Draft Biological Water Quality Objectives

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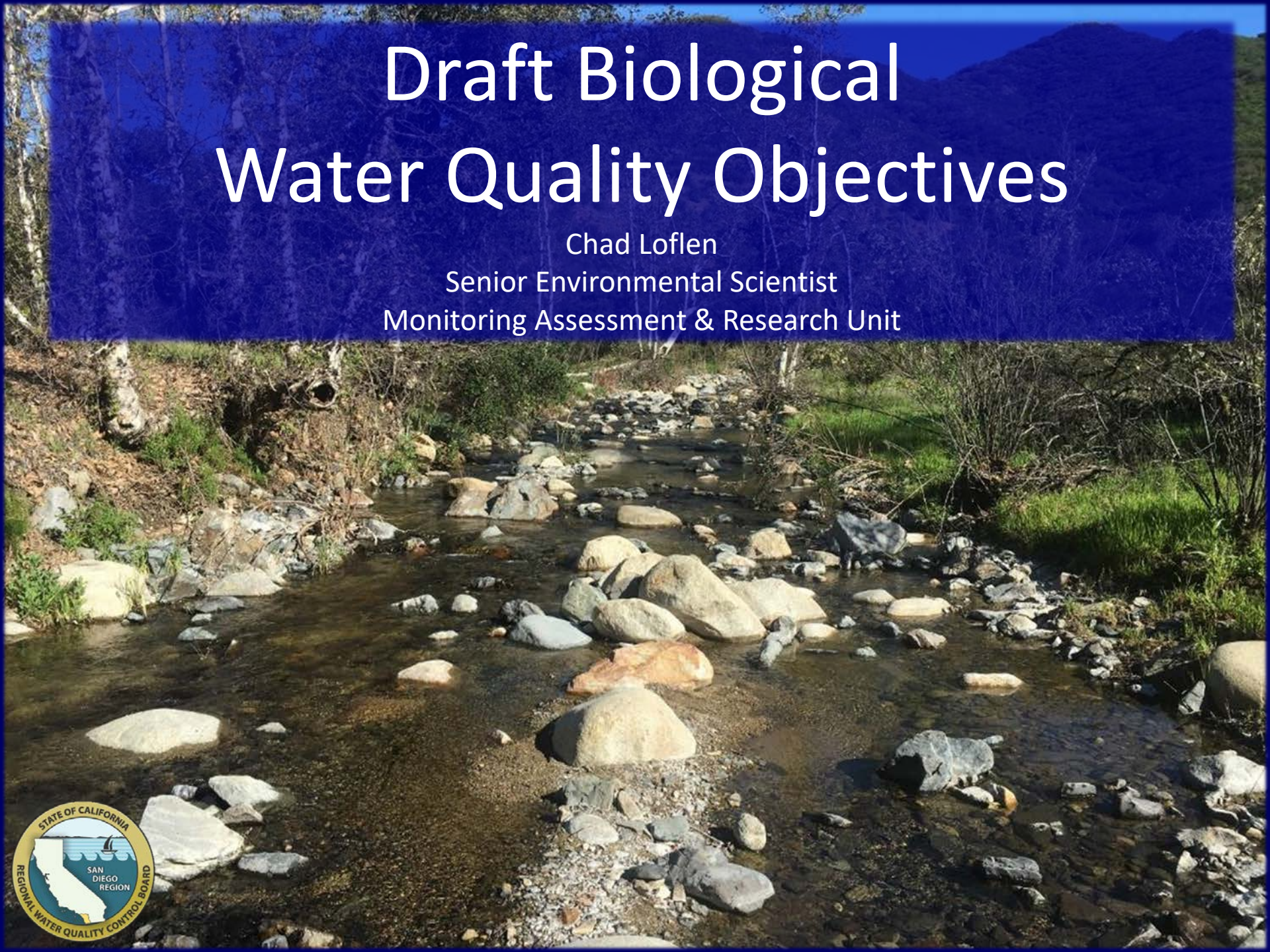


Project Goals:

- Protect High Quality Waters
- Guide Meaningful Restoration

Clean Water Act Objective

Protect and Restore the Physical, Chemical, and **Biological Integrity** of the Nation's Waters

Clean Water Act Objective

Beneficial Uses San Diego Streams:

"Includes uses of water that support warm/cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, **including invertebrates**."

Biological Beneficial Uses Need Biological Water Quality Objectives

Today:

- Water Quality Objective
- Program for Implementation

Today:

- Water Quality Objective = Protects Beneficial Use
- Program for Implementation = How the Objective is Applied

Biological Objective: Reference Approach

- *Overall Narrative Objective*
- *Numeric Objective "Translators"*

Narrative Objective:

Surface waters within the San Diego Region shall support an ecologically balanced and resilient community of organisms having a native species composition, diversity, abundance, and functional organization commensurate with that of unaltered analogous waters.

Biological Objective:
Numeric Translators for Streams

California Stream Condition Index (CSCI)

2016. *Freshwater Science* 35(1): 237-248

Evaluating the adequacy of a reference-site pool for ecological assessments in environmentally complex regions

Peter R. Ode[1,7], Andrew C. Rehn[1,8], Raphael D. Mazor[1,2,9], Kenneth C. Schiff[2,10], Eric D. Stein[2,11], Jason T. May[3,12], Larry R. Brown[3,13], David B. Herbst[4,14], David Gillett[2,15], Kevin Lunde[5,16], and Charles P. Hawkins[6,17]

2016. *Freshwater Science* 35(1): 249-271

Bioassessment in complex environments: designing an index for consistent meaning in different settings

Raphael D. Mazor[1,2,5], Andrew C. Rehn[2,6], Peter R. Ode[2,7], Mark Engeln[1,8], Kenneth C. Schiff[1,9], Eric D. Stein[1,10], David J. Gillett[1,11], David B. Herbst[3,12], and Charles P. Hawkins[4,13]

CSCI

EXPECTED

LOCATION

CLIMATE

GEOLOGY

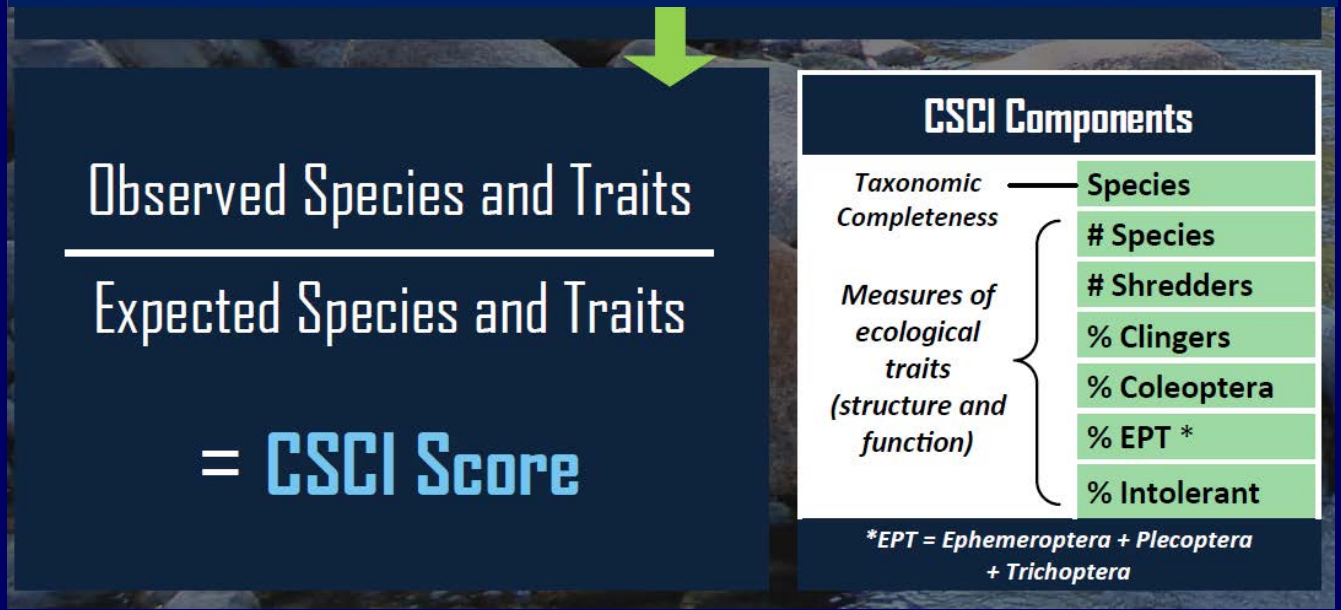
WATERSHED SIZE

CSCI

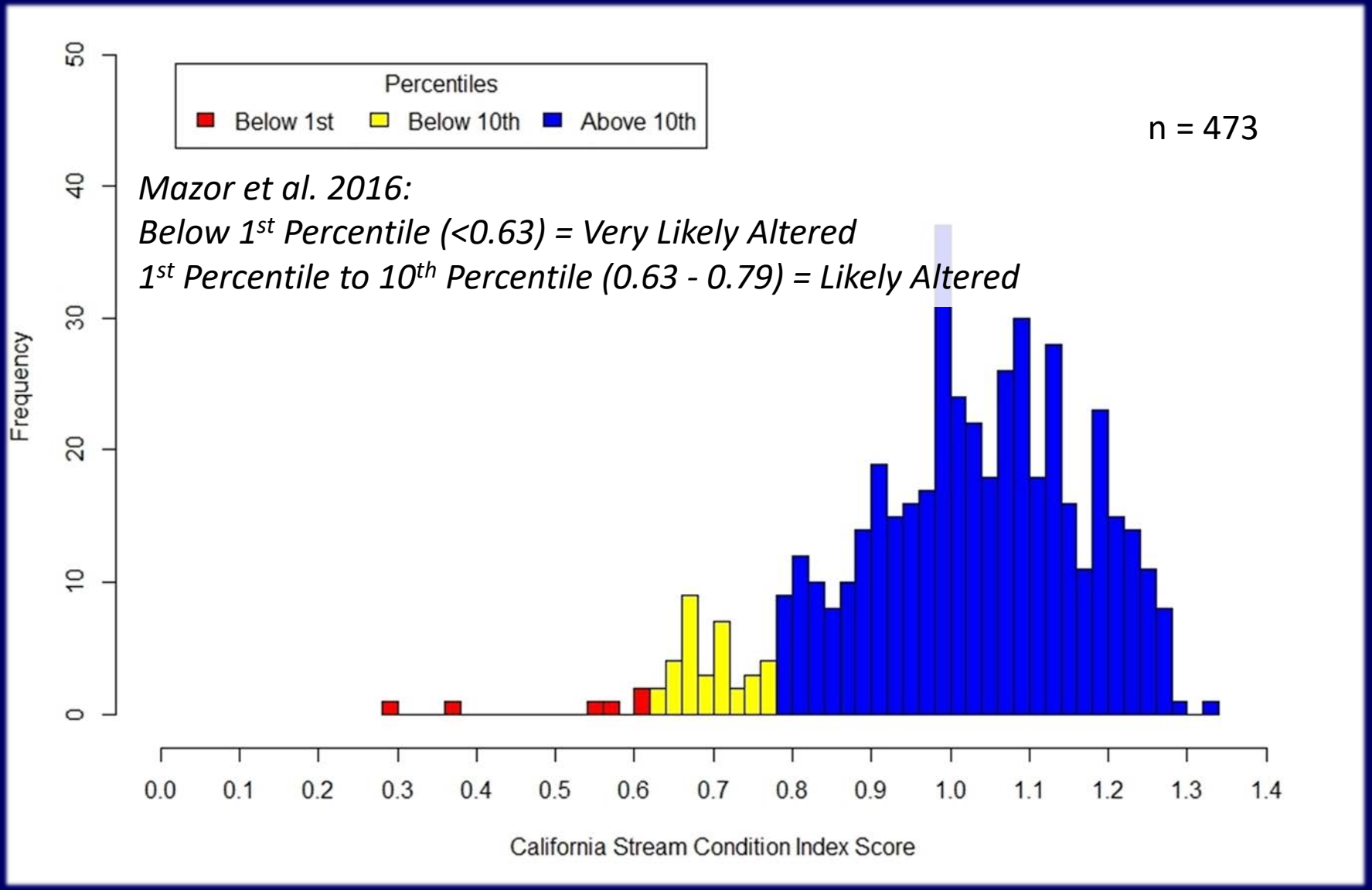
OBSERVED

The site is sampled and species are identified in the lab.

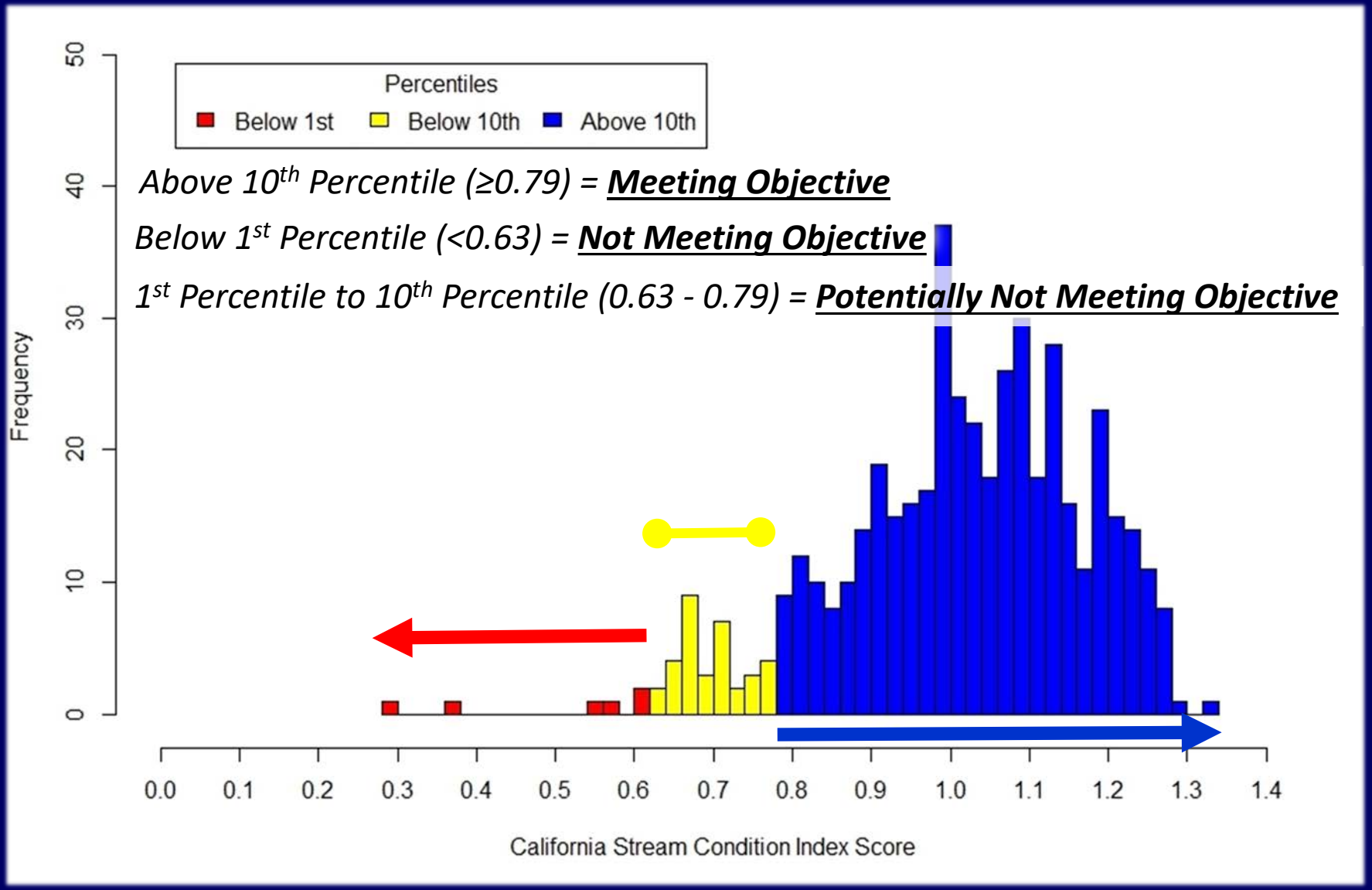
CSCI


Observed Species and Traits
Expected Species and Traits
= CSCI Score
CSCI Components
Taxonomic Completeness
Species
Measures of ecological traits (structure and function)
Species
Shredders
% Clingers
% Coleoptera
% EPT *
% Intolerant
*EPT = Ephemeroptera + Plecoptera + Trichoptera

CSCI Score: Percentile of Reference



CSCI Score: Biological Objective



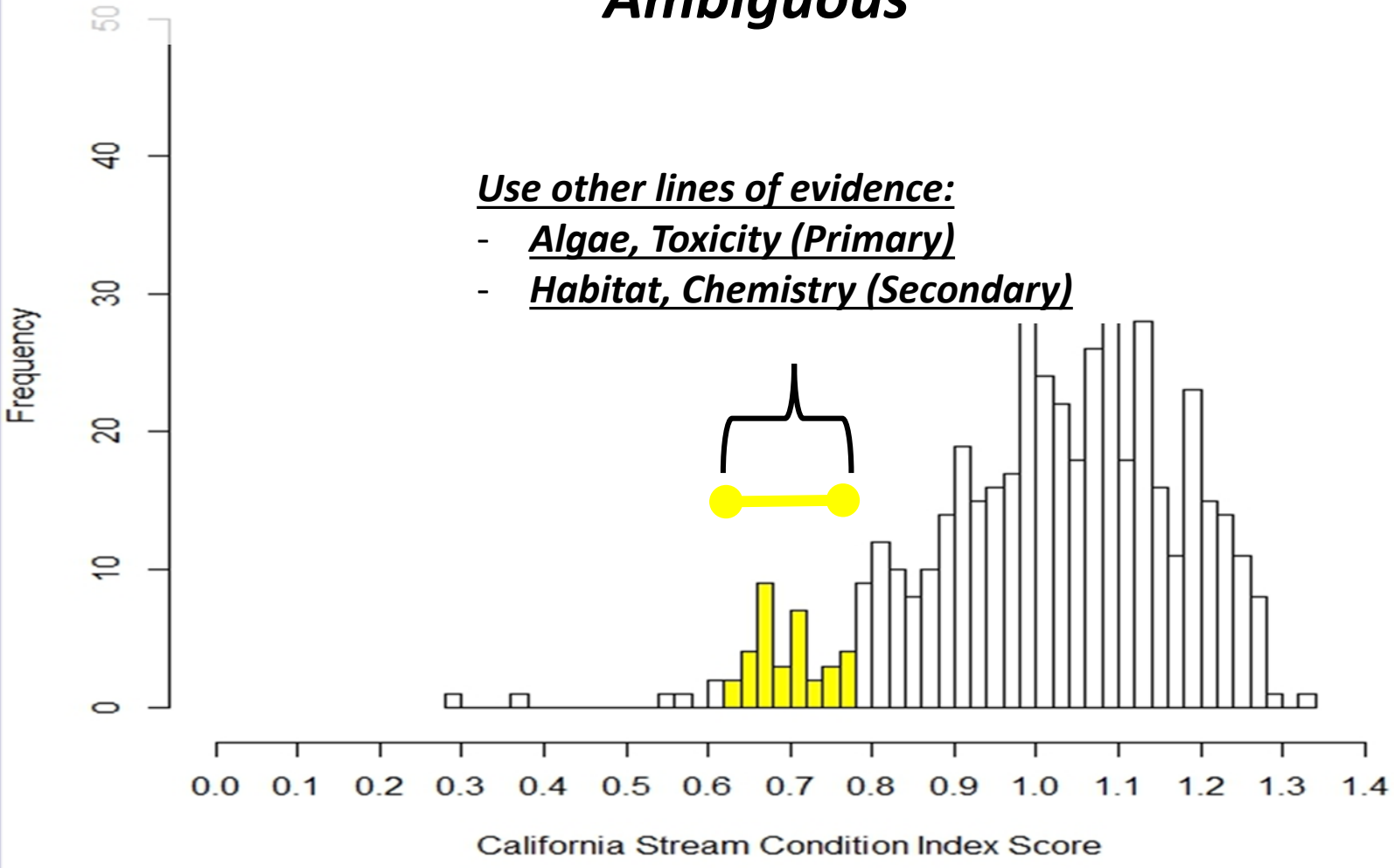
CSCI Score: Biological Objective

1st Percentile to 10th Percentile (0.63 - 0.79) = ***Potentially Not Meeting Objective***

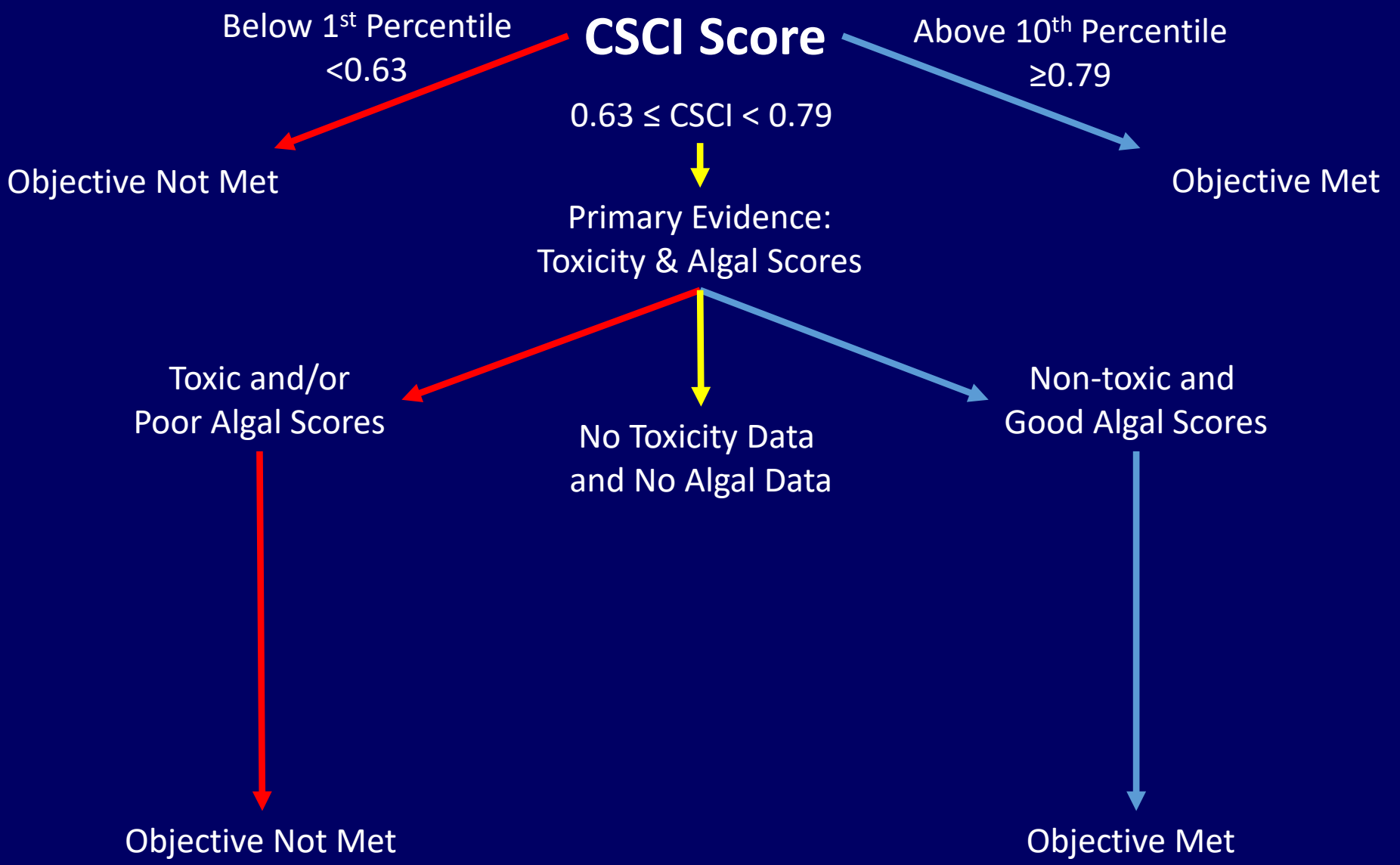
"Ambiguous"

Use other lines of evidence:

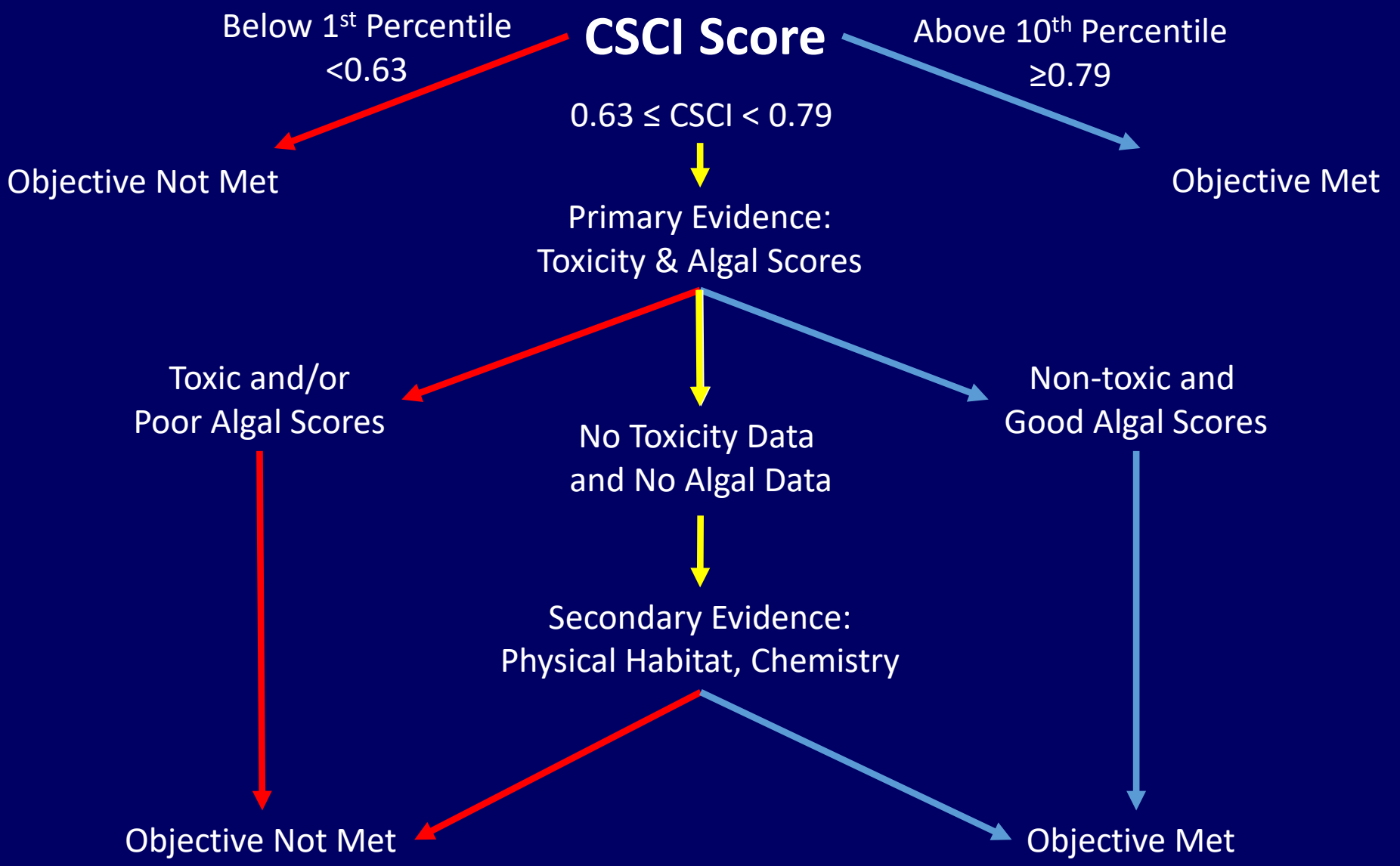
- ***Algae, Toxicity (Primary)***
- ***Habitat, Chemistry (Secondary)***



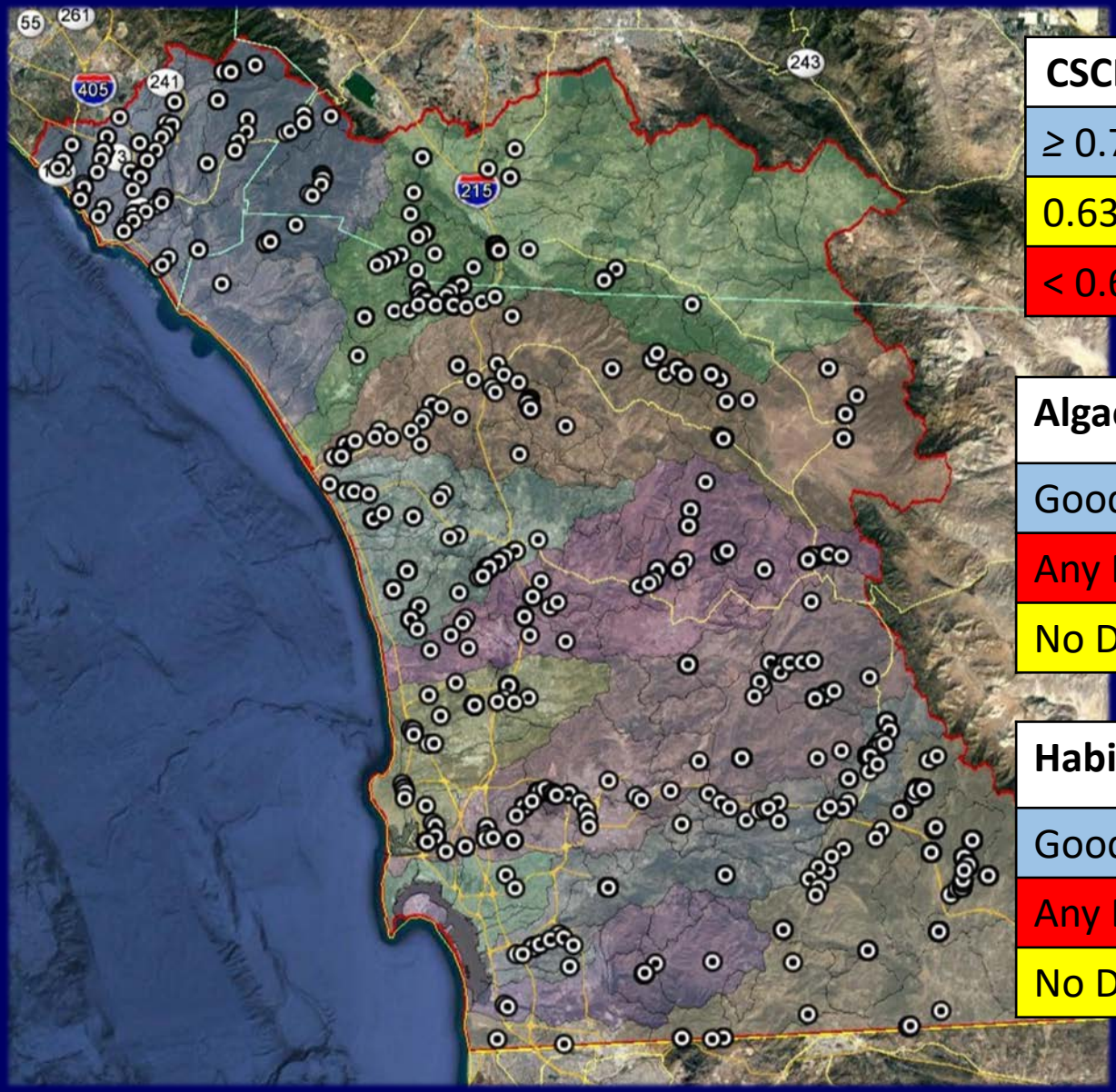
Biological Objectives: Walkthrough



Biological Objectives: Walkthrough



Bioassessment: 1,300+ samples at 400+ sites



CSCI Score	Objective Met?
≥ 0.79	Yes
0.63-0.79	Ambiguous: Next Table
< 0.63	No

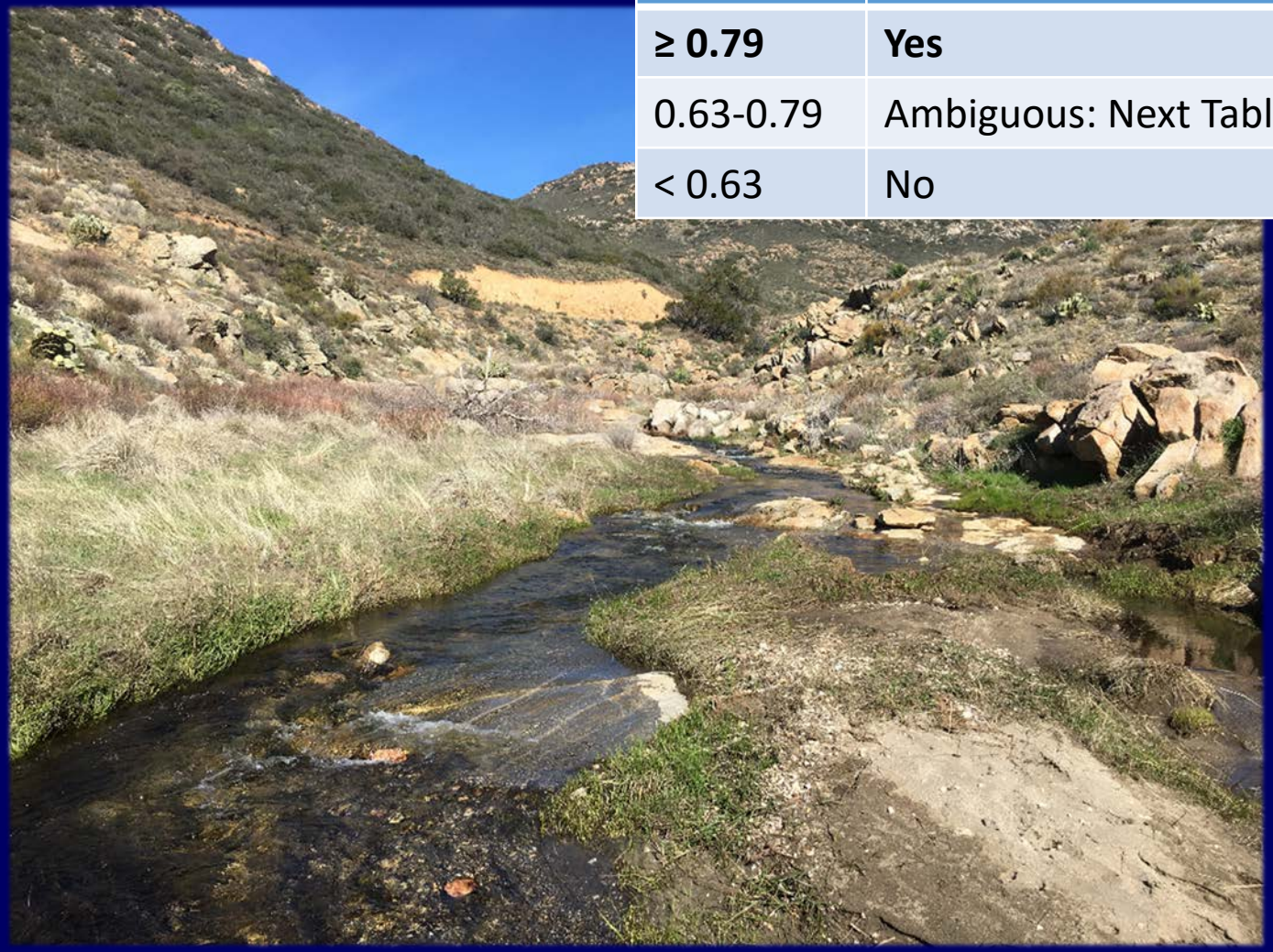
Algae/Toxicity	Objective
Good	Yes
Any Bad	No
No Data	Next Table

Habitat/Chemistry	Objective Met?
Good	Yes
Any Bad	No
No Data	Inconclusive

CSCI Score: Objective Met?

CSCI Scores:
0.95
0.96
0.98
0.96

CSCI Score	Objective Met?
≥ 0.79	**Yes**
0.63-0.79	Ambiguous: Next Table
< 0.63	No



CSCI Score: Objective Met?

CSCI Score	Objective Met?
≥ 0.79	Yes
0.63-0.79	Ambiguous: Next Table
< 0.63	**No**

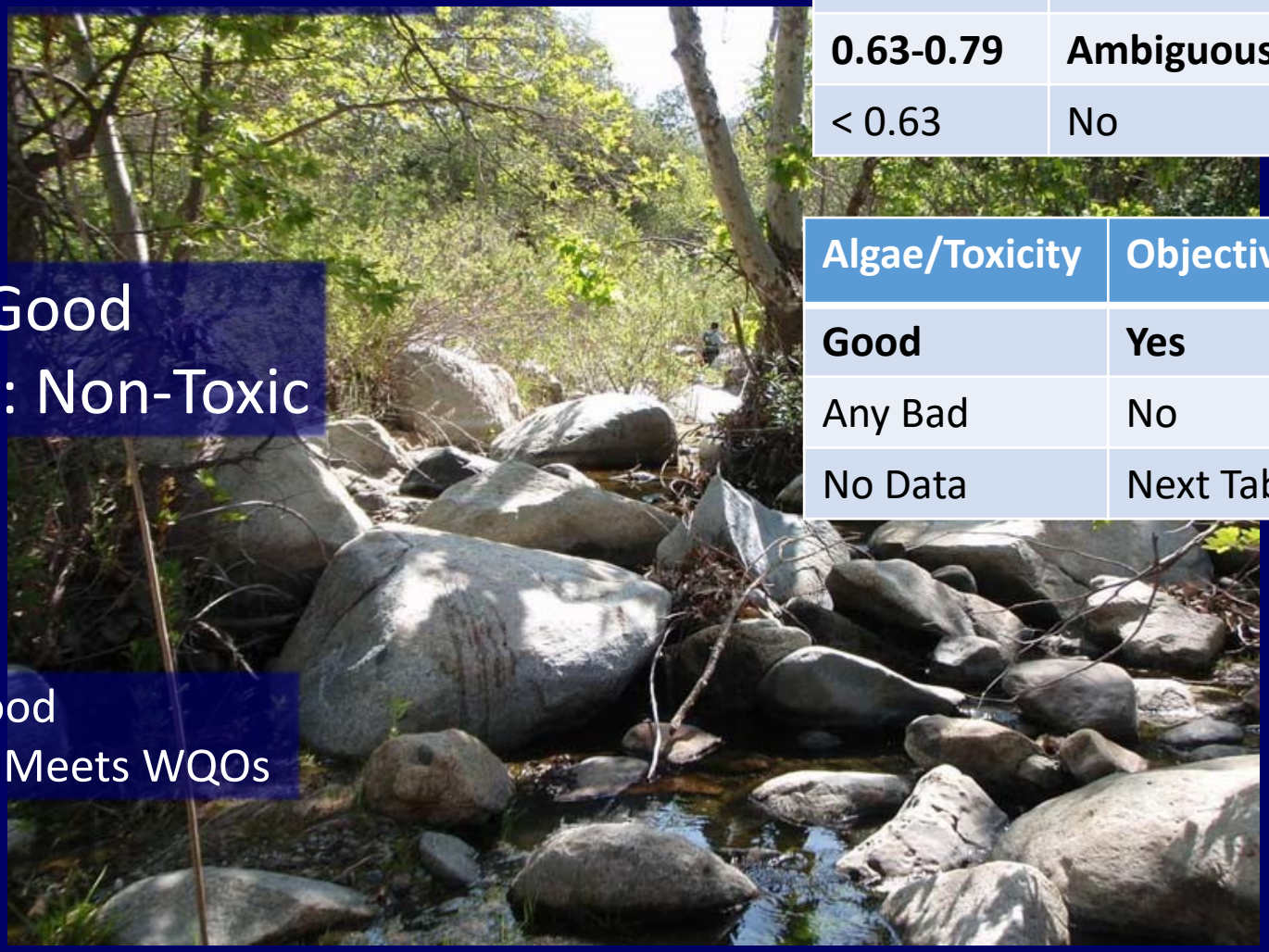
CSCI Scores:

0.33	0.21
0.27	0.20
0.22	0.34

CSCI Score: Objective Met?

CSCI Score: 0.69

CSCI Score	Objective Met?
≥ 0.79	Yes
0.63-0.79	**Ambiguous: Next Table**
< 0.63	No

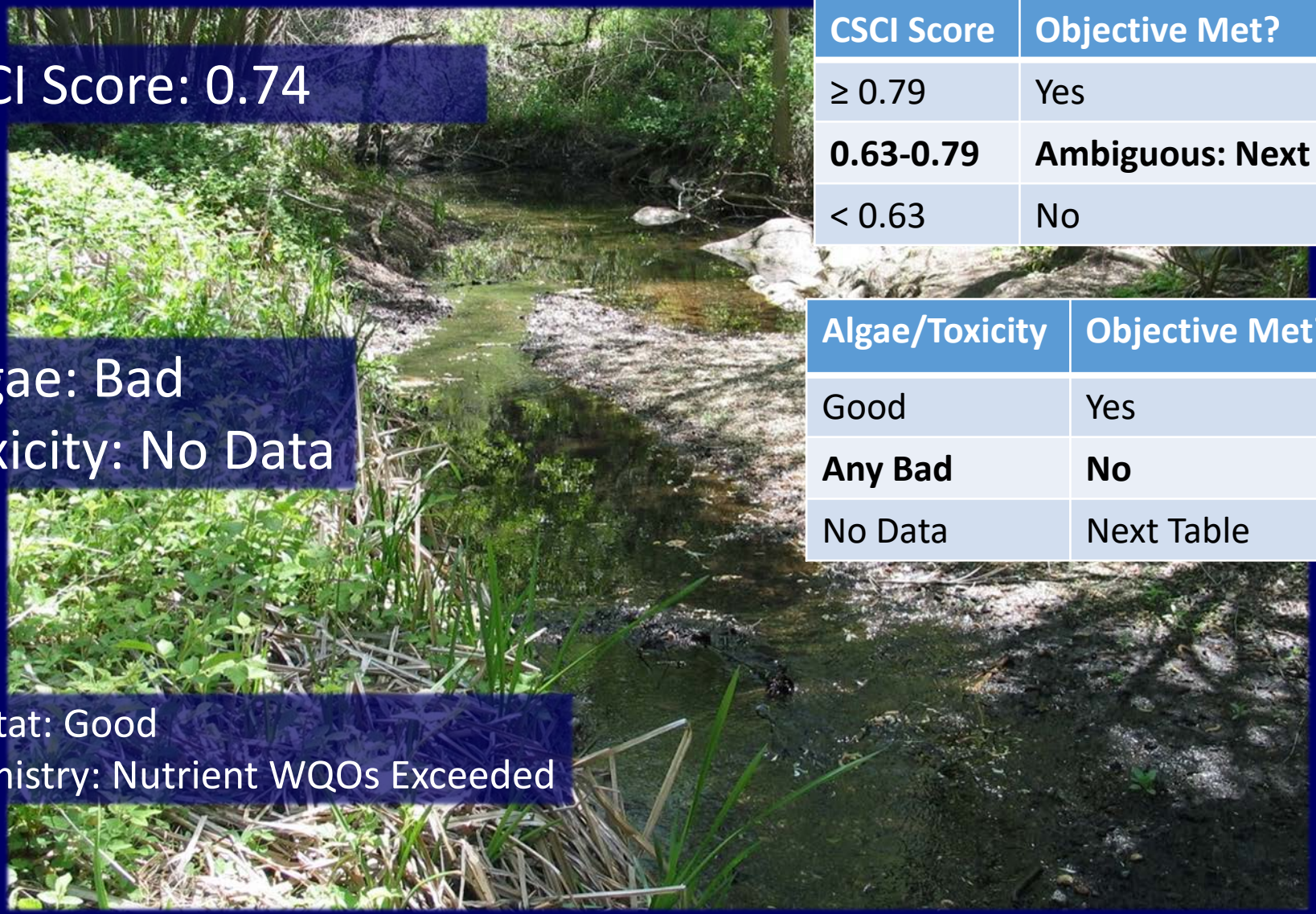


Algae: Good
Toxicity: Non-Toxic

Algae/Toxicity	Objective Met?
Good	**Yes**
Any Bad	No
No Data	Next Table

Habitat: Good
Chemistry: Meets WQOs

CSCI Score: Objective Met?



CSCI Score: 0.74

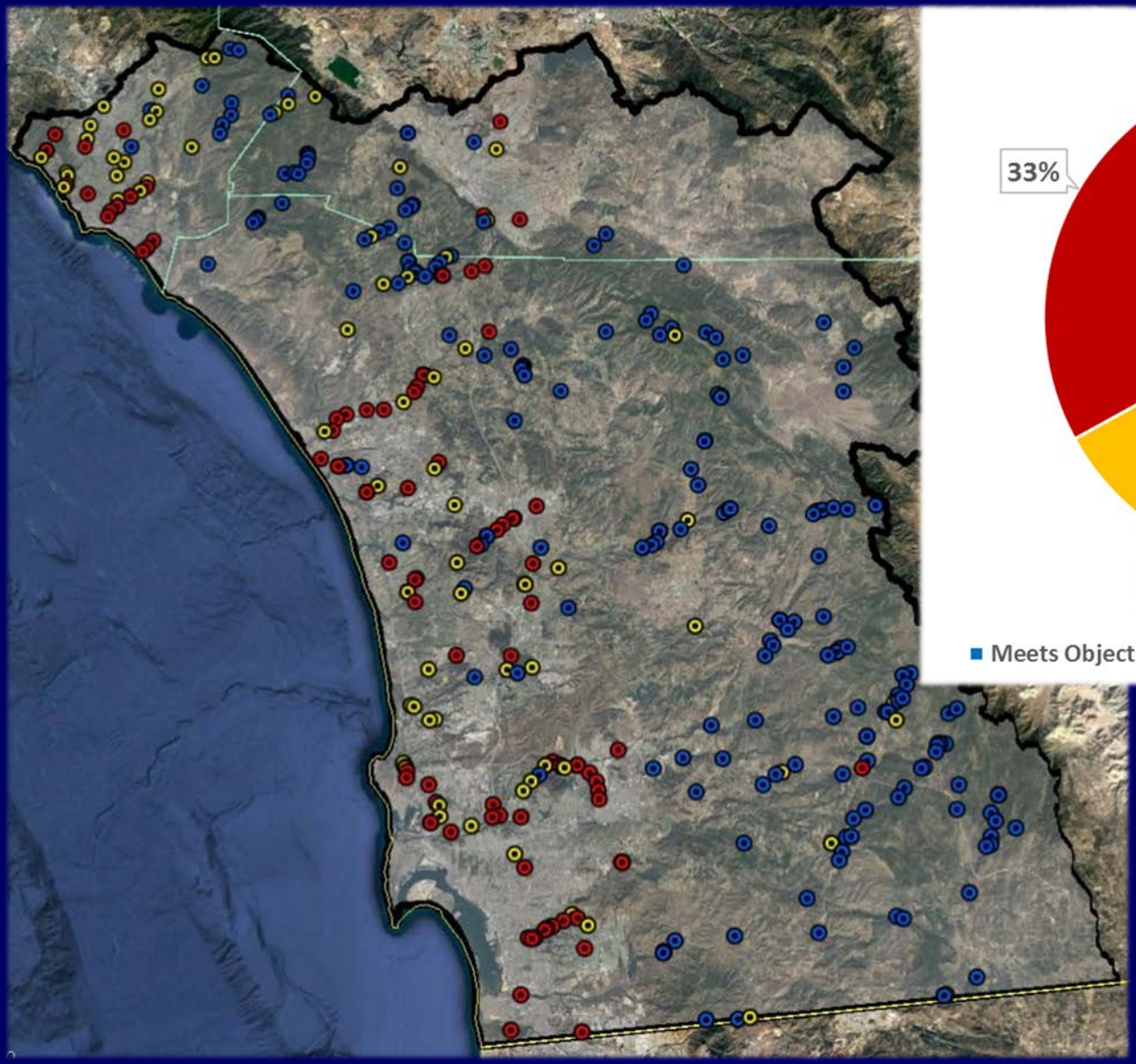
Algae: Bad
Toxicity: No Data

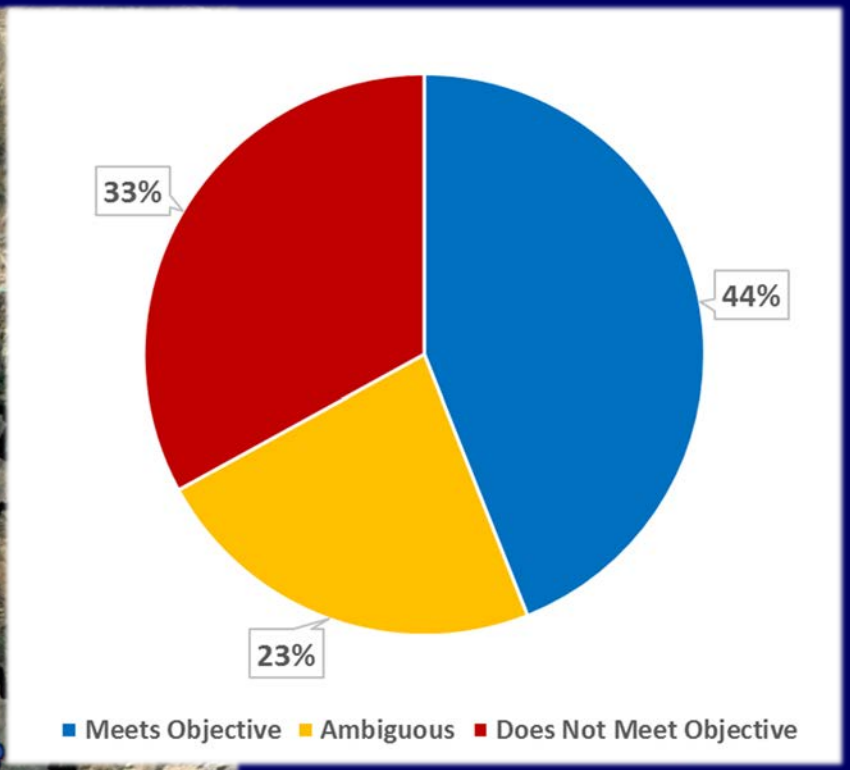
Habitat: Good
Chemistry: Nutrient WQOs Exceeded

CSCI Score	Objective Met?
≥ 0.79	Yes
0.63-0.79	**Ambiguous: Next Table**
< 0.63	No

Algae/Toxicity	Objective Met?
Good	Yes
Any Bad	**No**
No Data	Next Table

CSCI Scores: What does the Region look like?





Today:

- Water Quality Objective
- Program for Implementation

Short Break!

- Water Quality Objective
- Program for Implementation

Today:

- Water Quality Objective = Protects Beneficial Use
- Program for Implementation = How the Objective is Applied

Program of Implementation

What does a Basin Plan Amendment Require?

A Description of a Program for Implementation

CWC 13242

"(a) A description of the nature of actions which are necessary to achieve the objectives, including recommendations for appropriate action by any entity, public or private.

(b) A time schedule for the actions to be taken.

(c) A description of surveillance to be undertaken to determine compliance with objectives."

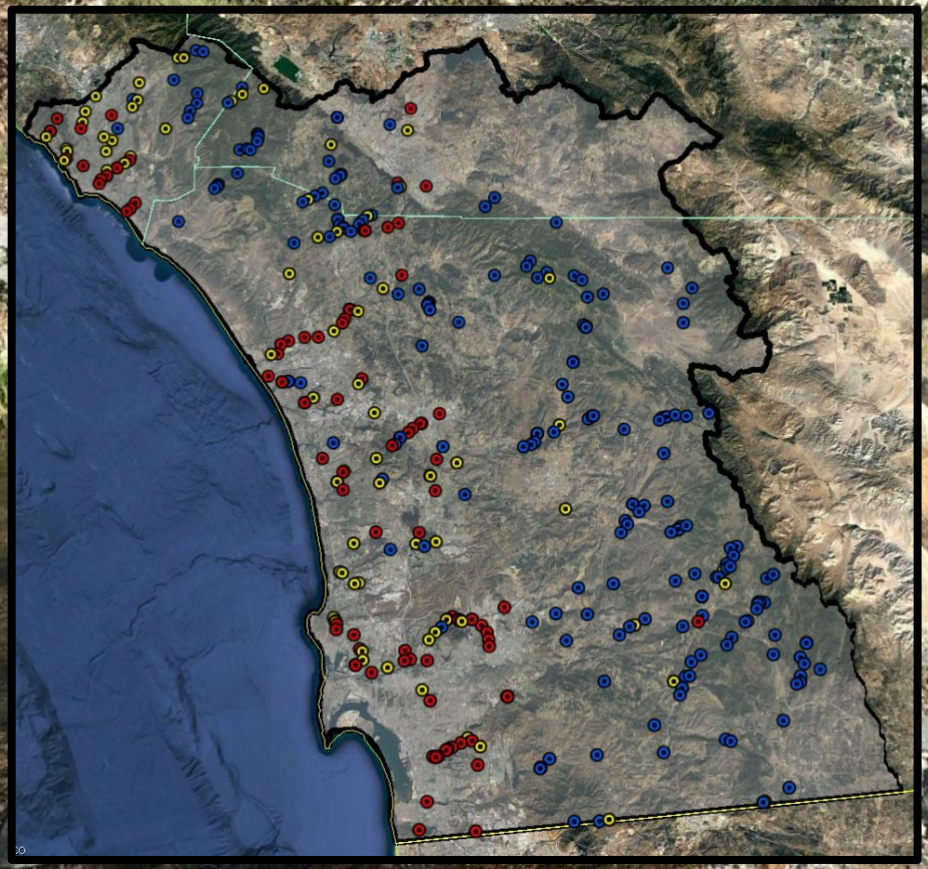
Chapter 4 of the Basin Plan: *A Framework for Implementation of Biological Objectives*

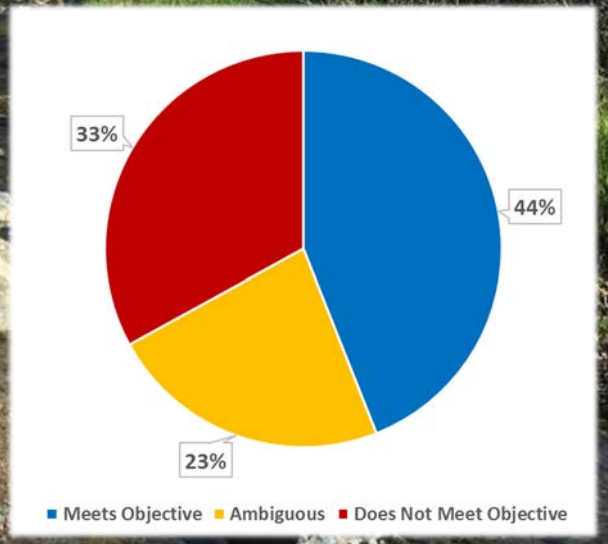
DOES: Overview of how SD Water Board will implement by program

DOES NOT: Specify how implemented on a permit-by-permit or project-by-project basis

Project Goals:

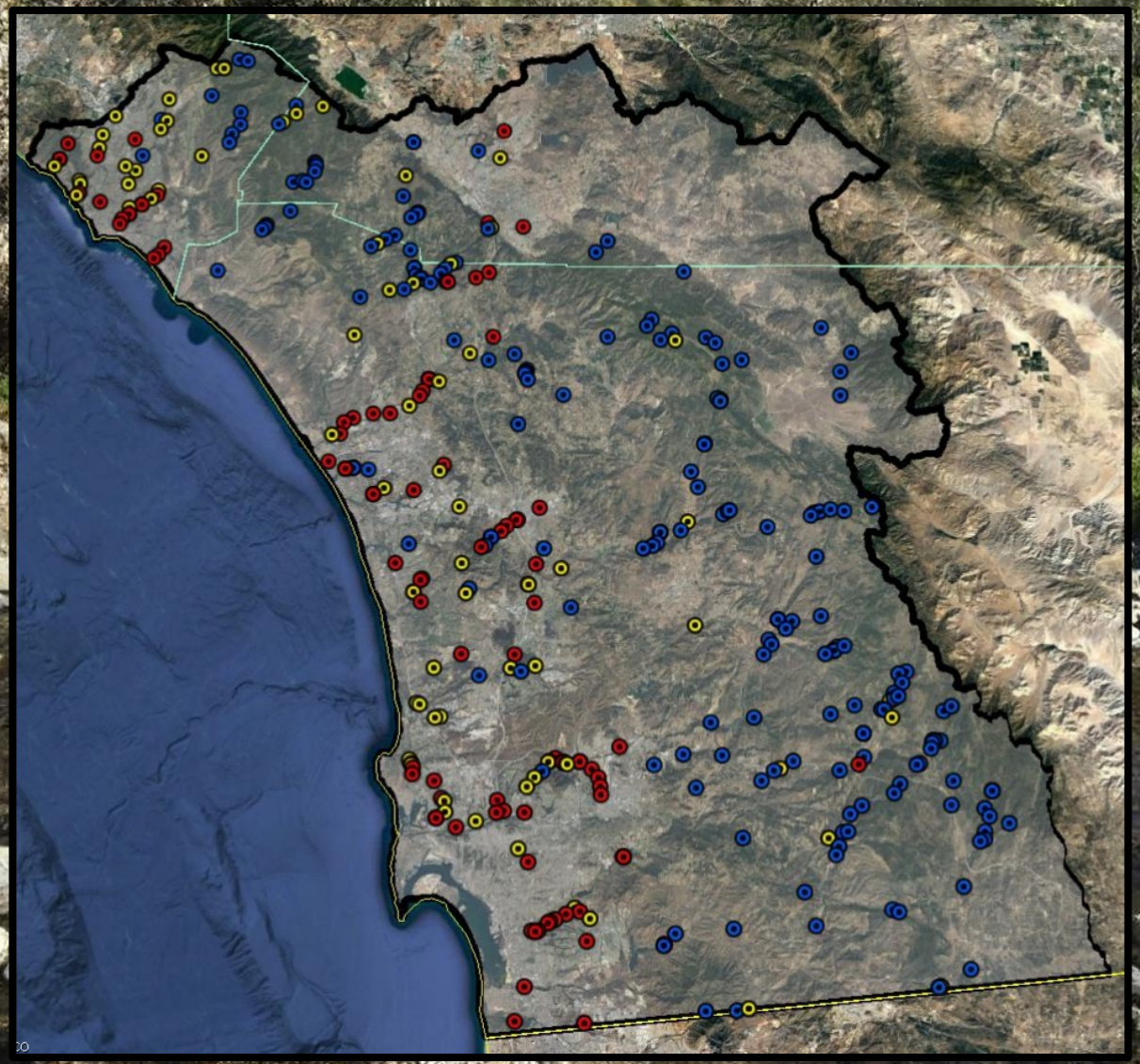
- Protect High Quality Waters
- Guide Meaningful Restoration





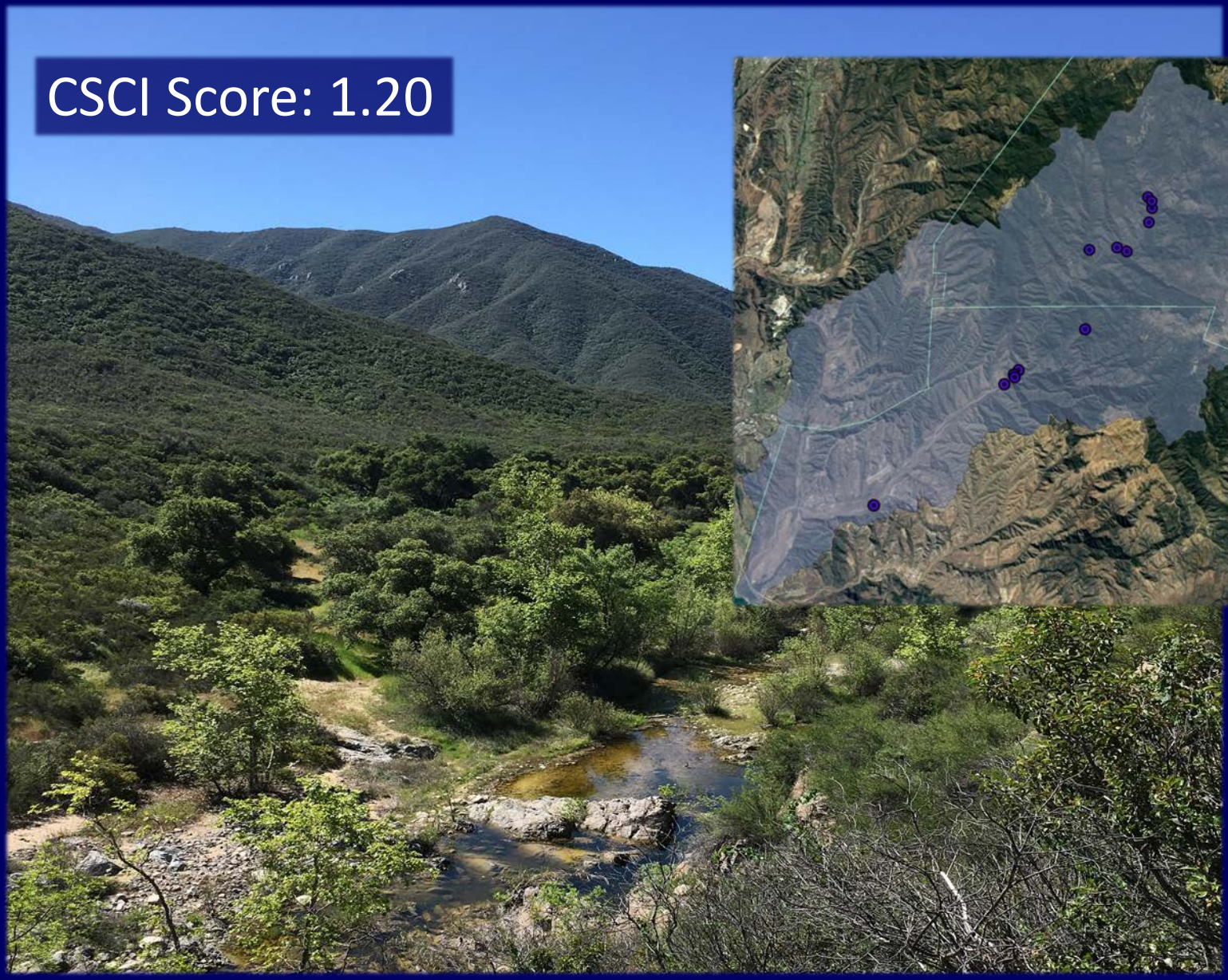
To Protect Your Rivers, Protect Your Mountains

Emperor Yu(China)

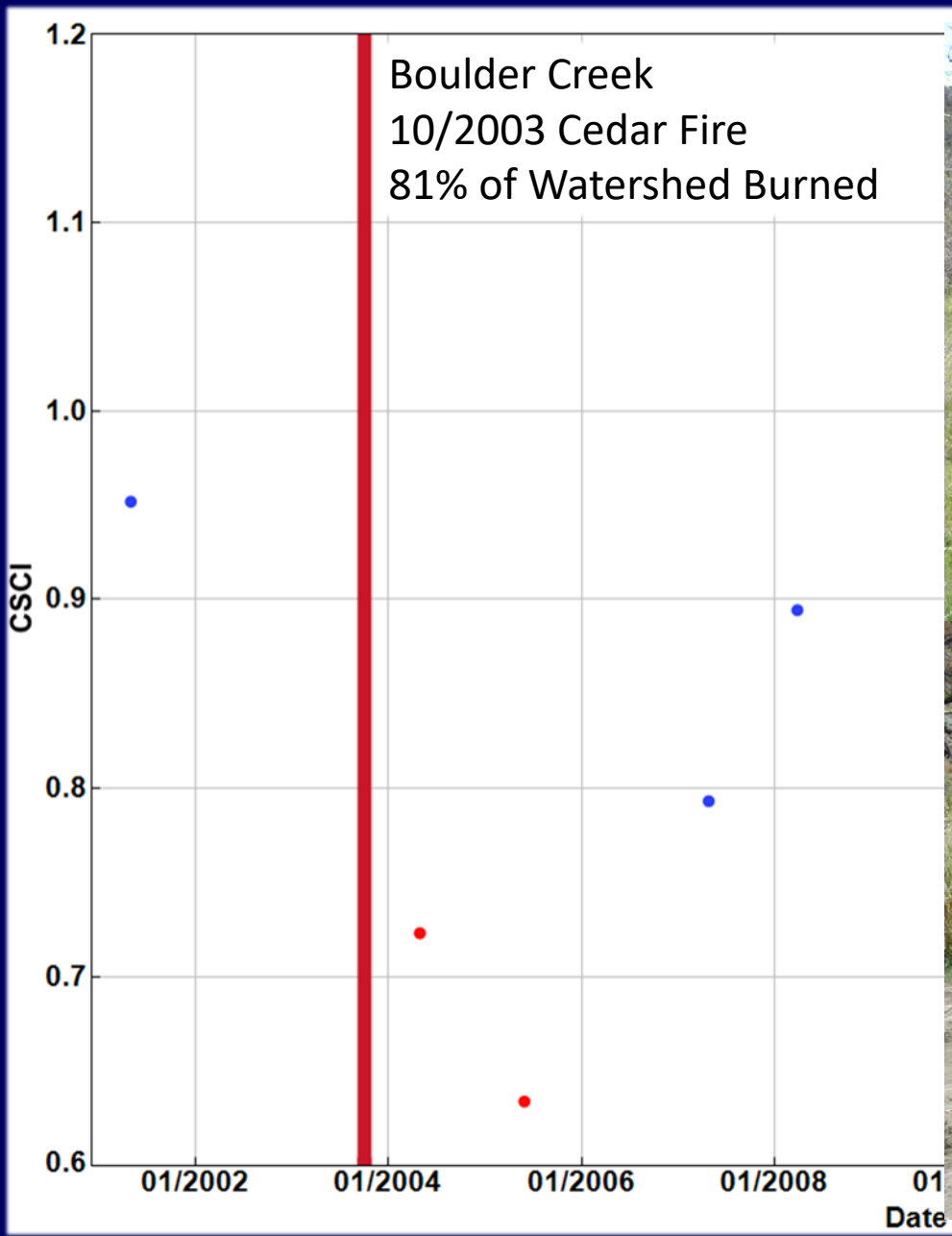



Protect High Quality Waters:
- Clean Water Act 401 Certifications
- Assessing Environmental Harm
- Grants & Environmental Projects
Education and Outreach!

CSCI Score: Protect High Quality



CSCI Score: Protect High Quality




Guide Meaningful Restoration
- Restore Impaired Waters
- Assessing and Prioritizing BMPs/Effluent Limits in Permits
- Grants & Environmental Projects
Education and Outreach!

Biological Objectives: Guide Program Activities

CSCI Score: 0.74

CSCI Score	Objective Met?
≥ 0.79	Yes
0.63-0.79	**Ambiguous: Next Table**
< 0.63	No

Biological Objectives: Guide Program Activities

Biological Objectives: Prioritize Efforts

CSCI Score: 0.58

CSCI Score	Objective Met?
≥ 0.79	Yes
0.63-0.79	Ambiguous: Next Table
< 0.63	**No**

Biological Objectives: Prioritize Efforts

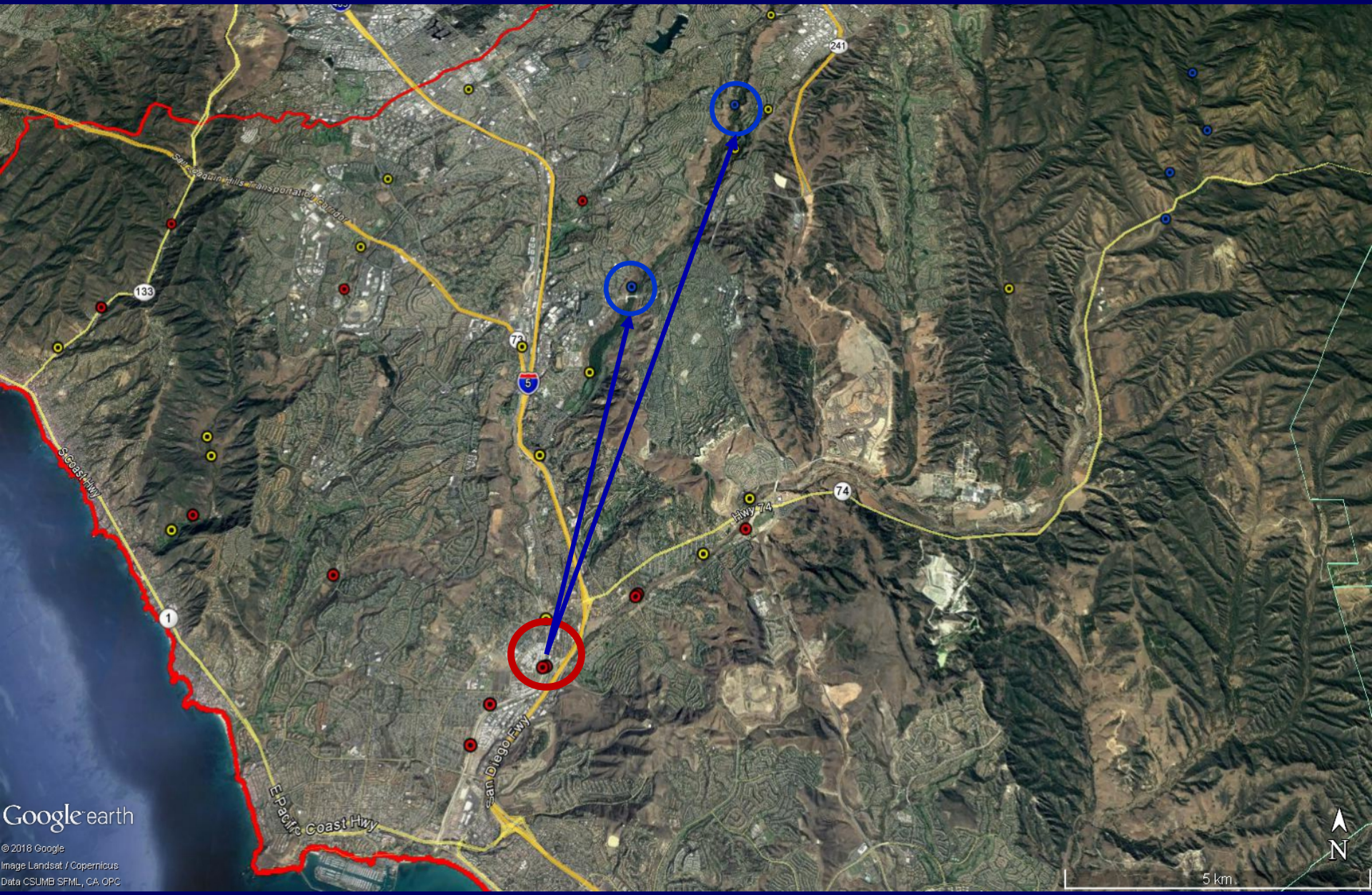
CSCI Score: 0.58

Algae: Bad
Toxicity: Toxic

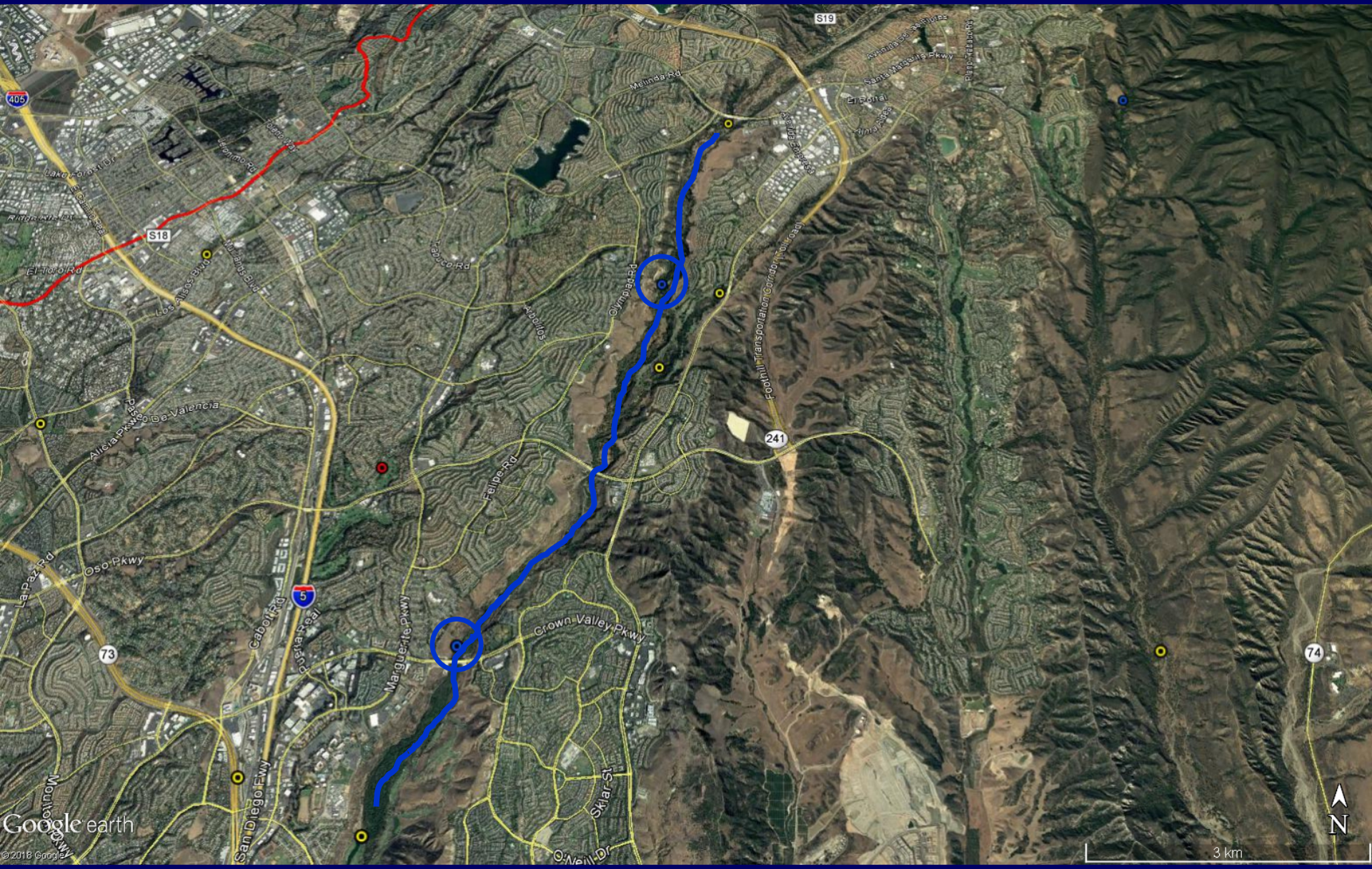
Habitat: Bad
Chemistry: Nutrients
Selenium
Bacteria
DDE

Biological Objectives:
Not a Mandate to Remove Concrete

Biological Objectives: Prioritize Efforts



Biological Objectives: Prioritize Efforts



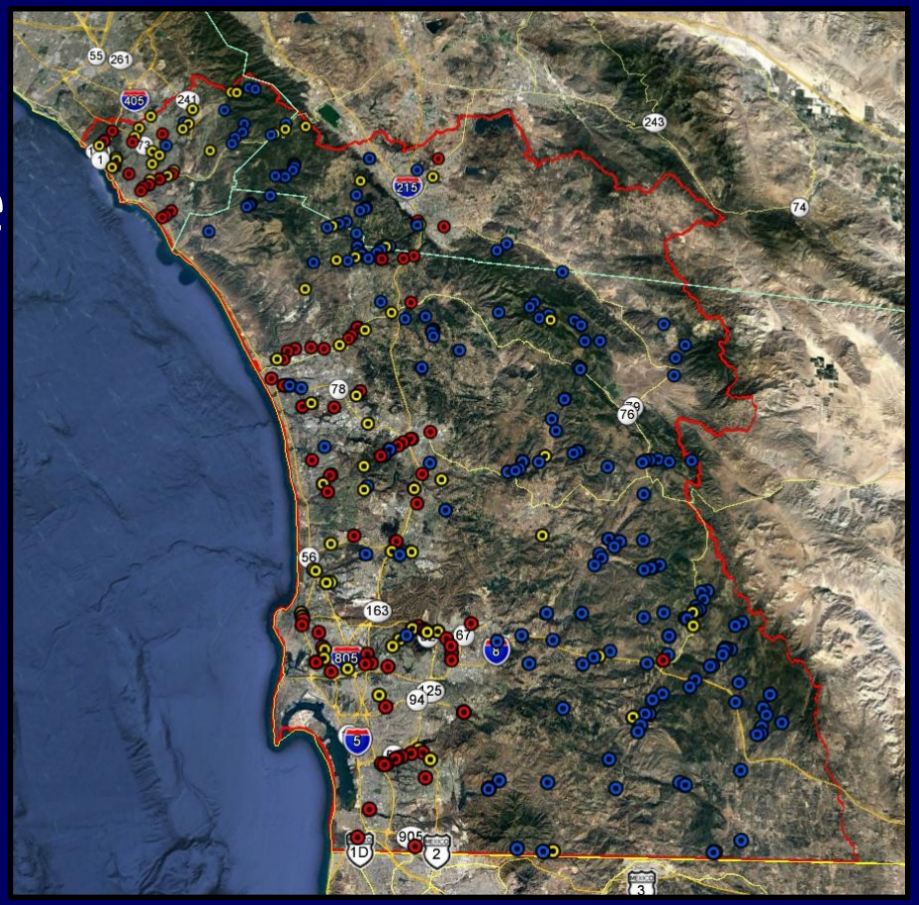
Biological Objectives:

Next Steps

- Consider Comments
- Revise Documents
- Public/Peer Review Release
- Summer Workshop
- Fall Hearing

Biological Objectives:

- Biological Beneficial Uses Need Objectives
  - Protect High Quality
  - Better Resolution = Better Restoration
- The Science is Sound
- The Data are Available



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https://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/bio_objectives/

Bioassessment Program

1996

State Board Funds:
-Index Development
-Reference Pool Validation

SD Region:
Focused Bioassessment Monitoring for Index Development

2008

SD Region:
Triennial Review Identifies Biological Objectives as Priority

2015

Draft Objectives Released for Public and Peer Review

2018

2004

SD Region Develops Biological Objectives Framework

Identifies Need for Better IBI

Identifies Need to assess intermittent streams

2013

SD Region:
Funds Intermittent Stream Project

2016

CSCI and Reference Approach Published

R9 Staff Work on Biological Objectives

CWC (13050):
The limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or prevention of nuisance within a specific area.

CWA (40 CFR 131.11):
States should establish narrative criteria or criteria based upon biomonitoring methods where numerical criteria cannot be established or **to supplement numerical criteria**.

R9 Biological Objectives: A Brief History

2004 – Framework for Regional Biological Objectives
- Identified need for a more specific Index of Biotic Integrity
- Identified need to address intermittent streams
- San Diego SWAMP ramps up monitoring

2008 – State Board funds work for Statewide Index and Reference Approach
- Statewide California Stream Condition Index
- Statewide Reference Condition Approach

2013– San Diego Water Board begins Intermittent Stream Study
- Index evaluation for San Diego intermittent stream sites

2015 – San Diego Water Board adopts Basin Plan Triennial Review
- Biological Objectives a Tier I Project
- Staff Begins Work on Biological Objectives

2016 – California Stream Condition Index and Reference Site Approach Published

2018 – Draft Biological Objectives Released for Public Comment & Peer Review

TMDL and Alternatives: 2014 Clean Water Act Integrated Report

TMDL REQUIRED!

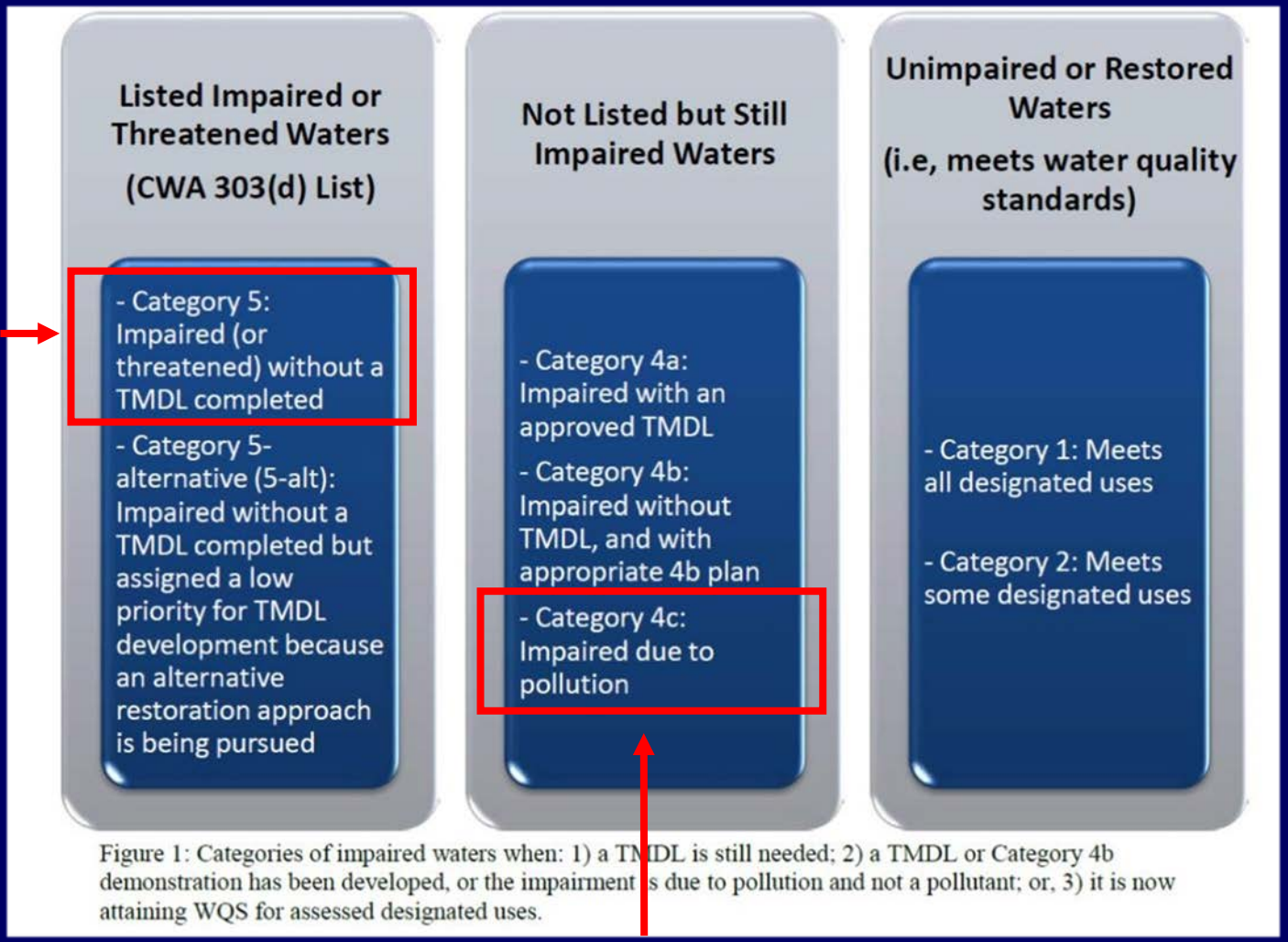

Figure 1: Categories of impaired waters when: 1) a TMDL is still needed; 2) a TMDL or Category 4b demonstration has been developed, or the impairment is due to pollution and not a pollutant; or, 3) it is now attaining WQS for assessed designated uses.

TMDL NOT REQUIRED!

CWA (40 CFR 131.11):

“States should establish narrative criteria or criteria based upon biomonitoring methods:

- where numerical criteria cannot be established, or
- **to supplement numerical criteria**.”

“In establishing criteria states should use scientifically defensible methods.”