

Monitoring Program Sampling Framework

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ESJ Surface Water Quality Monitoring Program Review Panel

January 7, 2020

East San Joaquin Water Quality Coalition

- Formed in 2003
- Initiated surface water monitoring in 2004
- 3,279 Landowner / Operators
- 701,318 irrigated acres (November 2019)
 - Madera, Merced, Stanislaus, Tuolumne, Mariposa counties



Monitoring Program Goals

1



Detect water quality issues attributable to agriculture as soon as possible (ILRP Questions 1 & 2)

2



Measure improvements in water quality (ILRP Questions 3 & 4)

3



Link improvements in water quality to management practices (ILRP Questions 5 & 6)

Representative Monitoring – Stratified by Zones

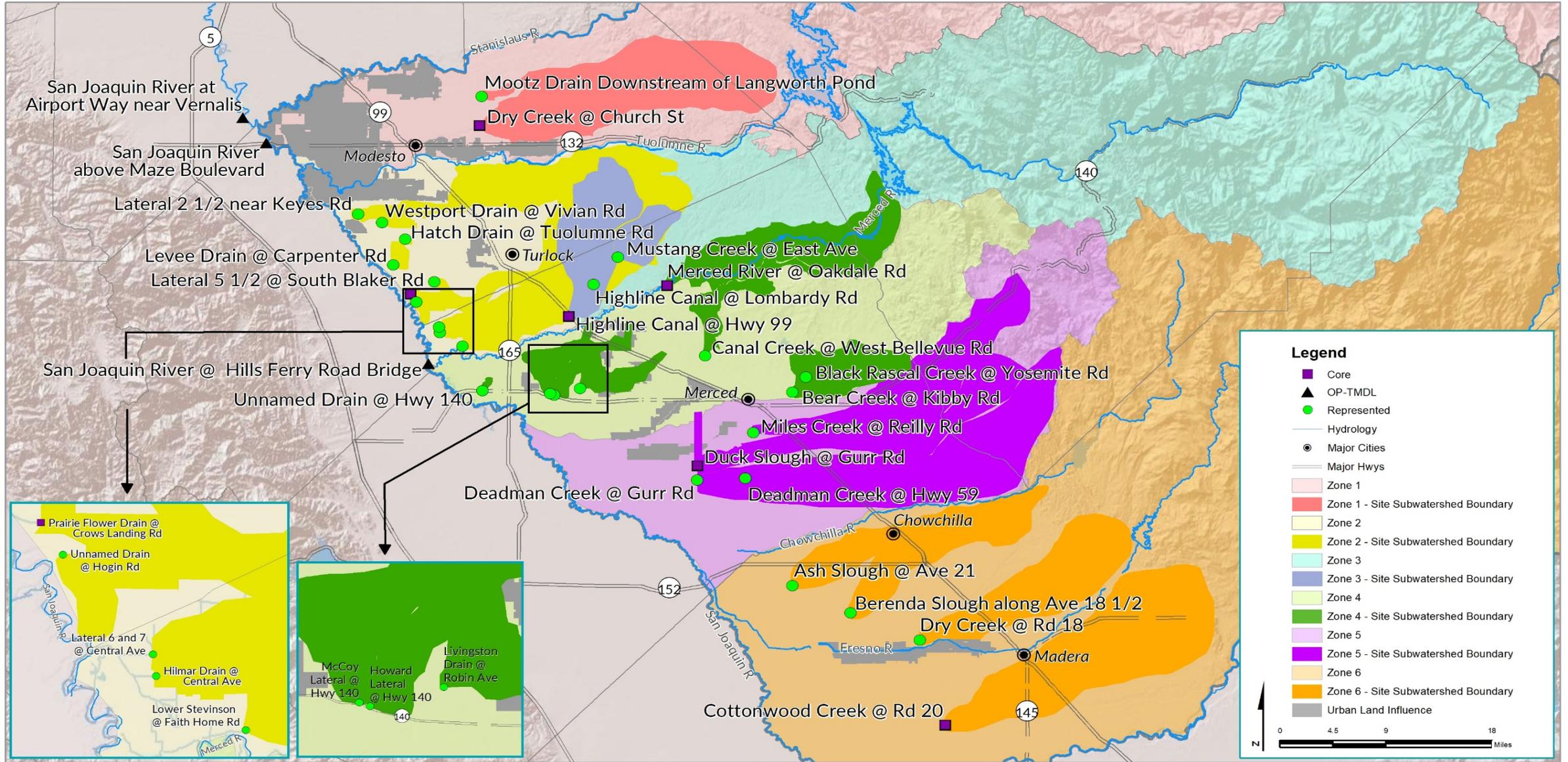
Hierarchical Cluster Analysis

- Group sites together based on the shared characteristics

Watershed Characteristics

- Soils
- Depth to groundwater
- Crop type
- Precipitation

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ESJWQC 2018 WY Monitoring Sites Zone Boundaries & Urban Land Influence

ESJWQC

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
 Projection: property=Lambert Conformal Conic
 Units: Foot US
 Service Layer Credits: Shaded Relief: Copyright: © 2014 Esri
 Hydrology - NHD hydrodata, 1:24,000-scale, <http://nhd.usgs.gov/>
 Roads, Highways, Railroads - ESRI



Monitoring Program



Normal monitoring (Representative)

Core-Represented sites within zones



Management plan monitoring

Targeted monitoring at sites experiencing two exceedances of the same constituent in three years



TMDL/BPA compliance monitoring

Targeted monitoring for specific constituents



Special studies

Source identification studies – e.g., *E. coli*, copper

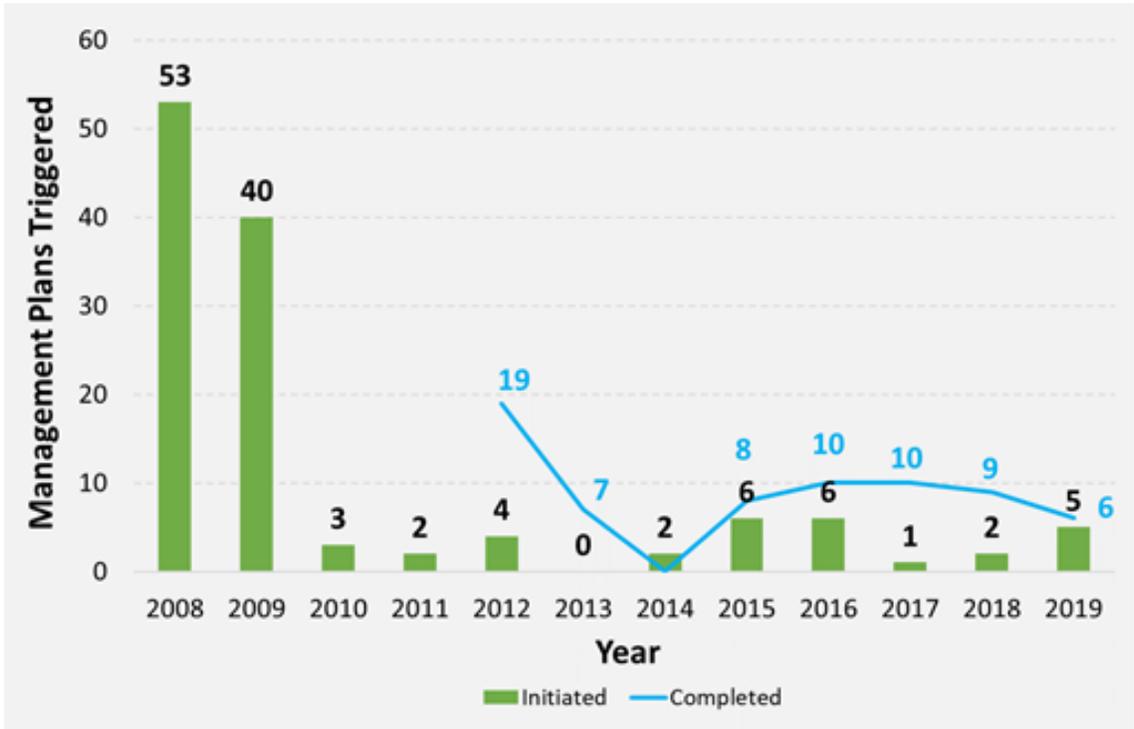
Management Plans



Copper, Nitrate, Pesticides, Toxicity

Requires three years of monitoring

Monitoring includes multiple months each year



BPA Compliance Monitoring and Special Studies



TMDL/BPA compliance monitoring

Organophosphates
Pyrethroids
Salinity (EC)
Dissolved Oxygen



Special studies

Is irrigated agriculture the source of the exceedances?

E. coli

Copper

Criteria for Selecting Monitoring Locations



**Naturally
occurring creeks
and sloughs**



Permanent flow



**Exclude irrigation
district
conveyance
structures**



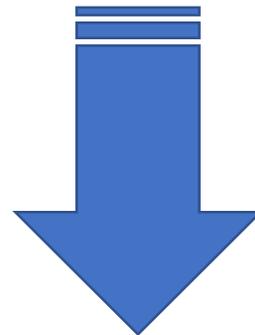
**Exclude
watersheds**

Dairy

Urban

Confined animal
operations

Non-members



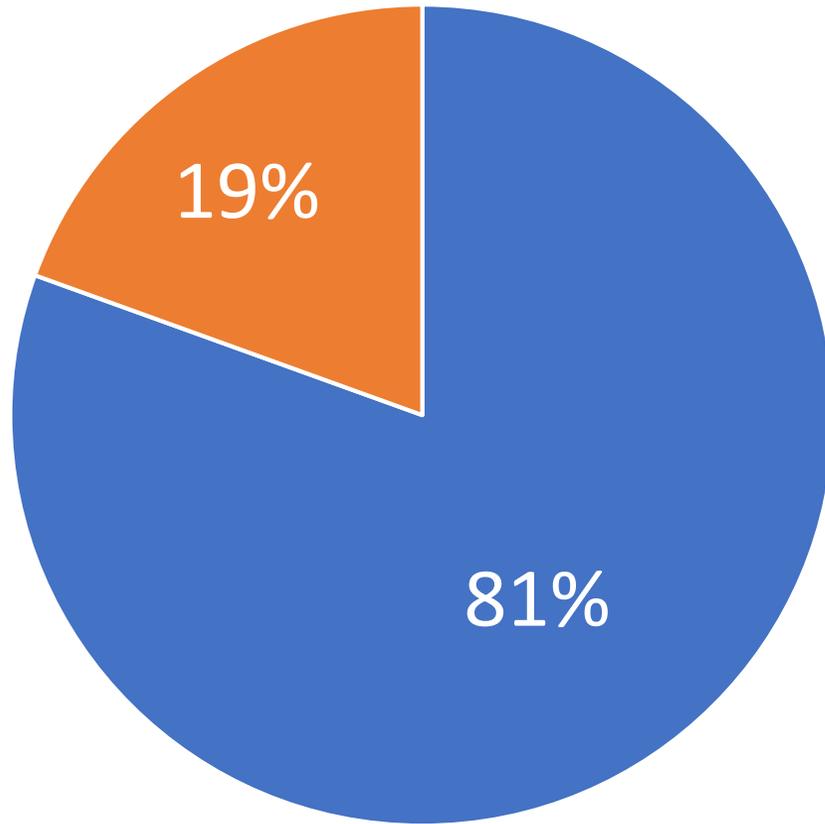
Monitoring Sites



- Creeks
- Sloughs
- Drains
- Canals
- Ephemeral

Spatial Coverage of Sampling Sites

Surface Water Monitoring Coverage

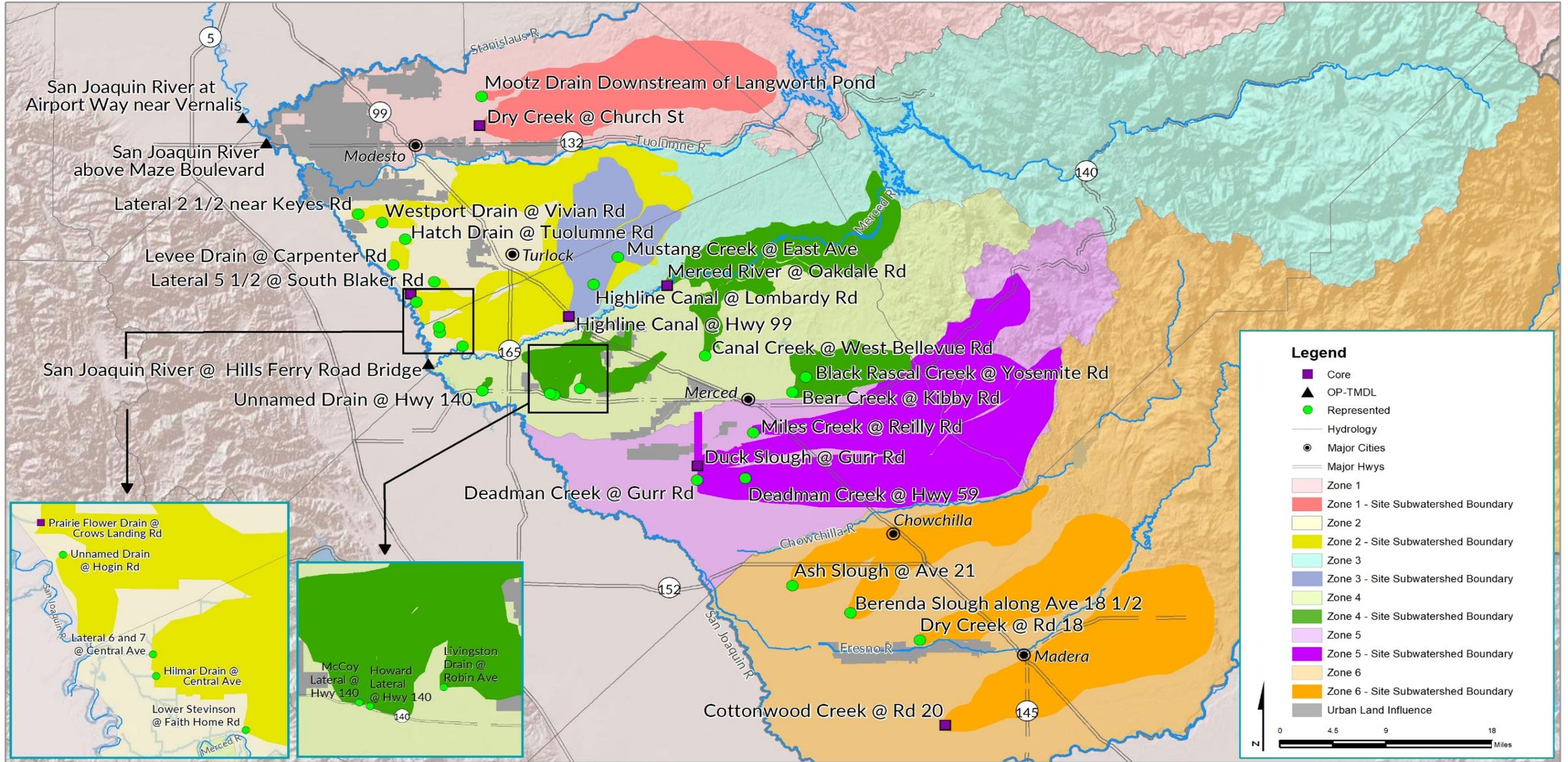


■ Covered ■ Open

Area not covered by sampling

- No discharge to surface water
- Acreage enrolled due to potential discharges to groundwater

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Cost of Monitoring



MONITORING AND REPORTING
(COST PER SITE)

\$7,386

+



OUTREACH /
EDUCATION

\$3,895

=



AVERAGE MONTHLY
COST PER SITE IN
2019

\$11,281



AVERAGE MONTHLY
COST IN 2019

\$125,000 - \$200,000

Monitoring Program Summary



SPATIAL COVERAGE IS AS GOOD AS THE COALITION CAN ACHIEVE AND STILL MAINTAIN A REASONABLE AGRICULTURE FOOTPRINT



MONTHLY MONITORING DETECTS EXCEEDANCES



EXCEEDANCES TRIGGER ADDITIONAL REPRESENTATIVE MONITORING AND MANAGEMENT PLAN MONITORING

Questions?