

Monitoring Program Sampling Framework

Michael L. Johnson, PhD

ESJ Surface Water Quality Monitoring Program Review Panel

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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)

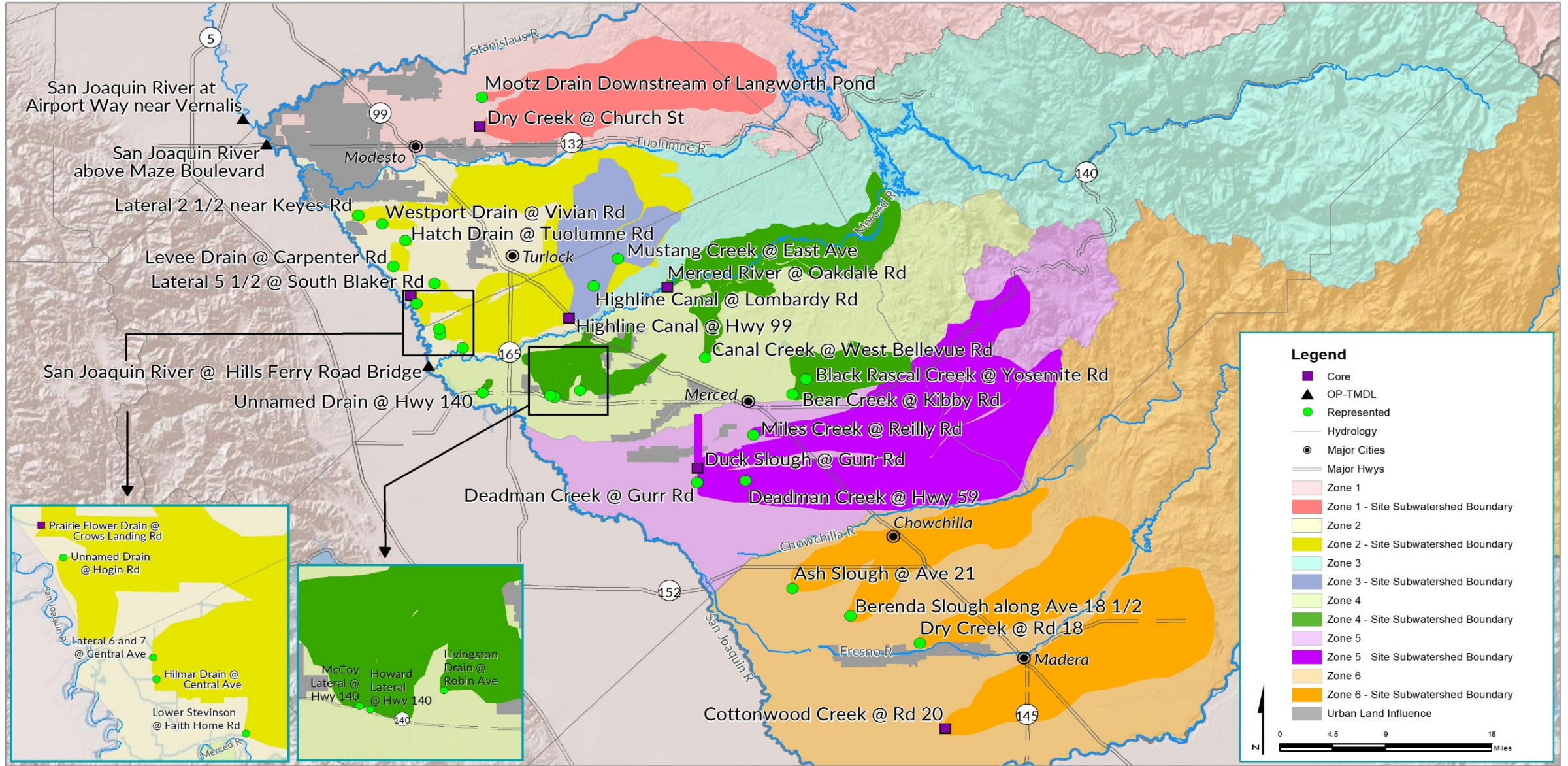
Representative Monitoring – Stratified by Zones

Hierarchal Cluster Analysis

- Group sites together based on the shared characteristics

Watershed Characteristics

- Soils
- Depth to groundwater
- Crop type
- Precipitation



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

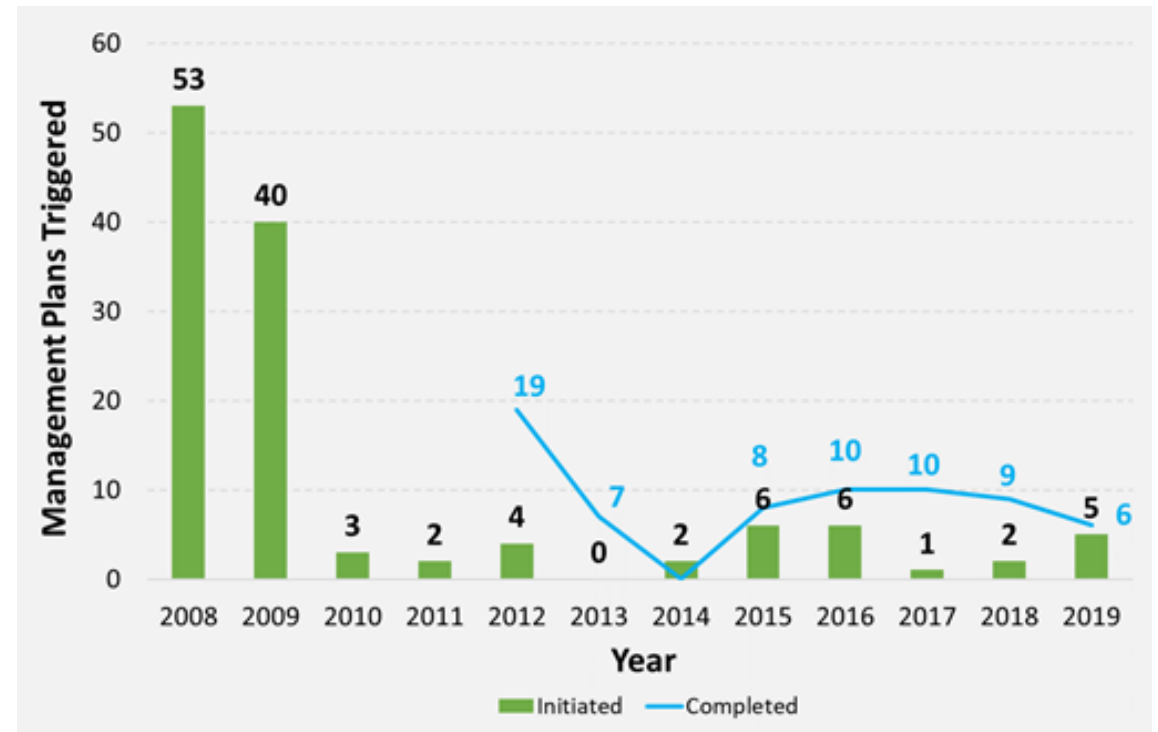
Management Plans



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**



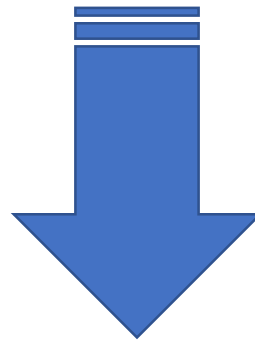
**Exclude
watersheds**

Dairy

Urban

Confined animal
operations

Non-members



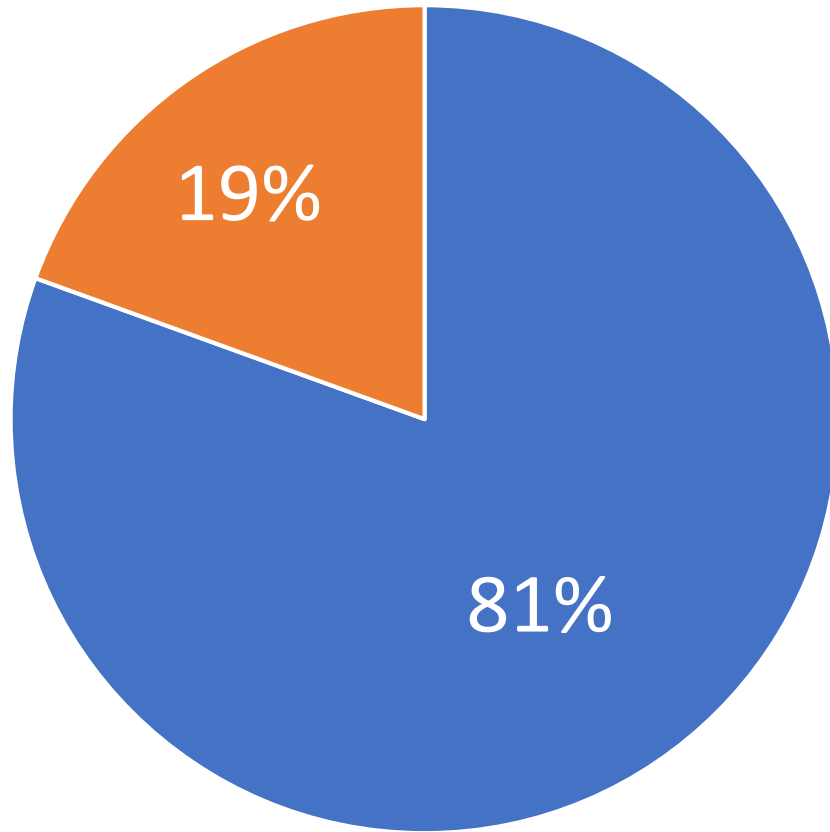


Monitoring Sites

- Creeks
- Sloughs
- Drains
- Canals
- Ephemeral

Spatial Coverage of Sampling Sites

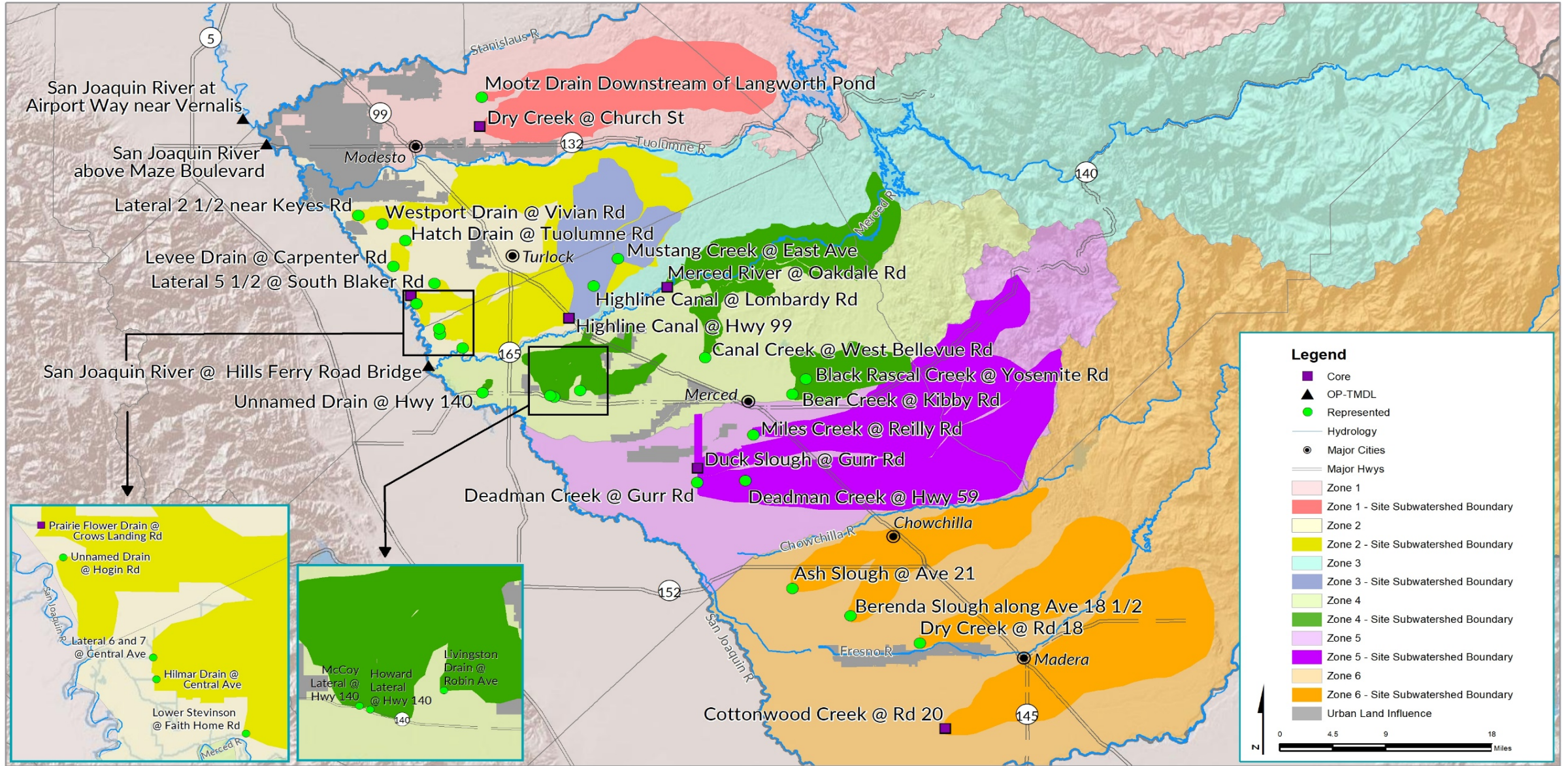
Surface Water Monitoring Coverage



■ 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?