Surface Water Quality Conditions
Item 4

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CALIFORNIA
Water Boards

Presentation Outline

Central Coast Region
Surface Water Quality Conditions

Monitoring Programs Data

- Regional, statewide, and local monitoring programs

Regional status and trends

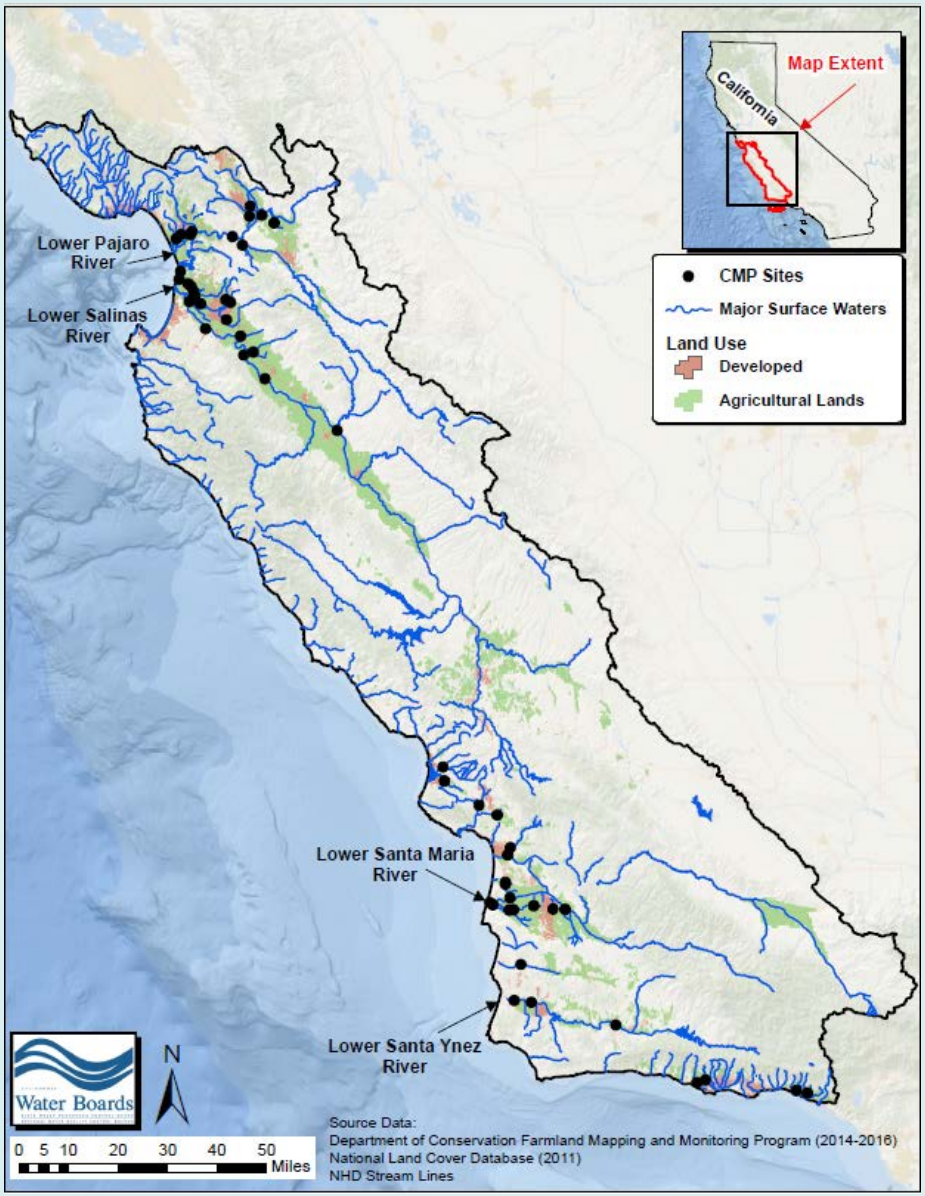
- Nitrate, pesticides, toxicity, and turbidity
- Overall status - Aquatic Life and Human uses

Cooperative Monitoring Program (CMP)

Program Design

- 48 waterbodies
- 54 sites
- Monthly and seasonal monitoring
- Since 2005

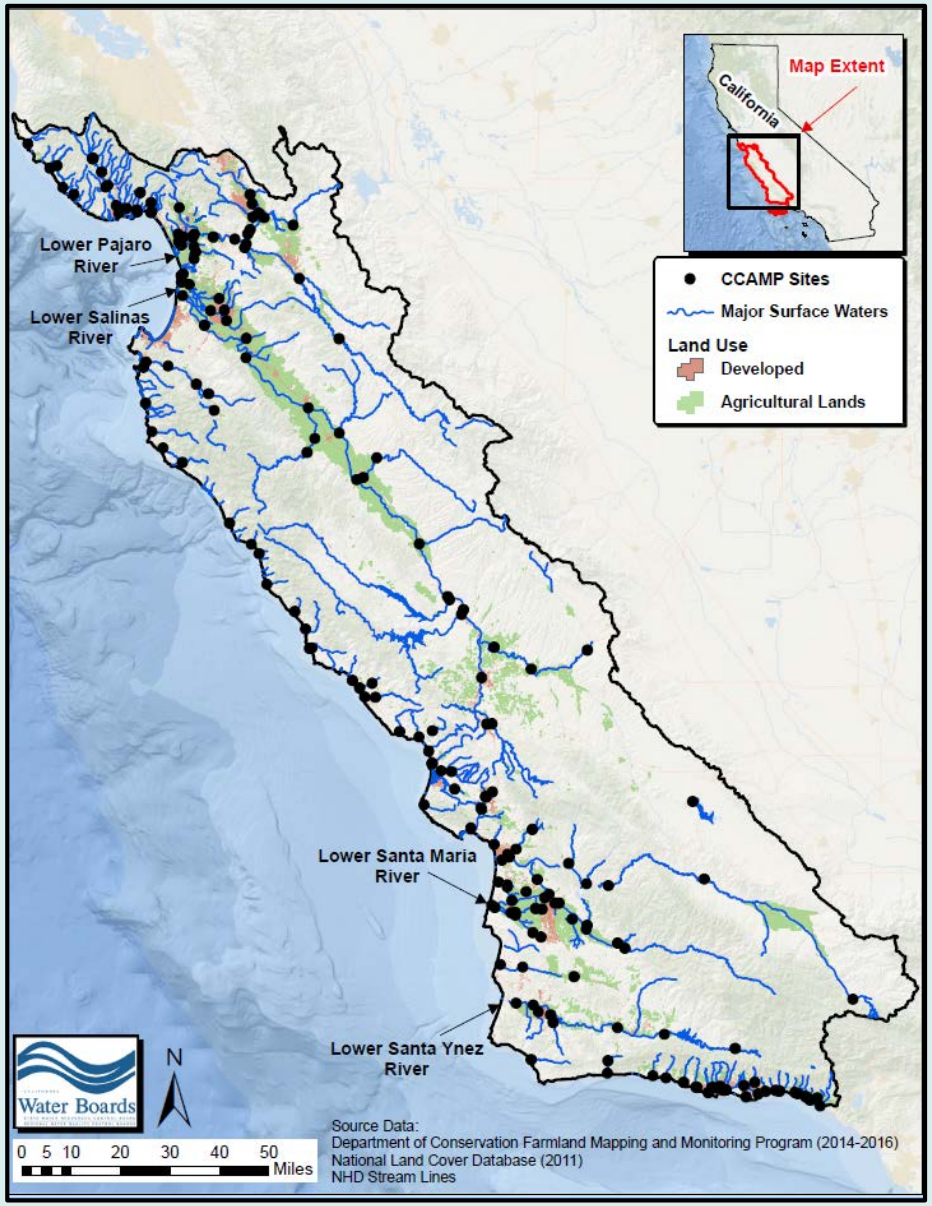
Targets waterbodies in agricultural areas on the 303(d) List for agricultural related pollutant



Central Coast Ambient Monitoring Program (CCAMP)

Program Design

- 190+ sites
  - Watershed Rotation monitoring Since 1998
  - Coastal Confluence monitoring since 2001
- Targets large waterbodies and major tributaries
- Brackets land use changes and major tributary inputs
- Monitoring frequency:
  - Monthly and seasonal monitoring



Monitoring Programs

Strengths

- Status and trends
- Identify areas where follow-up is needed

Limitations

- Identify sources
- Identify causality

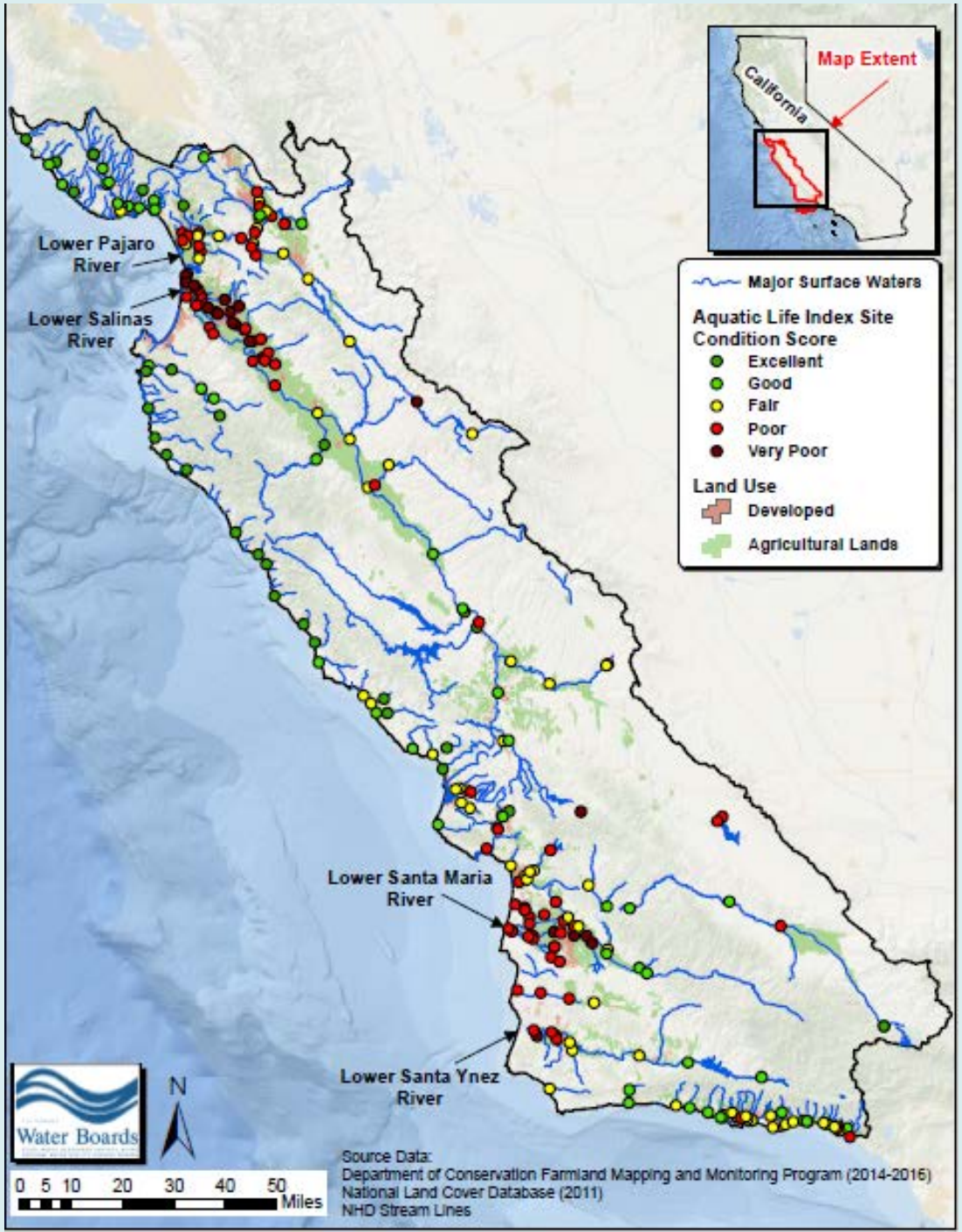
Water Quality Conditions

- Region wide assessment (multiple programs data)
  - Status
    - Meeting water quality objectives
    - Supporting beneficial uses
  - Trends/change over time

Overall Aquatic Life Index Scores

Overall condition based on multiple parameters

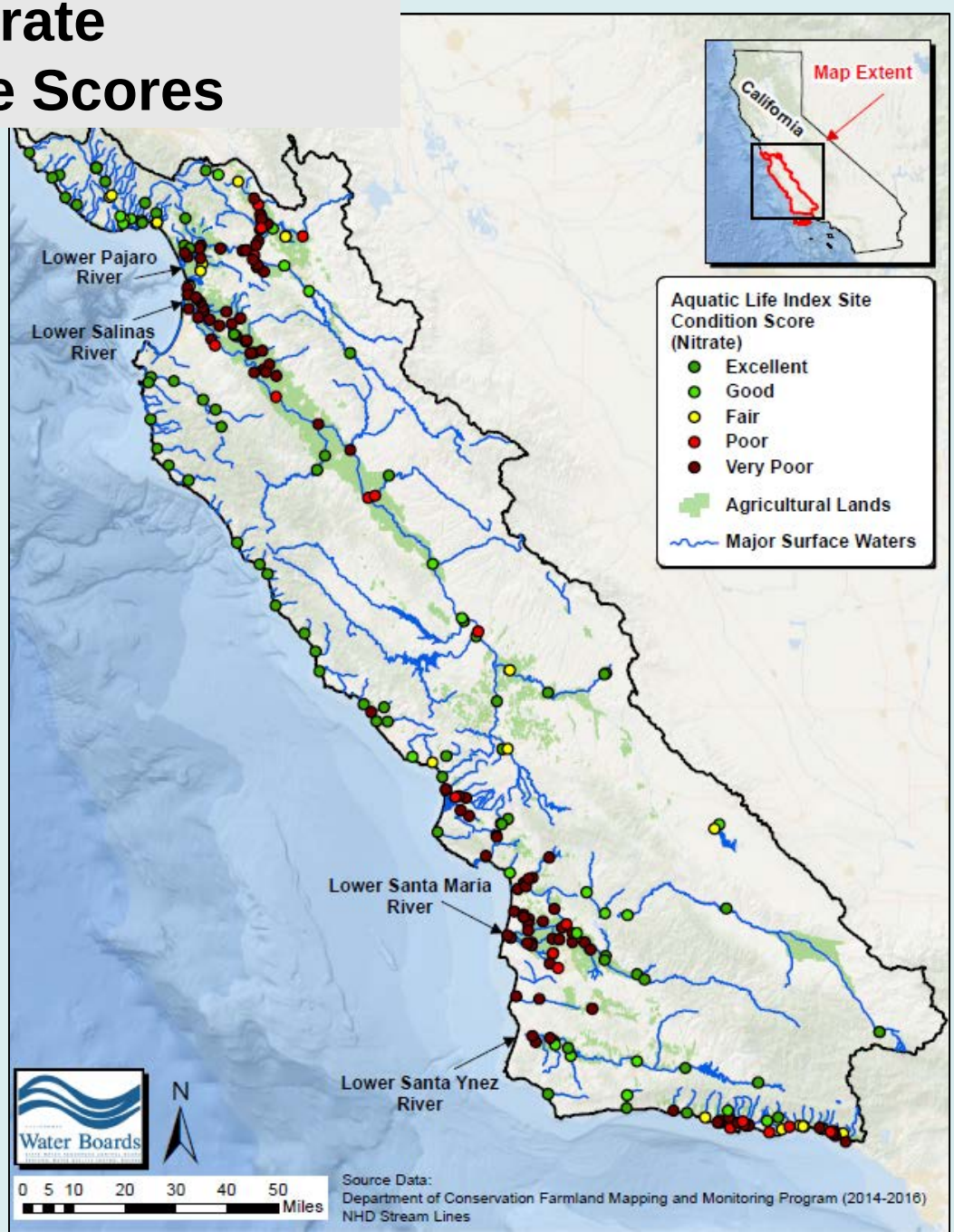
- Nutrients
- Dissolved oxygen
- Turbidity
- Water temperature



Status – Nitrate
Aquatic Life Site Scores

Site scores for Nitrate > 1.0 mg/L

Sites exceeding are areas typically in agricultural and mixed agricultural/urban landscapes

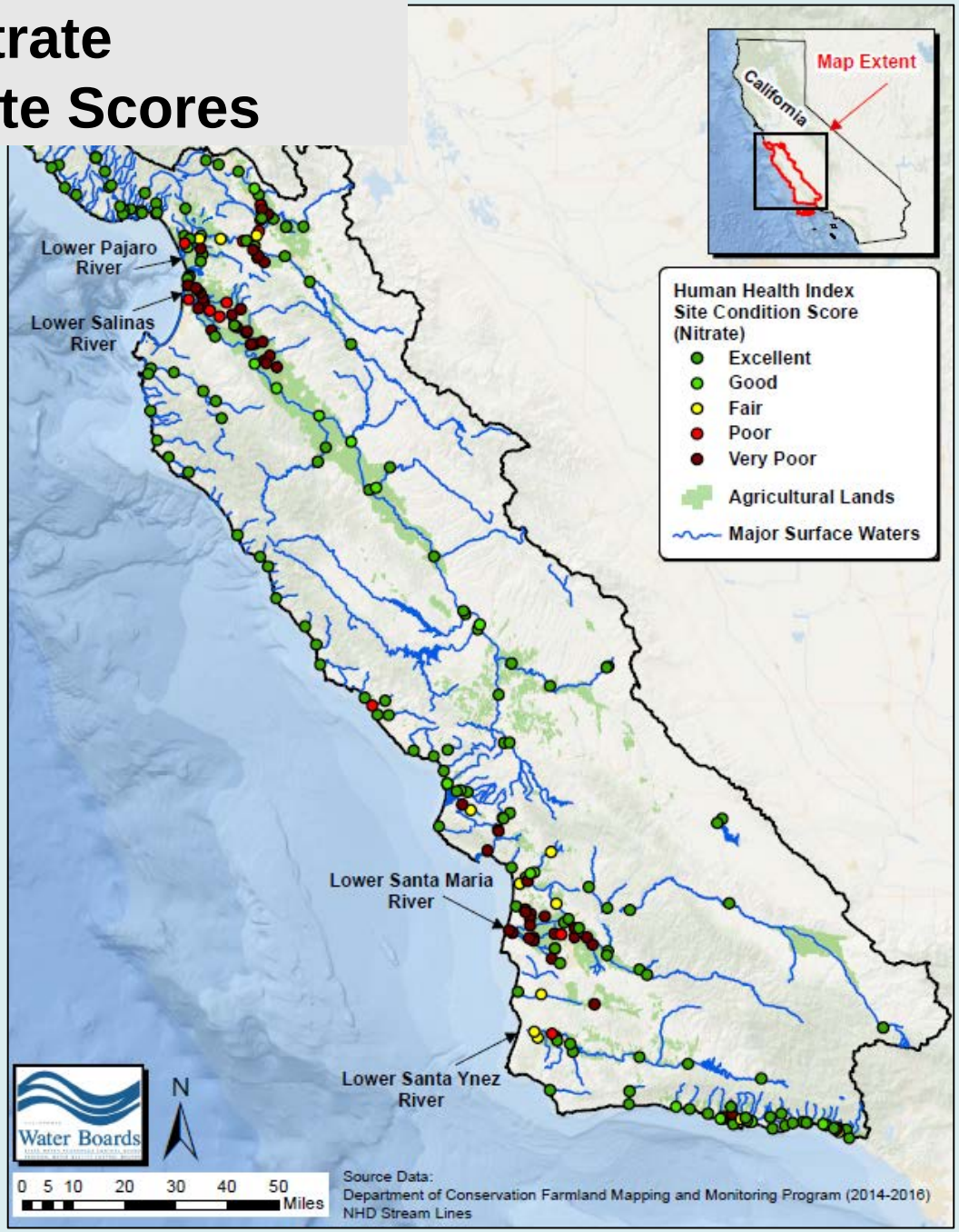


Status – Nitrate
Human Health Site Scores

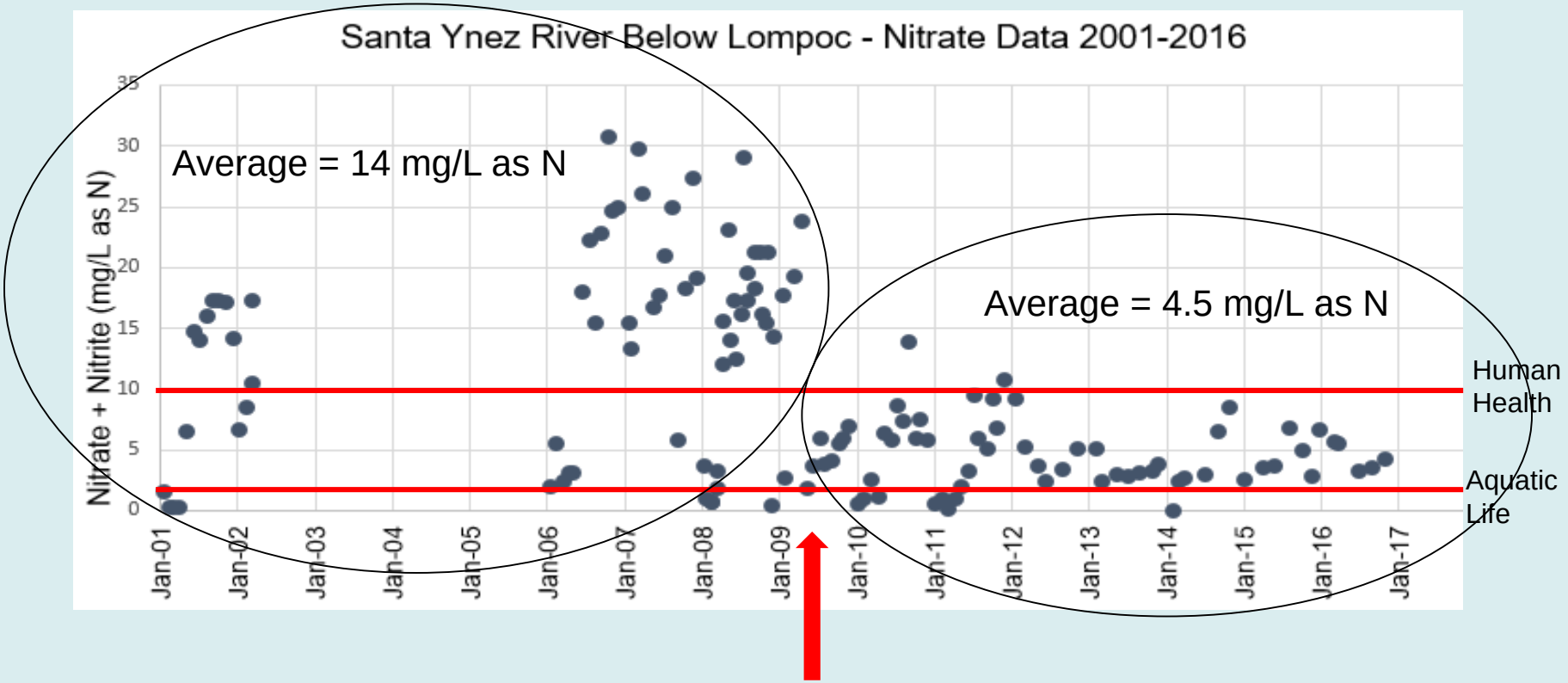
Site scores for Nitrate > 10 mg/L

Protective of Human Health not Aquatic Life

Majority of sites exceeding are in agricultural areas



Nitrate – Statistically Significant Trends

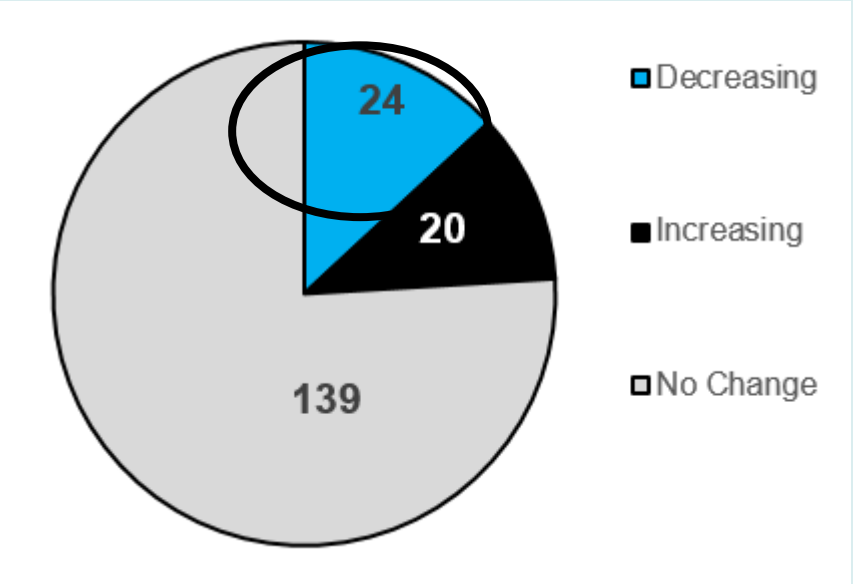


Nitrate Condition: River typically meets Human Health threshold but not Aquatic Life threshold

Cause & Effect: Post nitrate treatment upgrade, significant decrease in nitrate concentration (improvement) in the river

Region Wide Trends
Nitrate Concentration

Statistical Analysis – Significant Change Points



- No change at 139 sites
- Increasing concentration at 20 sites
- Decreasing concentration (improving) at 24 sites

Zero sites improved to meet Aquatic Life threshold
Four sites improved to meet Human Health threshold

Region Wide
Nitrate Conditions Recap

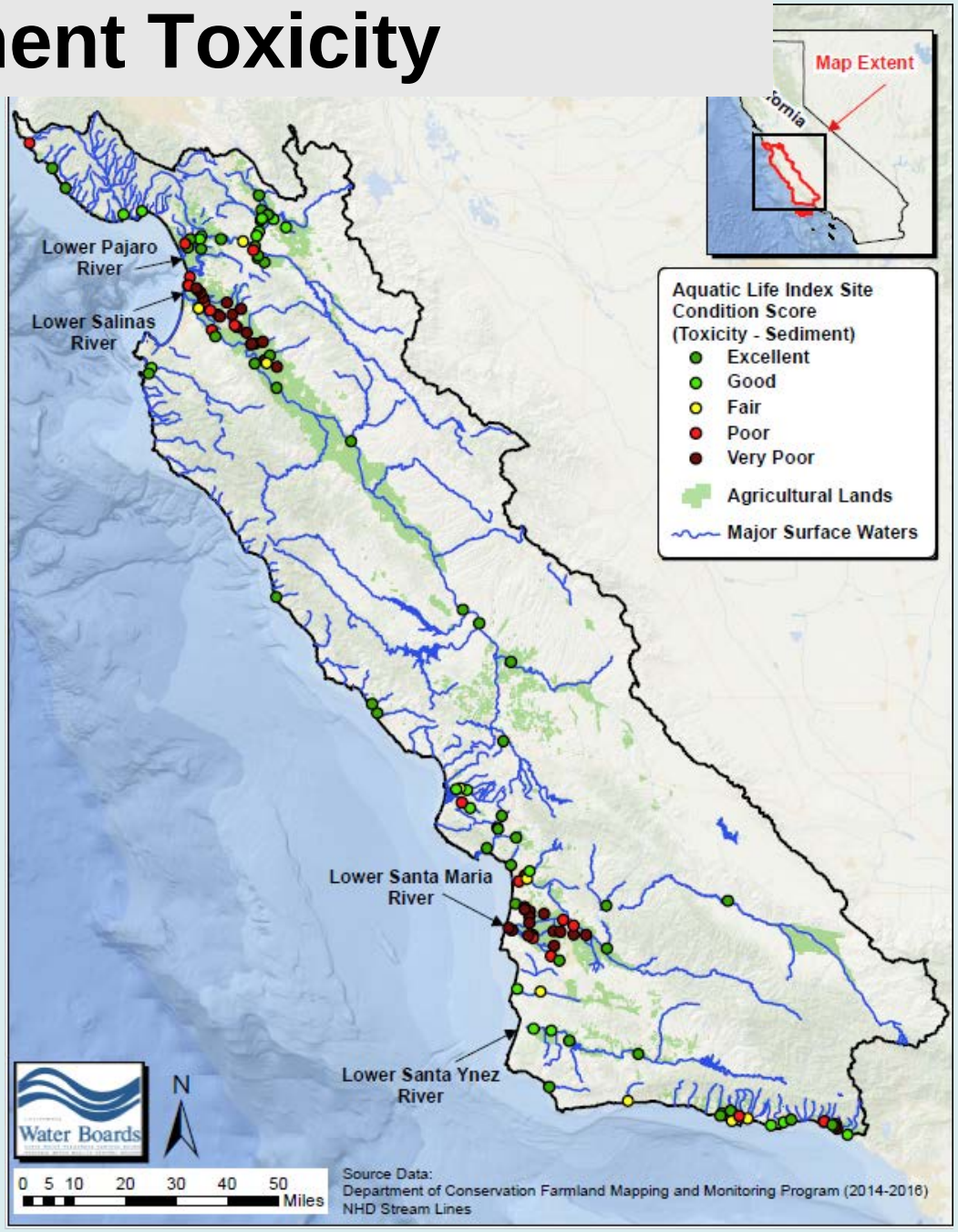
- No trend at majority of sites
- Concentration improving at 13% of sites
  - Located in multiple landscapes
  - Supporting Beneficial Uses?
    - Four sites improved to meet Human Health threshold
    - Zero sites improved to meet Aquatic Life threshold
  - Cause of improvement is uncertain for most sites

Status – Sediment Toxicity

Invertebrate
Hyalella azteca

Sensitive to pyrethroid insecticides

Majority of sites with toxicity are in agricultural or mixed agriculture/urban areas

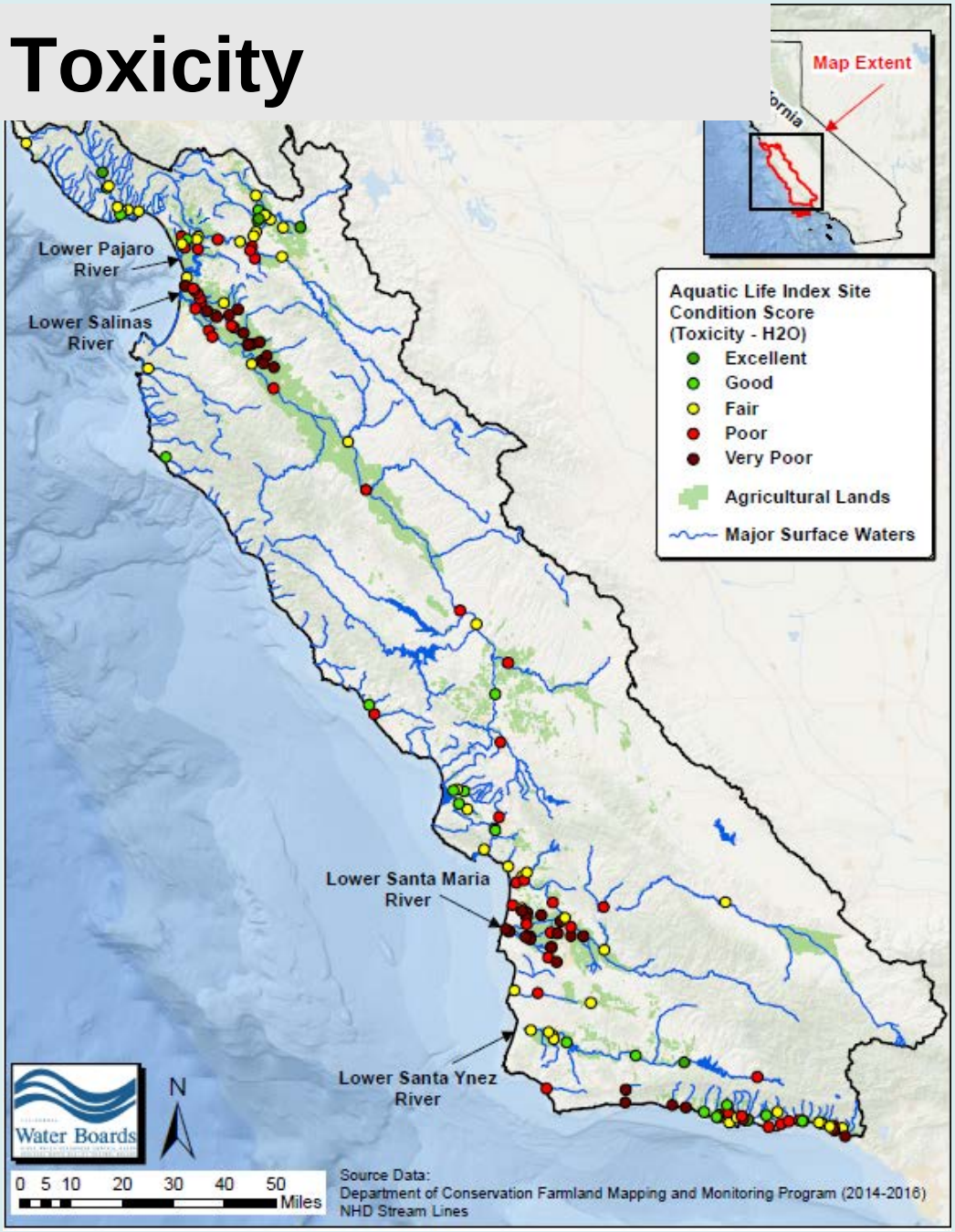


Status – Water Toxicity

Scores combine results from multiple test species

- Invertebrates
- Larval fish
- Algae

Each sensitive to different stressors



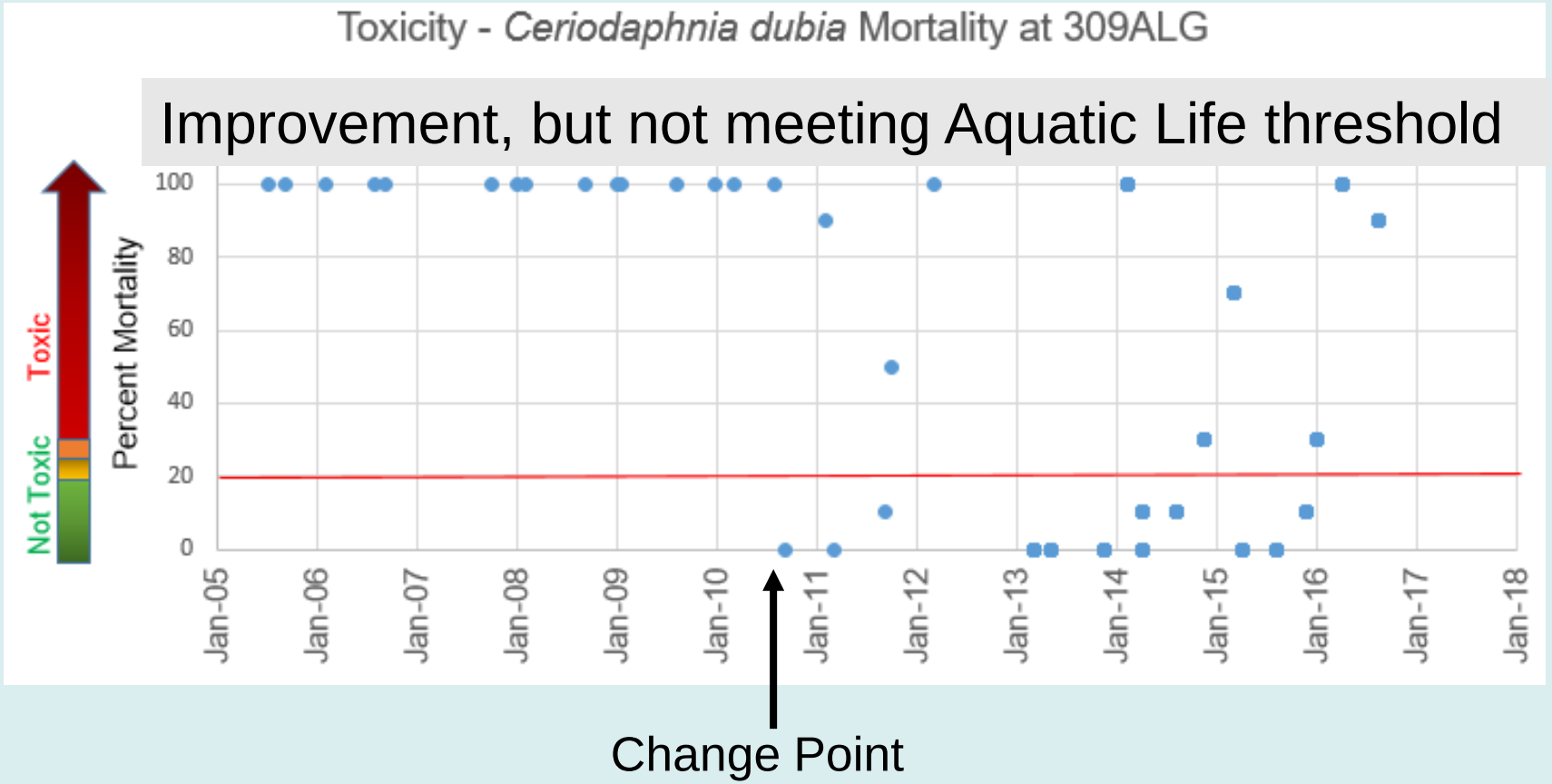
Trends – Toxicity to *Ceriodaphnia dubia* in Water

- Toxicity in water
  - Decreasing invertebrate survival (more toxicity)
    - One site
  - Increasing invertebrate survival (less toxicity = improving)
    - Three sites

Zero sites improved to meet Aquatic Life threshold

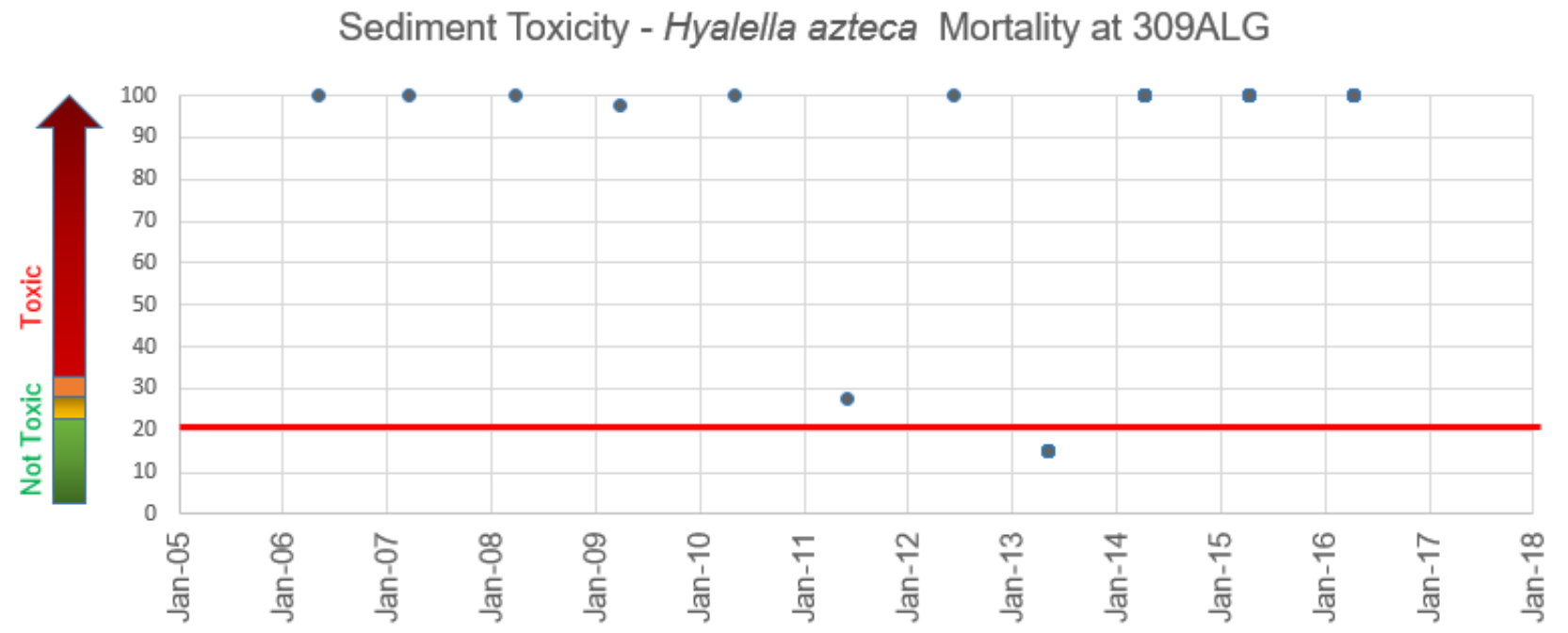
Trends – Toxicity to *Ceriodaphnia dubia* in Water

Significant trend of reduced toxicity to *Ceriodaphnia dubia* at the Salinas Reclamation Canal site 309ALG



No Corresponding Improvement for Sediment Toxicity

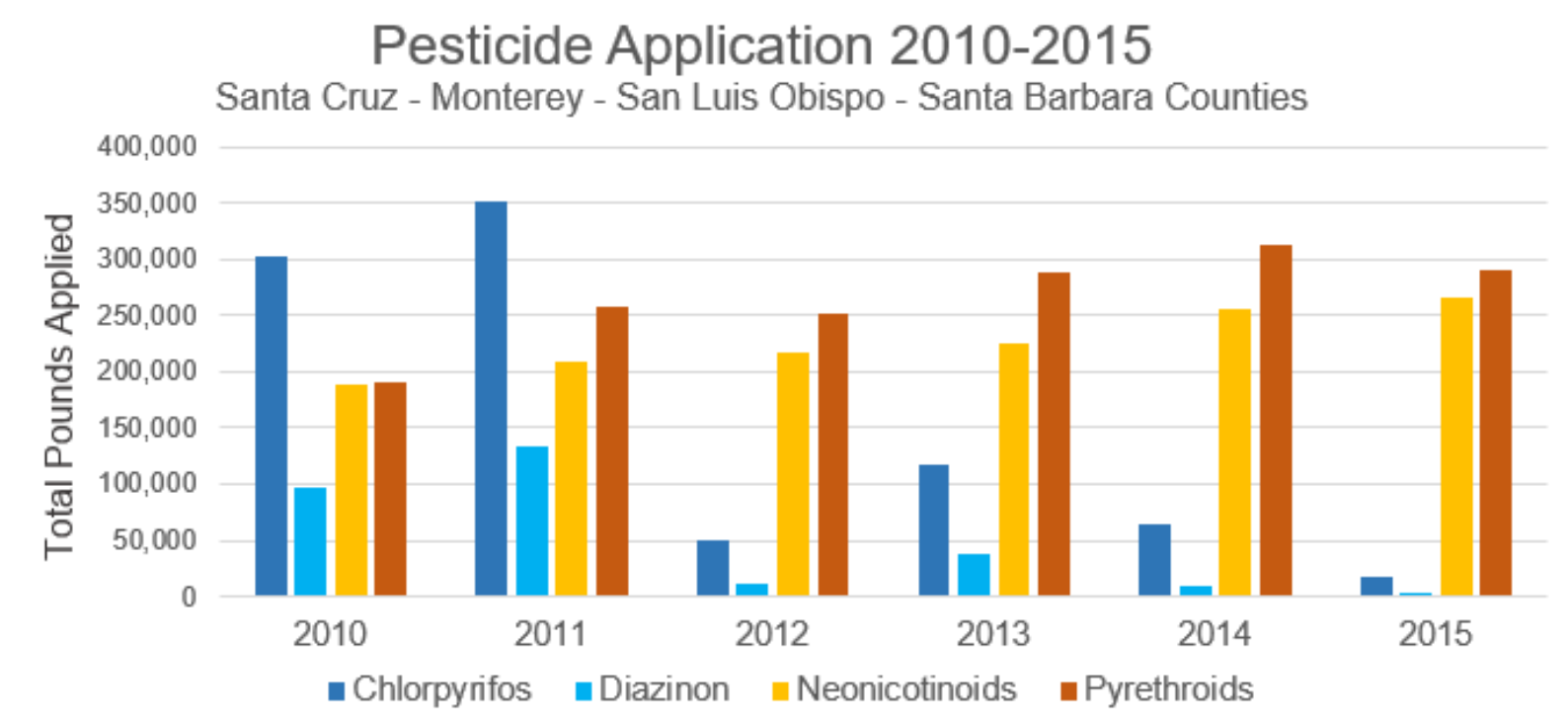
Sediment from Salinas Reclamation Canal
site 309ALG continues to be toxic to *Hyalella azteca*



Overall Condition Degraded
Salinas Reclamation Canal at La Guardia

- Trends
  - Improving: Toxicity in water and nitrate load
  - Declining: Dissolved oxygen and pH
- Overall Condition: Not supporting beneficial uses

Department of Pesticide Regulation
Pesticide Use Reporting

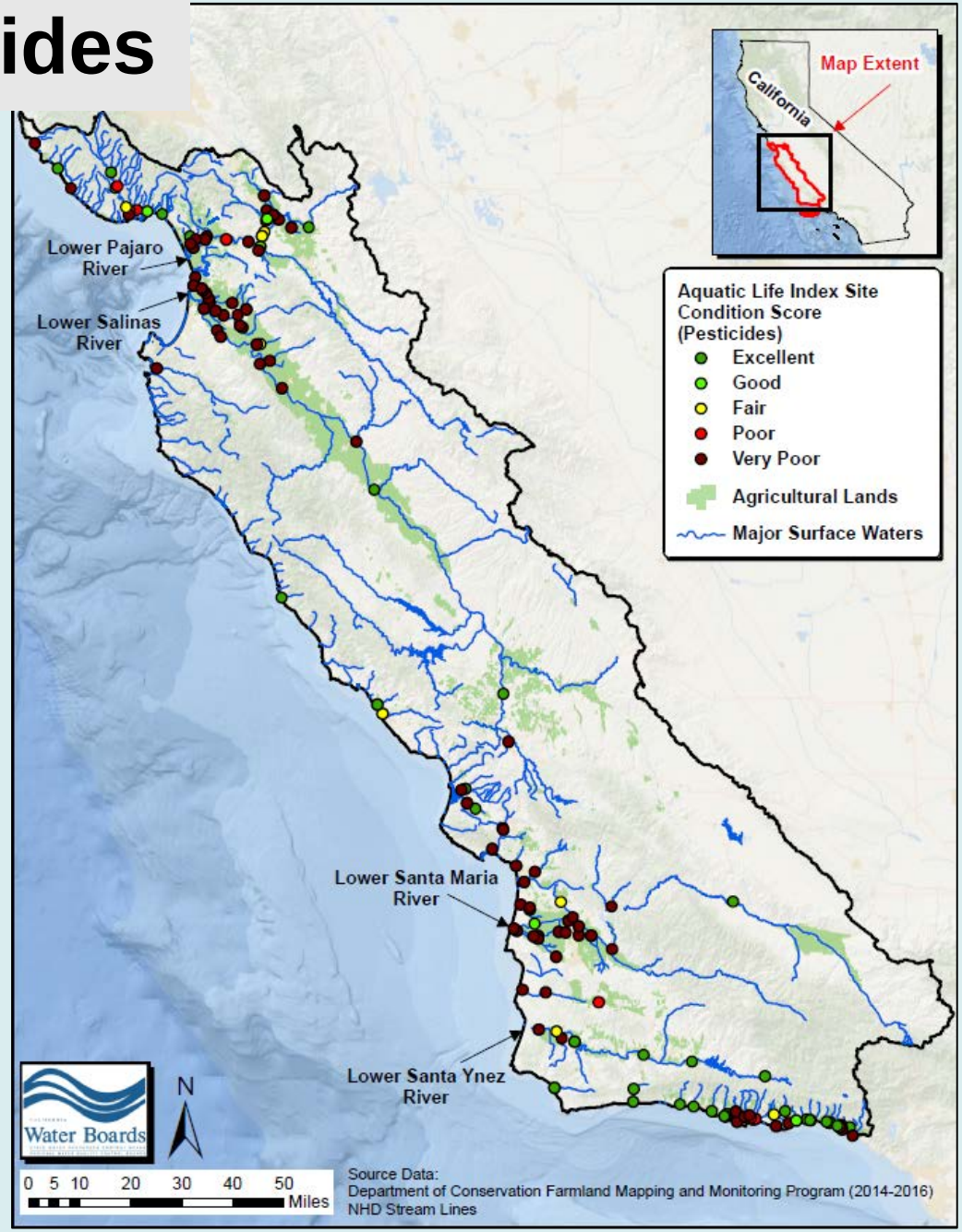


- Chlorpyrifos and Diazinon use decreased by over 90% in the region
- Use of pyrethroid and neonicotinoid insecticides increased and exceed thresholds in recent samples

Status - Insecticides

Index Score combines data from multiple insecticides

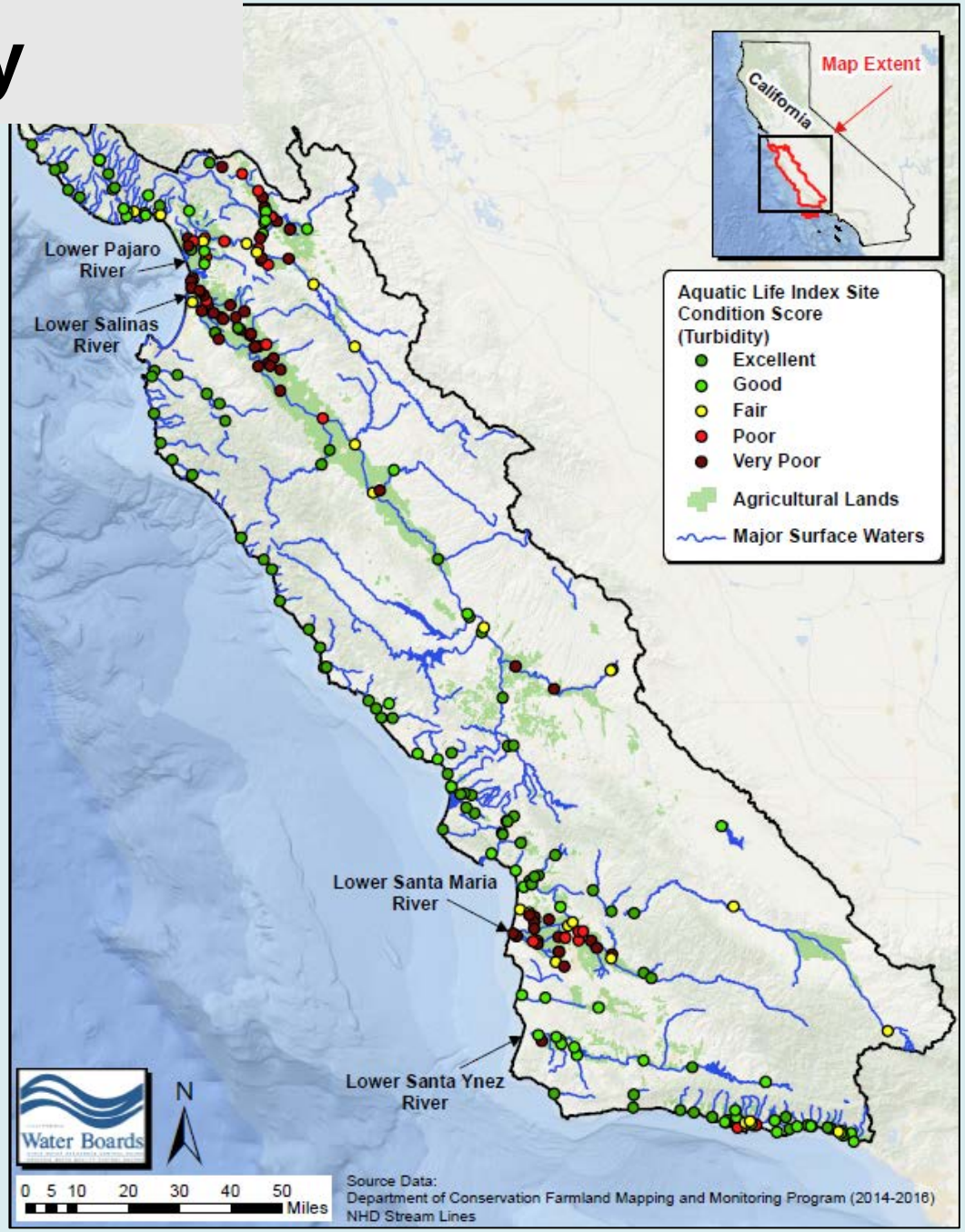
Most sites exceeding thresholds occur in agricultural and mixed agriculture/urban areas



Status - Turbidity

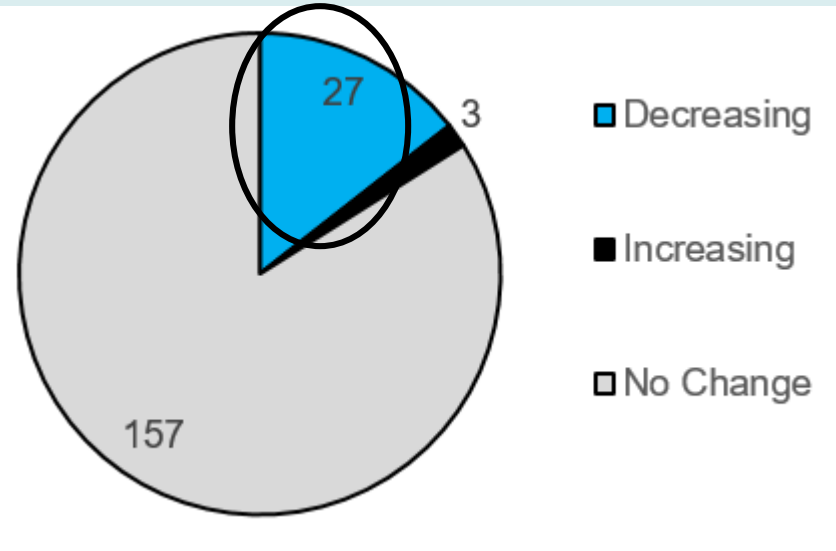
Turbidity > 25 NTUs

Sustained turbidity primarily in lower ends of agricultural areas



Region Wide Trends
Turbidity

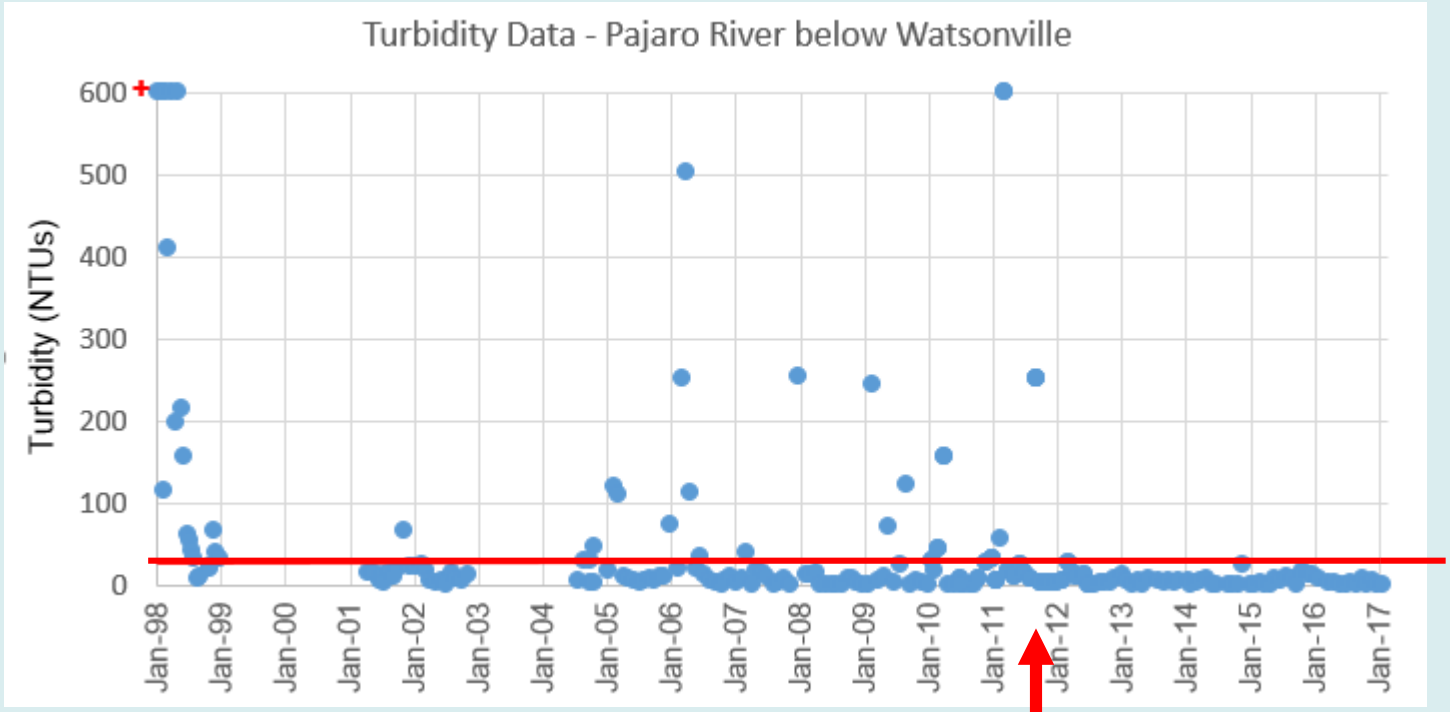
- No change at 157 sites
- Increasing turbidity at 3 sites
- Decreasing (improving) turbidity at 27 sites



One site improved to meet Aquatic Life threshold

Turbidity – Statistically Significant Trends

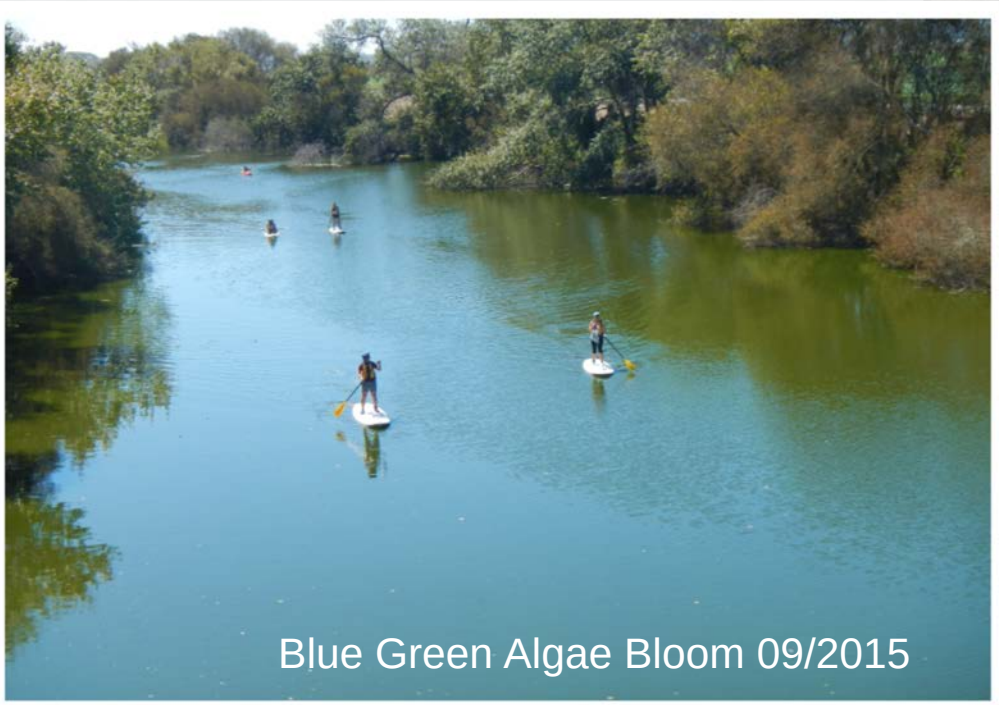
Statistically significant decrease in turbidity (improving) and now meets Aquatic Life threshold



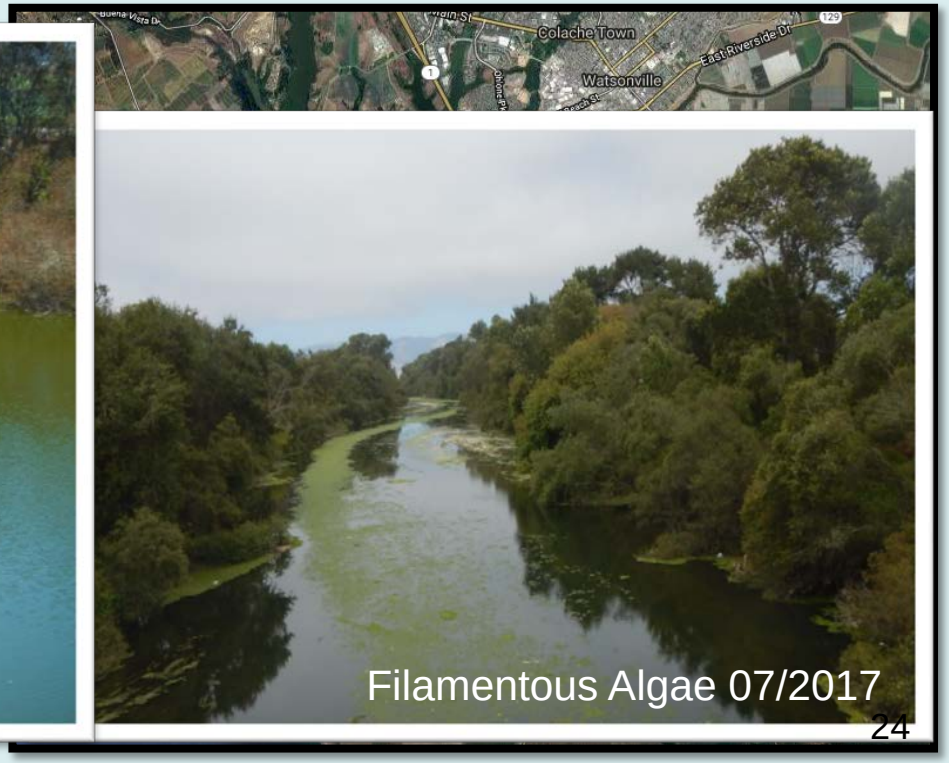
Overall Condition Degraded

Pajaro River below Watsonville

- Trends
  - Turbidity now meeting Aquatic Life threshold
  - Nitrate now meeting Human Health objective but not meeting Aquatic Life threshold
- Overall Condition: Not supporting Aquatic Life uses



Blue Green Algae Bloom 09/2015

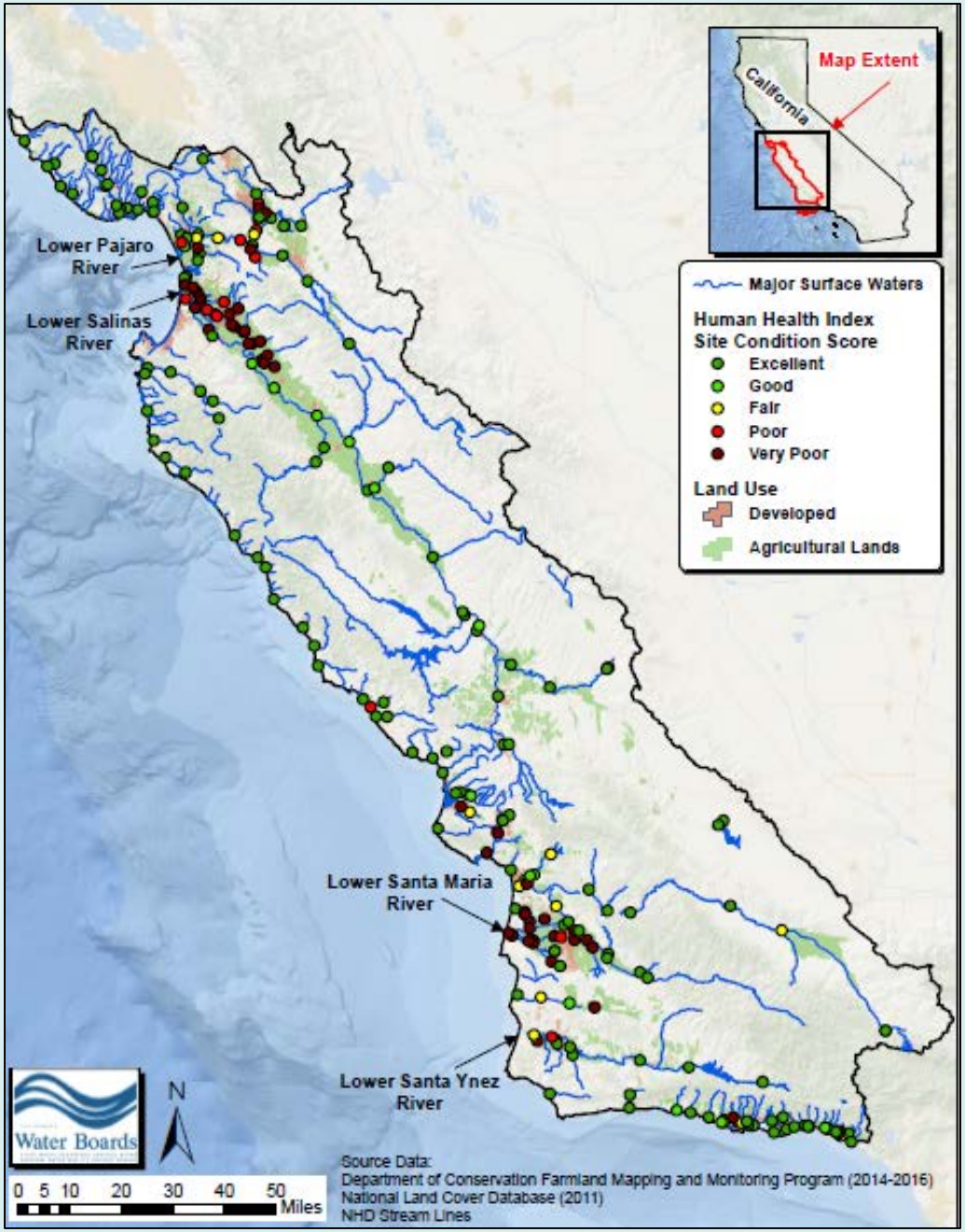


Filamentous Algae 07/2017

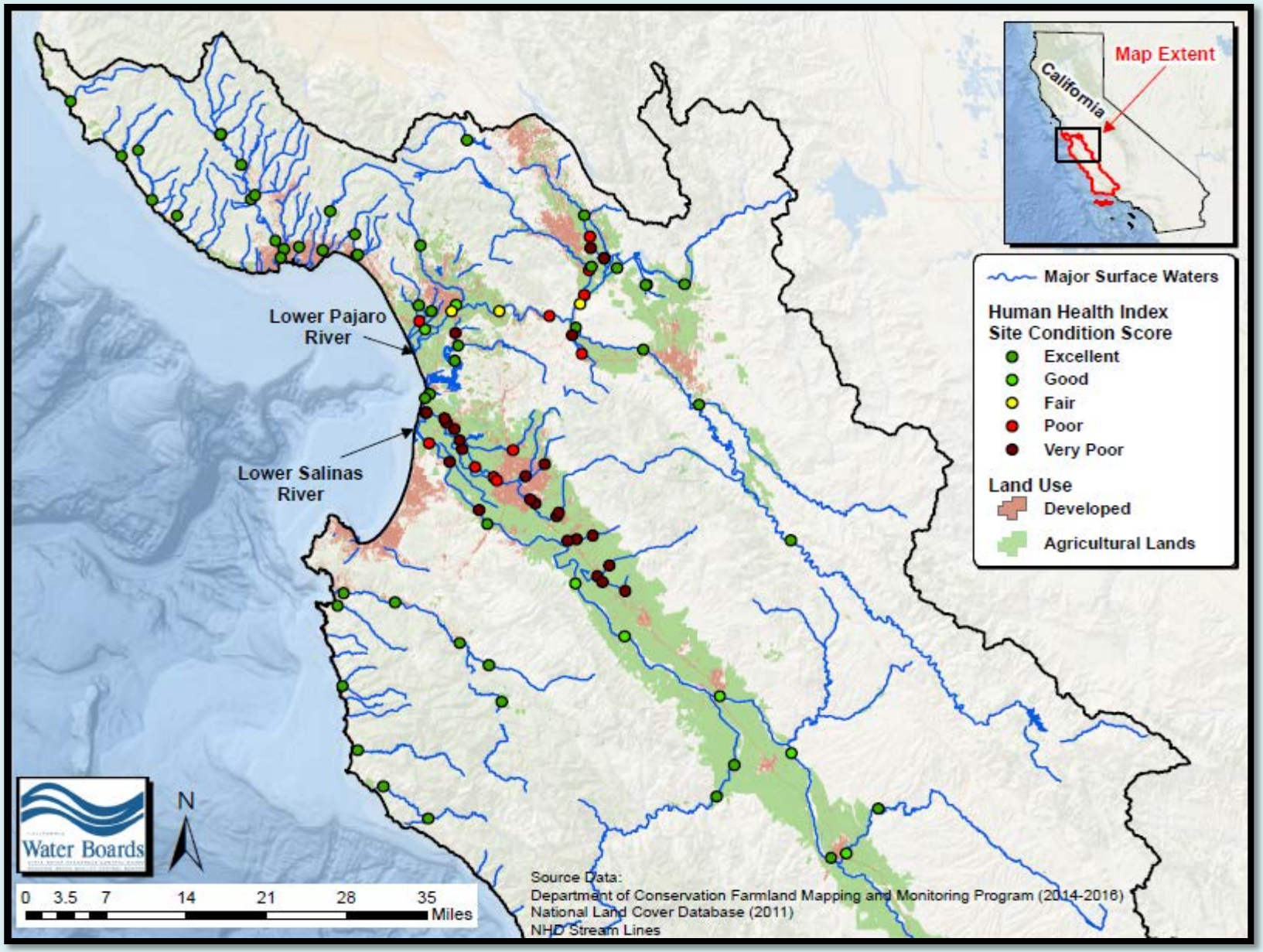
Overall Human Health Index Scores

Overall condition based on multiple nutrients

Degradation in areas of intensive agriculture and below treated wastewater discharges



Human Health Index Scores



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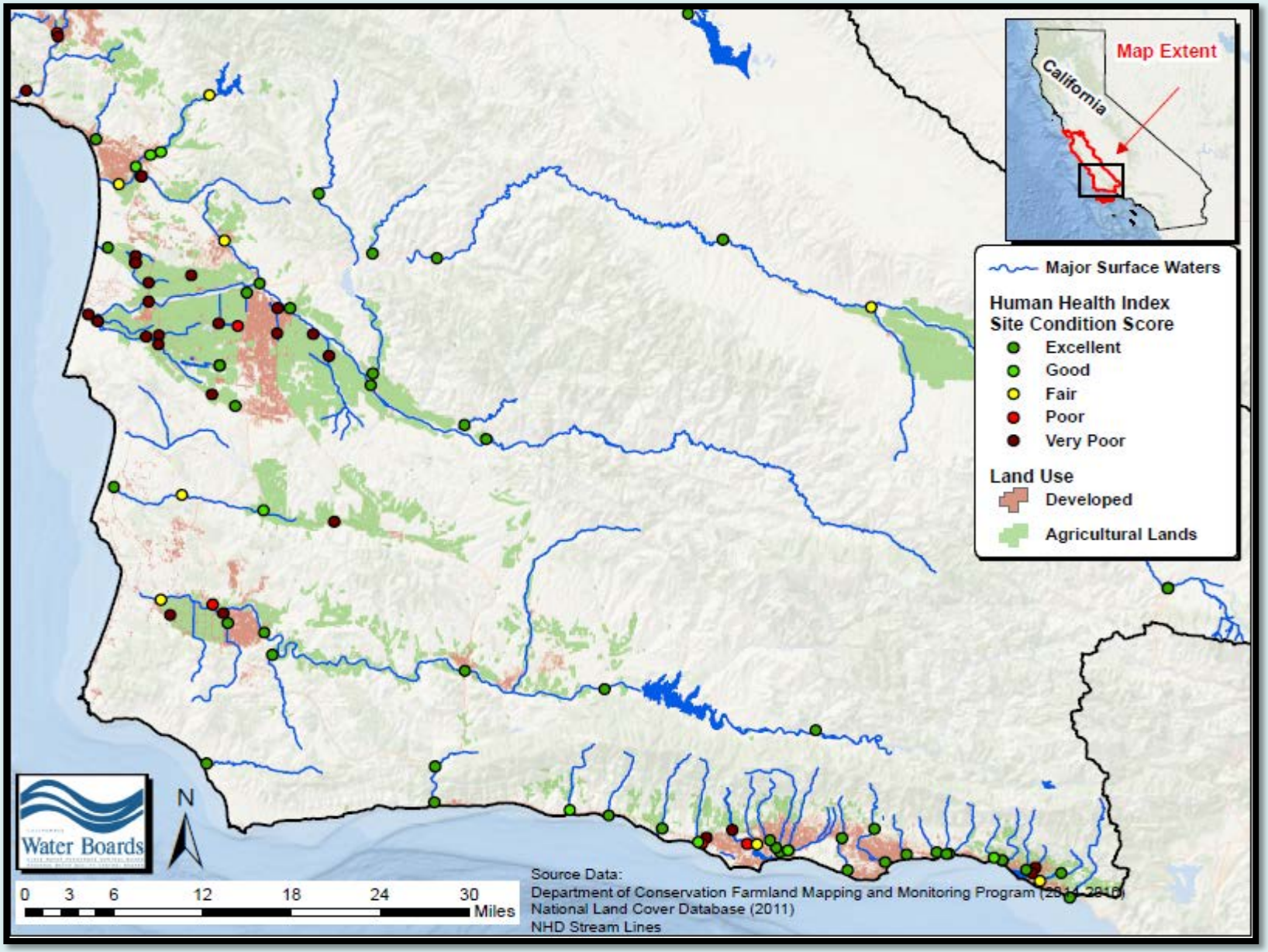
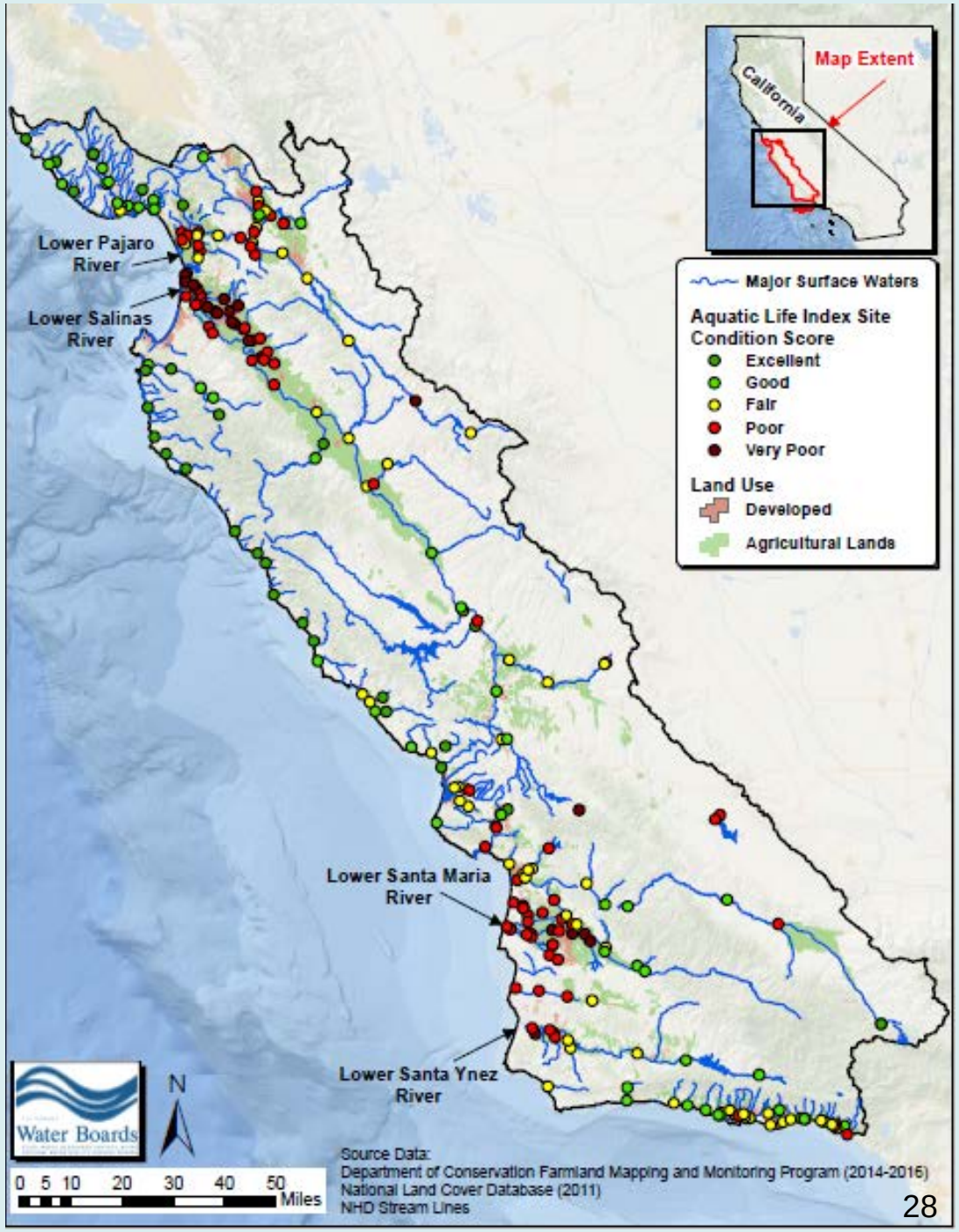


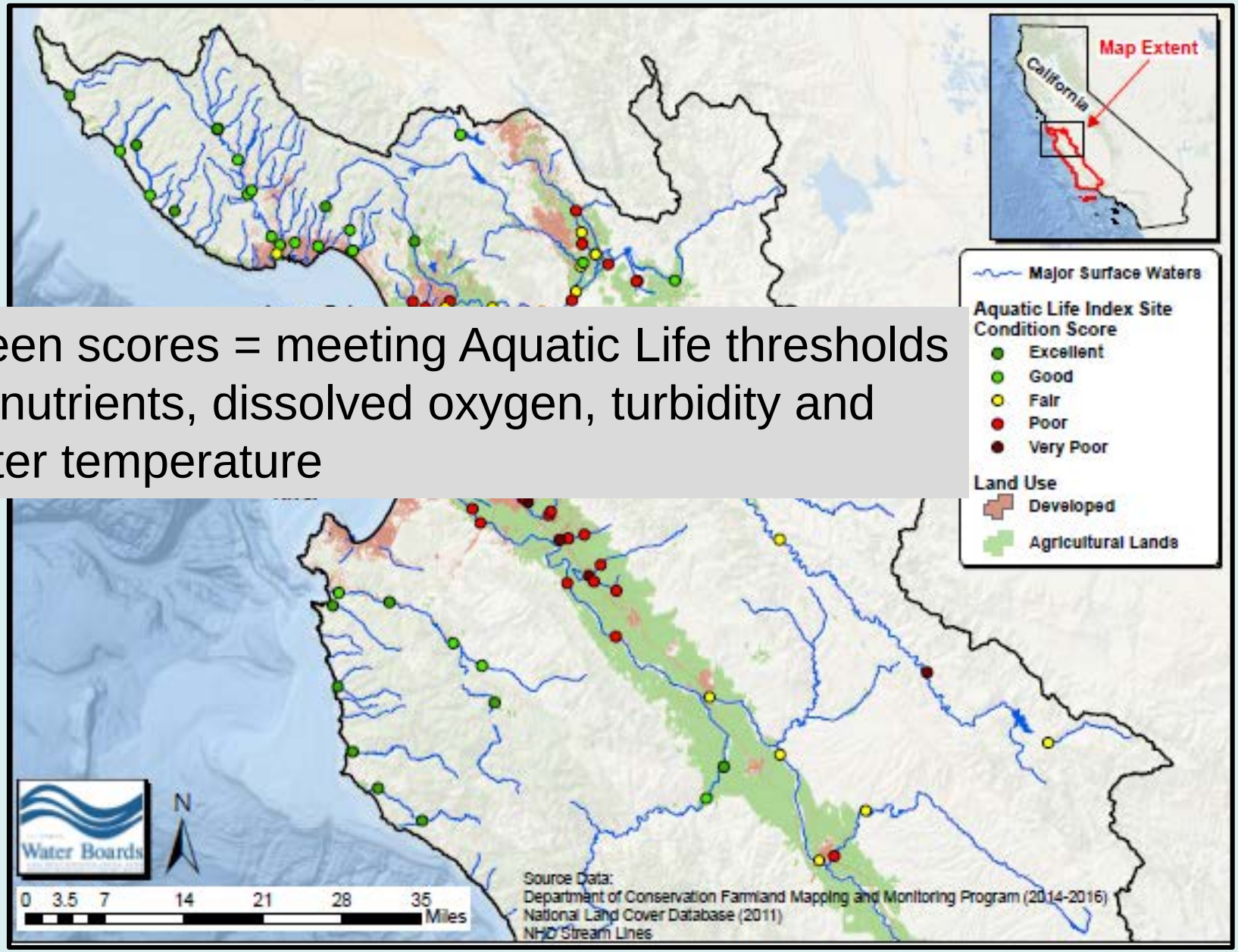
Overall Aquatic Life Index Scores

Overall condition based on multiple parameters

- Nutrients
- Dissolved oxygen
- Turbidity
- Water temperature

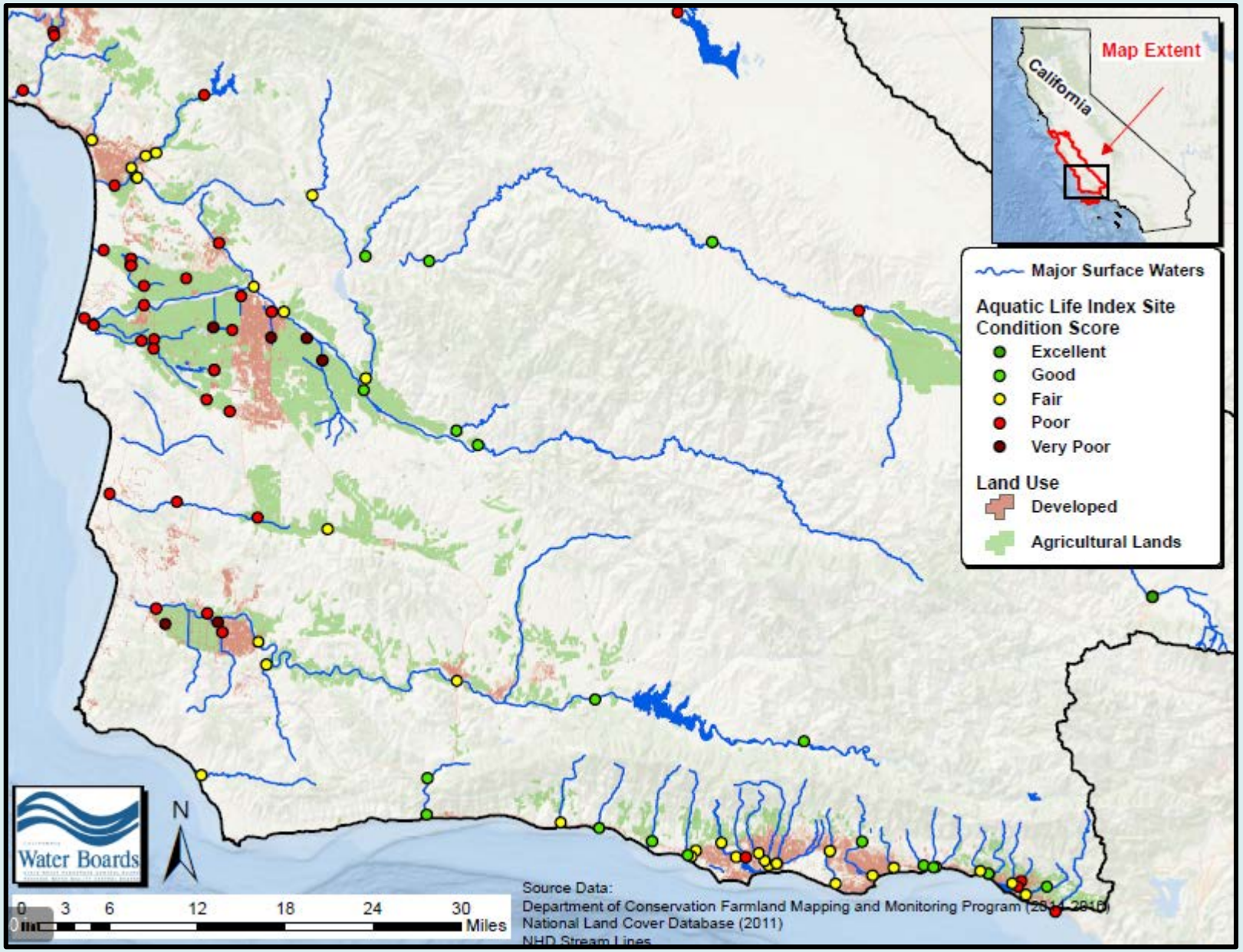


Aquatic Life Index Scores



Green scores = meeting Aquatic Life thresholds for nutrients, dissolved oxygen, turbidity and water temperature

Aquatic Life Index Scores



Conclusions

- Many sites do not meet water quality objectives and therefore do not support beneficial uses

- Pollutant trends
  - No trends at most sites
  - Some trends of improvement for individual parameters but overall degraded sites remain degraded
    - Causality uncertain in most cases
      - Staff developing diagnostic monitoring options

Acknowledgements:
Karen Worcester and Dave Paradies
Melissa Daugherty