# Protecting Aquatic Ecosystem Function and Value

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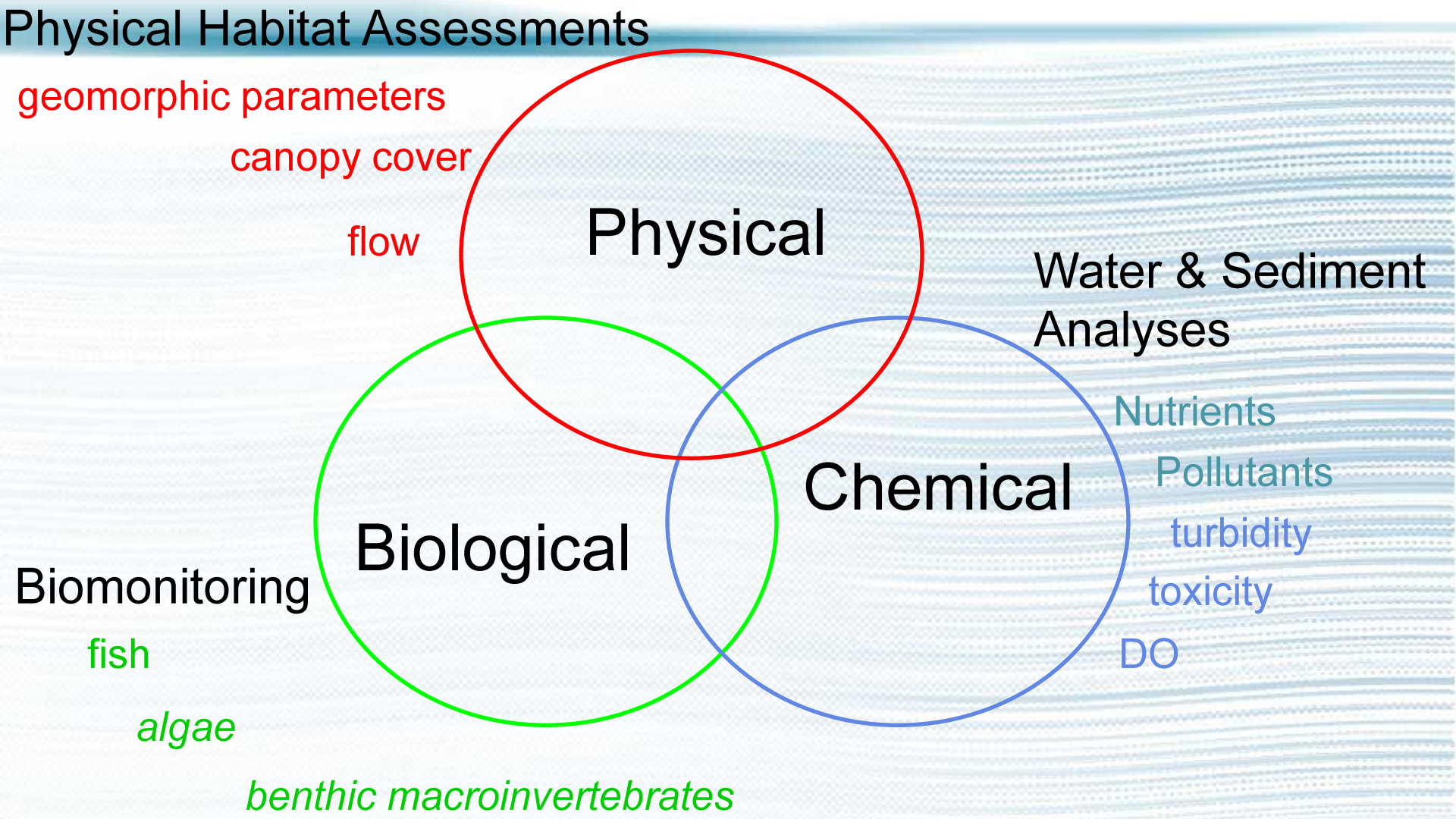
**California Regional Water Quality Control Board**
**San Francisco Bay Region**

# 3 Components of Monitoring & Assessment

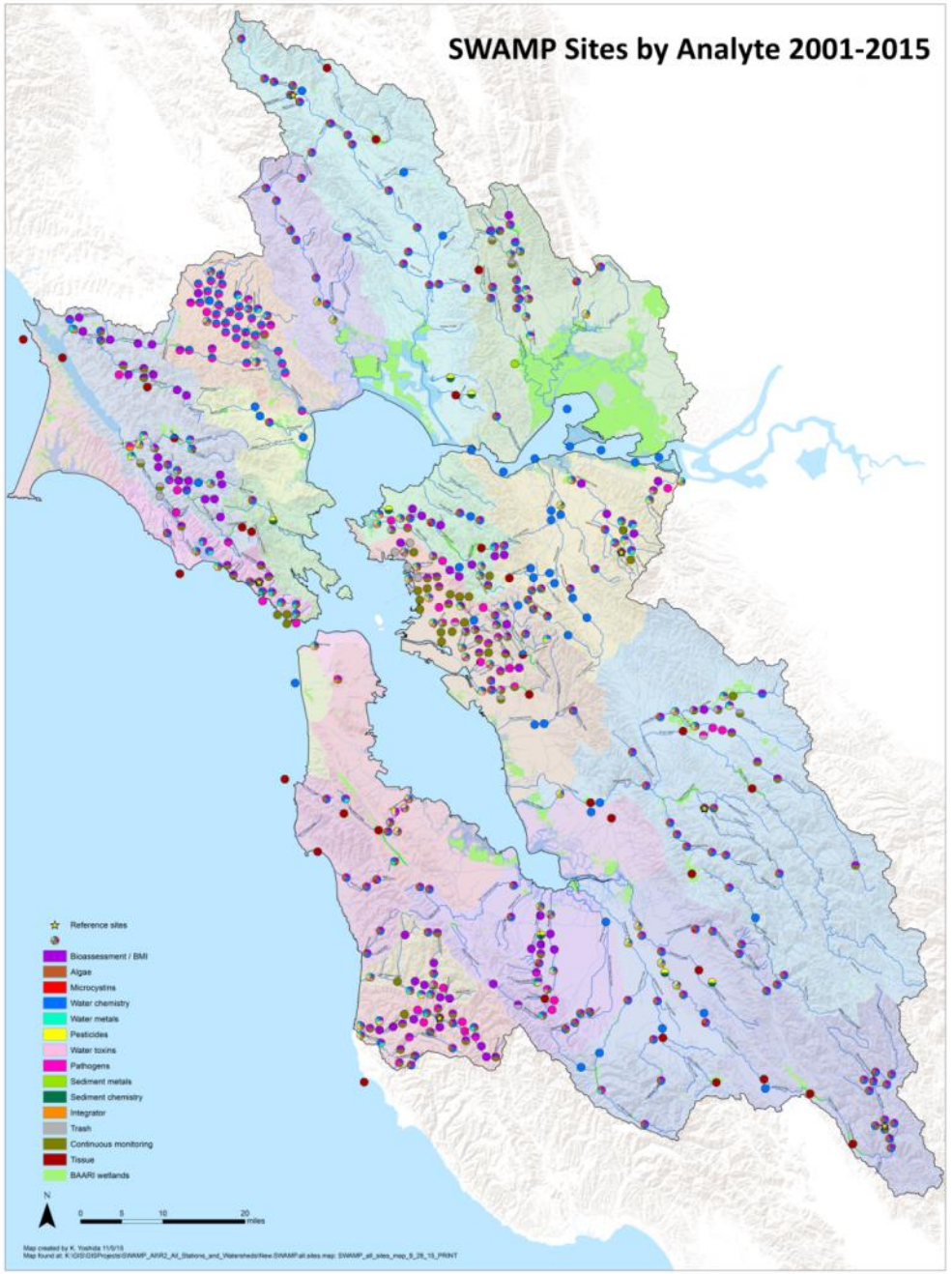


# Regional SWAMP Program Goals

- Identify the ambient water quality conditions of streams, lakes, and wetlands within the SF Bay Area
- Help develop statewide or regional water quality objectives
- Support TMDL development
- Develop standard methods to collect and interpret water quality data

# Regional SWAMP Monitoring

- Stream bioassessment data (macroinvertebrate, algae, and physical habitat indicators)
- Nutrients
- Fecal indicator bacteria
- Pesticides
- Water and sediment toxicity
- Water and sediment metals
- Continuous monitoring (dissolved oxygen and temp.)
- Mercury and PCBs in fish tissue


SWAMP Sites by Analyte 2001-2015
Reference sites
Bioassessment / BMI
Algae
Microcystins
Water chemistry
Water metals
Pesticides
Water toxins
Pathogens
Sediment metals
Sediment chemistry
Integrator
Trash
Continuous monitoring
Tissue
BAARI wetlands
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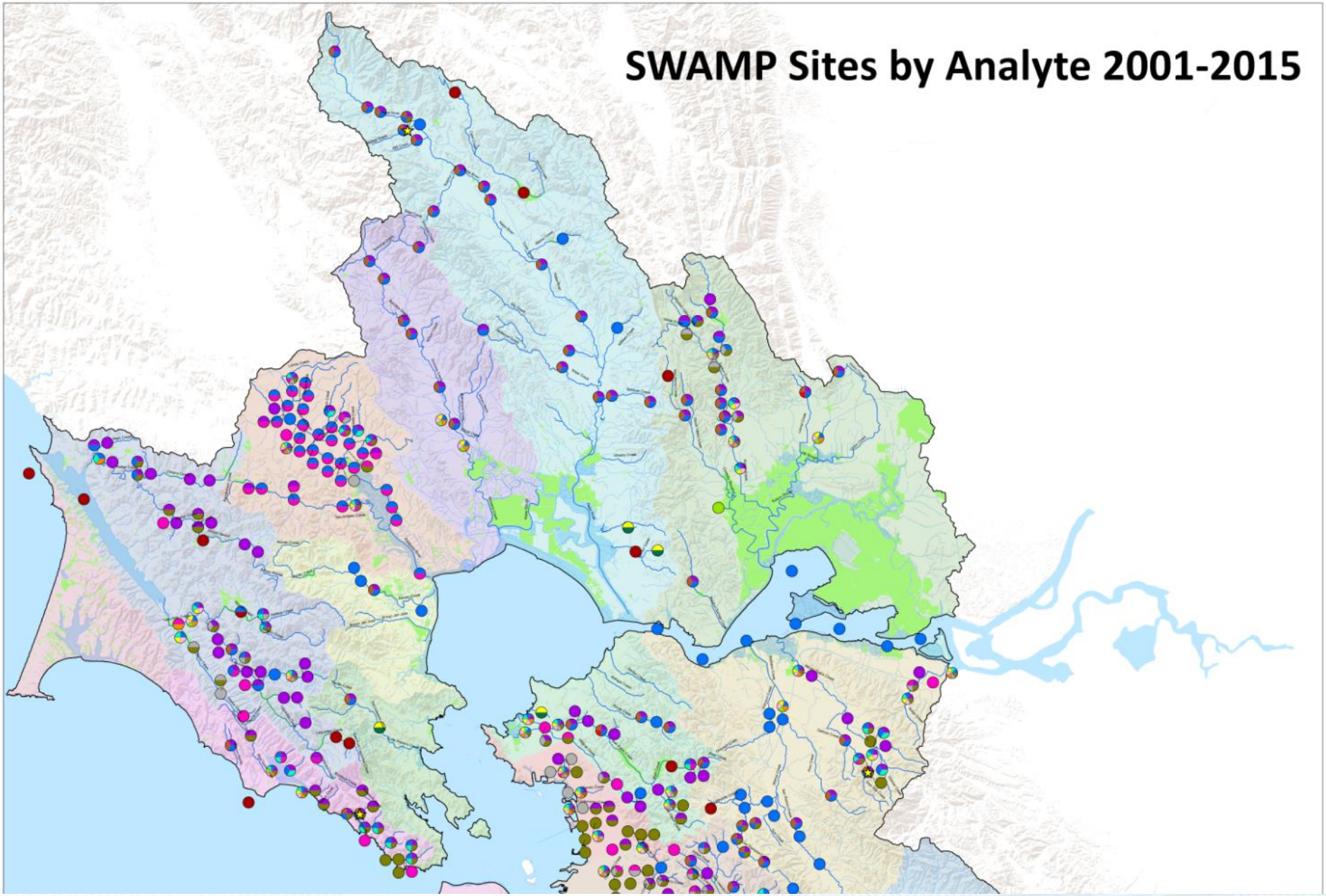
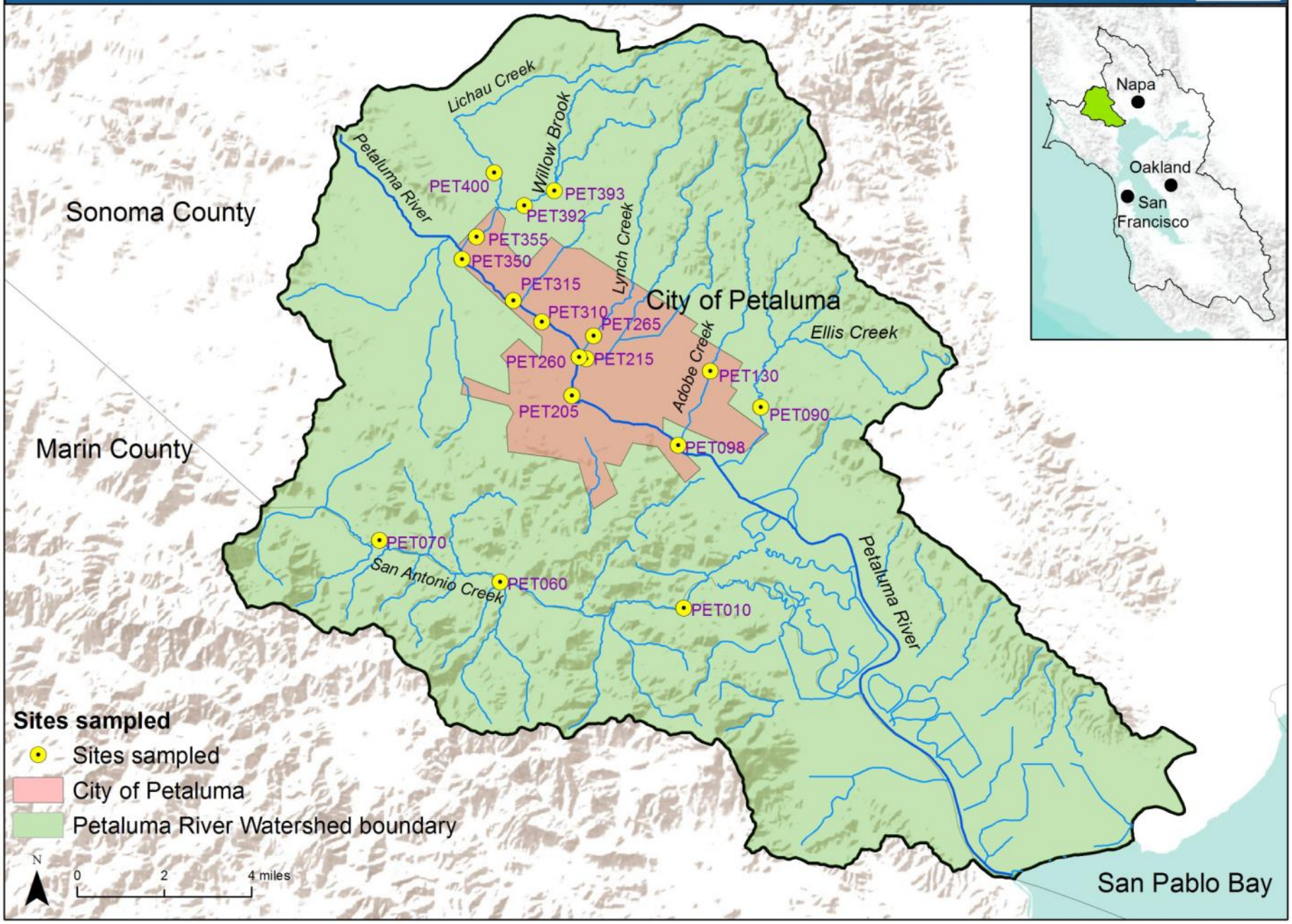

SWAMP Sites by Analyte 2001-2015

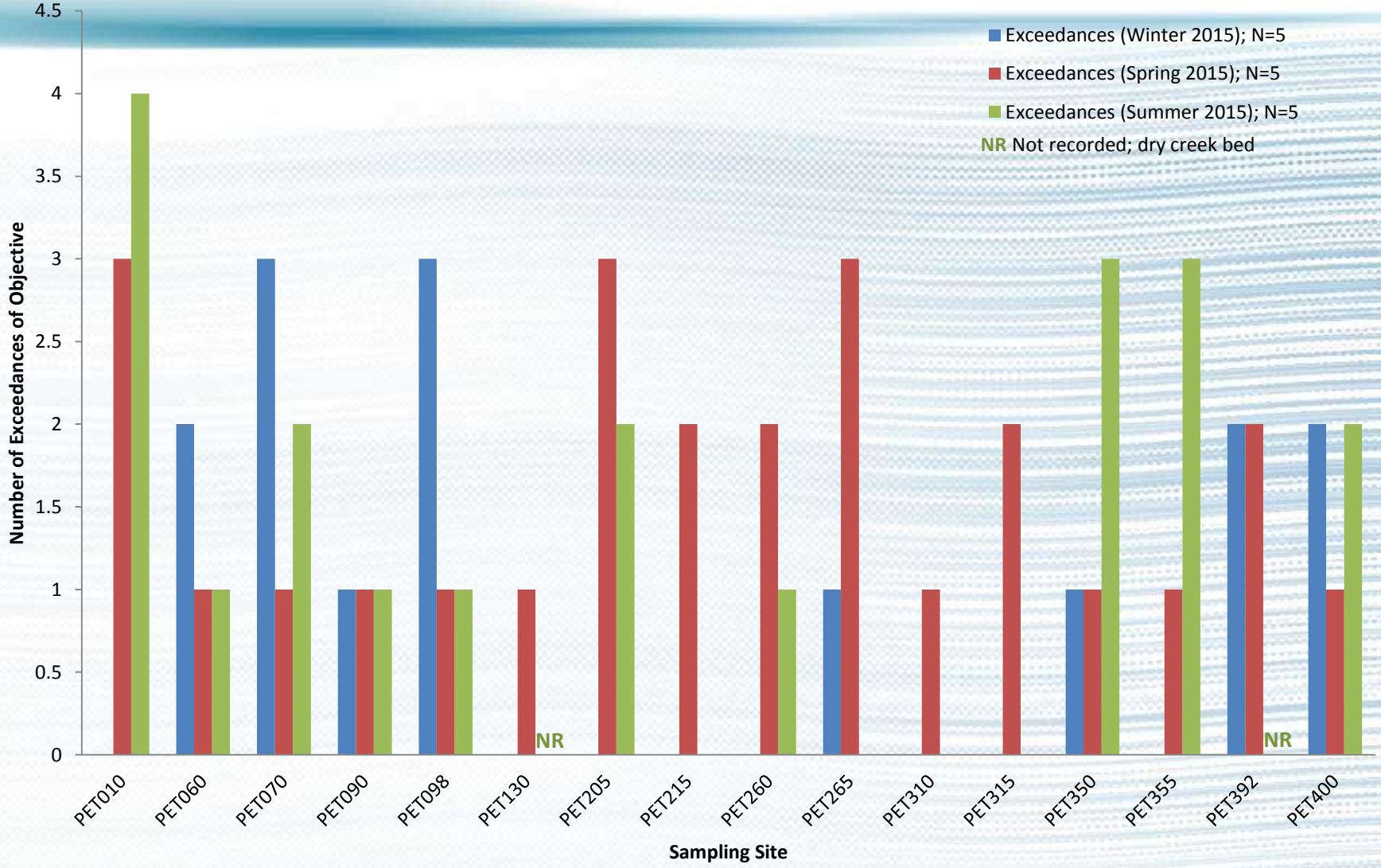
# Petaluma River – nutrient and pathogen TMDL monitoring

- Monitoring will inform TMDLs for nutrients and pathogens
- Sampling time frame: pilot test spring 2014, full sampling in winter, spring and summer 2015
- Sampled 18 sites throughout the main stem and major tributaries
- Sampling efforts focused on freshwater, non-tidal sections of the main stem
- Sampling for E. coli to compare to 2012 EPA criteria

# Petaluma River Bacteria Monitoring



# Number of Exceedances of Single Sample *E. coli* Objective
## Winter, Spring, and Summer 2015
### (EPA 2012 Water Quality Criteria = 410 MPN/100 mL)



# Sorting Out Sediment
# A Water Quality Perspective

# Regulatory Framework

Controllable water quality factors shall not disturb geomorphic and hydrologic processes and the physical attributes of waterbodies to levels that adversely affect beneficial.

# Tool box for getting the right size sediment where it needs to be

- Policies – Basin Plan, TMDLs
- Permits – WDRs, WDRs Waivers, NPDES, 401 WQ certs
- Support – grants, SEPs

# Many streams are impaired by sediment and lacking in habitat complexity and connectivity

Channel incision reduces the frequency of gravel bars and pools, side channels and alcoves, and results in disconnections of the channel from its floodplain.

# Fundamental alterations of channel sediment transport and storage processes.

Reductions in flood plain areas and large woody debris loading diminishes capacity to store and meter sediment

# Dams and culverts can reduce coarse sediment supply and promote incision

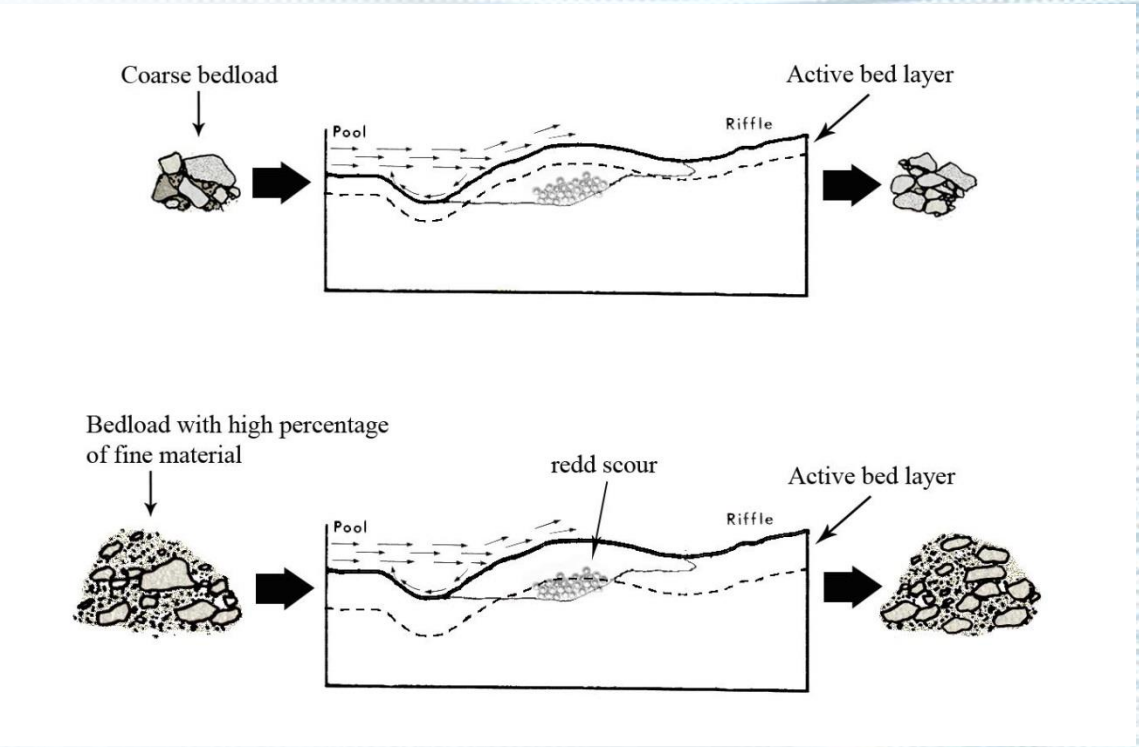
Channel incision reduces the frequency of gravel bars and pools, side channels and alcoves, and results in disconnections of the channel from its floodplain.

# Excess fine sediment impairs fish habitat

Channel incision reduces the frequency of gravel bars and pools, side channels and alcoves, and results in disconnections of the channel from its floodplain.

# Sediment Targets

Substrate composition
Spawning gravel permeability
Streambed scour  Depth
Pool filling



# Stream Maintenance WDRs and 401 certs

Watershed scale

Routine stream maintenance activities

- sediment management
- vegetation management
- Bank stabilization

Mitigation

# Stream Maintenance WDRs and 401 certs

*Targeted* sediment removal in channels reduces the need
for *reach* scale removal downstream

# Stream Maintenance WDRs and 401 certs

Channel capacity
Hydraulic constrictions
Roughness

# Stream Maintenance WDRs and 401 certs

Promote management aimed at sustaining a desirable value for vegetative roughness in order to balance the functions of the vegetation for erosion control, shade, temperature, aquatic habitat, and flood risk reduction

# Stream Maintenance WDRs and 401 certs

Require developing channel capacity objectives and estimates of flood stage-discharge relationships so that quantifiable information will inform when maintenance is needed for flood protection.

# Stream Maintenance WDRs and 401 certs

Channel dimension objectives:

- Facilitate stream equilibrium conditions
- Address excessive erosion and deposition problems
- Promote sustainable habitat conditions
- Guide channel grading and enhancements activities