

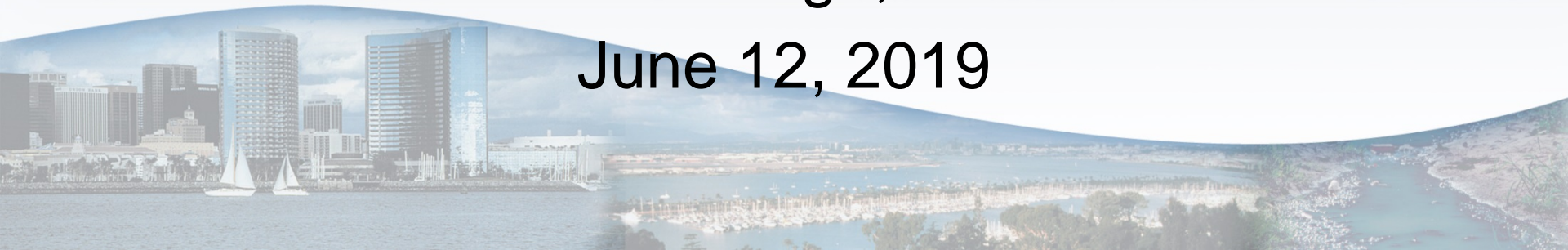
Update on Santa Margarita River Estuary Water Quality Restoration Strategy and Investigative Order

Hiram Sarabia,
Environmental Scientist

San Diego Water Board

San Diego, CA

June 12, 2019



Purpose

1) Estuary Restoration Strategy

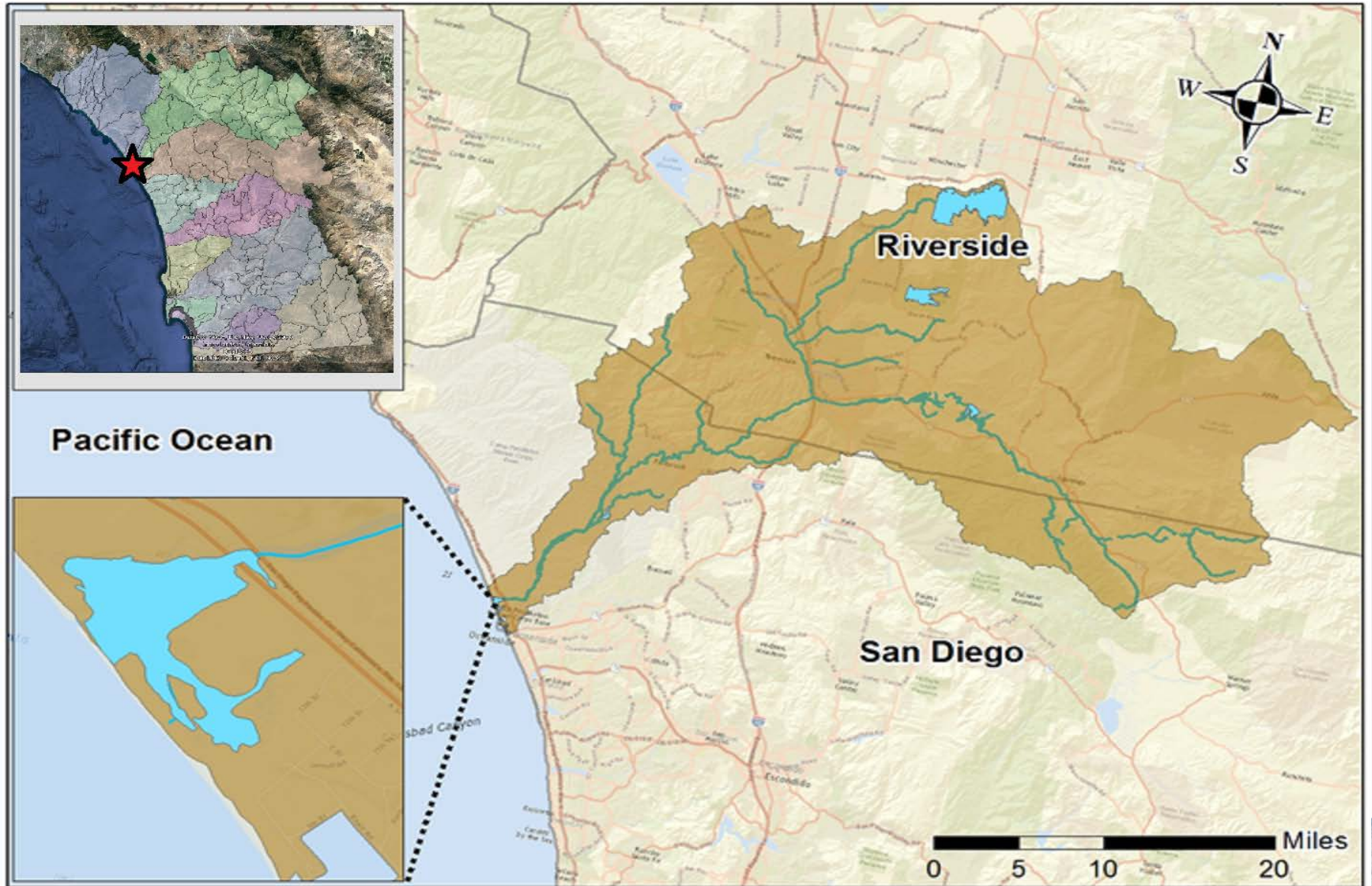
- a. Importance of Estuary and Impairment
- b. Strategy Being Implemented

2) Investigative Order R9-2019-0007

- a. Role of IO in Strategy
- b. Directives and Schedule



Santa Margarita River Estuary



Wild River



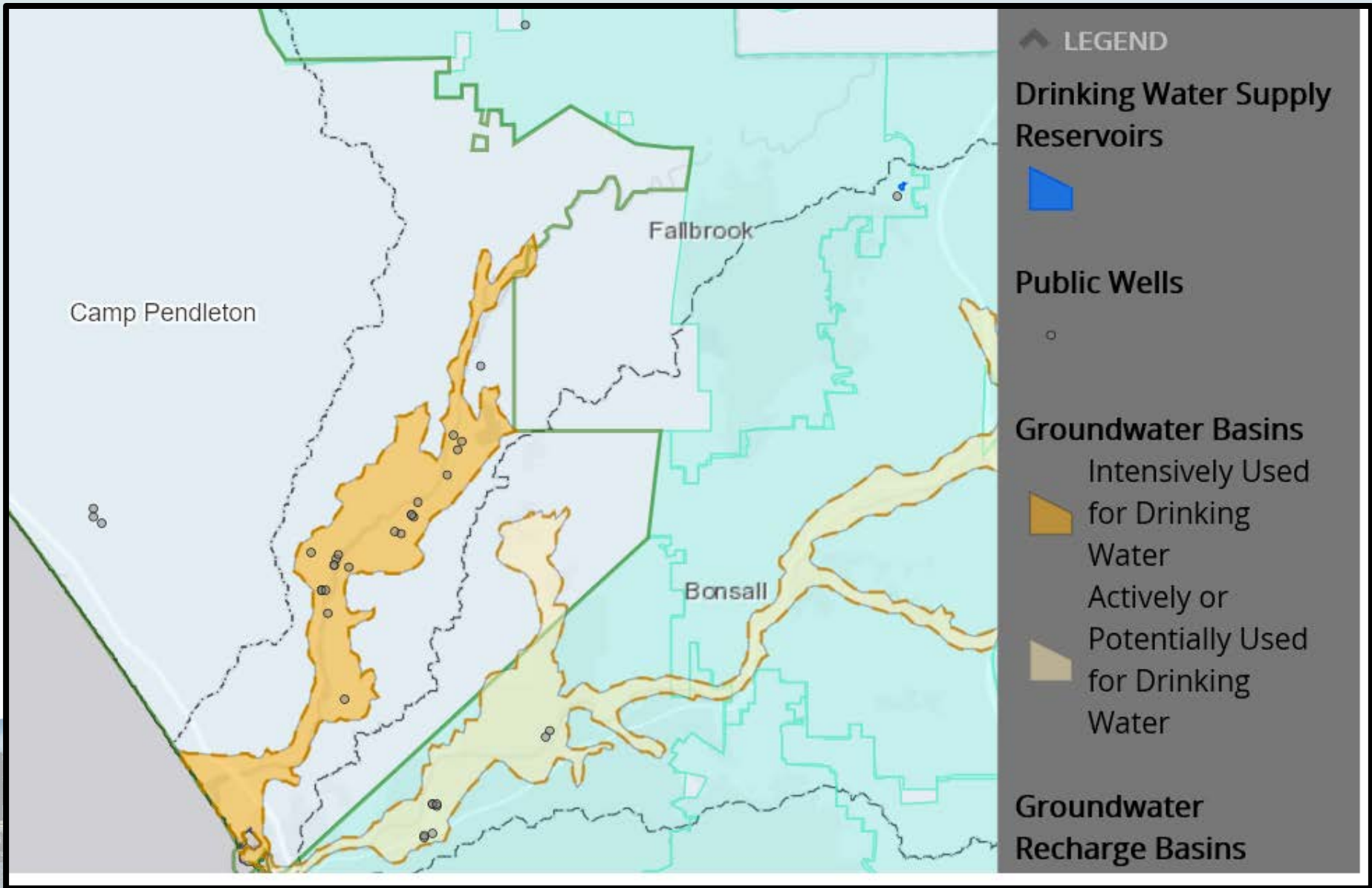
192 Acres of Estuarine Habitat



Rare and Endangered Species



Drinking Water



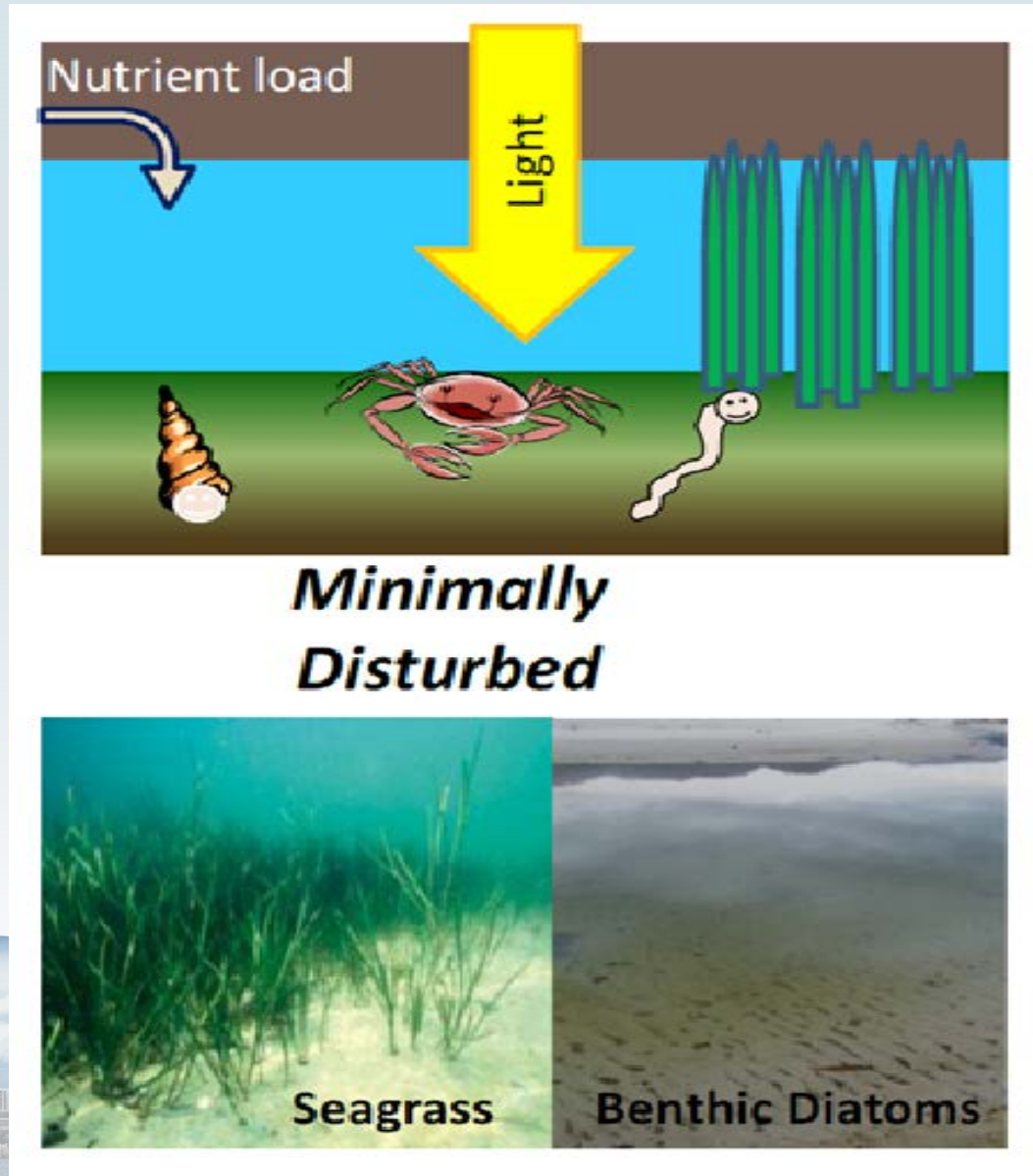
1986



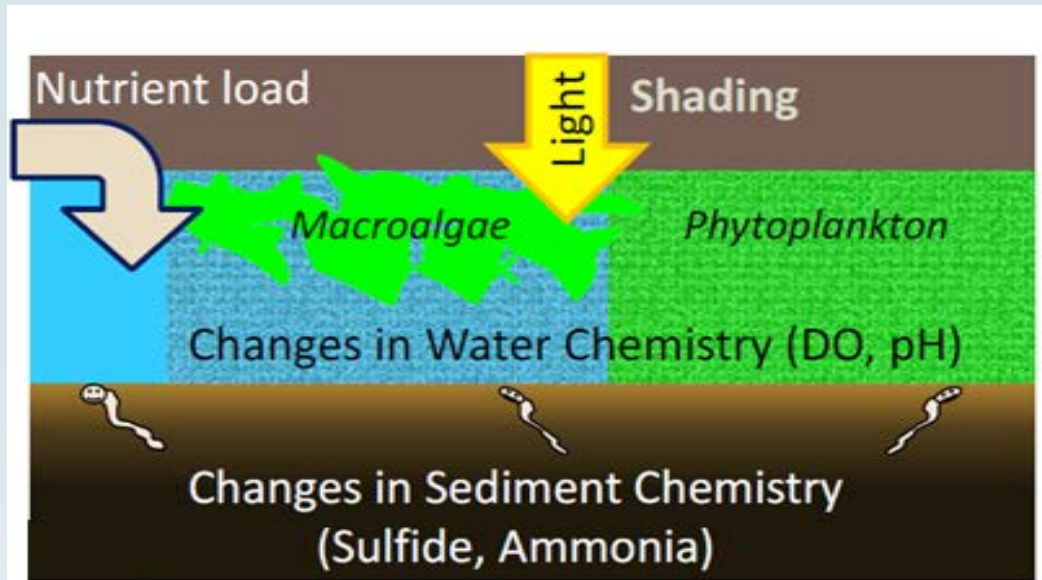
Eutrophic Conditions



Minimally Disturbed Conditions



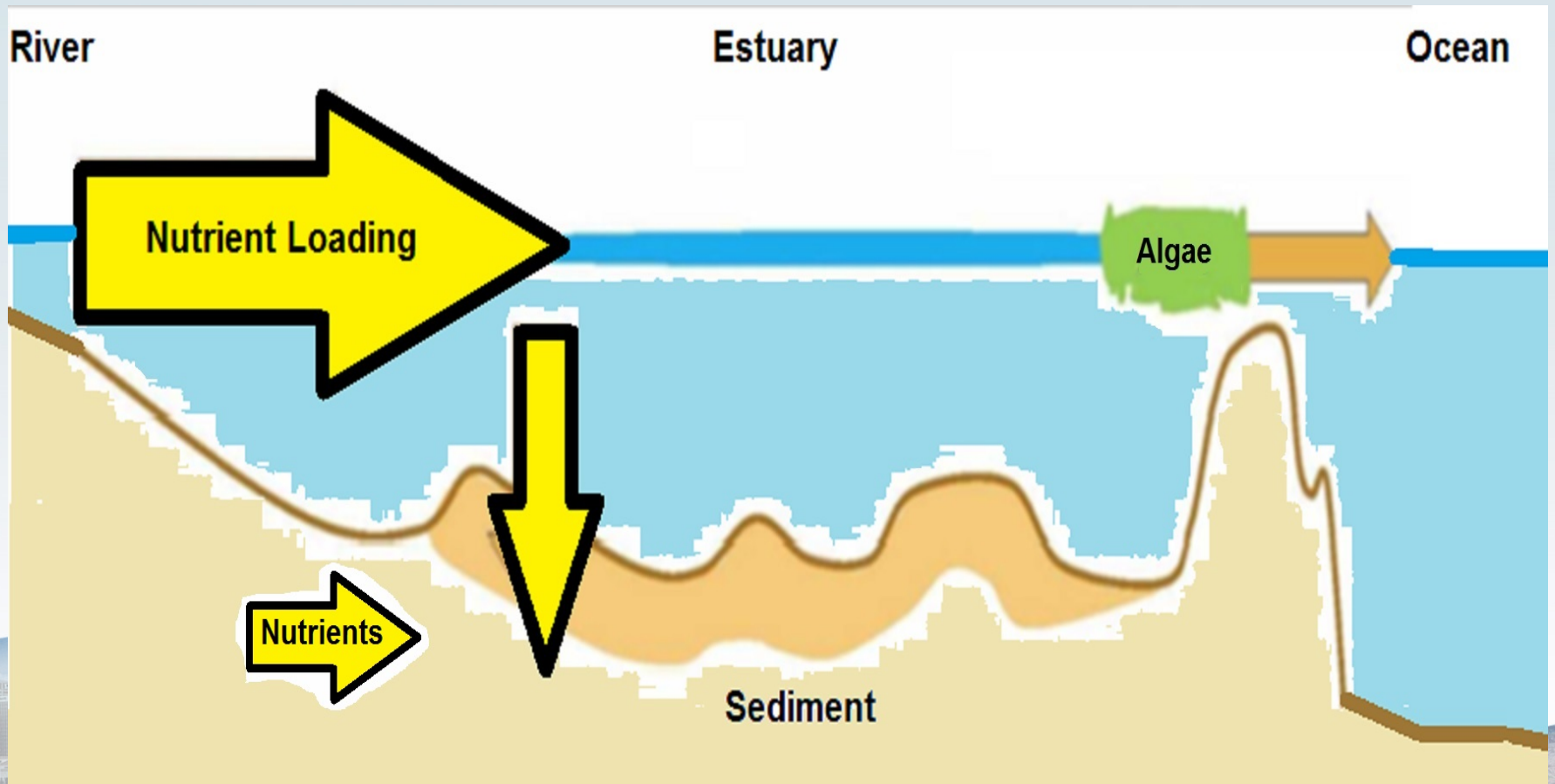
Eutrophic Conditions



Eutrophic- Hypertrophic

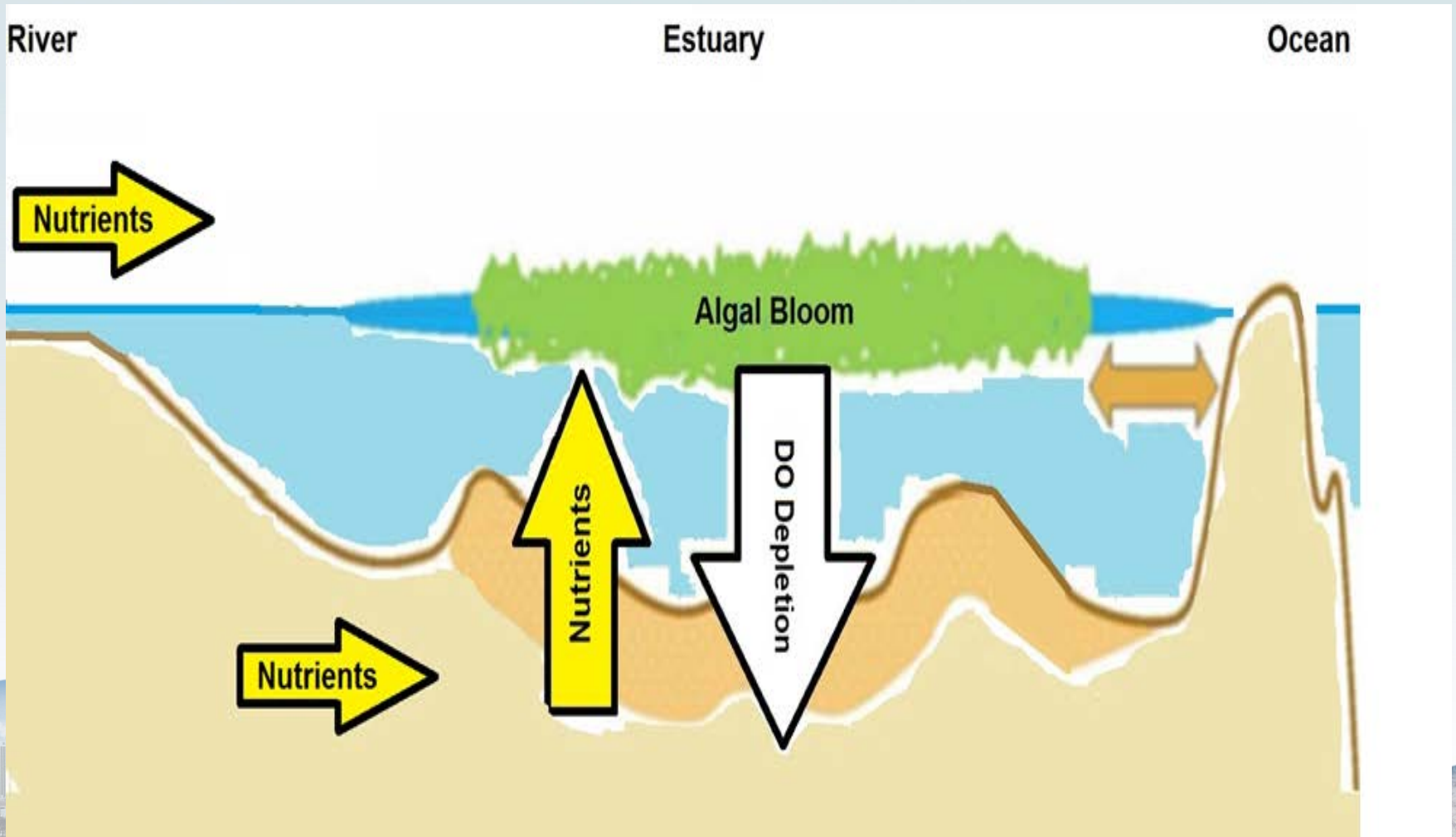


Santa Margarita River Estuary Wet Weather Conditions



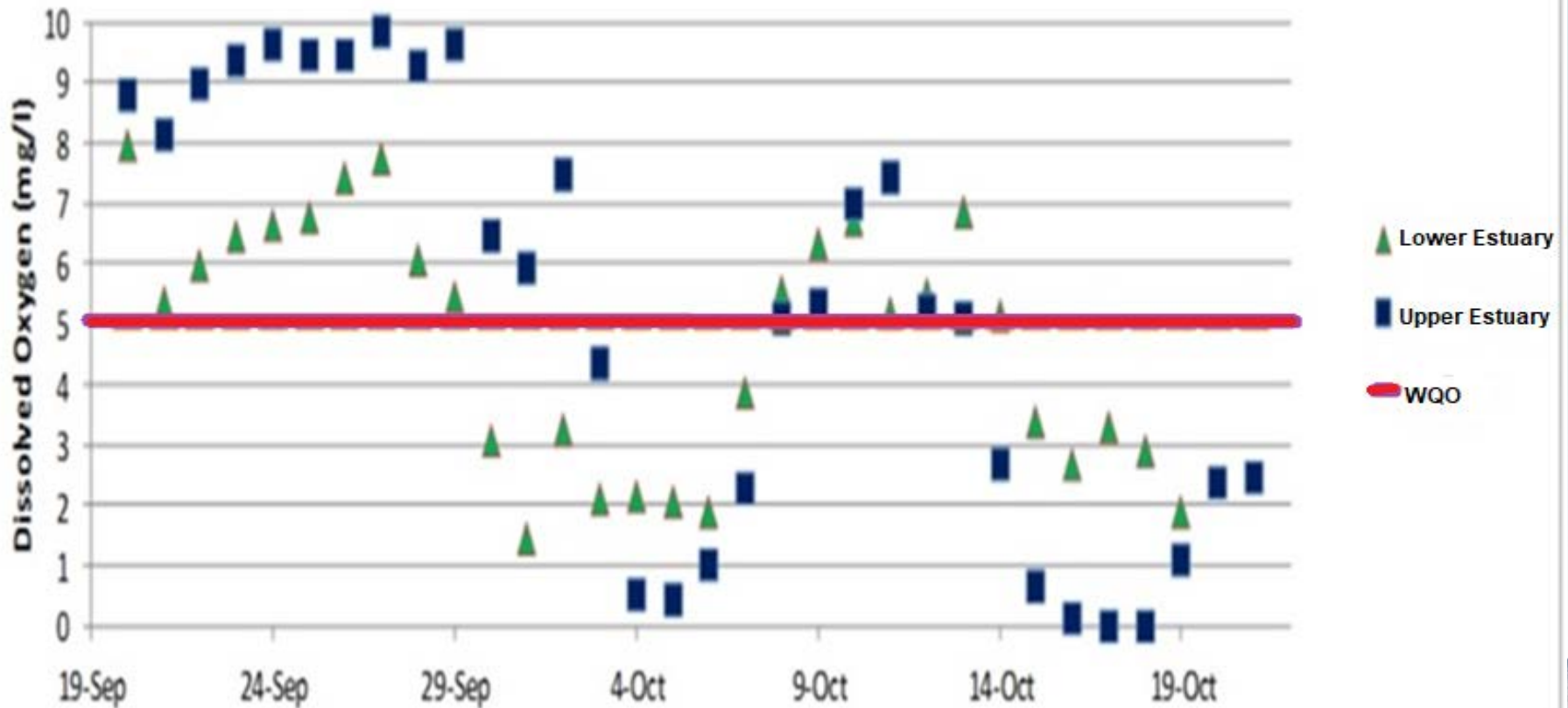
Santa Margarita River Estuary

Dry Weather Conditions



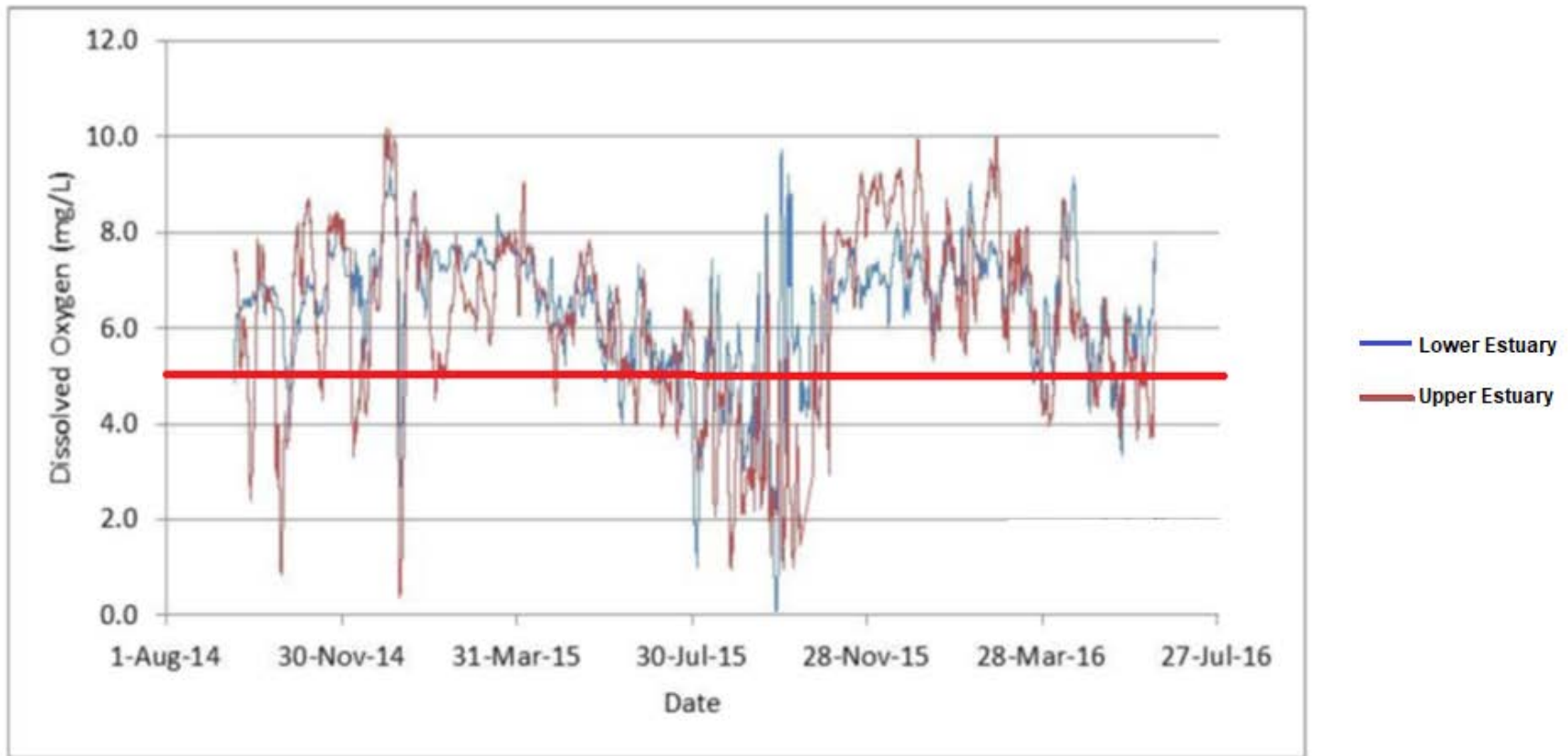
Fall 2010 Estuary Dissolved Oxygen

Daily Average Dissolved Oxygen (DO) Concentrations

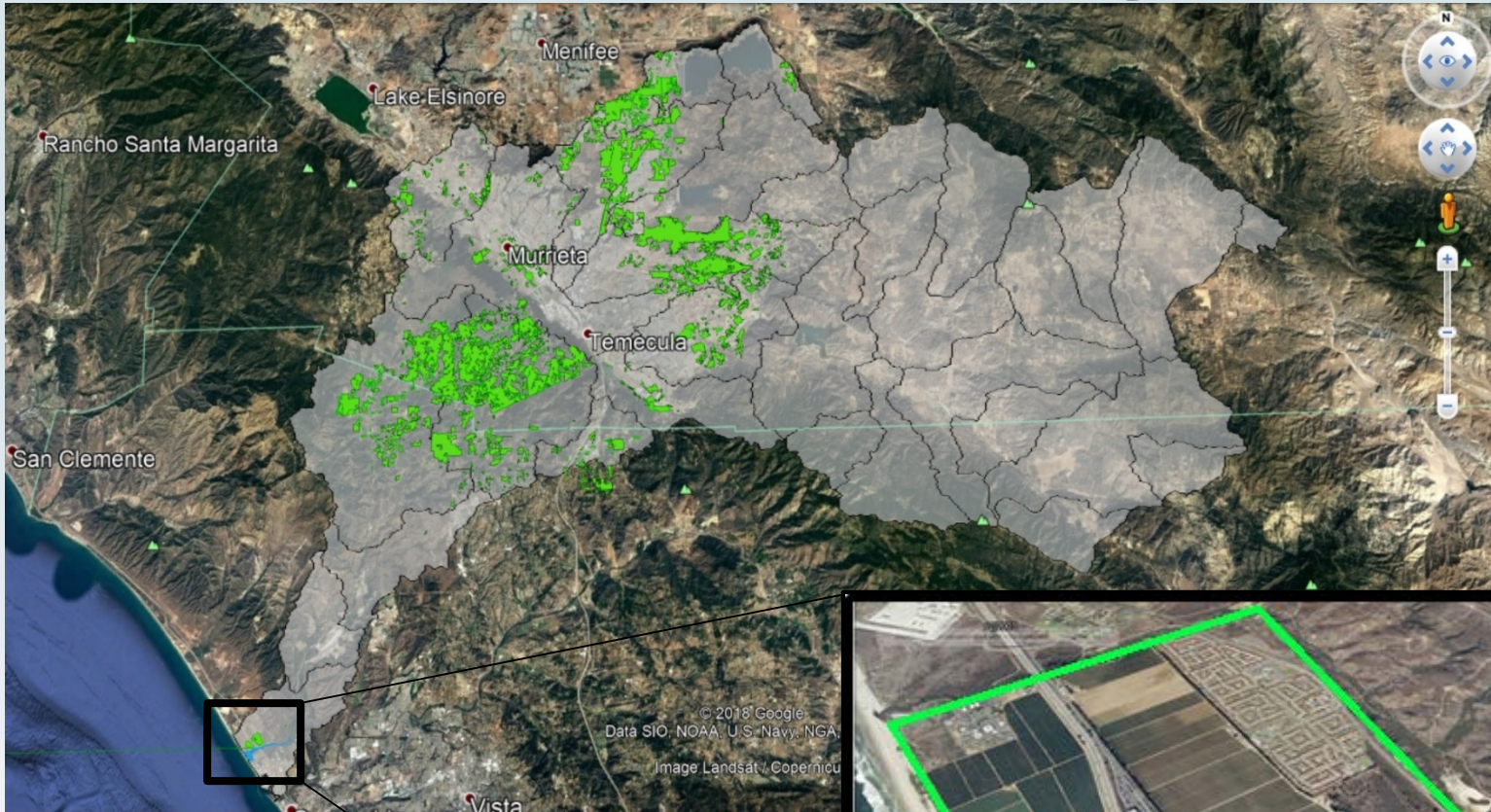


2014-2016 Estuary Dissolved Oxygen

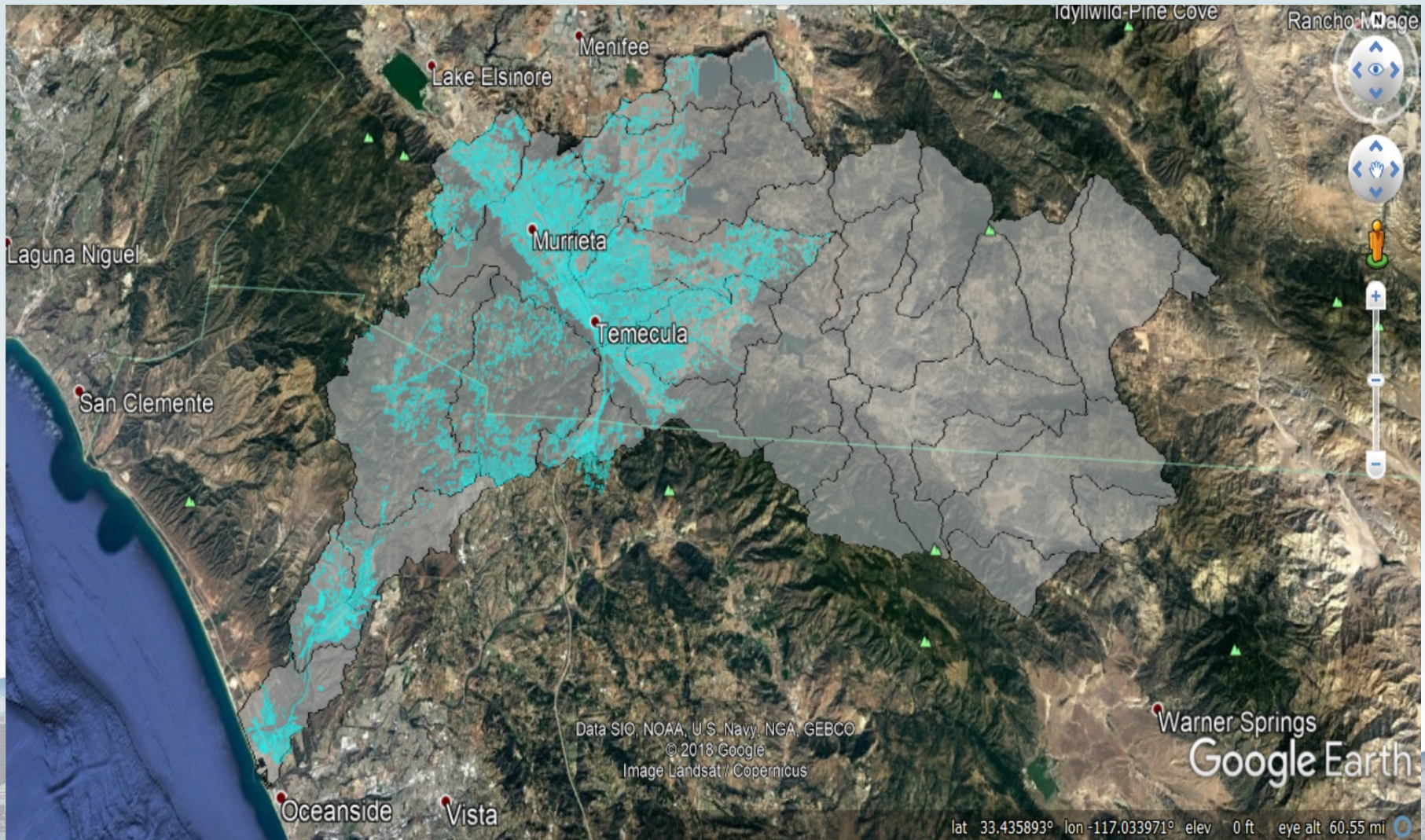
Daily Average Dissolved Oxygen (DO) Concentration



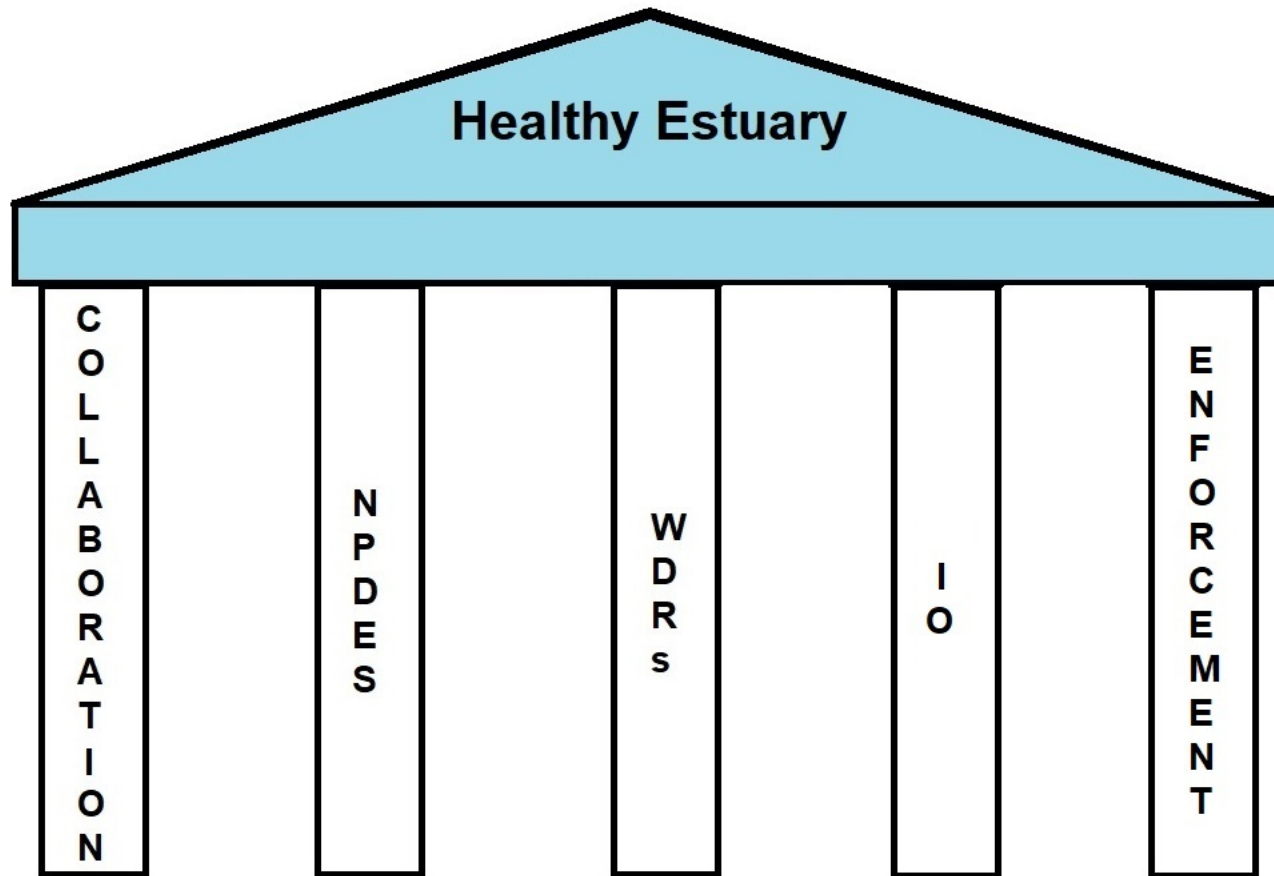
Nutrient Sources (Agriculture)



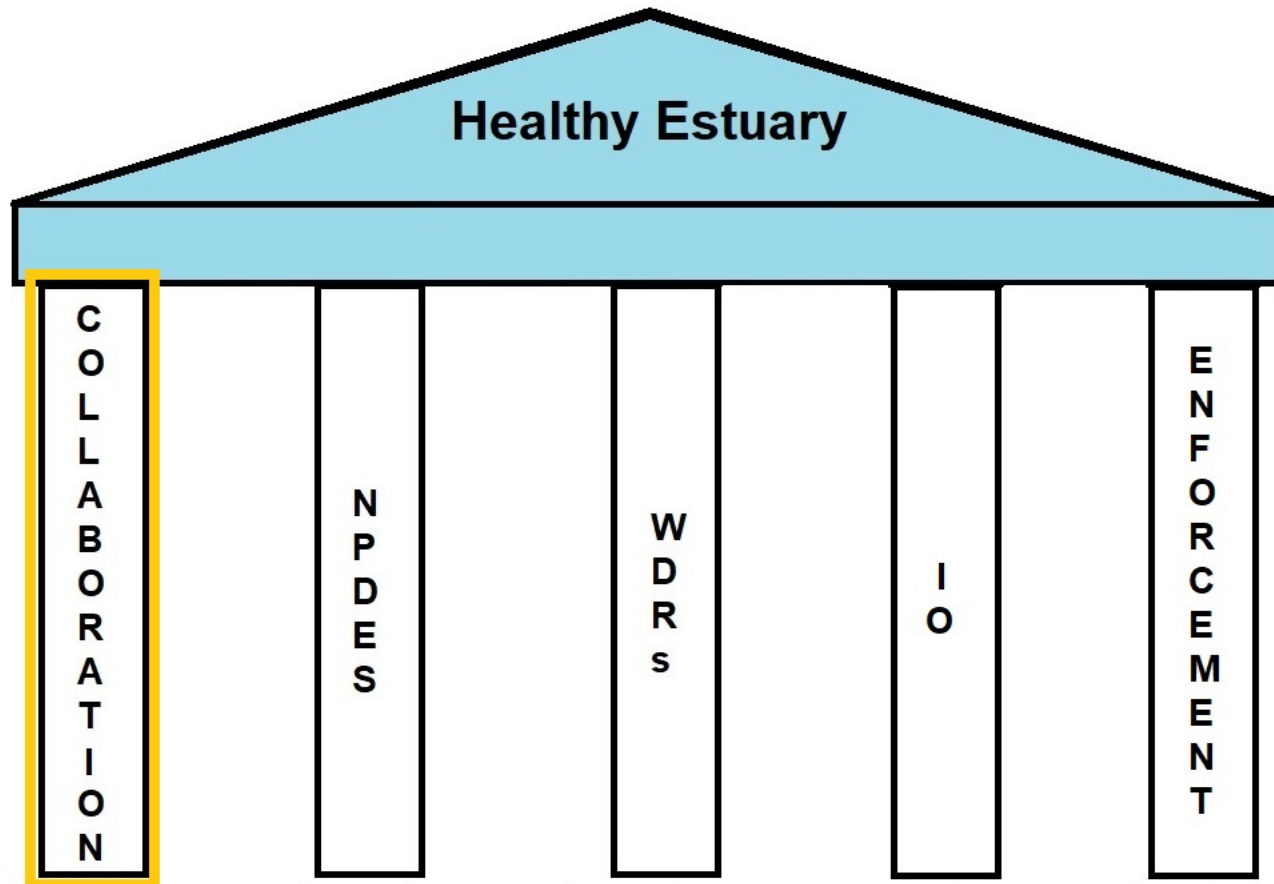
Nutrient Sources (MS4)



Water Quality Restoration Strategy



Water Quality Restoration Strategy



2011



Santa Margarita River Watershed Nutrient Initiative Stakeholder Group

County of San Diego

Riverside County Flood Control and Water Conservation District

County of Riverside

Rancho California Water District

City of Temecula

City of Murrieta

City of Wildomar

U.S. Marine Corps Base Camp Pendleton

NAVY Space and Naval Warfare Systems – Systems Center Pacific

Pechanga Band of Luiseno Indians

Sierra Club

Cal Trout

Tetra Tech, Inc.

Stetson Engineers

Larry Walker and Associates

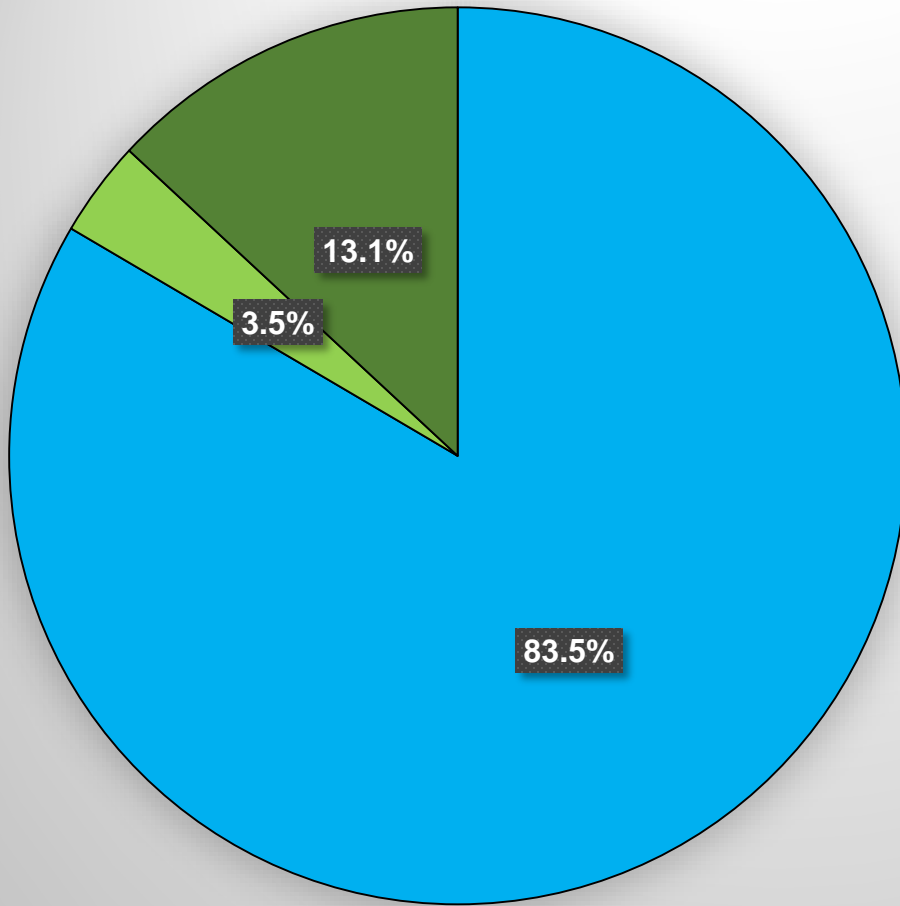
Southern California Coastal Water Research Project

United States Environmental Protection Agency

2017-2018



Dry Weather Total Nitrogen

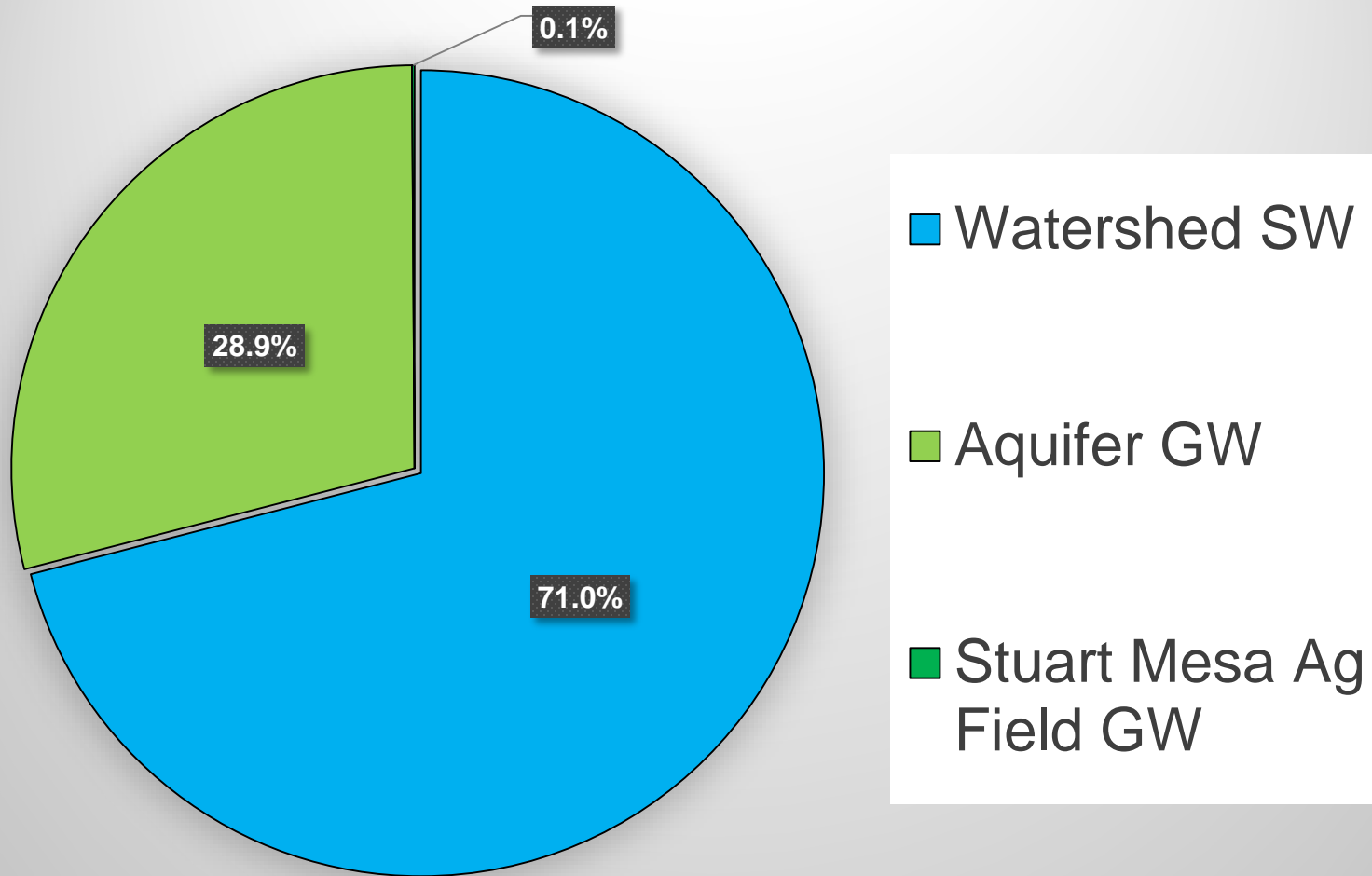


■ Watershed SW

■ Aquifer GW

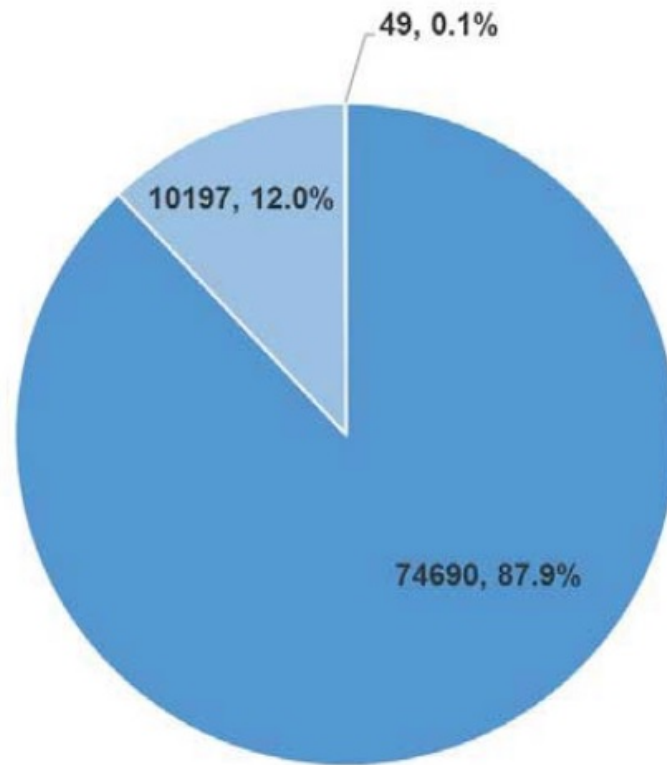
■ Stuart Mesa Ag
Field GW

Dry Weather Total Phosphorus



Modeled Dry Weather Sources by Discharger

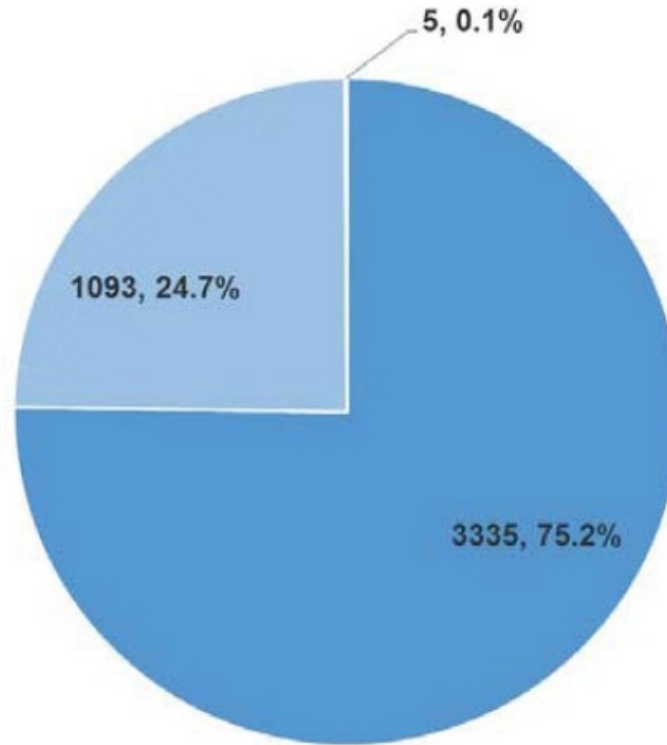
Total Nitrogen
(lbs/yr)



■ Agricultural Discharges ■ MS4 Discharges ■ Dairy Farm Discharges

Modeled Dry Weather Sources by Discharger

Total Phosphorus
(lbs/yr)



■ Agricultural Discharges ■ MS4 Discharges ■ Dairy Farm Discharges

Numeric Nutrient Endpoint-based Numeric Targets

Adopted Ecological Response Indicators based on NNE criteria	Metric	Primary Numeric Targets	Secondary Numeric Targets	Season
	Surface Water Macroalgal Biomass	≤ 57 g dw/m ²	≤70 g dw/m ²	Winter Dry and Summer Dry
	Water Column Dissolved Oxygen	Daily minima ≥5.0 mg/L	7-day average daily minimum measurements ≥5.0 mg/L 10 percent allowable exceedance	Winter Dry and Summer Dry
	SQO Benthic Community Condition Score	---	≤2.0 (Low Disturbance)	Winter Dry and Summer Dry

Total Maximum Daily Loads

- **76% TN and TP Load Reduction**
- 13,246 pounds (**6008 Kg**) of delivered TN/year
- 1,528 pounds (**693 Kg**) of delivered TP/year



Scientific Peer Review

**CALIFORNIA REGIONAL WATER QUALITY CONTROL
BOARD
SAN DIEGO REGION**

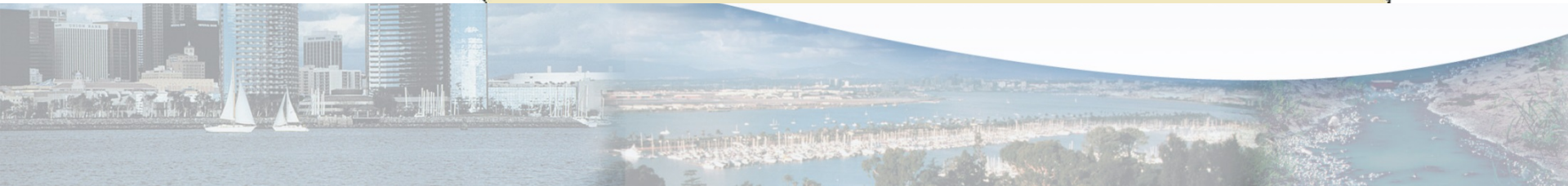
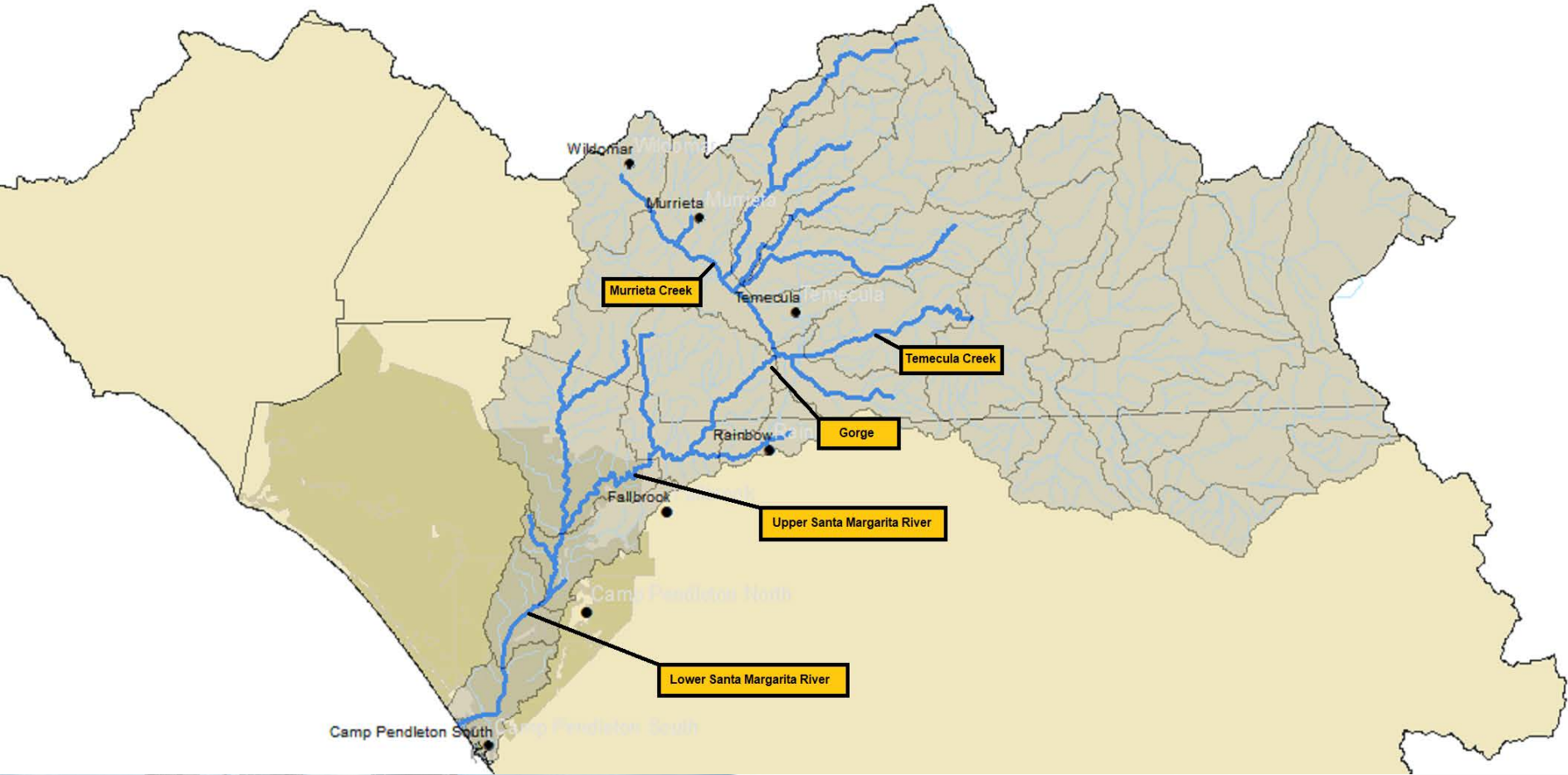
**SANTA MARGARITA RIVER ESTUARY, CALIFORNIA
NUTRIENTS TOTAL MAXIMUM DAILY LOAD PROJECT**

DRAFT STAFF REPORT

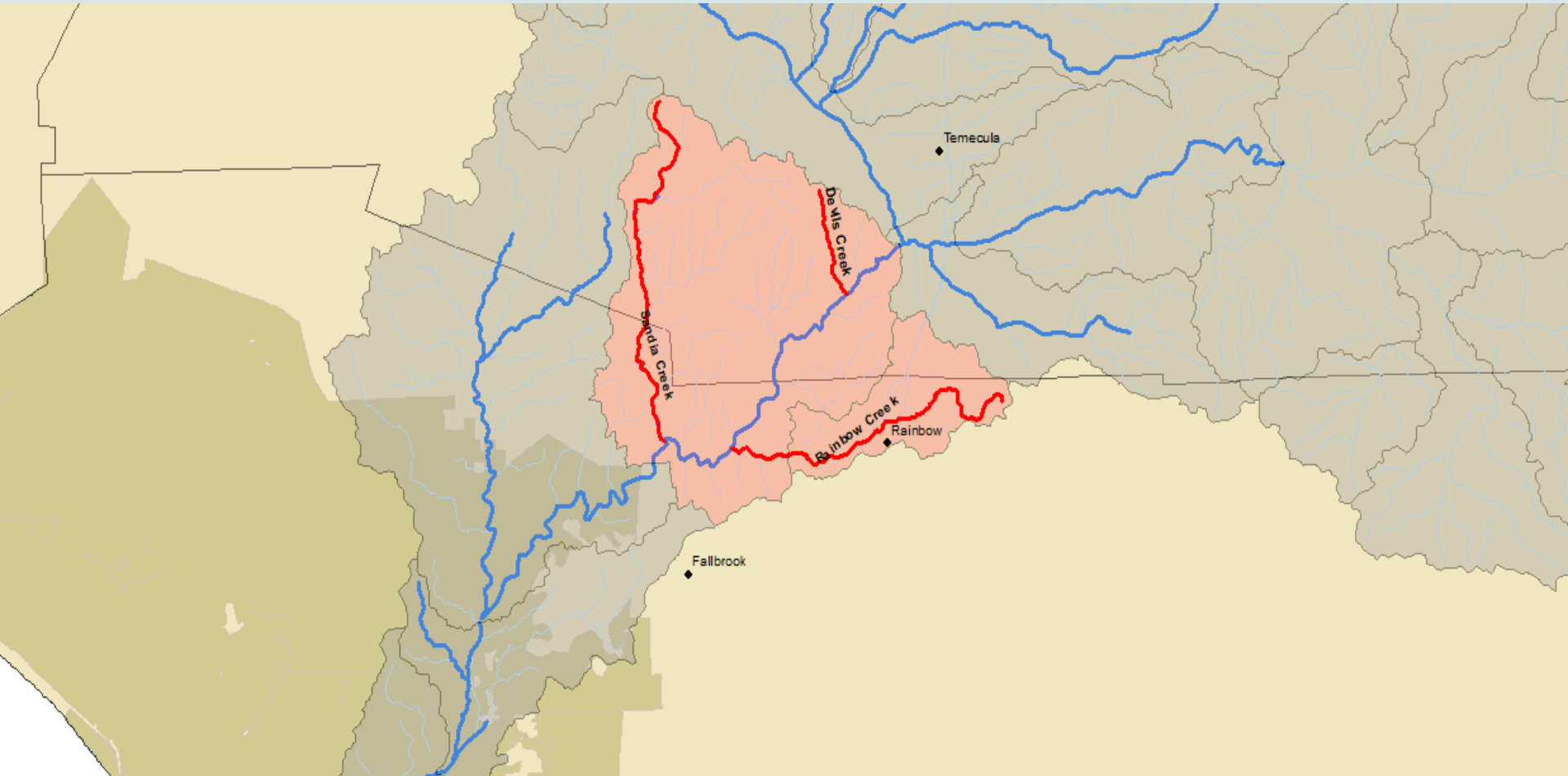


DRAFT JULY 2018

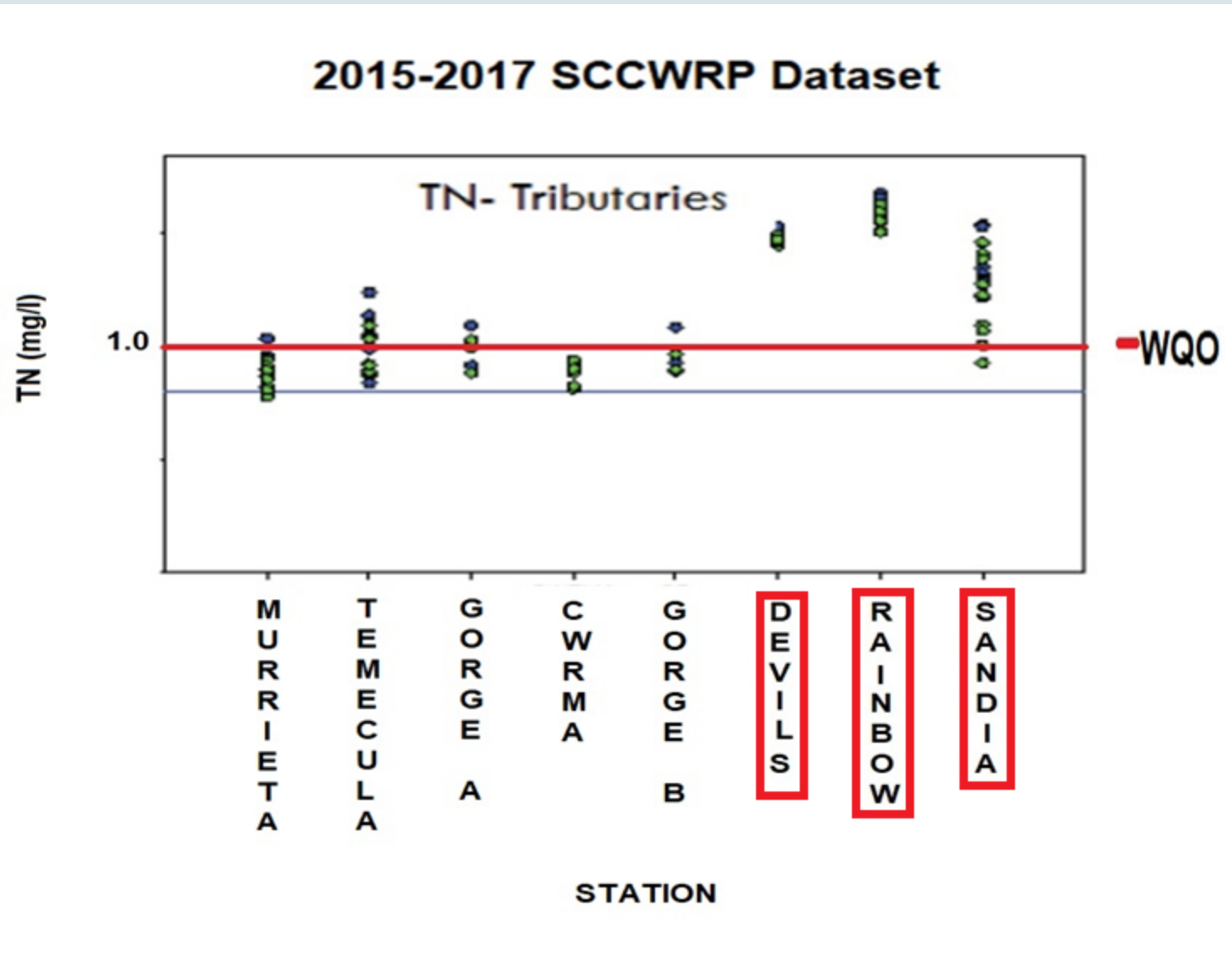
Santa Margarita River



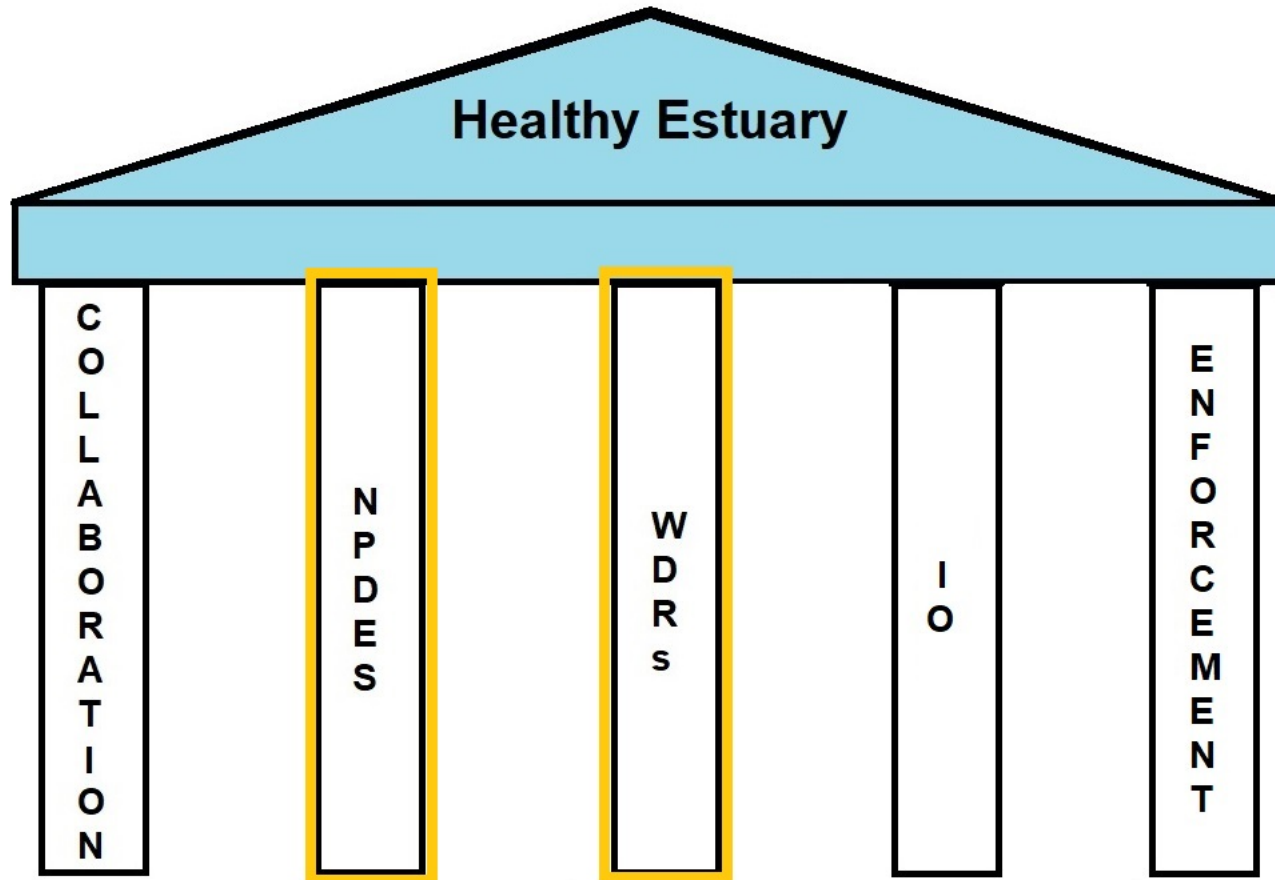
Highest Loading Drainages



Highest Loading Drainages



Water Quality Restoration Strategy



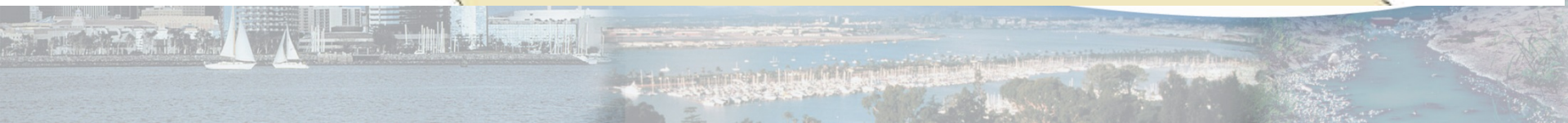
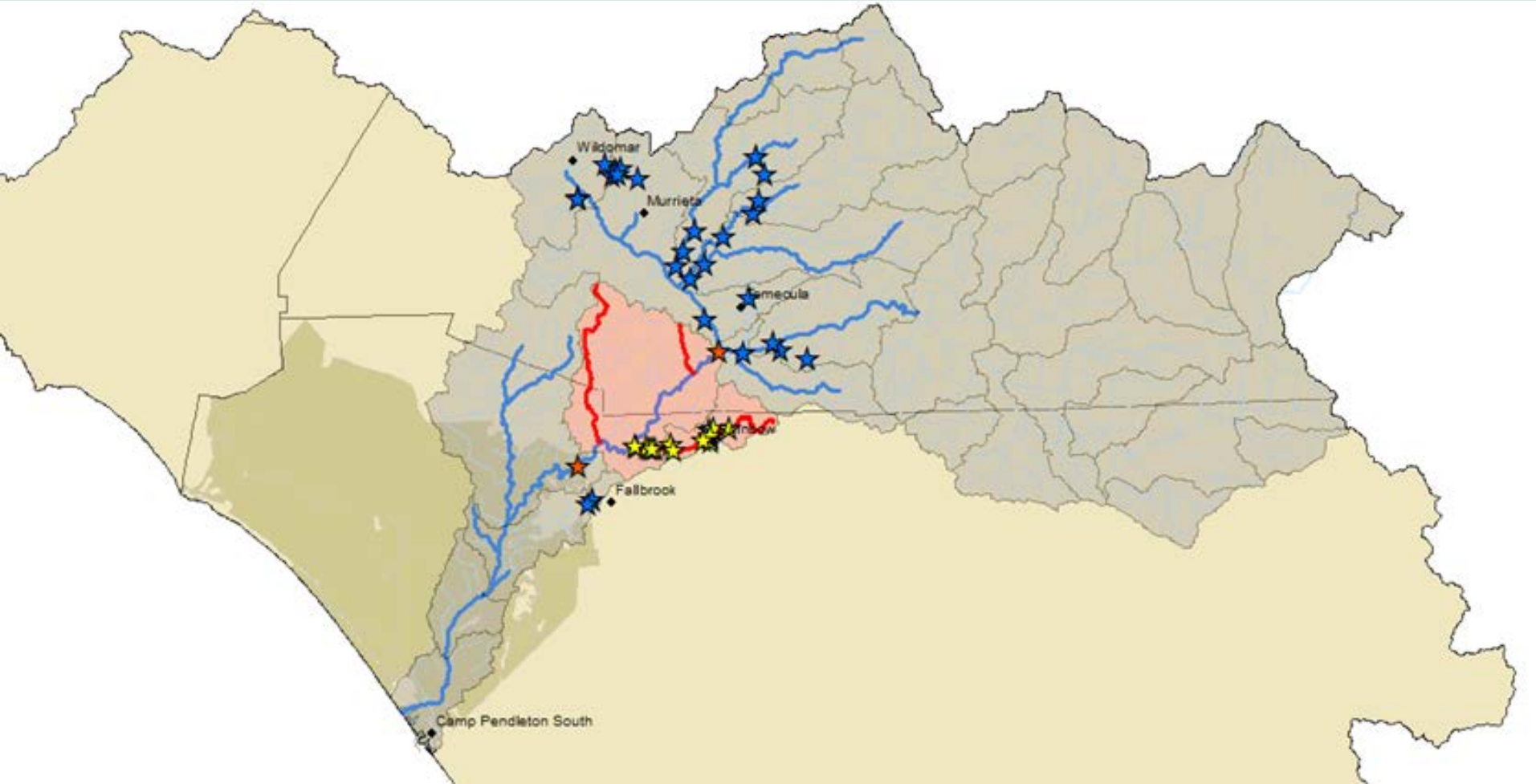
Municipal Storm Water

- **Camp Pendleton**
 - Discharge Prohibitions & Receiving Water Limitations
- **Counties of San Diego and Riverside**
 - Effective prohibition of non-stormwater discharges + WQIP
 - **Monitoring in Rainbow Creek + Other WQIP Sites**



Municipal Storm Water

Rainbow Creek Monitoring + Other WQIP Sites



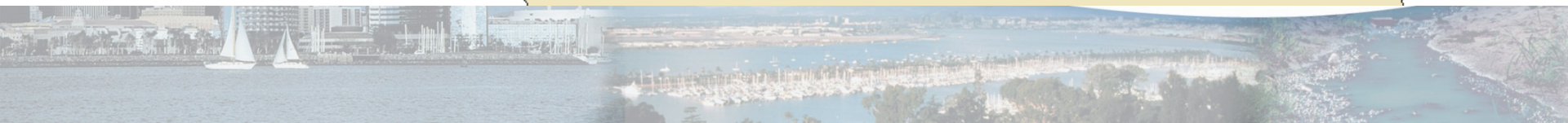
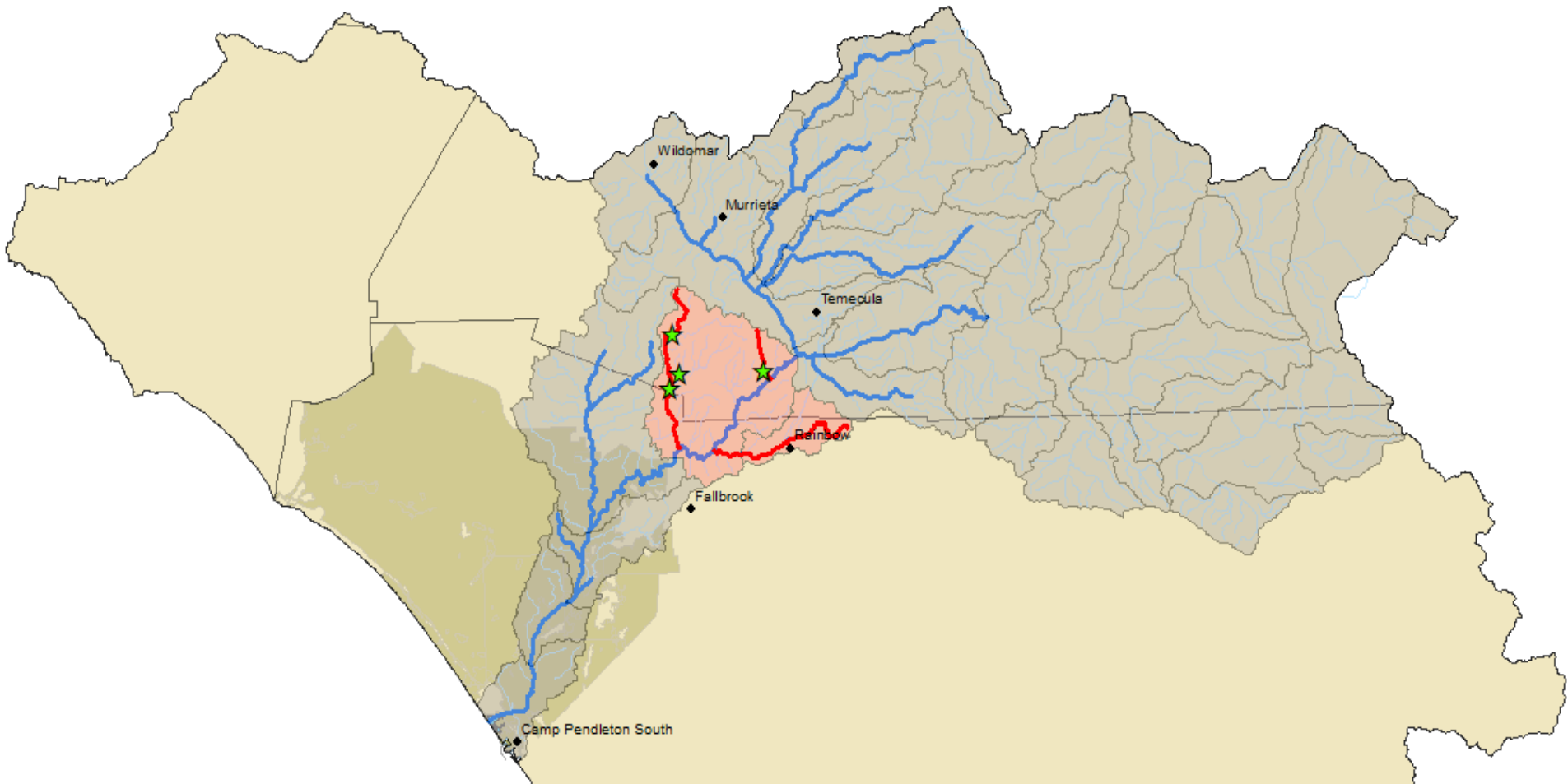
WDRs

- **Agricultural Operations**
 - **New permit:** discharge prohibitions and receiving water limitations
 - **Monitoring of Sandia Creek and Devils Creek**



WDRs

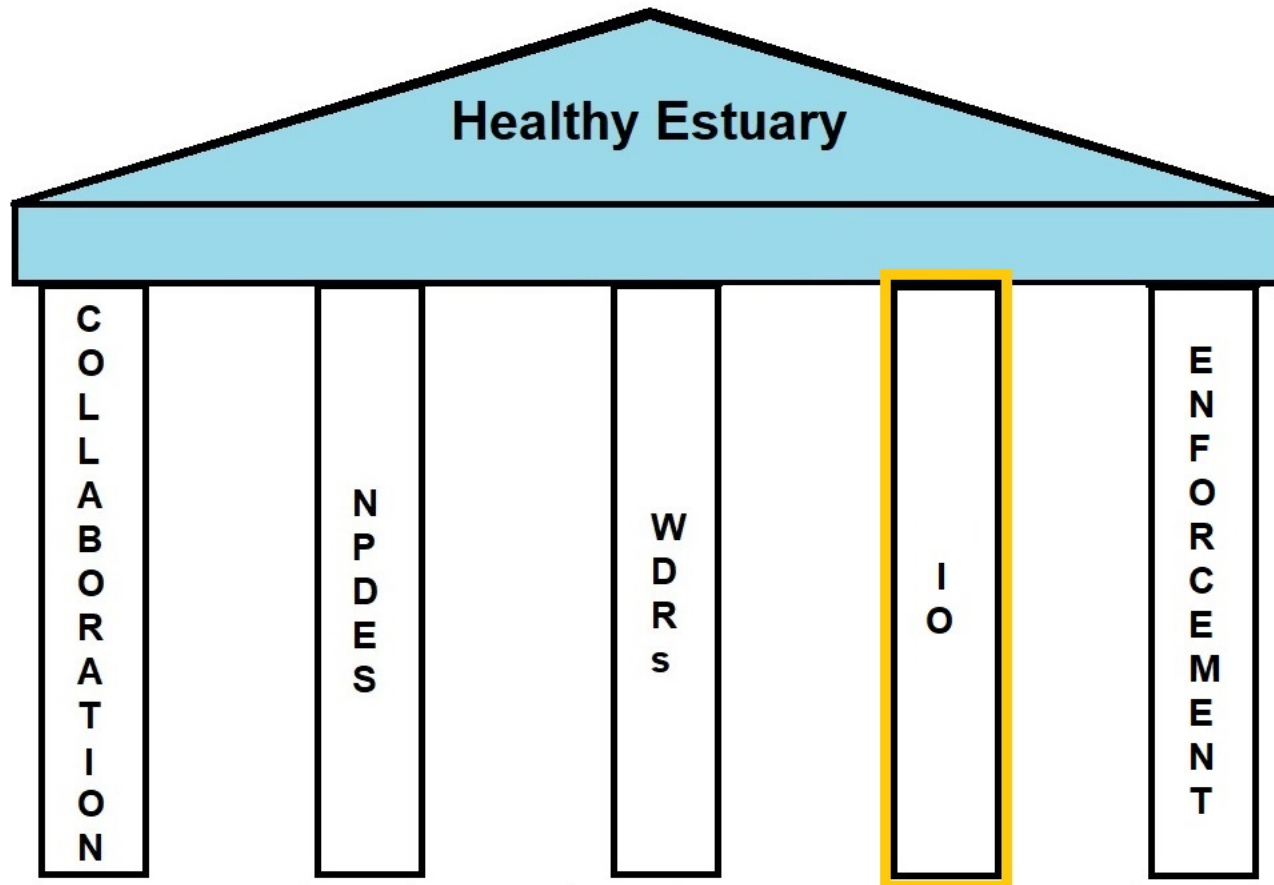
Sandia Creek and Devils Creek



2019



Water Quality Restoration Strategy

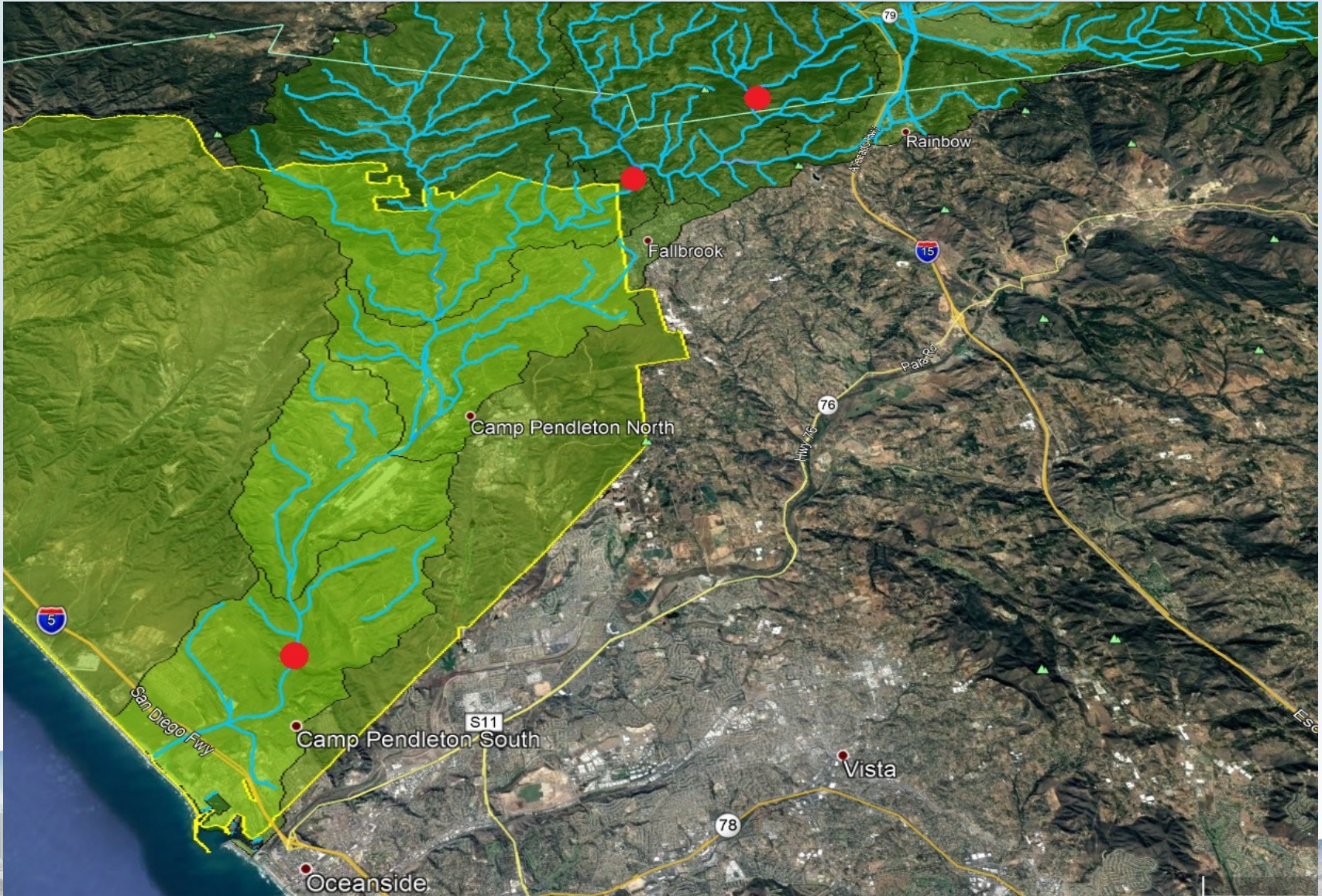


Investigative Order R9-2019-0007 (May 2019)

- 1. California Water Code section 13267**
- 2. Track progress of restoration**
- 3. Linkage between river and Estuary**



River Monitoring



Estuary Monitoring



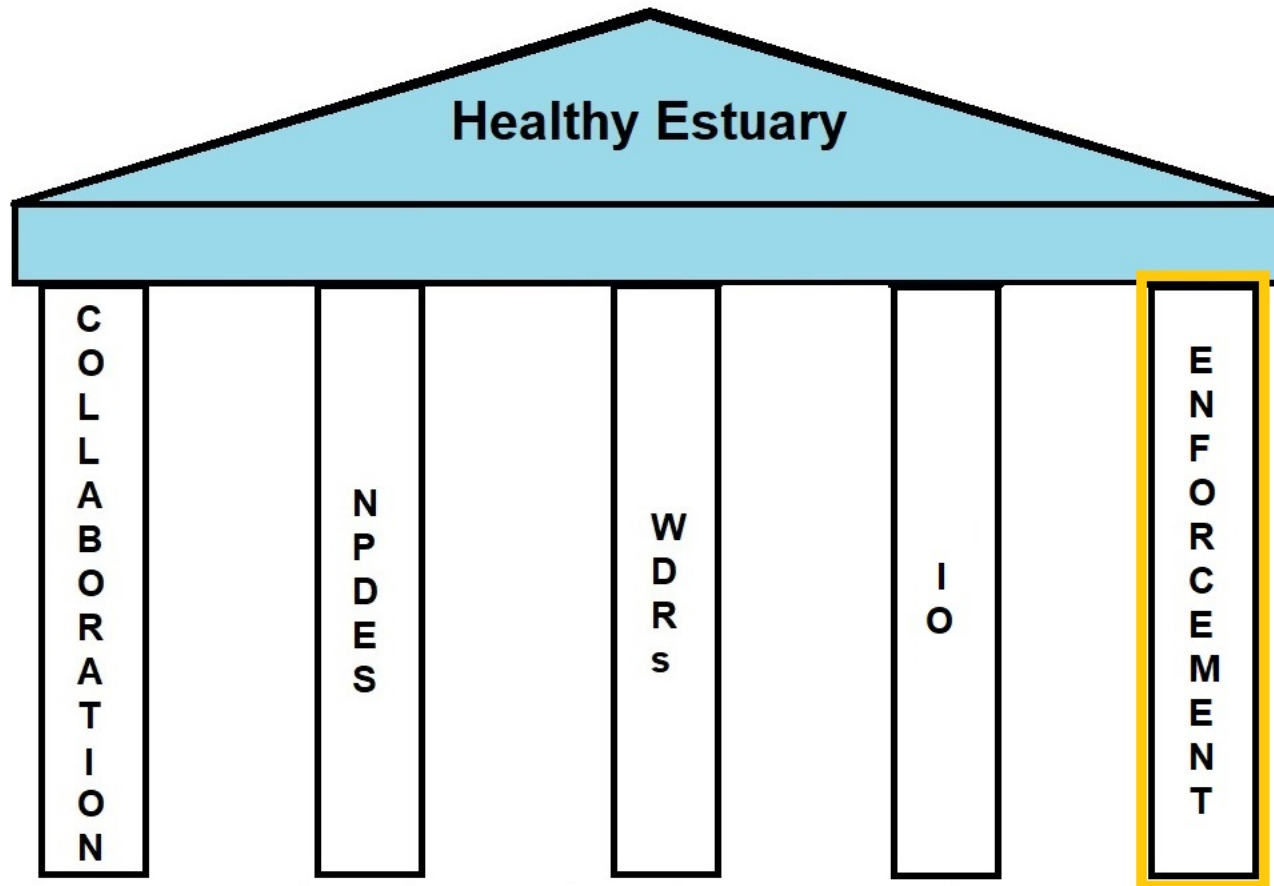
Investigative Order - Schedule

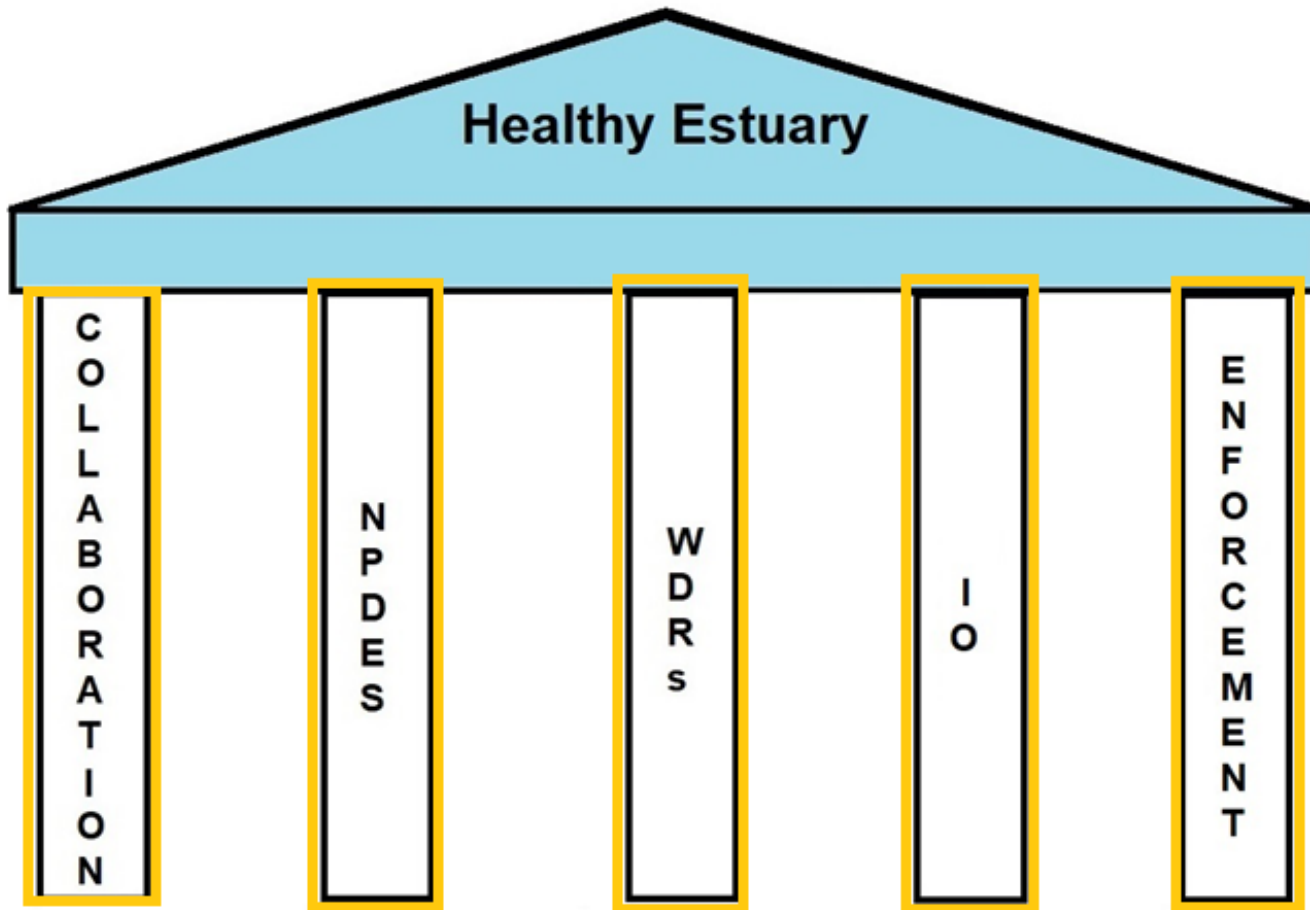
Table 3
Order Compliance Dates

Activity	Due Date
Submit Monitoring and Assessment Program Workplan	Within six months of issuance of the Order
Begin Monitoring and Assessment	Within 60 days of receiving Executive Officer's approval of Monitoring and Assessment Workplan
Implement Monitoring and Assessment Program	Monthly (April through October) for four years as soon as possible and ending in October 2023.
Submit Annual Monitoring Reports and Final Report	Each January 31 from 2021 through 2023; and a final 4-year report in March 2024.

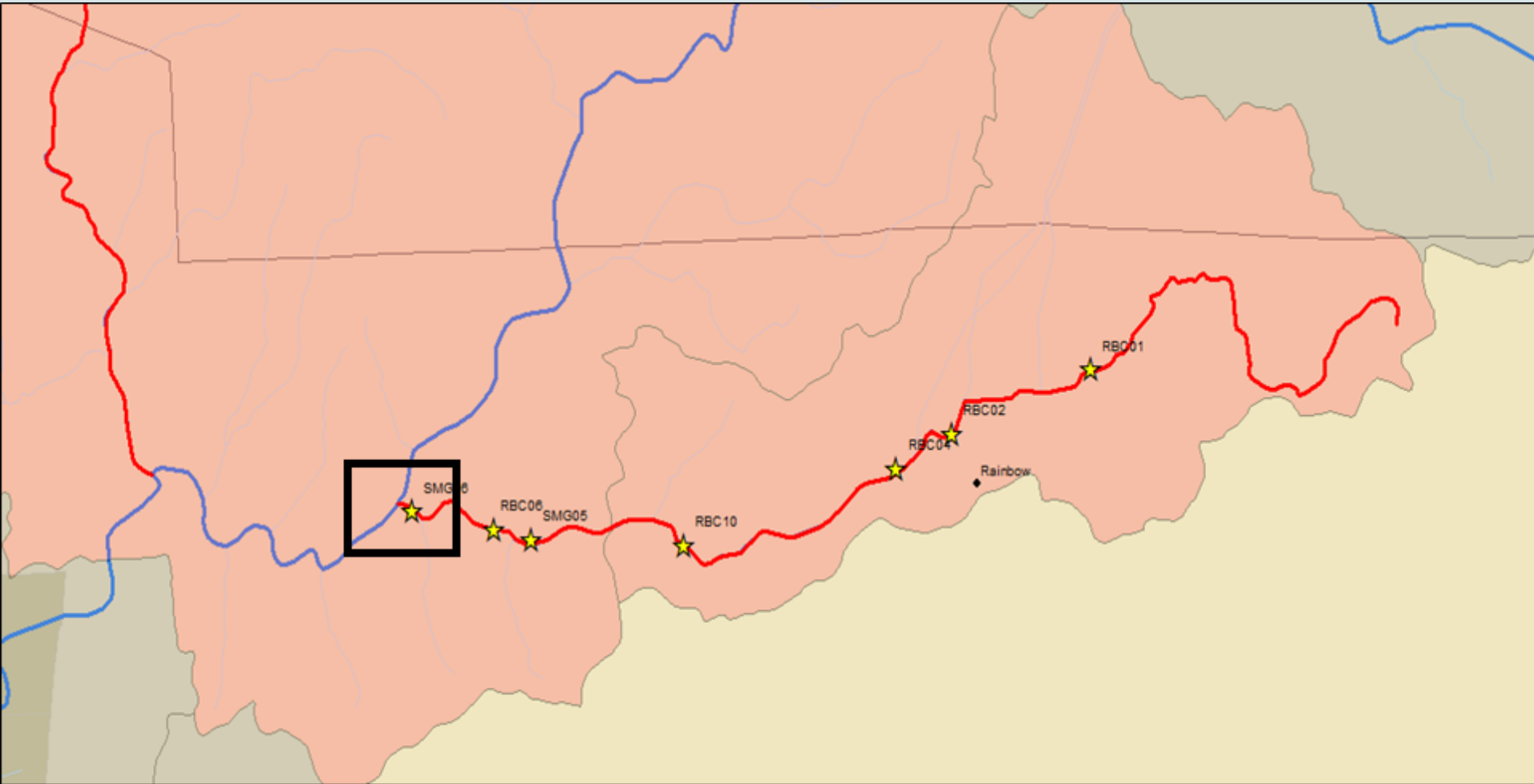


Water Quality Restoration Strategy



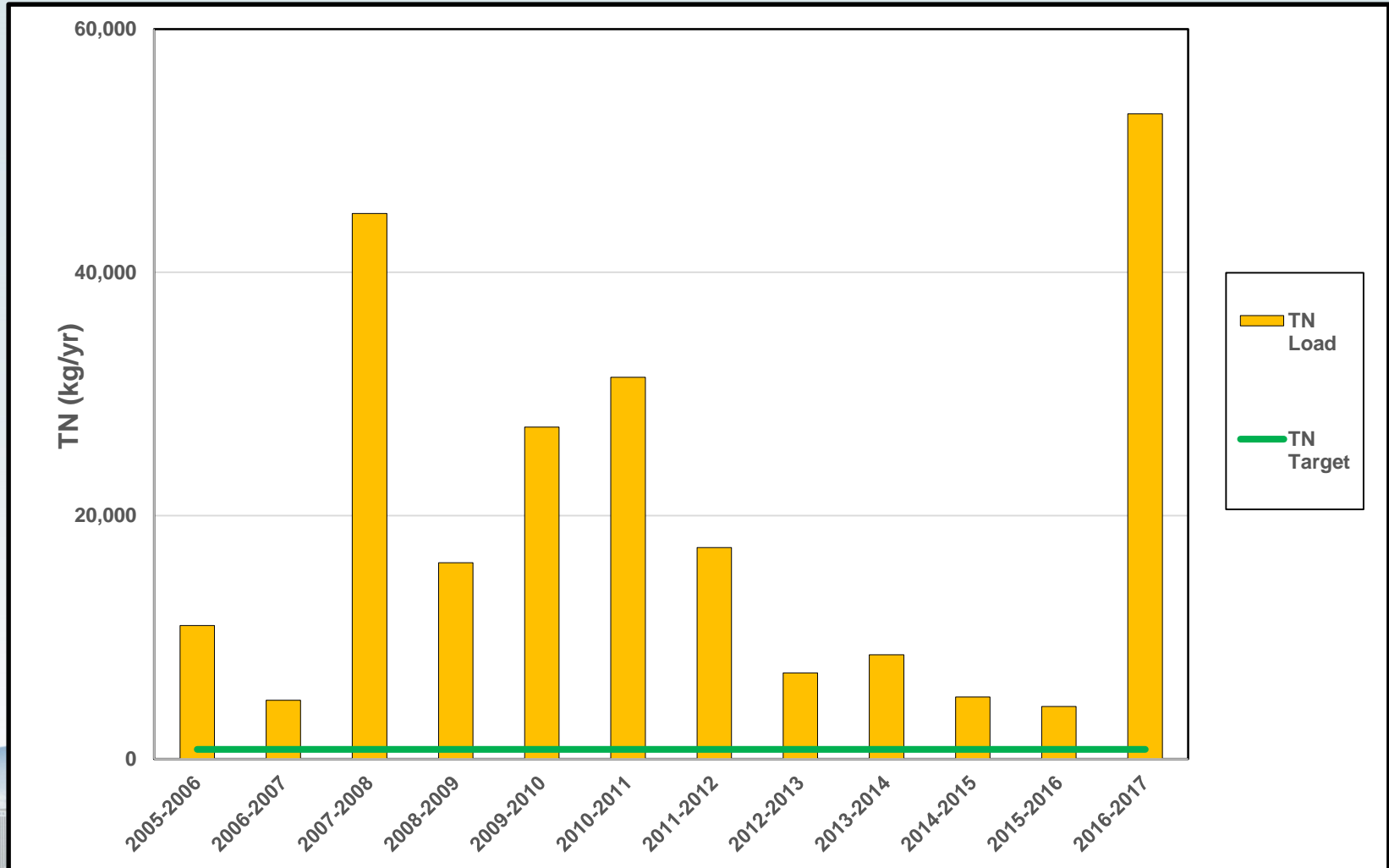


Rainbow Creek TMDL Monitoring Sites



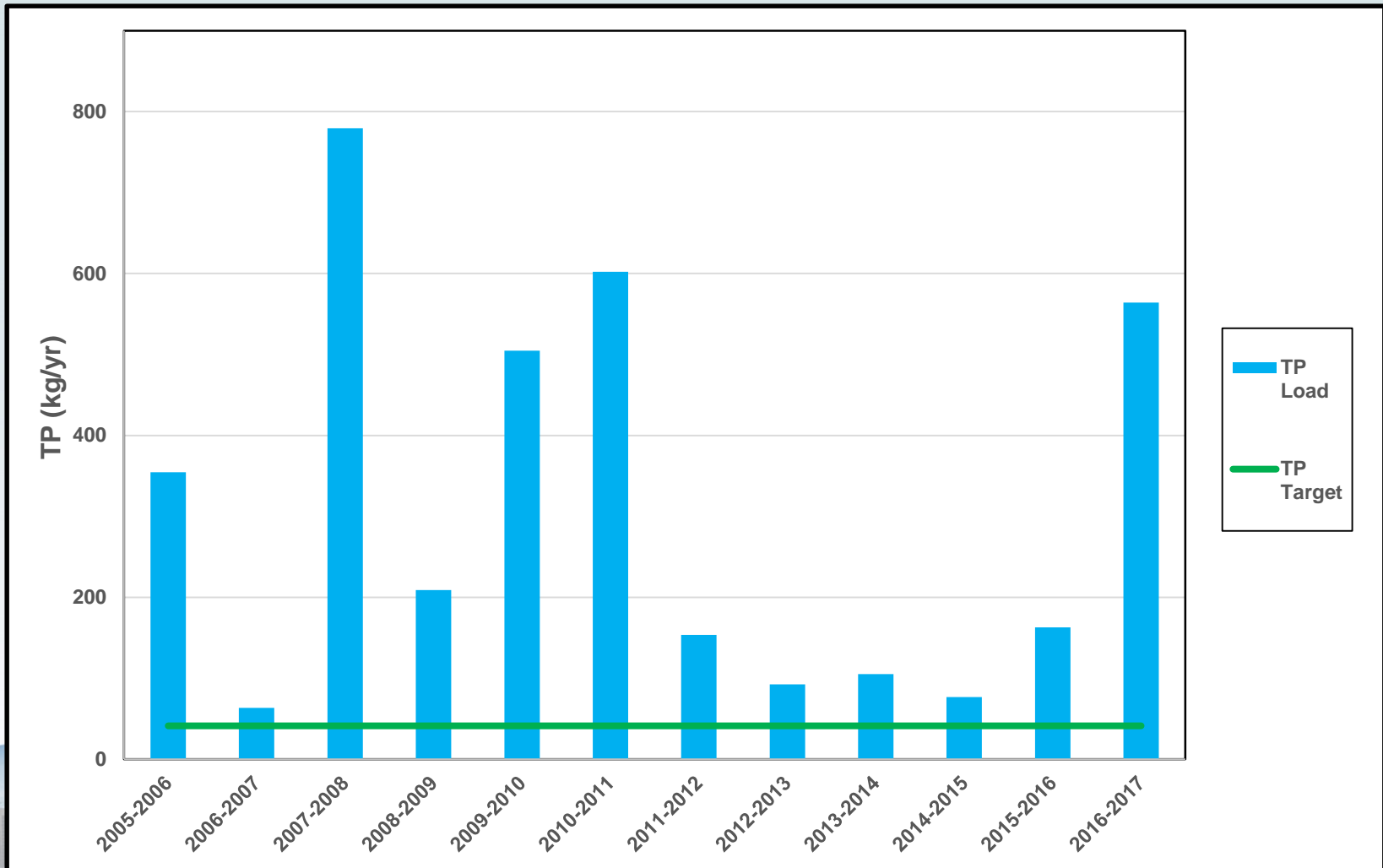
Rainbow Creek

Estimated TN Annual Loading

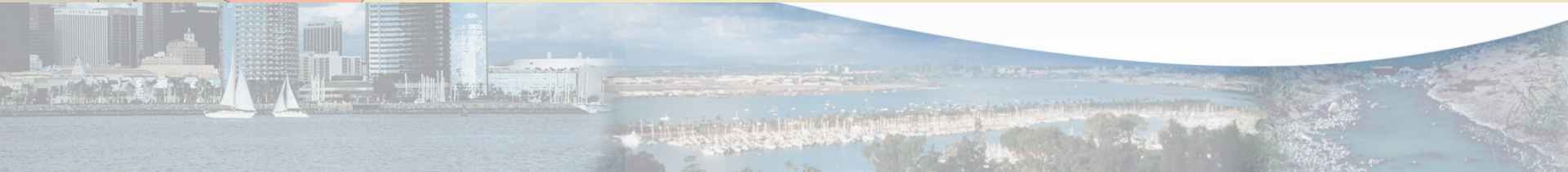
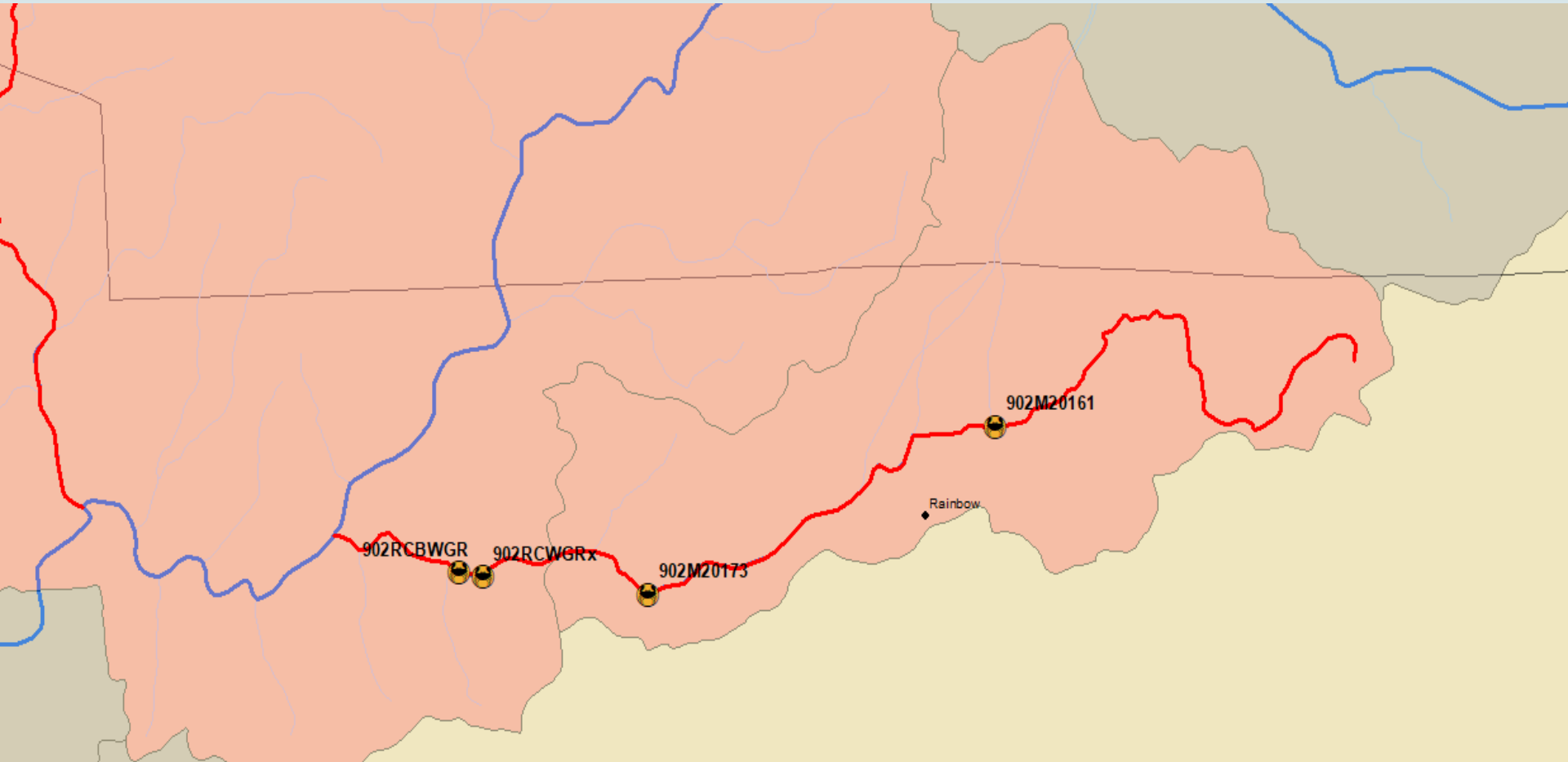


Rainbow Creek

Estimated TP Annual Loading

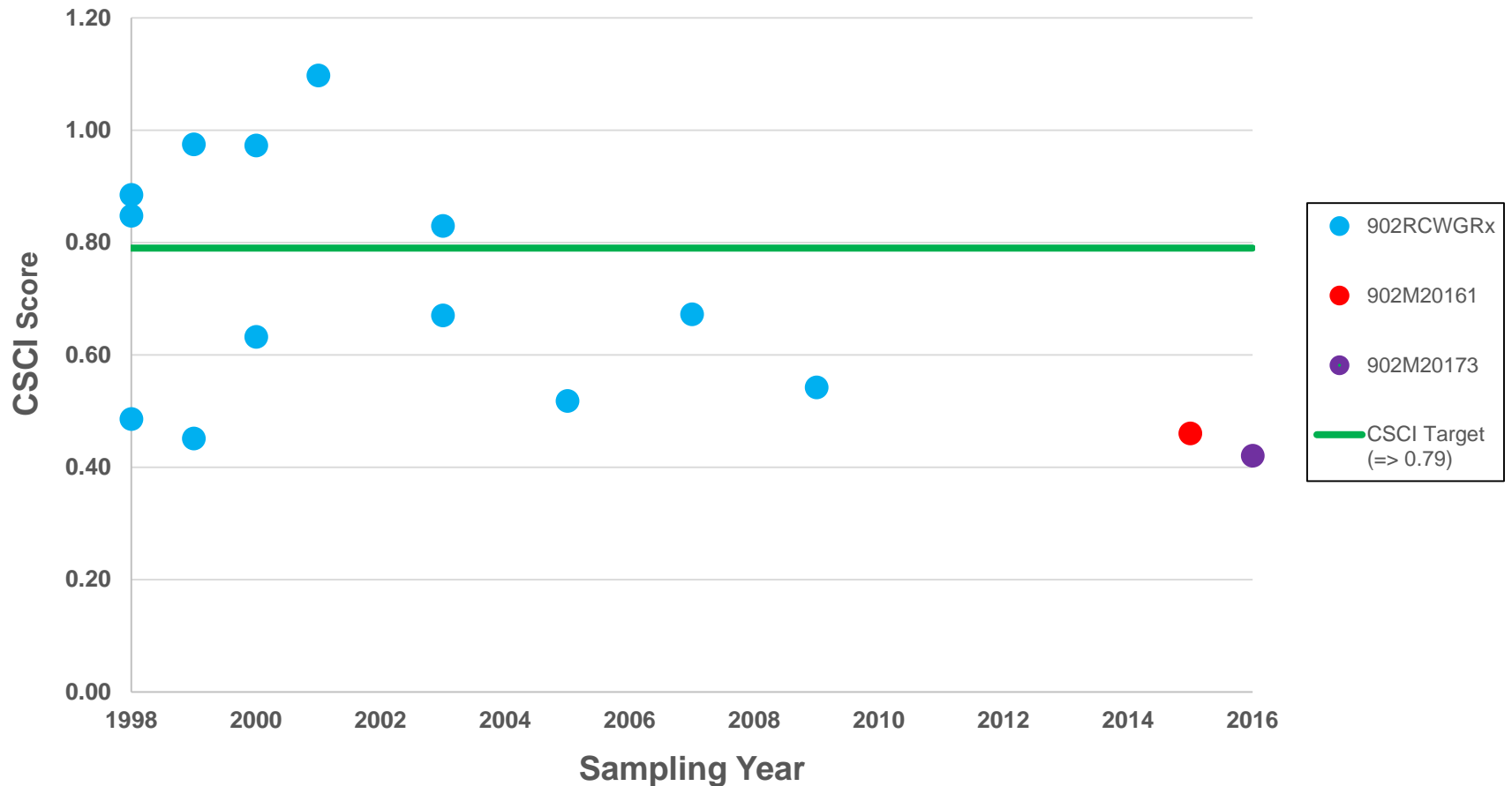


Rainbow Creek CSCI Monitoring Sites



CSCI Data Rainbow Creek

California Stream Condition Index (CSCI) Scores Upstream of SMG06



Healthy Estuary

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