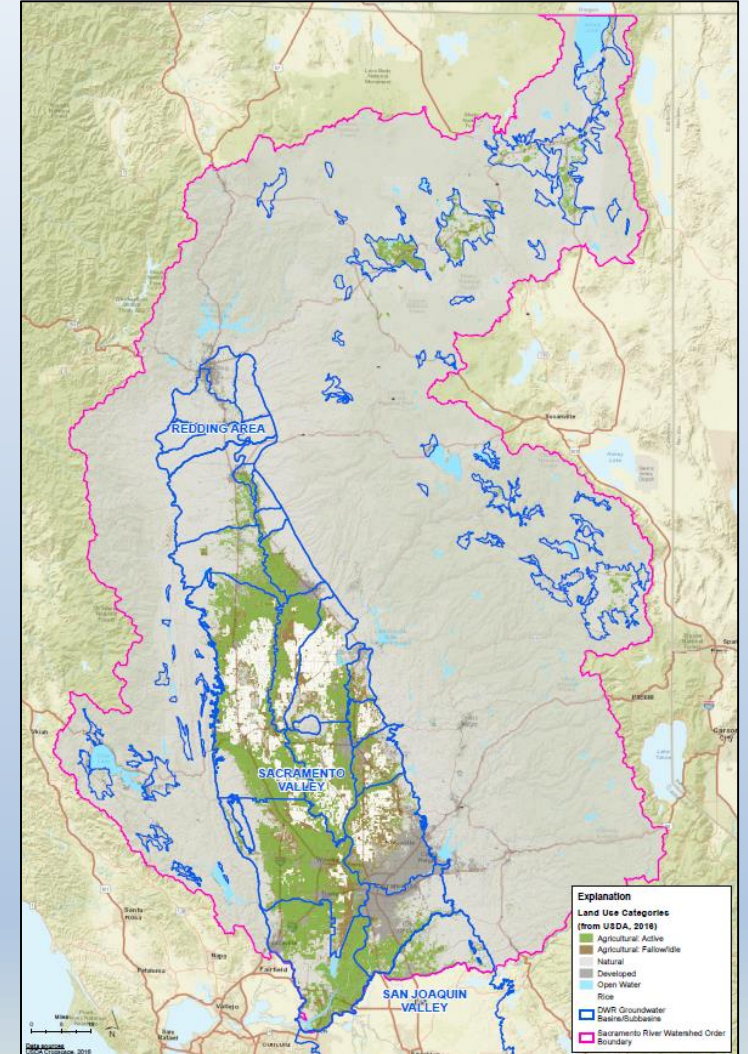


Source: Central Valley Water Board

Irrigated Lands Regulatory Program

➤ WDRs for Sacramento River Watershed

- Regulation of discharges irrigated agriculture
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- **WDR groundwater requirements**
 - Groundwater Quality Report (GAR)
 - Groundwater Quality Management Plan
 - Management Practices Evaluation Program (MPEP)
 - **Groundwater Quality Trend Monitoring (GQTM)**



GQTM Workplan Requirements

➤ Approach

- Rationale for monitoring network:
 - Agricultural commodities
 - Vulnerability and prioritization factors
 - Communities reliant on groundwater: relationship to recharge areas

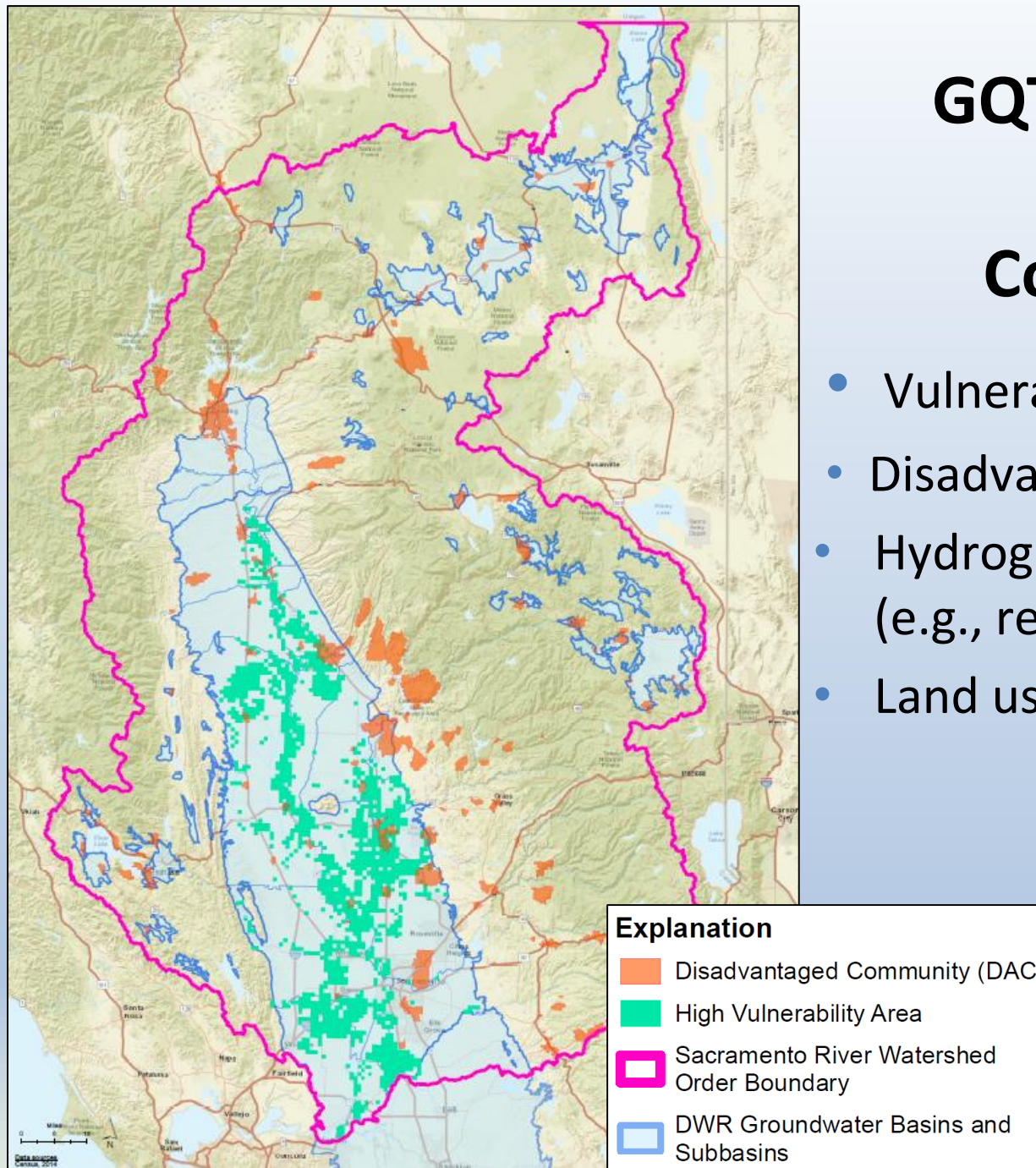
➤ Well construction details

➤ Sampling schedule and parameters

➤ Implementation and trend analysis

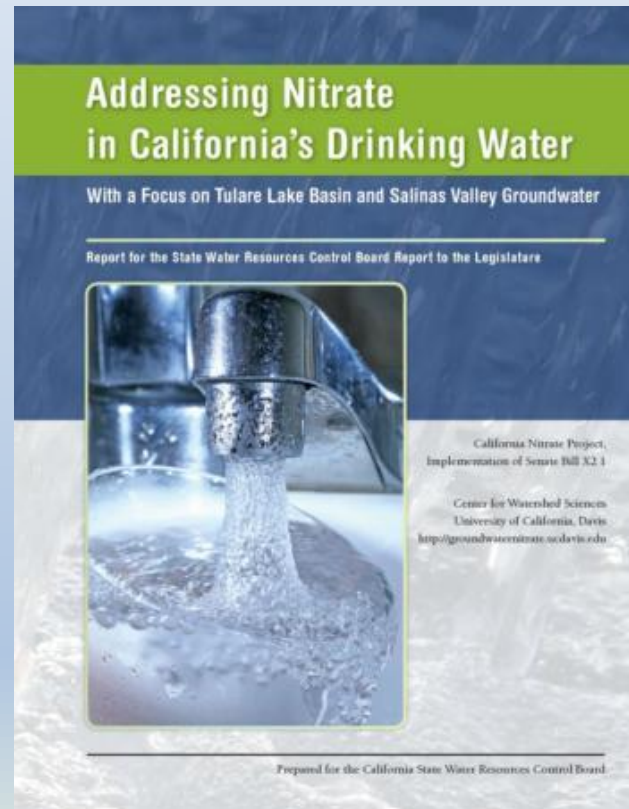
GQTM Monitoring Design Considerations

- Vulnerability – High and low
- Disadvantaged communities
- Hydrogeologic characteristics (e.g., recharge, depth to water)
- Land use



Why the Focus on Groundwater Quality

- SWRCB Recommendations to Legislature on nitrate in groundwater for the Tulare Lake Basin and Salinas Valley (Feb 2013).



2013 Petitions – AGUA and Environmental Justice Community Contentions about Adoption of ESJ General Order

- The General Order will allow for degradation and even pollution of groundwater quality, in violation of the State's Antidegradation Policy and state law.
- The General Order will disproportionately impact low income communities and communities of color because it does not protect groundwater from continued degradation.

2013 Petitions – California Sportsfishing Protection Alliance (CSPA) Contentions about Adoption of ESJ General Order

- The General Order fails to comply with Resolution 68-16, the State Board's Antidegradation Policy. With focus on [Surface Water Monitoring Programs](#)
- The General Order fails to comply with California's Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program.
- The General Order fails to comply with the California Environmental Quality Act.

**CV SALTS - Salt and Nitrate Basin Plan
Groundwater Quality Information**

SNMP Identifies New Tools and Regulatory Options

Alternative Compliance Program

- Specific Conditions to allocate assimilative capacity or grant discharge exceptions

Management Goal 1

- Safe Drinking Water Supply
 - Short & Long Term Solutions



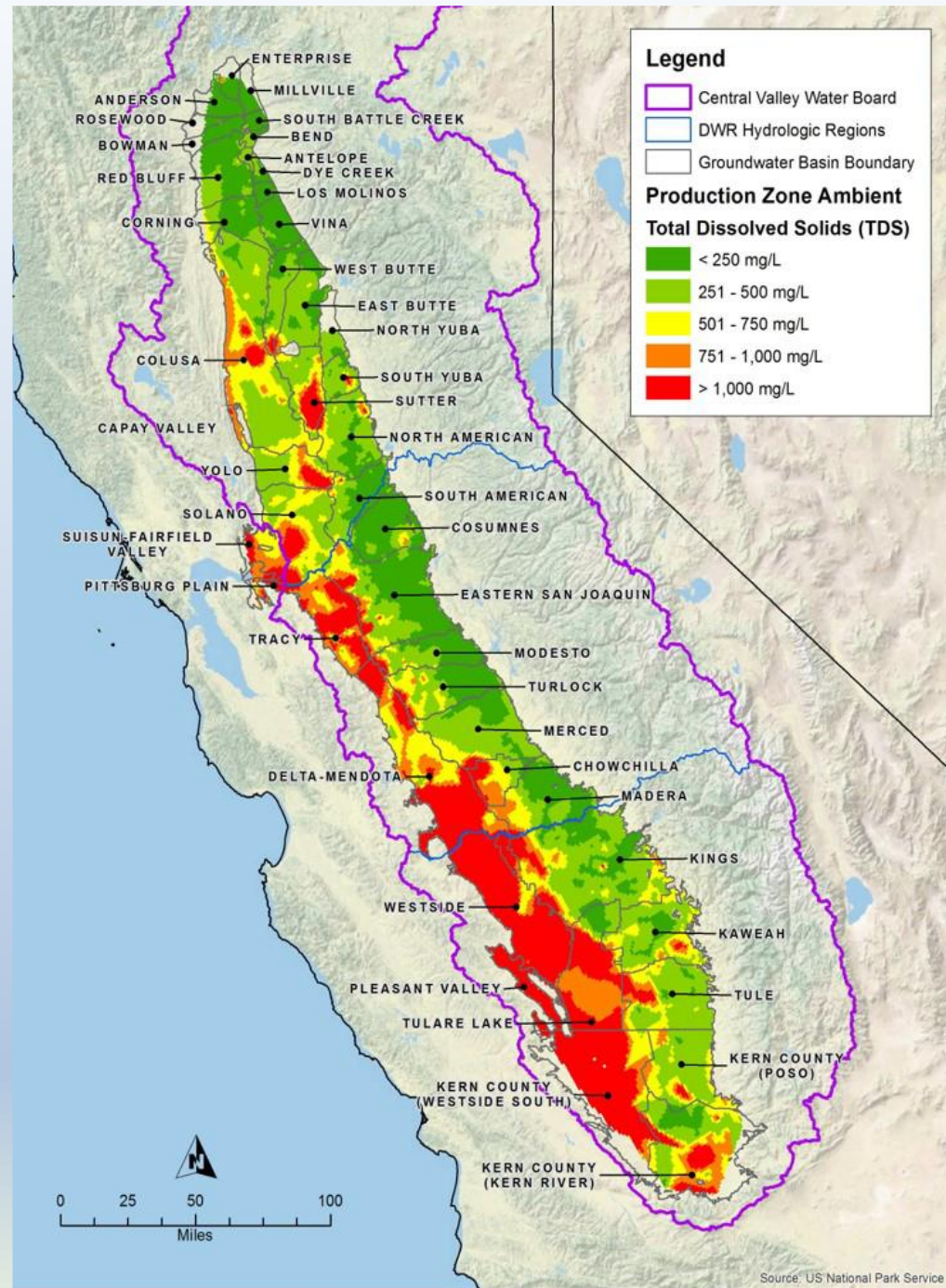
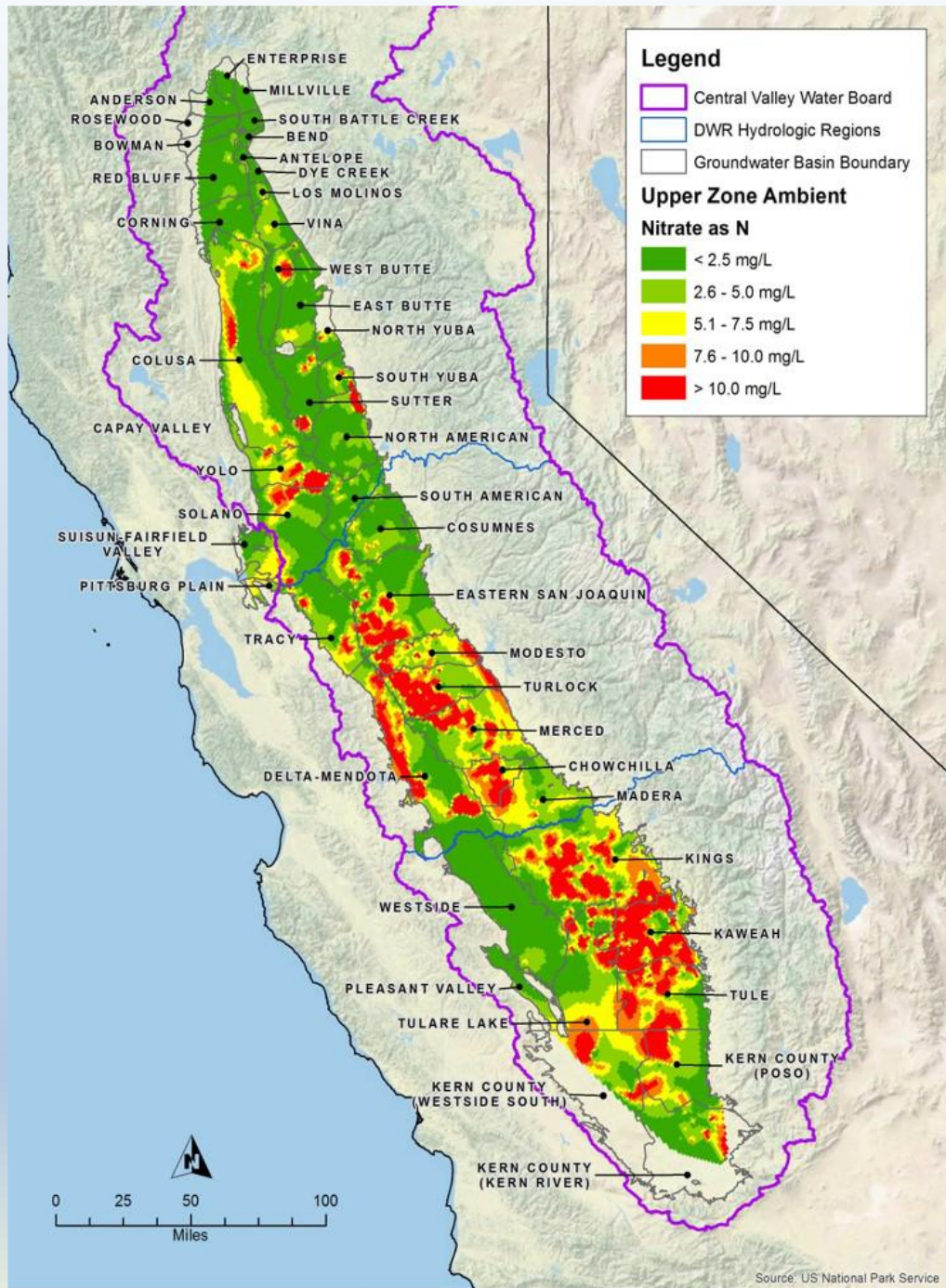
Management Goal 2

- Achieve Salt/Nitrate Balance
 - Timeframe & Costs Vary

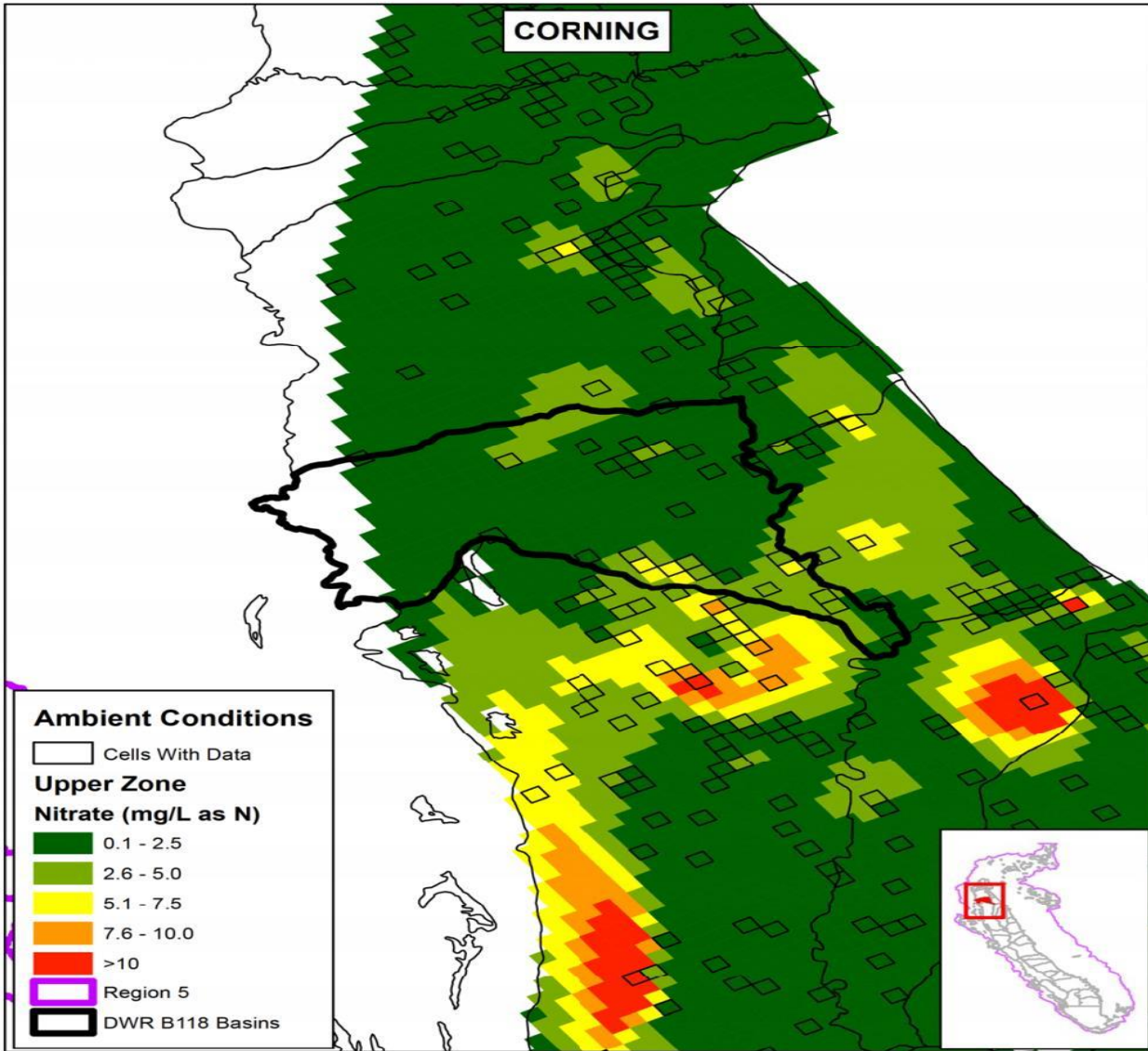


Management Goal 3

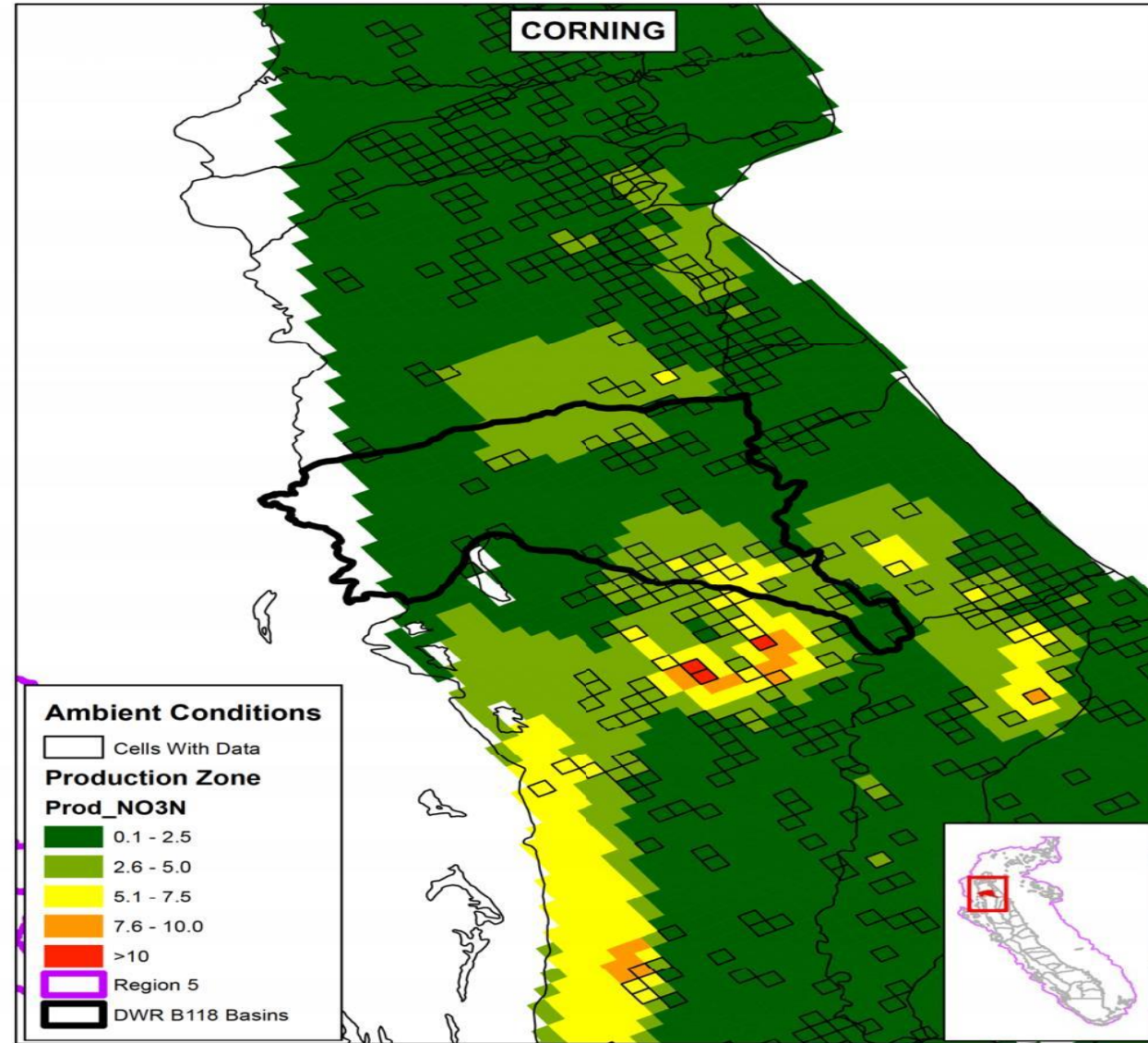
- Restore Groundwater Quality
 - Where Feasible & Practicable



Ambient Nitrate Concentrations Upper Zone: Corning Subbasin

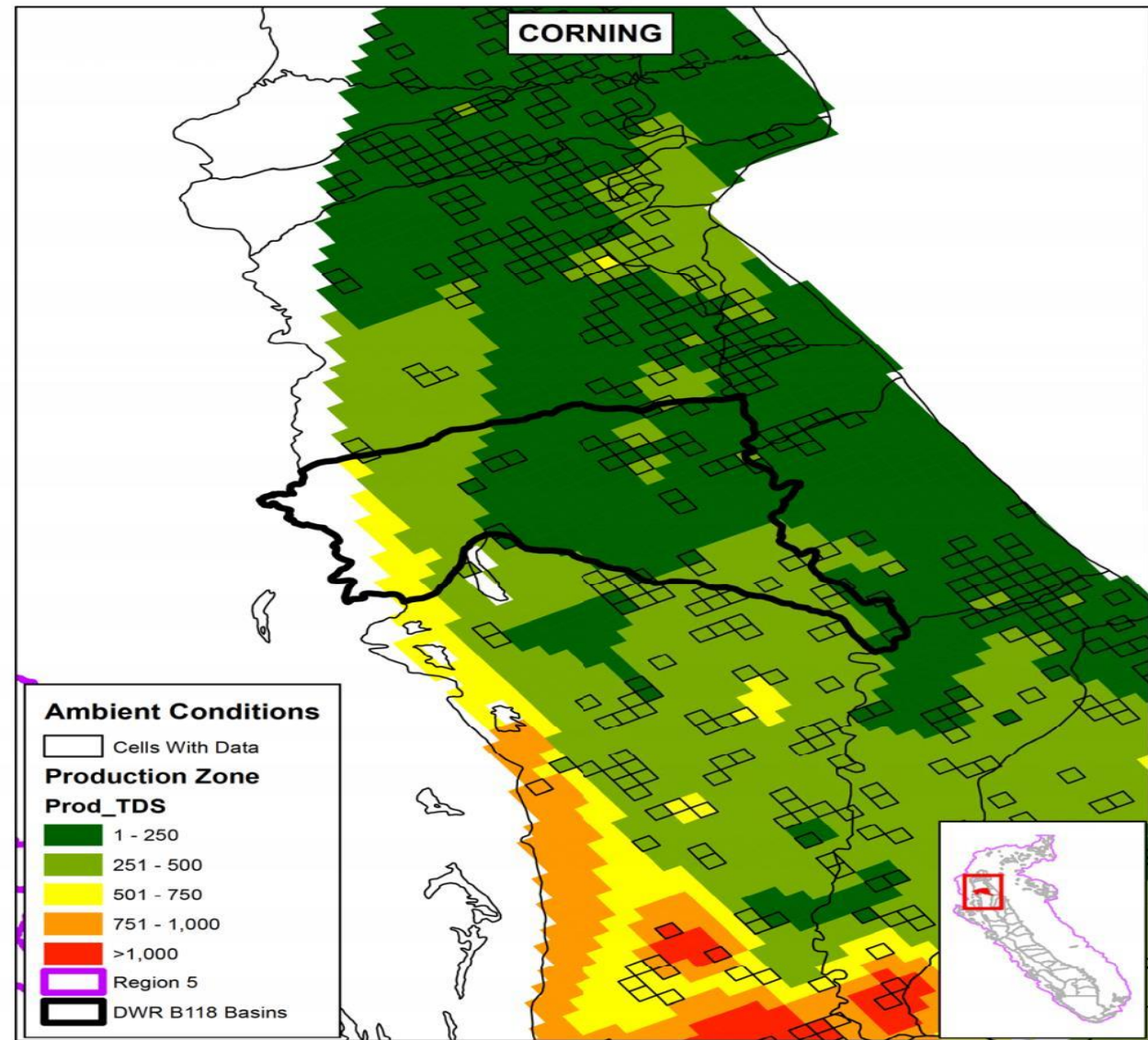
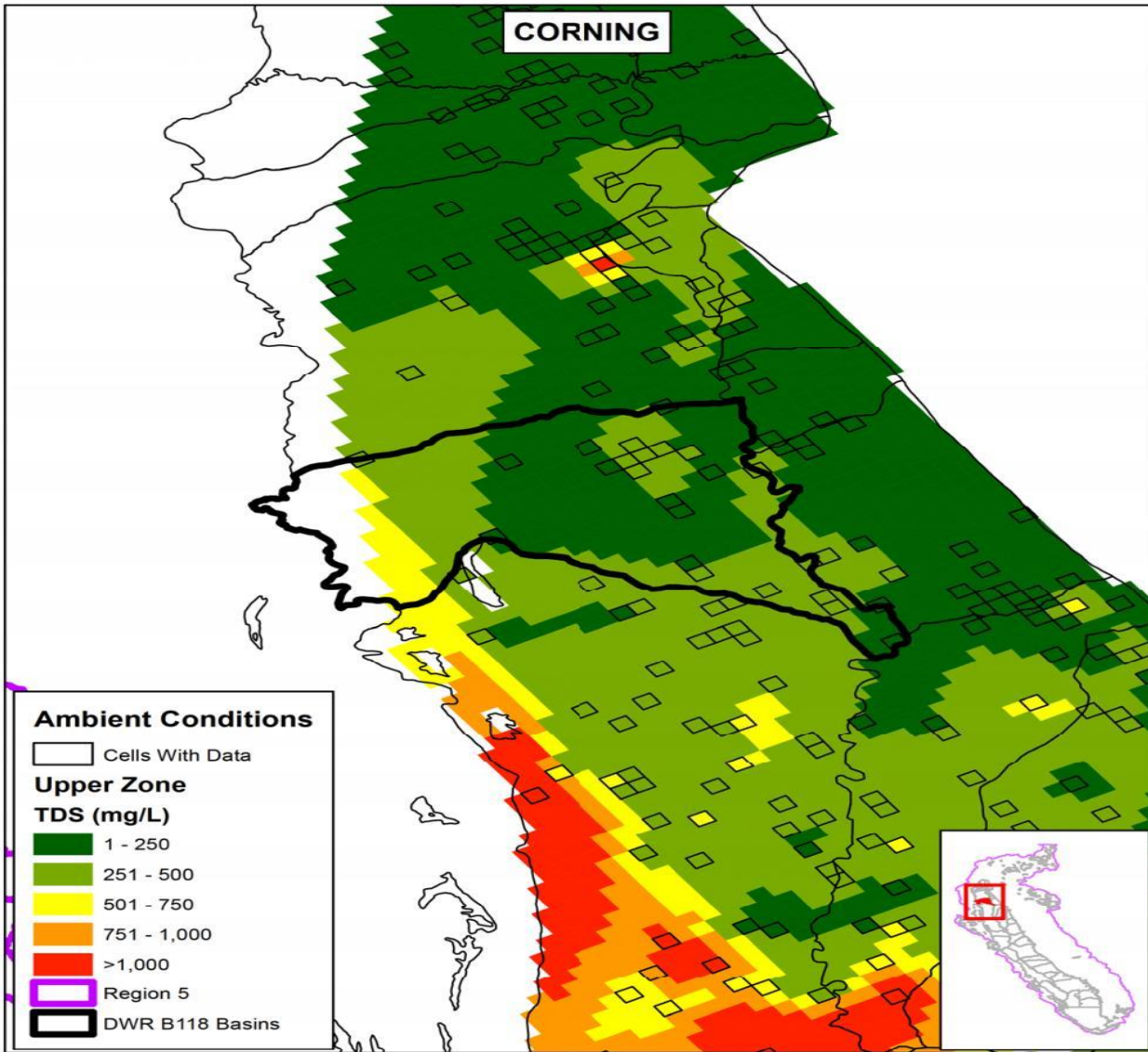


Attachment Figure 12



Attachment Figure 94

Ambient TDS Concentrations Upper Zone: Corning Subbasin



DWR Basin: SACRAMENTO VALLEY

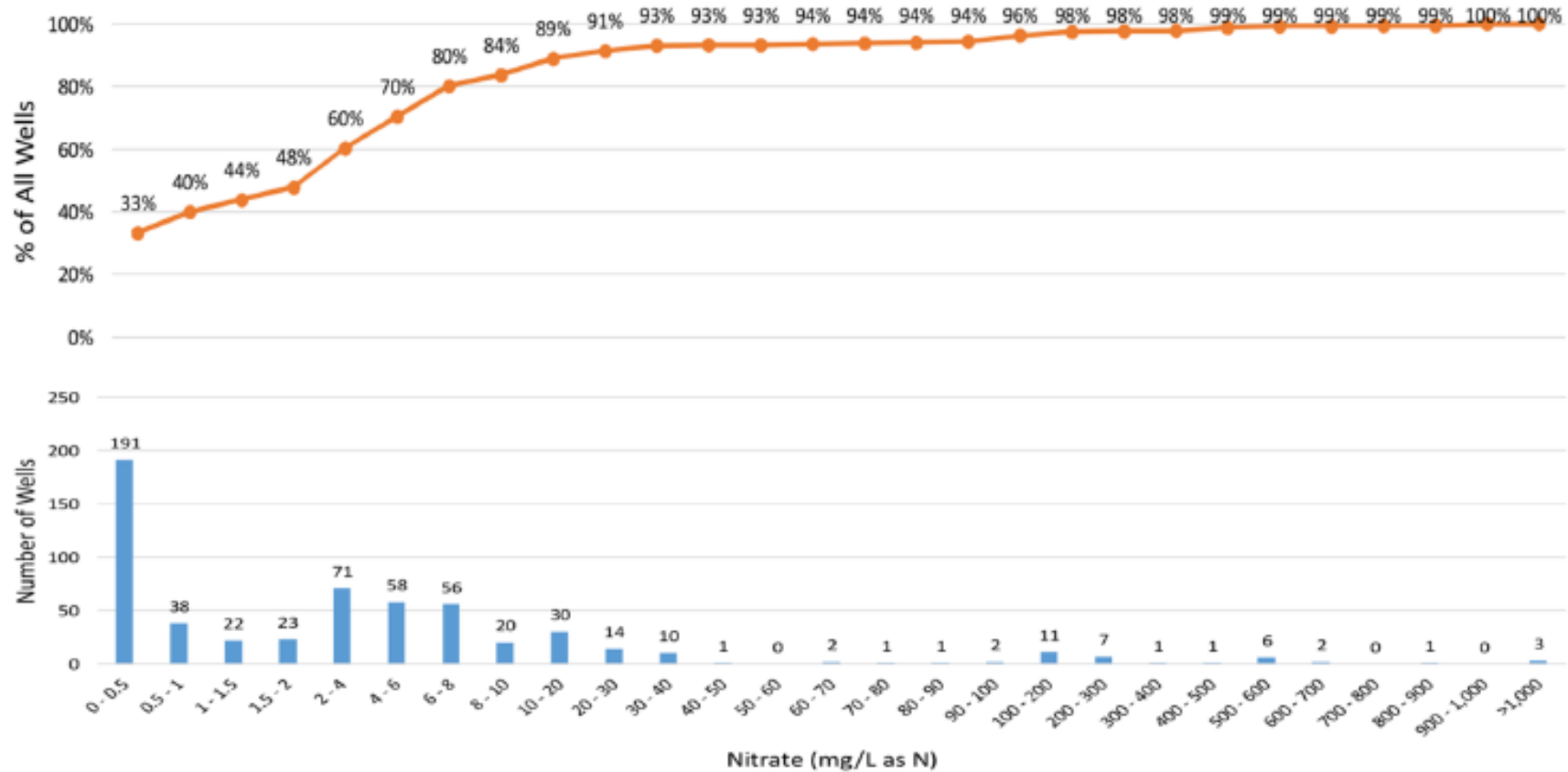
Sub-basin: YOLO

DWR Code: 5-21.67

NITRATE

NITRATE (<i>as N</i>)	Upper Zone	Production Zone
# of Wells	431	572
Mean Concentration (mg/L)	36.8	28.6
Median Concentration (mg/L)	1,9	2.4
75 th Percentile (mg/L)	7.5	6.9
95 th Percentile (mg/L)	186	135
Maximum Concentration (mg/L)	1,542	1,541
Percent of Wells >10 mg/L	21%	16%

Average Nitrate Concentration for Wells in the PRODUCTION Zone (2000-2016)



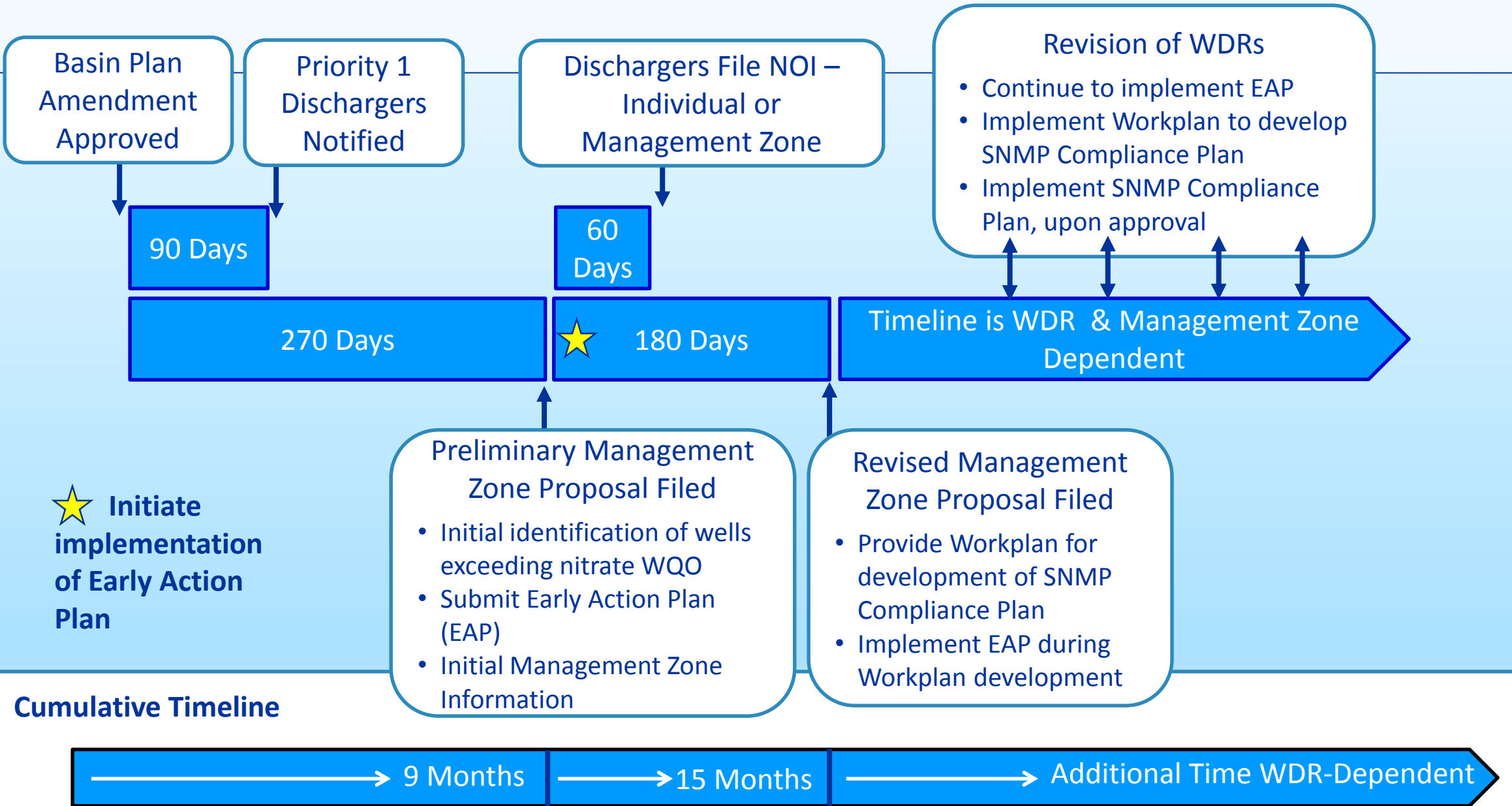
Summary of Available Trend Data for Nitrate					
Groundwater Zone (# wells w/ trend data)	Decreasing Trend	Slightly Decreasing	Neutral Trend	Slightly Increasing	Increasing Trend
Upper (48)	13 (27%)	11 (23%)	5 (10%)	9 (19%)	10 (21%)
Production (10)	0	3 (30%)	1 (10%)	5 (50%)	1 (10%)
Lower (34)	0	8 (24%)	10 (29%)	16 (47%)	0

Timeline

- March 9 2017: Board received Salt Nitrate Management Plan (SNMP) Framework
- October 2017: Draft Basin Plan Policy Amendments Drafted
- January 2018: Regional Board Workshop
- May 31 2018: Adoption of Basin Plan
- Spring 2019: State Board Hears Basin Plan
- December 2019: SNMP Implementation **begins**



Implementation Timeline – Management Zones



Salt/Nitrate Management Strategy: General Timeline for Existing Dischargers

Activity	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	2 nd 10 Years	3 rd 10 Years
Effective Basin Plan amendment	★											
Nitrate – Priority 1 Areas	1	3			4							
Nitrate – Priority 2 Areas			2			3			4			
Nitrate – Remaining Areas								5				
Salinity Management	Phase I Prioritization and Optimization Study (further define short and long-term projects to manage salt in the Central Valley)										Phase II – Permitting, Engineering Design	Phase III – Project Construction

- 1 Notice to Comply (NTC) (within 1 year of BPA effective date)
- 2 NTC (within 2-4 years of BPA effective date)
- 3 Initial planning (w/i ~15 months of NTC), including develop/implement Early Action Plan to address drinking water concerns
- 4 Outcome is revised WDRs/Waivers with discharger-specific nitrate management requirements - Time to completion varies based on permitting approach
- 5 For remaining areas, the time to a NTC to be determined

Questions/Comments