

Nitrate Permitting Strategy

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CV-SALTS Executive
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Implementation Prioritization Approach - Strawman Proposal



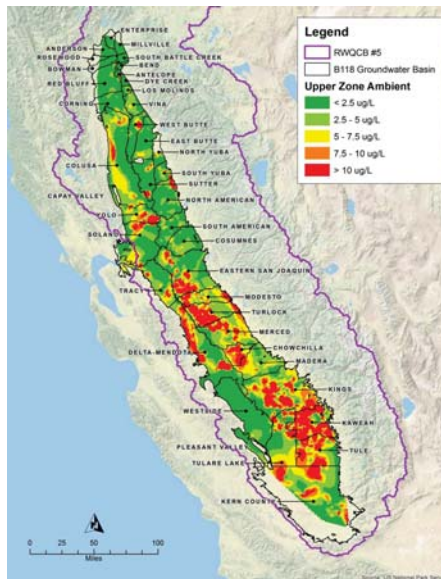
Prioritization Approach

- Objective is to determine a prioritization approach for implementing the Nitrate Permitting Strategy for Central Valley floor groundwater basins
- Priority factors in Nitrate Permitting Strategy:
 1. Current ambient groundwater quality (nitrate-N)
 2. Trends in nitrate concentrations in groundwater
 3. Number of individuals or community systems that are being impacted by groundwater that exceeds nitrate drinking water standards
- Can apply approach to both Upper Zone and Production Zone – This presentation based on Upper Zone

Priority Factors 1 and 2

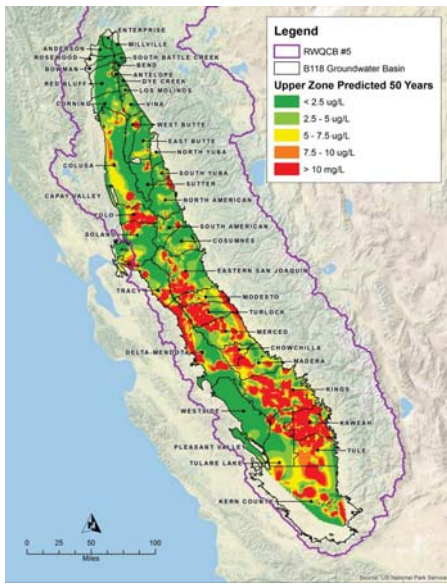
- Ambient groundwater quality and trends in nitrate concentrations
 - Current ambient groundwater quality (nitrate-N) from LSCE and LWA, 2016*.
 - Trends in nitrate concentrations in groundwater from LSCE and LWA, 2016*.

*Luhdorff & Scalmanini Consulting Engineers and Larry Walker Associates. 2016. High Resolution WQ Analysis: Central Valley Salinity Alternatives for Long Term Sustainability (CV-SALTS) Region 5: updated Groundwater Quality Analysis and High Resolution Mapping for Central Valley Salt and Nitrate Management Plan. June 2016. Prepared for: San Joaquin Valley Drainage Authority, Submitted by: Luhdorff and Scalmanini Consulting Engineers in association with: Larry Walker Associates, Inc.



Priority Factor 1

- Ambient Nitrate in Groundwater in Upper Zone (volume-weighted data)

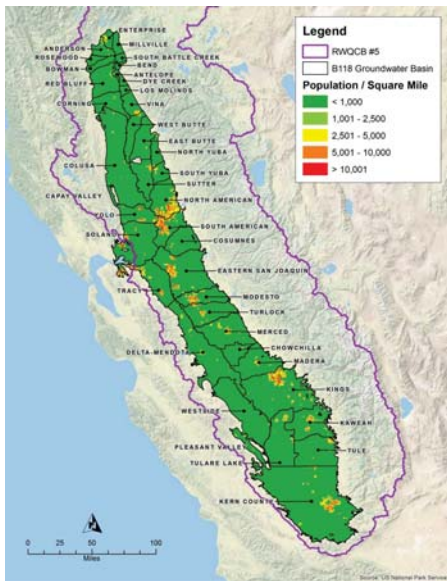


Priority Factor 2

- Predicted Nitrate Water Quality Groundwater in the Upper Zone in 50 Years (volume-weighted data)

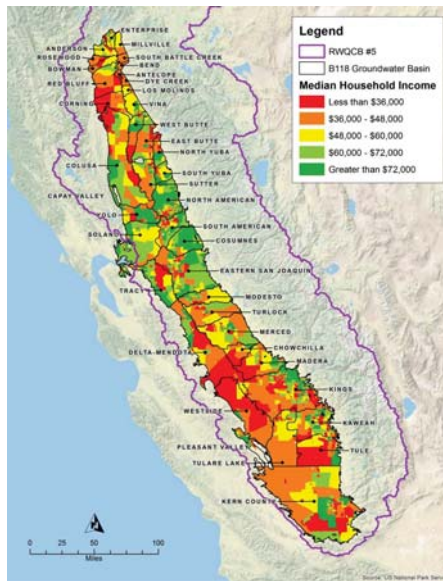
Priority Factor 3 – Impacts to Users

- Reviewed surrogate criteria for individuals and communities at risk from nitrate contamination in groundwater:
 - Population density
 - Median household income
 - Wells serving 25 people or fewer
 - California Communities Environmental Health Screening Tool (Cal EnviroScreen 3.0 Draft)



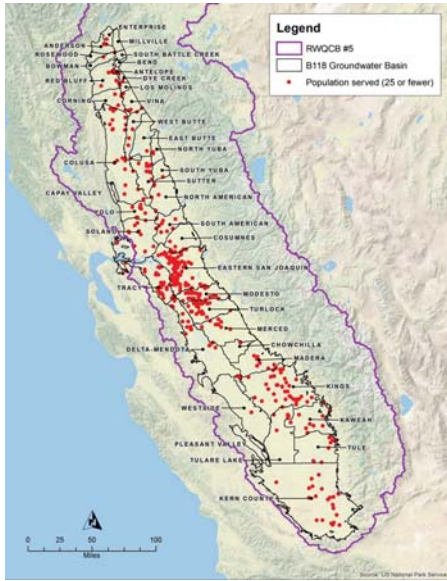
Priority Factor 3

- Population Density
- (Census Block Group 2011)



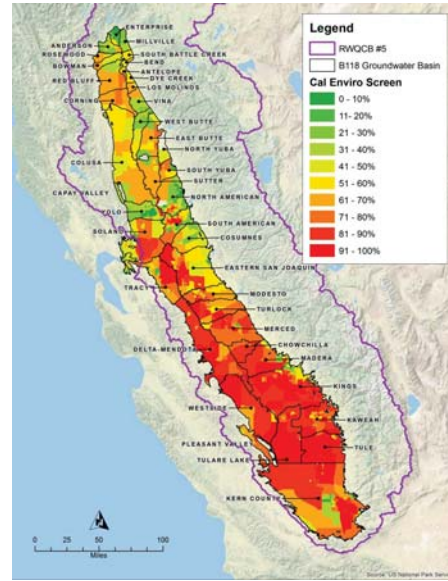
Priority Factor 3

- Median Household Income
- (CA 2011 Median: \$60,000)



Priority Factor 3

- Community Water System (CWD) Wells Serving a Population Served (25 or fewer)
- CV-SALTS Database



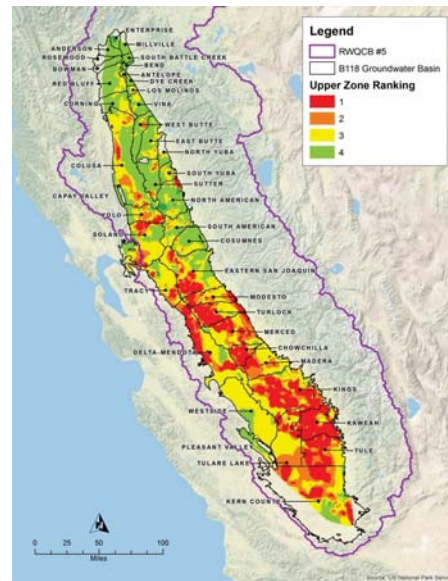
Priority Factor 3

- CalEnviro Screen 3.0 Draft
- 20 indicators of environmental conditions and population vulnerability
- CalEnviroScreen Score = Pollution Burden (10) X Population Characteristics (10)

Calculation of Prioritization Score for Each Groundwater Basin

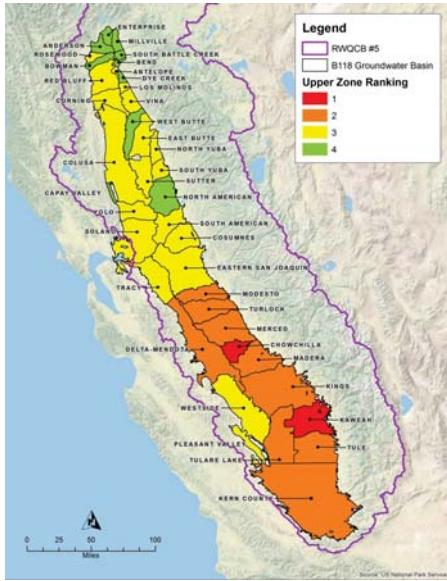
- Initial Prioritization Score

$$N_{score} = N_{ambient} + N_{projected} + \text{Cal EnviroScreen}$$



Priority Ranking 1 Square Mile

- $N_{ambient} +$
- $N_{projected} +$
- Cal EnviroScreen



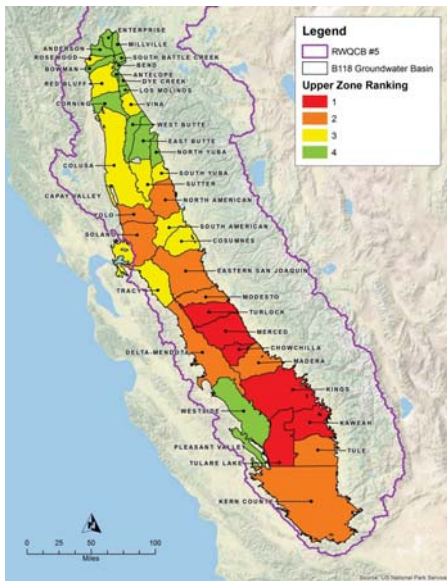
Initial Priority Ranking GW Basins

- N_{ambient} +
- $N_{\text{projected}}$ +
- Cal EnviroScreen

Prioritization Score: Additional Criterion

- Initial criteria did not result in adequate parsing of groundwater basins
- Lack of data/spatial coverage in some groundwater basins
- Did not highlight well enough areas where we know there are significant nitrate concerns in groundwater
- Added average nitrate concentration in each groundwater basin to mitigate basins where data were sparse

$$N_{\text{score}} = N_{\text{ambient}} + N_{\text{projected}} + \text{Cal EnviroScreen} + N_{\text{well average}}$$



Priority Ranking GW Basins

- N_{ambient} +
- $N_{\text{projected}}$ +
- Cal EnviroScreen +
- $N_{\text{well average}}$

Priority 1 & 2

Priority Ranking	Basin Number	Basin Name	Score
Priority 1	5-22.11	Kaweah	4.65
	5-22.03	Turlock	4.32
	5-22.08	Kings	4.24
	5-22.04	Merced	4.10
	5-22.05	Chowchilla	4.02
	5-22.12	Tulare Lake	4.01
Priority 2	5-22.07	Delta-Mendota	3.99
	5-22.13	Tule	3.96
	5-22.14	Kern County	3.77
	5-22.01	Eastern San Joaquin	3.75
	5-22.02	Modesto	3.69
	5-21.67	Yolo	3.69
	5-21.66	Solano	3.62
	5-22.06	Madera	3.56
	2-4	Pittsburg Plain	3.54
	5-21.64	North American	3.17

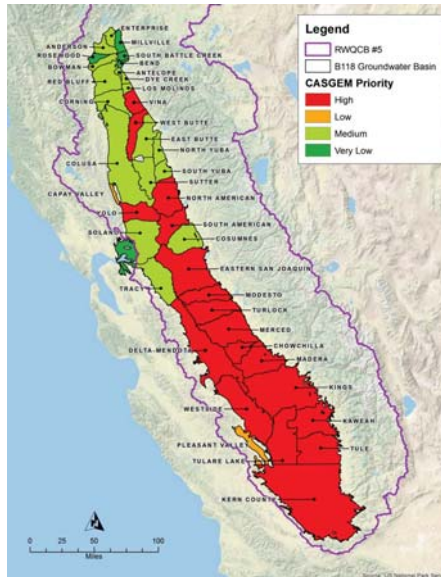
Priority 3 & 4

Priority Ranking	Basin Number	Basin Name	Score
Priority 3	5-22.15	Tracy	2.91
	5-21.62	Sutter	2.89
	2-5	Clayton Valley	2.79
	2-6	Ygnacio Valley	2.43
	5-6.02	Rosewood	2.42
	2-3	Suisun-Fairfield Valley	2.33
	5-21.52	Colusa	2.27
	5-21.68	Capay Valley	2.27
	5-21.61	South Yuba	2.16
	5-21.50	Red Bluff	2.08
	5-21.65	South American	2.08
	5-22.16	Cosumnes	2.04
5-21.57	Vina	2.02	
Priority 4	5-21.58	West Butte	1.94
	5-21.55	Dye Creek	1.86
	5-21.53	Bend	1.84
	5-22.09	Westside	1.82
	5-22.10	Pleasant Valley	1.78
	5-21.56	Los Molinos	1.73
	5-21.51	Corning	1.73
	5-21.60	North Yuba	1.66
	5-21.54	Antelope	1.63
	5-21.59	East Butte	1.62
	5-6.01	Bowman	1.60
	5-6.03	Anderson	1.48
	5-6.06	South Battle Creek	1.40
	5-6.05	Millville	1.32
	5-6.04	Enterprise	1.21



Cal EnviroScreen 3.0 Draft

<p>Pollution Indicators</p> <p>Exposure Indicators</p> <ul style="list-style-type: none"> Air Quality - Ozone¹ Air Quality - PM2.5¹ Direct Particulate Matter¹ Drinking Water Contaminants¹ Pesticide Use¹ Toxic Releases from Facilities¹ Traffic Volume¹ Cleanup Sites¹ Groundwater Threats¹ Hazardous Waste Generation and Facilities¹ Solid Waste Sites and Facilities¹ 	<p>Population Characteristics Indicators</p> <p>Sensitive Population Indicators</p> <ul style="list-style-type: none"> Asthma¹ Cardiovascular diseases¹ Low Birth Weight Infants¹ Educational Attainment¹ Linguistic Isolation¹ Poverty¹ Rent-adjusted Income¹ Unemployment¹
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Priority Factor X

- CASGEM