Surface and Groundwater Nitrogen Monitoring in Ventura County:

Successes and Opportunities Under a New Regulatory Framework

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LARRY WALKER ASSOCIATES
science | policy | solutions

Outline

- Overview of precedential requirements for nitrogen (and irrigation)
- Groundwater
  - Nitrate Trends in Ventura County
- Surface Water
  - Nitrogen/Nutrient Related TMDLs
- Water Management
  - Efficient Irrigation Systems
  - Tile Drains
  - Runoff Management

Precedential Requirements in Ag Order Related to Nitrogen

Supports both surface and groundwater protection goals. Required for all farms. Initial plans are due March 1, 2025. No data yet to discuss.

Groundwater

Groundwater Monitoring and Reporting

Drinking Water Well Monitoring

VCAILG Members (landowner/grower) Responsibility

Notification letters sent from Regional Board late July 2024

Wells to be sampled for nitrate-N + nitrite-N by September 28, 2024; annually thereafter

Groundwater Quality Trend Monitoring

VCAILG Responsibility

Continuing requirement from Conditional Waiver

Submitted every 3-years; last completed in 2022

Groundwater Protection Formulas, Values, and Targets

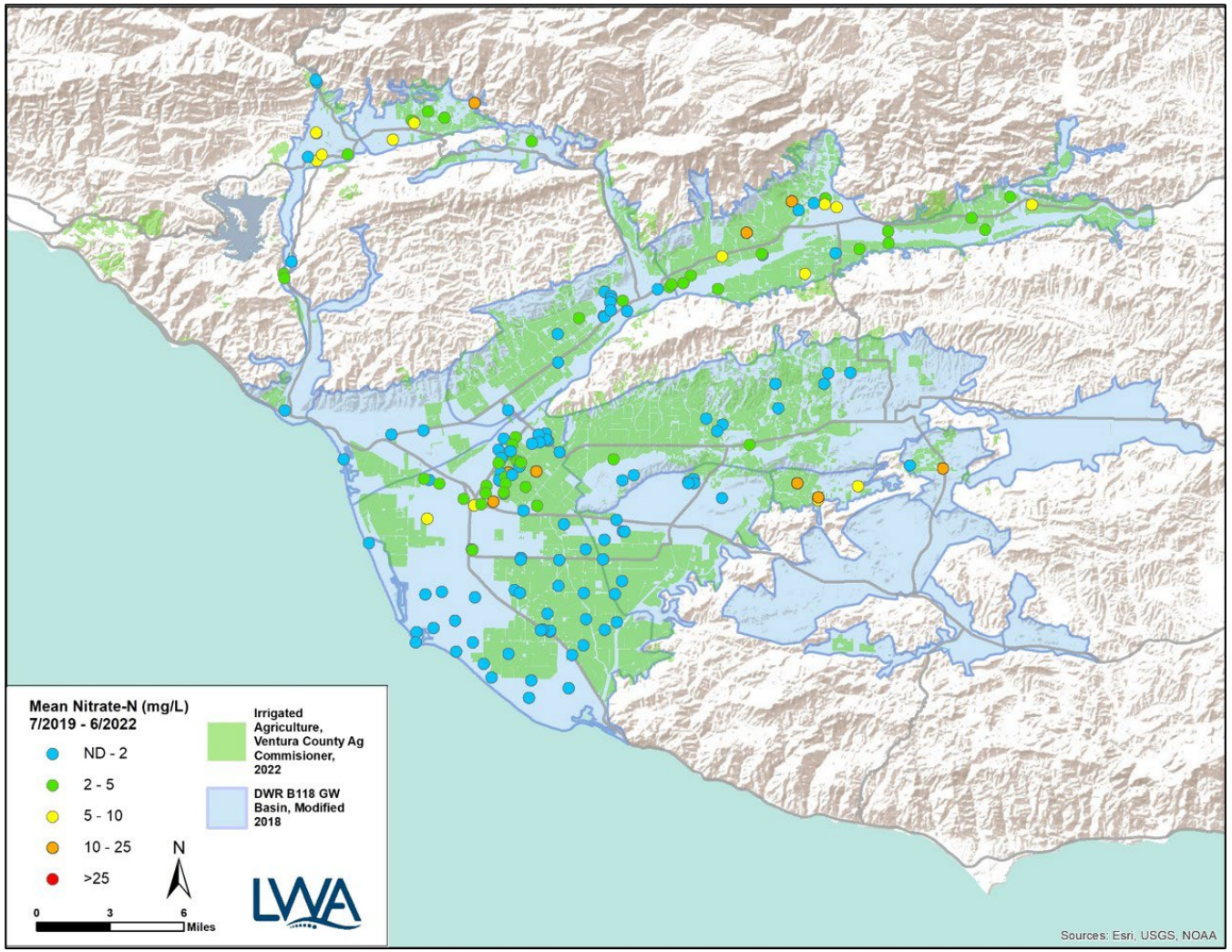
VCAILG Responsibility

For high priority groundwater basins

Fillmore, Upper Ventura River, Oxnard, Arroyo Santa Rosa, and Tierra Rejada have been ID

1st step – Groundwater Protection Formula due September 1, 2026

Groundwater Quality Trend Data



- 286 wells met criteria and were presented
- Mean nitrate-N >10 mg/L at 10 wells
- Mean nitrate-N = 5-10 mg/L at 19 wells
  - 4 out of 19 wells showed an increasing concentration trend

Surface Water

Ag Order Constituents

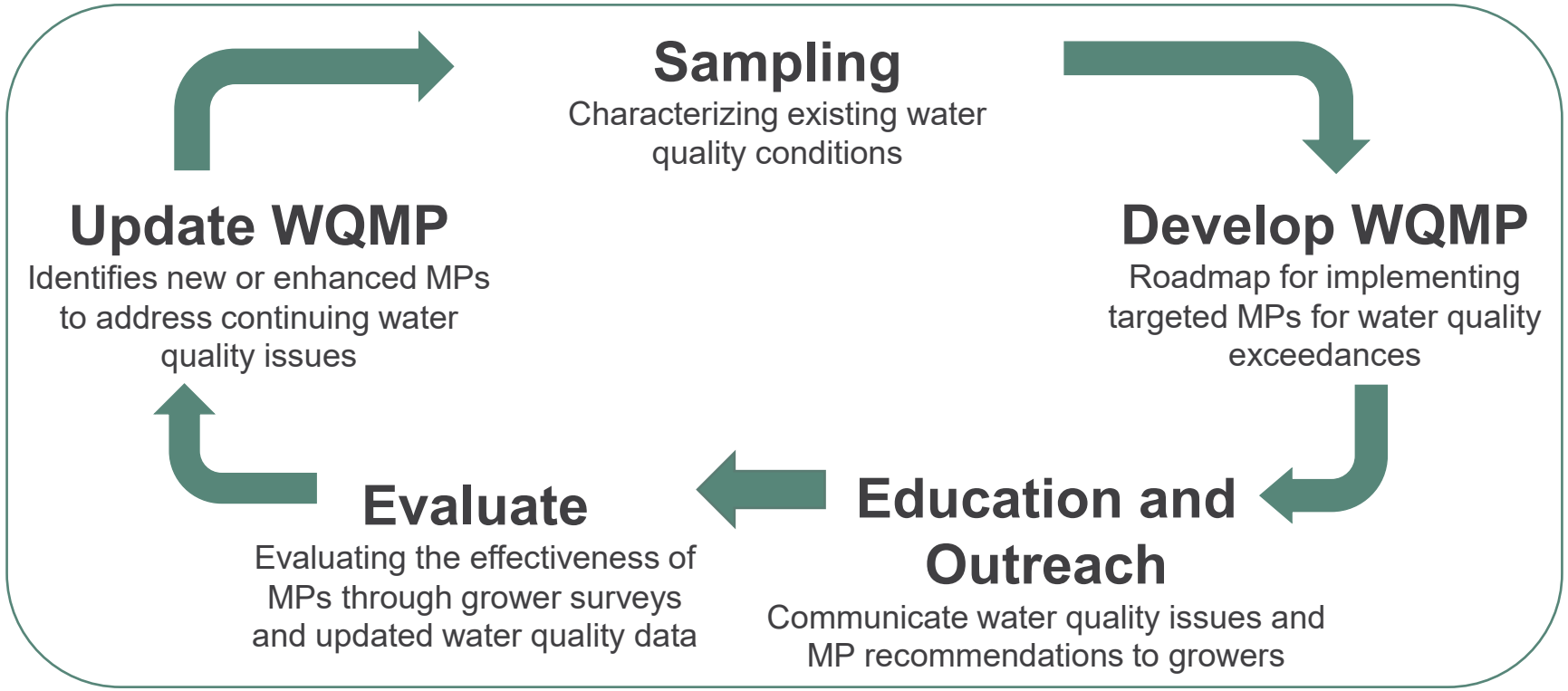
New Constituents

CONSTITUENT	FREQUENCY
FIELD MEASUREMENTS	2 dry events; 2 wet events
Flow, pH, Temperature, Dissolved Oxygen, Turbidity, Conductivity	
GENERAL WATER QUALITY CONSTITUENTS (GWQC)	
Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Hardness, Chloride, Sulfate	
NUTRIENTS	
Total Ammonia-N, Nitrate-N, Total Nitrogen, Phosphate, Total Phosphorus	
PESTICIDES	
Organochlorine, Organophosphorus, Pyrethroid, and Neonicotinoid Pesticides	
METALS	
Dissolved Copper, Total Copper	
TRASH	
Trash Observations	
BACTERIA	
E. Coli or Enterococci (where appropriate)	
AQUATIC CHRONIC TOXICITY	1 wet event; second dry event

Ag Order Monitoring Program Iterative Process

Implement MPs to the degree necessary to meet standard water quality benchmarks (Ag Order Appendix 4).

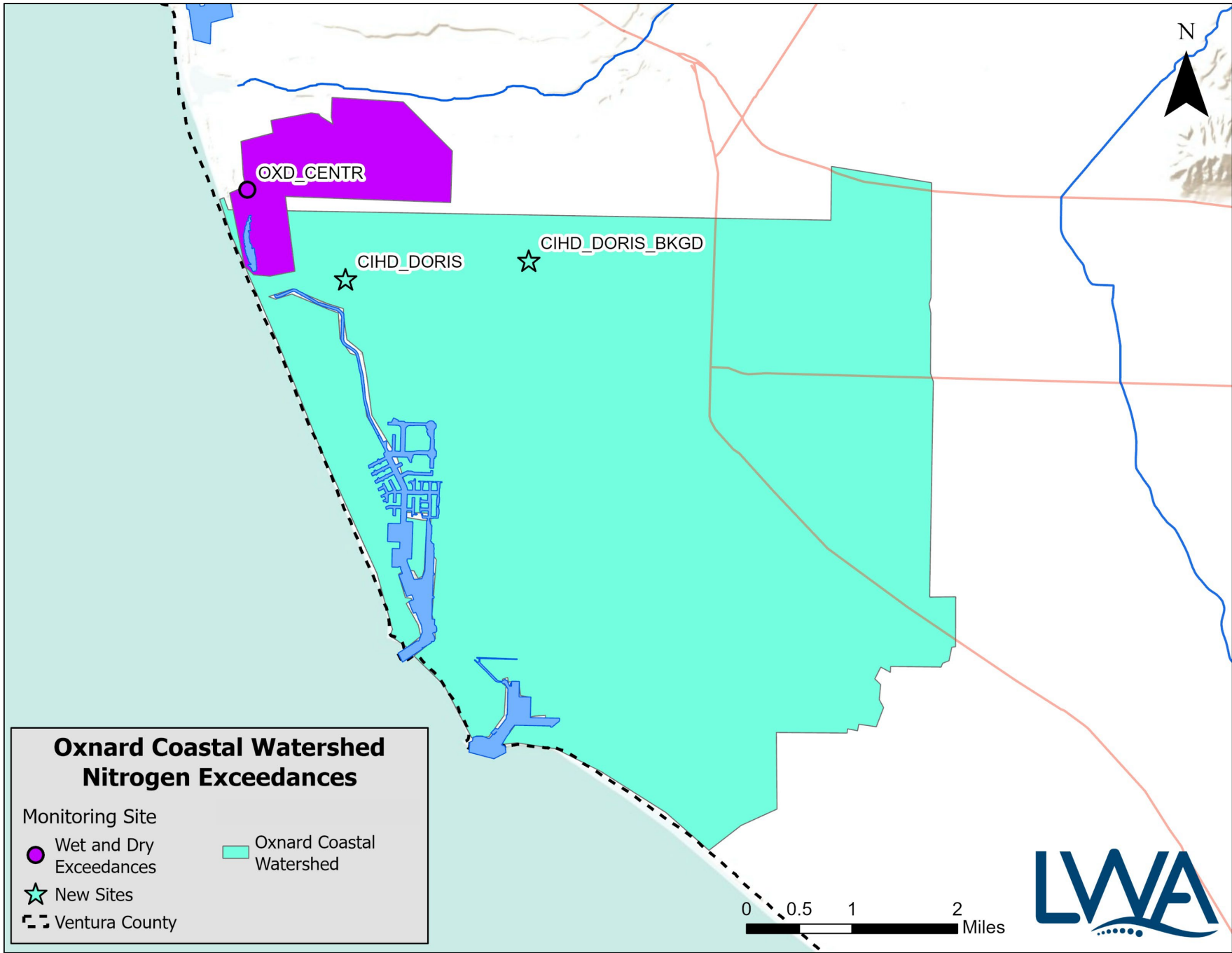
- VCAILG provides recommendations and referrals to technical service providers
- Growers decide what works best for individual farm/ranch



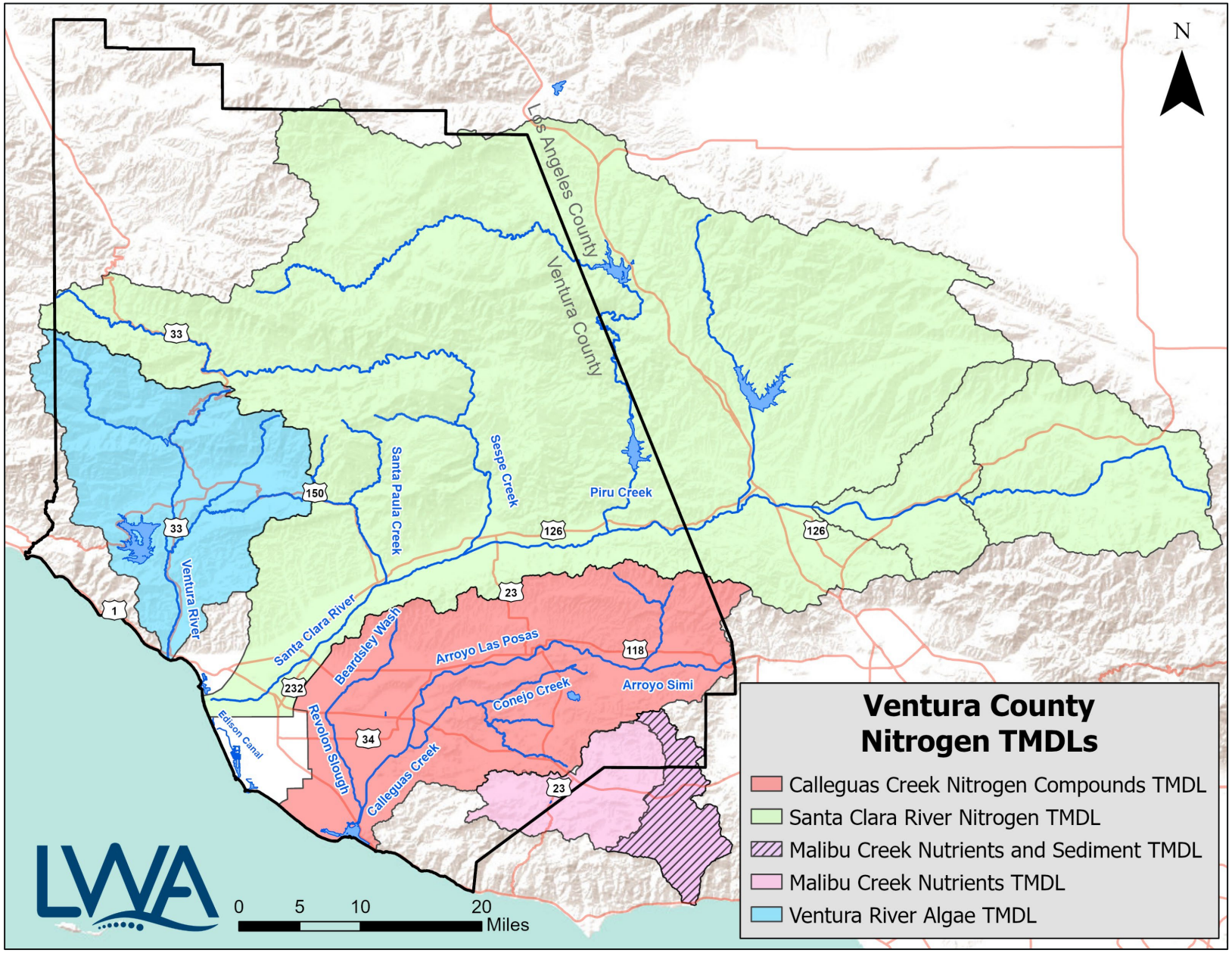
Oxnard Plain/Coastal Watershed

No Nutrient Related TMDLs

Data Compared to Ag Order Benchmark 10 mg/L Nitrate-N



Ventura County Watersheds with Nutrient Related TMDLs



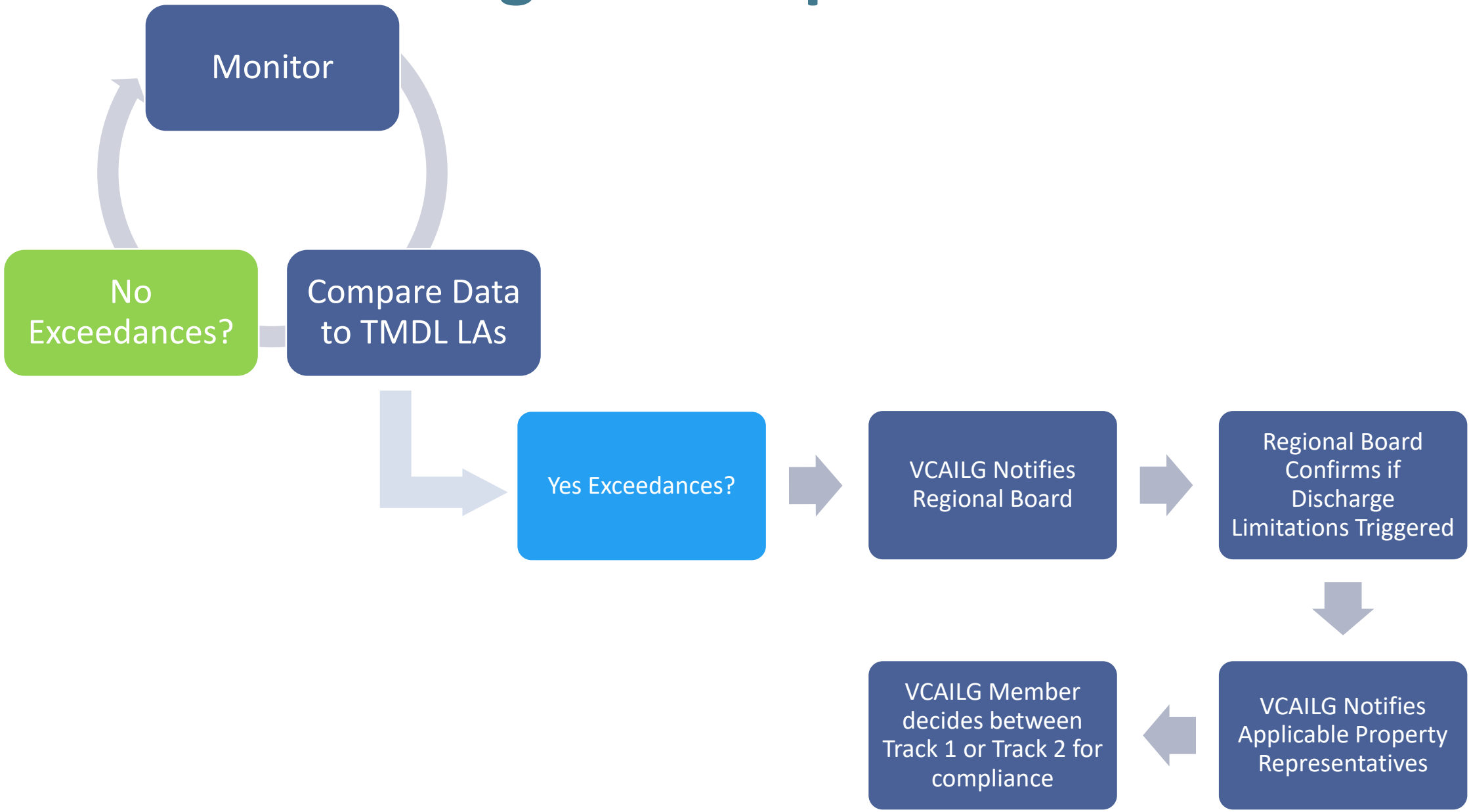
Nutrient Related Total Maximum Daily Load (TMDL) Constituents

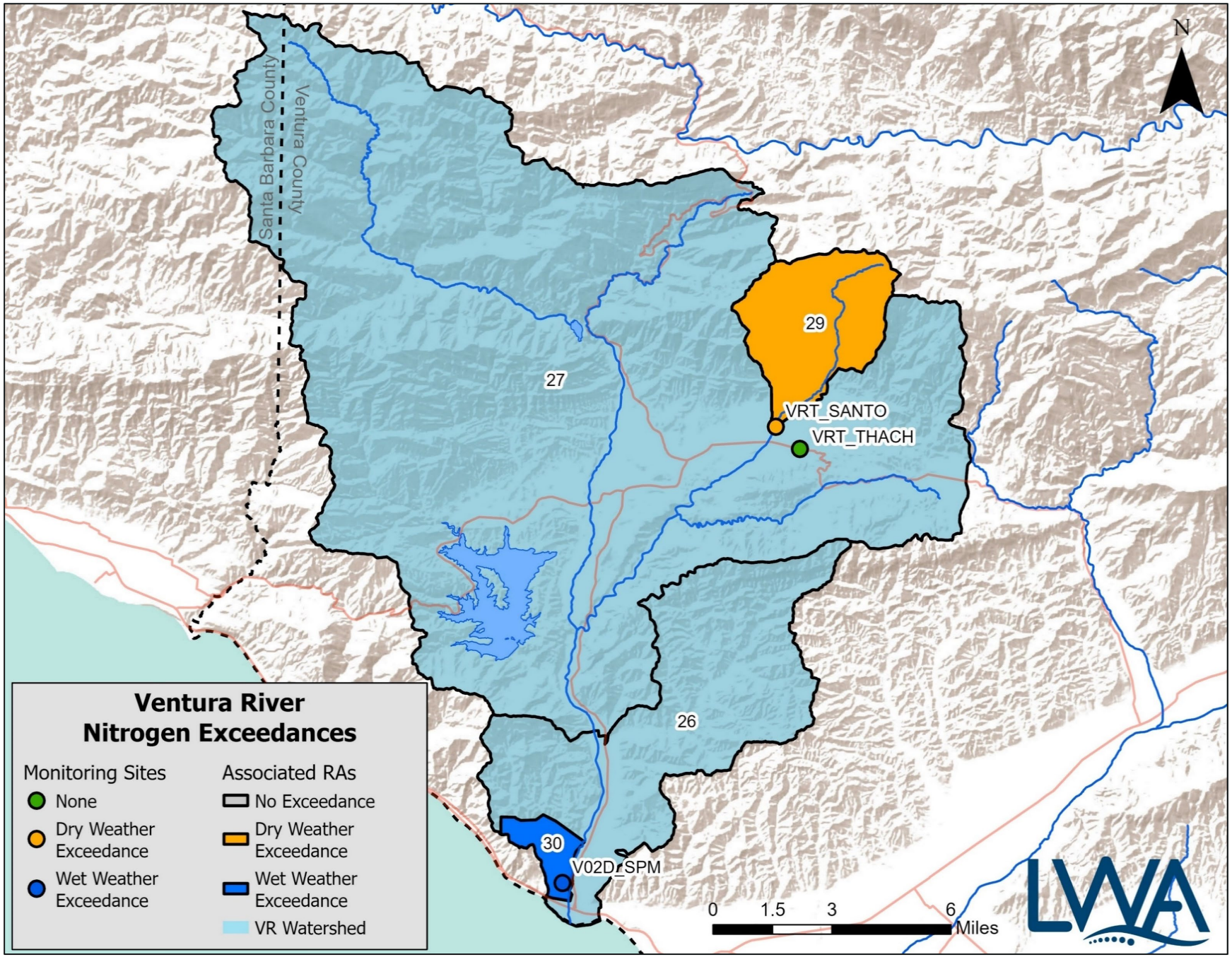
TMDL	Constituent	Load Allocation/ Benchmark
Ventura River Algae	Nitrate-N +Nitrite-N (wet weather)	5 mg/L (upper watershed) 10 mg/L (lower watershed)
	Total Nitrogen (dry weather)	16 lbs/day or 0.008 lbs/day/ac
	Total Phosphorus (dry weather)	0.12 lbs/day or 0.000063 lbs/day/ac
Calleguas Creek Watershed Nitrogen Compounds	Nitrate-N + Nitrite-N	9 mg/L
Santa Clara River Nitrogen Compounds	Ammonia-N + Nitrate-N + Nitrite-N	10 mg/L
Malibu Creek and Lagoon TMDL for Sedimentation and Nutrients (benthic)	Total Nitrogen	0.65 mg/L (summer) 1.00 mg/L (winter
	Total Phosphorus	0.1 mg/L
Malibu Creek Watershed Nutrients	Nitrate-N + Nitrite-N (winter)	8 mg/L
	Total Nitrogen (summer)	3 lbs/day
	Total Phosphorus (summer)	0.2 lbs/day

TMDL Compliance Deadlines

Nutrient Related TMDL	Compliance Deadline
Santa Clara River Nitrogen Compounds TMDL	March 23, 2004
Calleguas Creek Nitrogen Compounds and Related Effects TMDL	July 16, 2010
Ventura River Algae TMDL	June 28, 2019
Malibu Creek Watershed Sedimentation and Nutrients TMDL	October 14, 2022
Malibu Creek Watershed Nutrients TMDL	October 14, 2022

TMDL Monitoring and Response Process

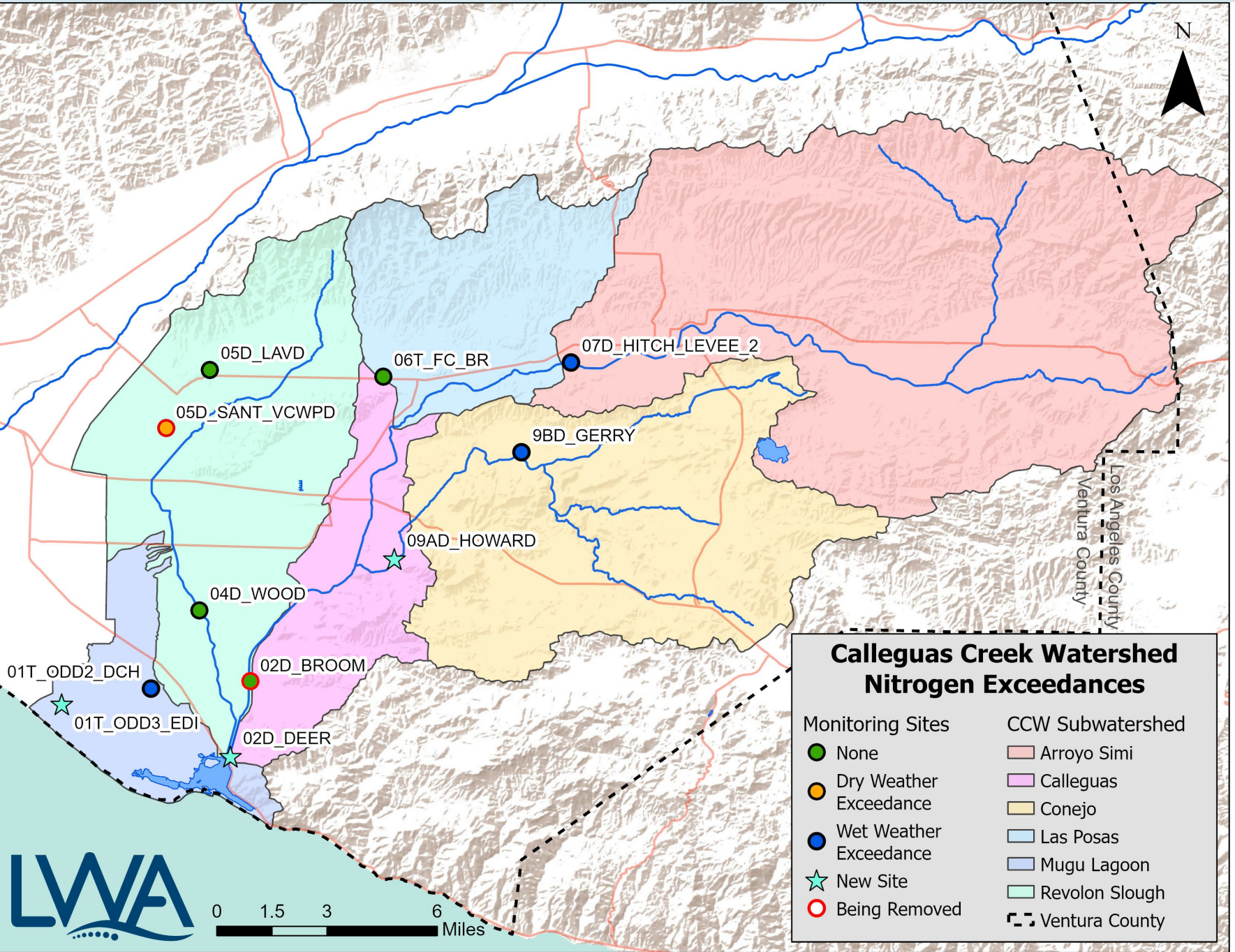




Ventura River Algae TMDL

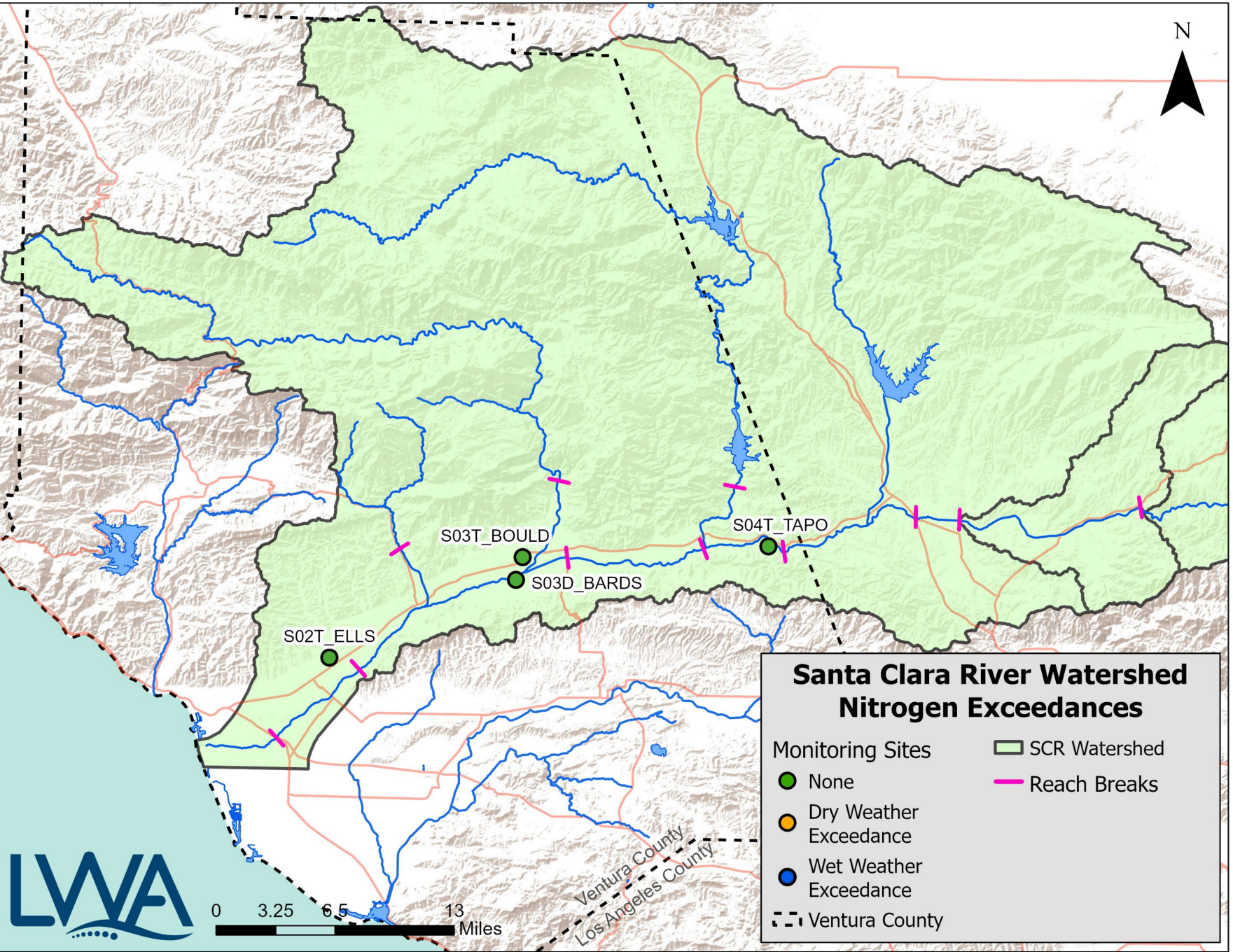
- 5 or 10 mg/L Nitrate-N + Nitrite-N: Wet Weather

- 16 lbs/day or 0.08 lbs/day/ac Total N: Dry Weather
- 0.12 lbs/day or 0.000063 lbs/day/ac Total P: Dry Weather



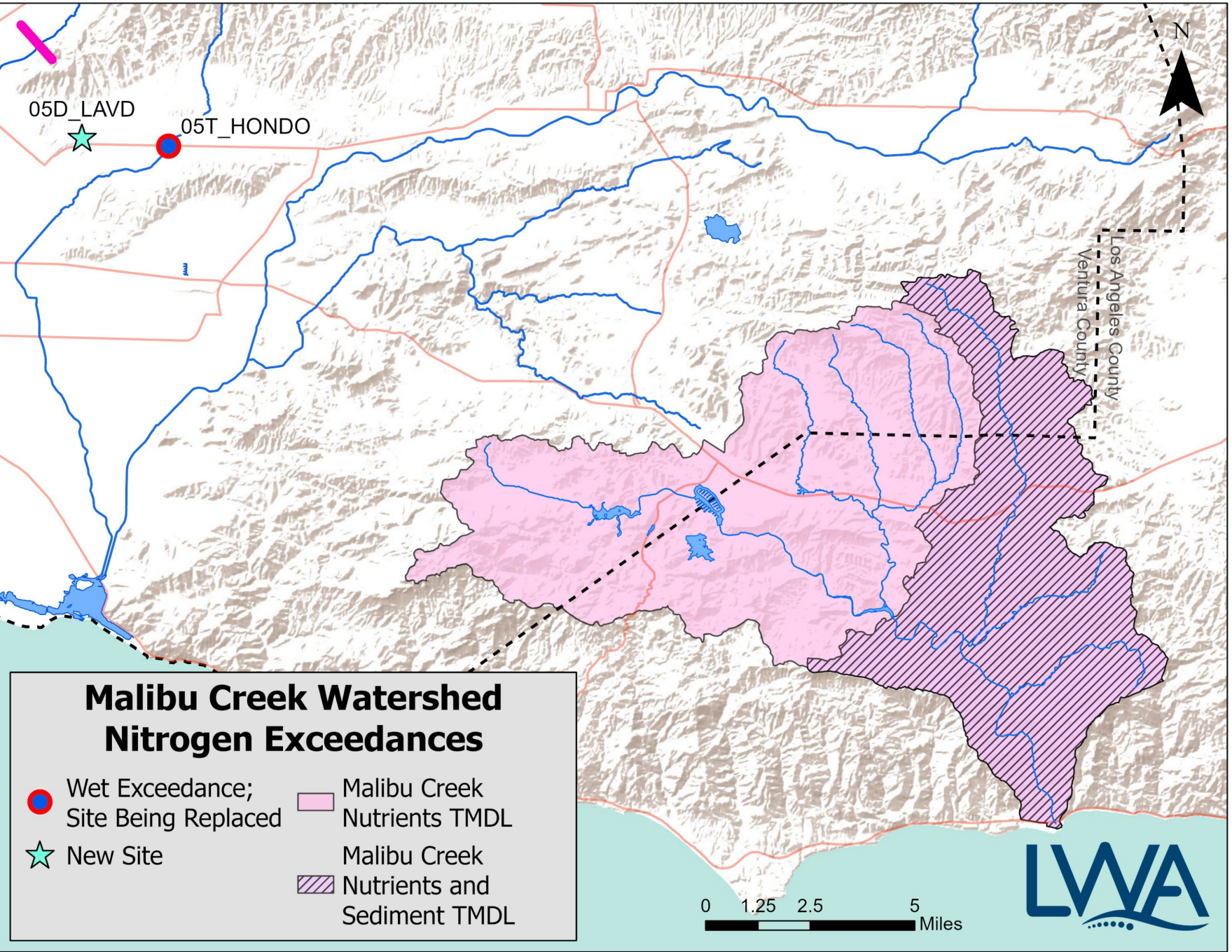
Calleguas Creek Watershed Nitrogen TMDL

9 mg/L Nitrate-N + Nitrite-N



Santa Clara River Nitrogen TMDL

10 mg/L Ammonia-N + Nitrate-N + Nitrite-N



Malibu Creek Nutrients TMDL

8 mg/L Nitrate-N + Nitrite-N (winter)

3 lbs/day Total Nitrogen (summer)
0.2 lbs/day Total Phosphorus (summer)

Malibu Nutrients and Sediment TMDL

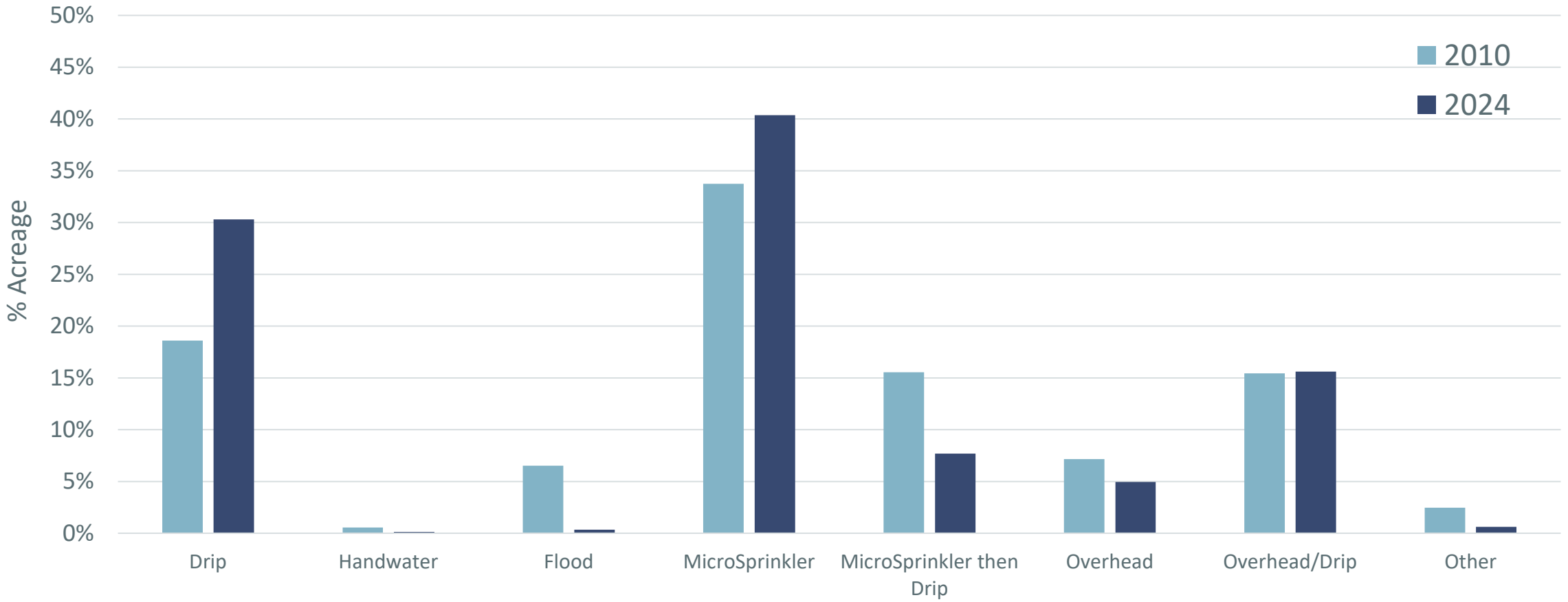
0.65 mg/L Total Nitrogen (summer)
1.00 mg/L Total Nitrogen (winter)

0.1 mg/L Total Phosphorus

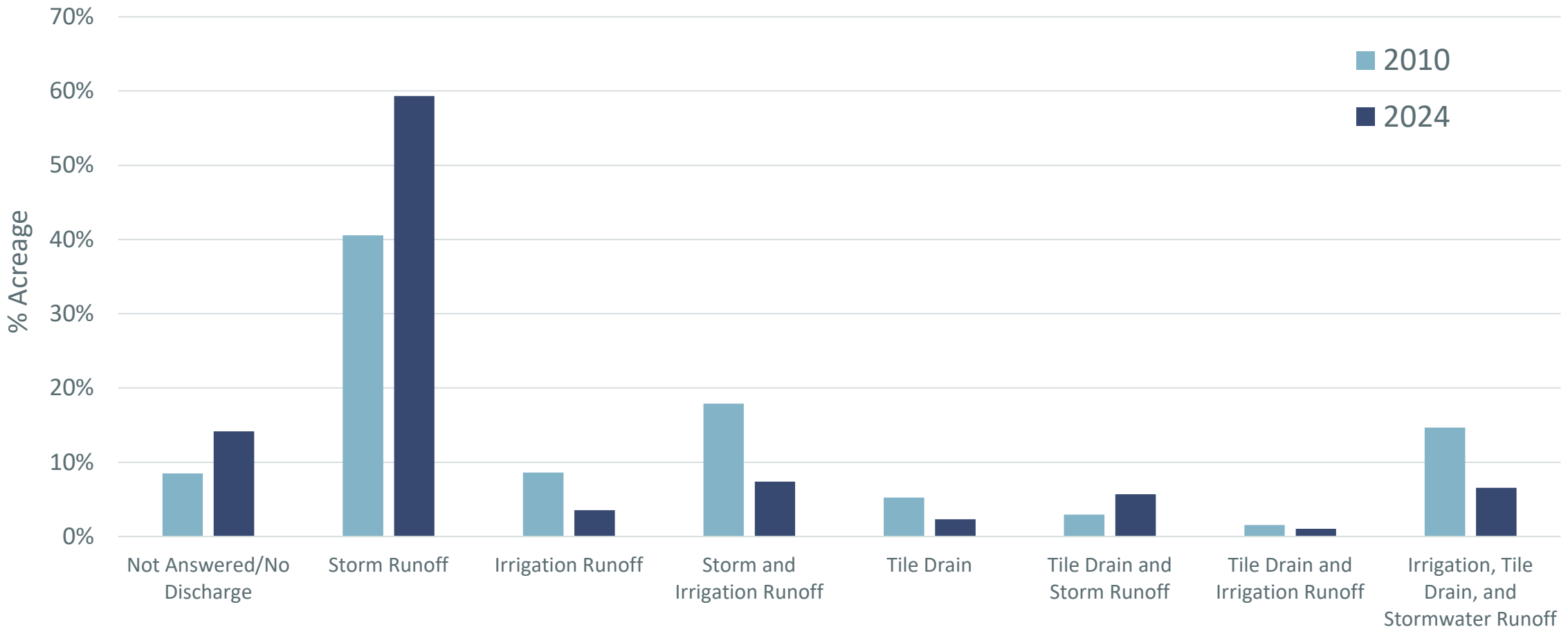
Water Management

Irrigation, Tile Drains, and Runoff Management

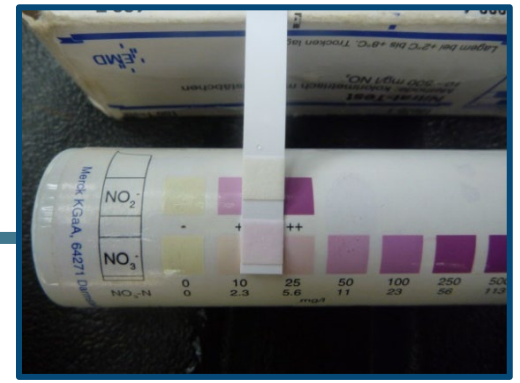
Irrigation Methods Utilized in Ventura County



Types of Farm Discharges Reported to VCAILG



Conclusion



- There are upcoming regulatory components that will provide additional/new data.
- Overall groundwater trends look good, a few areas will require additional management actions.
- Nutrient related TMDLs apply to most of the county, attainment of those TMDLs varies and all are past their deadline.
  - Discharge limitations and on farm actions will be starting in parts of some watersheds (Ventura River, Calleguas Creek, Malibu)
- Overall, improvements seen in irrigation methods – minimizing irrigation runoff
  - Addressing tile drain discharges and stormwater runoff will be the next areas of focus, while continuing to support efficient irrigation.

Thank You

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