

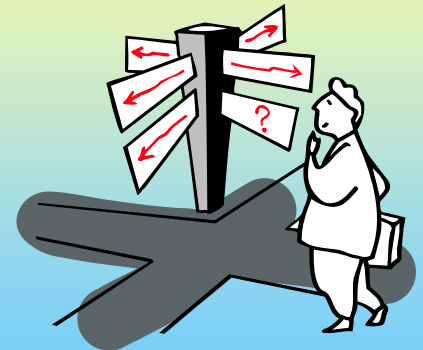
# **Building on the Western Pilot EMAP and Enhancing State Water Quality Monitoring to Better Address NPS Pollution in California**

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# Today's Discussion:

- Overview of California's NPS Program
- NPS Monitoring Needs
- Summary of Western EMAP Efforts
- CMAP and Integration with SWAMP
- Focus for the First Year

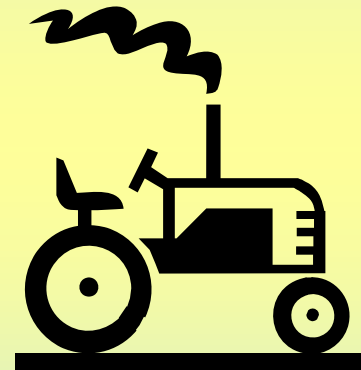


# What is NPS?

- Comes from many diffuse sources. NPS pollution is caused by rainfall or snowmelt moving over and through the ground.
- Comes from inappropriate or illegal land-use activities including over-irrigation, aerial deposition or illicit dumping
- NPS pollution difficult to track to source, and to account for changes in land use that create it.

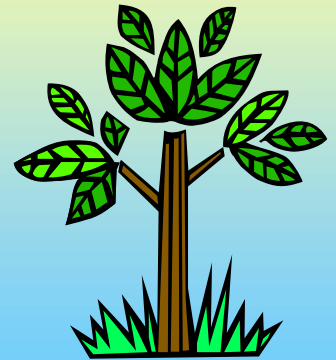
# Activities Associated with NPS Impairments

- Agriculture and Grazing
- Silviculture and Timber Harvesting
- Urban Runoff
- Resource Extraction
- Roads and Highways
- Illegal dumping, and littering
- Modification of waterways
- Recreation



# Nonpoint Source Land Use Categories

- Agriculture
- Forestry (Silviculture)
- Urban (includes construction, industrial, municipal)
- Marinas & Recreational Boating
- Hydromodification
- Wetlands



# CALIFORNIA'S NPS PROGRAM VISION

*'The vision of the NPS program is to reduce and prevent NPS pollution so that the waters of California support a diversity of biological, educational, recreational, and other beneficial uses.'*



# NPS PROGRAM IMPLEMENTATION

- Includes application of Management Measures and Management Practices in each Category
- Includes programmatic development as well as funded on-the-ground activities to reduce NPS pollution
- More than \$12 million per year is spent in California to address NPS Pollution

# EPA CWA Section 319 Priorities

- Restore Impaired Waters – Target TMDL Implementation
- Implement Watershed-Based Plans
- Achieve Measurable Water Quality Results – Quantifiable Pollutant Reductions
- Integrate with Farm Bill Funds (e.g., EQIP)



# Six Key NPS Questions

1. What is the quality of water in California?
2. What is the extent of impairments from NPS?
3. What are the NPS that are impairing or threatening?
4. Is water quality getting better or worse?

(Bottom Line Questions):



5. Is NPS Program investing resources consistent with water quality problems?
6. Are NPS investments effective in protecting and restoring water quality?

**Can we build upon EMAP effort to help?**

# EMAP OBJECTIVES

- Estimate ecological condition of streams for Region and each State
- Identify some of the potential stressors impairing these systems
- Develop partnerships with States to help build long-term monitoring capacity

# Assist with Tech Transfer

- Monitoring design
- Assessment tools
  - Stream bioassessment protocols
  - Metric development
  - Data analysis tools
  - GIS and landscape characterization
- Information management
  - Data management
  - Data sharing

# Base Sampling Design

- 50 samples per State over 4-year period
  - Assessment of 12 Western States
  - State specific assessment over 4-year period
  - Intensification in northern and southern California
  - Comparison of CDFG and EMAP sampling methods
  - Comparison of results from 305(b) and EMAP assessments

# The Challenge ...

- How to build on investment in monitoring
  - Probabilistic design
  - Monitoring infrastructure
  - Assessment tools
- To address nonpoint source issues
  - Affect on water quality
  - Effectiveness of program to improve water quality

What is the extent of WQ Impairment in California?

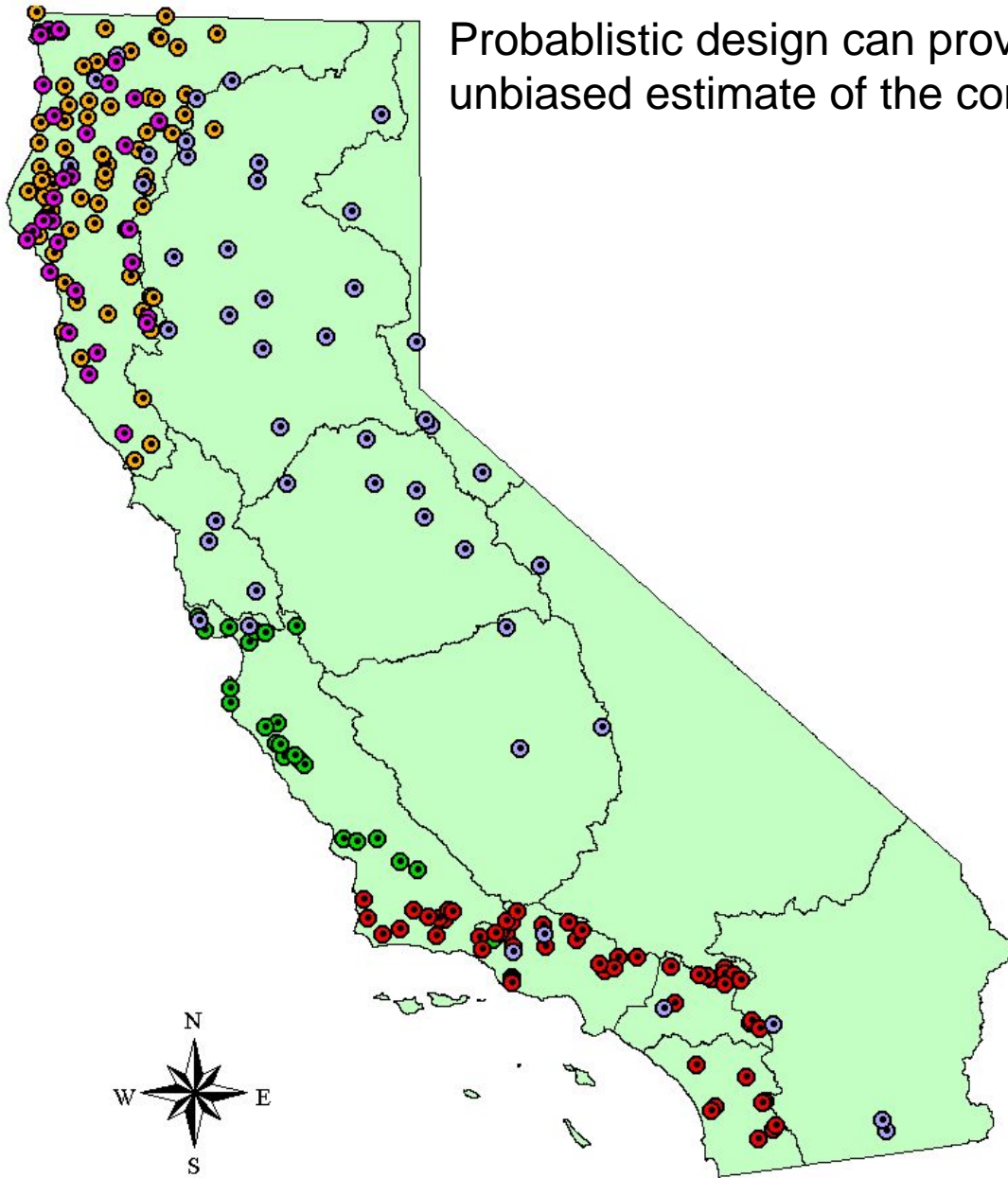


# Extent of resources in California

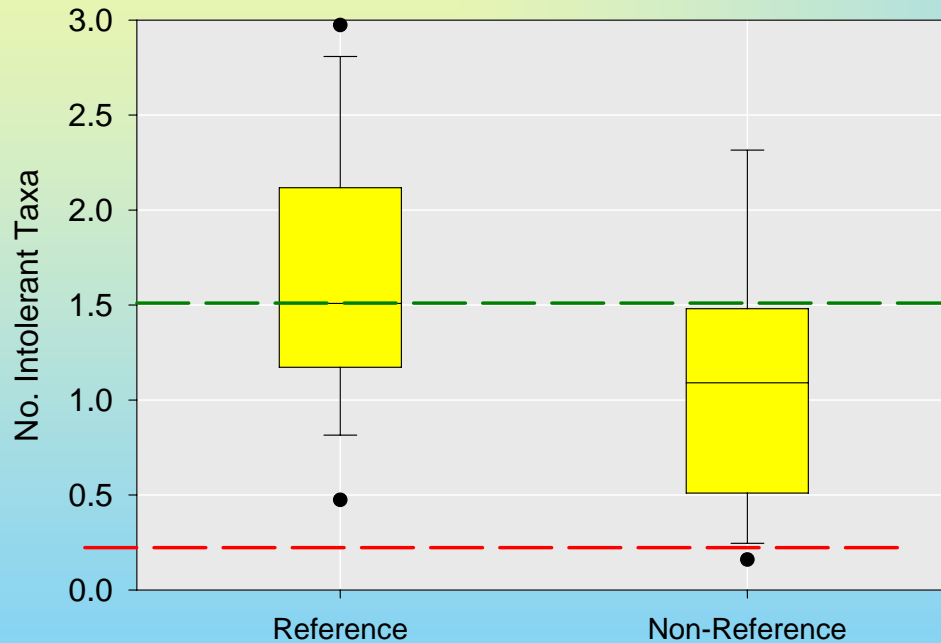
<b>Rivers</b>	<b>211,513 miles</b>
<b>Coastline</b>	<b>3,427 miles</b>
<b>Lakes</b>	<b>1,672,684 acres</b>
<b>Bays, harbors, estuaries</b>	<b>602,705 acres</b>
<b>Wetlands</b>	<b>273,907 acres</b>



Probabilistic design can provide managers with an unbiased estimate of the condition of the waters



# Need a metric to define impairments



Median from  
reference sites = 10

10th Percentile from  
non-reference sites = 0

# Western EMAP Population of Interest

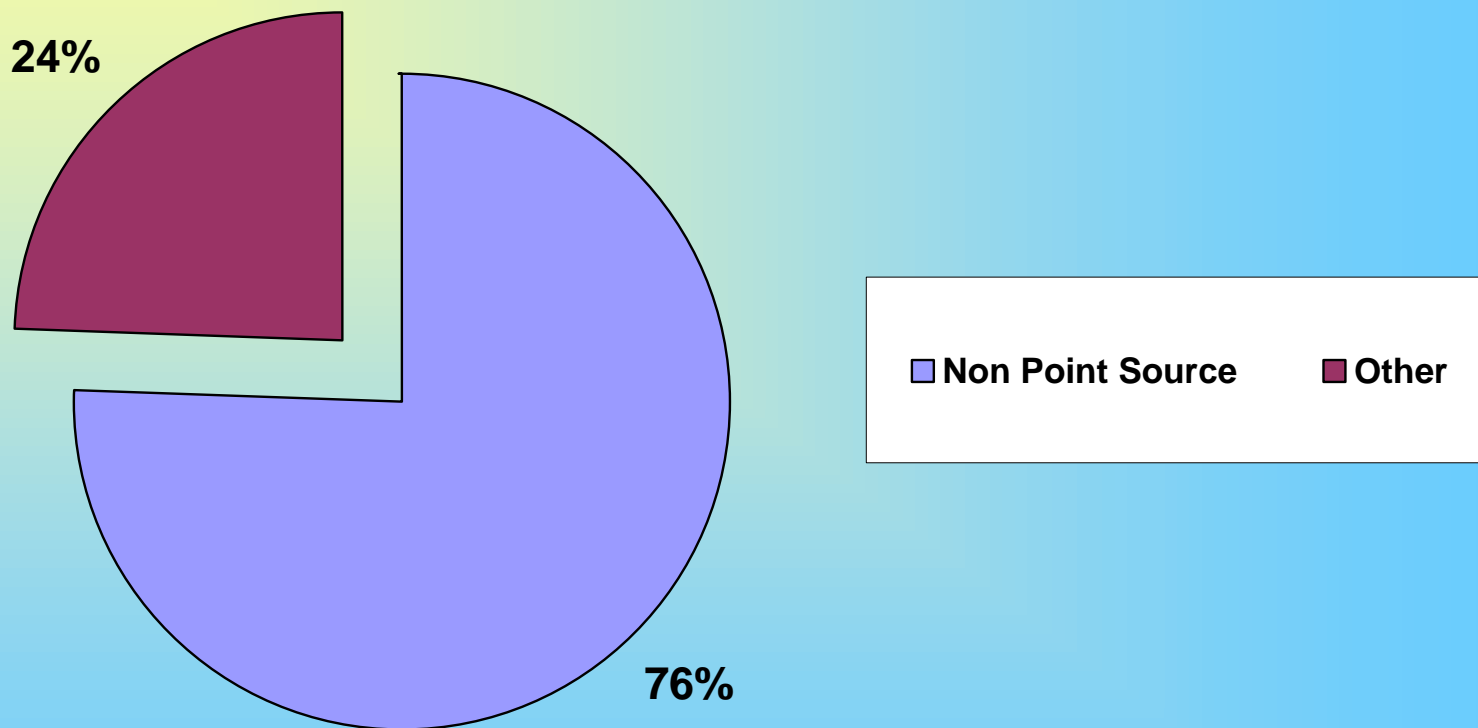
- Perennial and intermittent streams
- Sampleable using wadeable protocols
- Sampled when flowing

# Summary of EMAP Sites

- Statewide 47
- Northern California 66
- Northern California Reference 29
- Central Coast 23
- Southern California 59
  
- Total number of sites 224

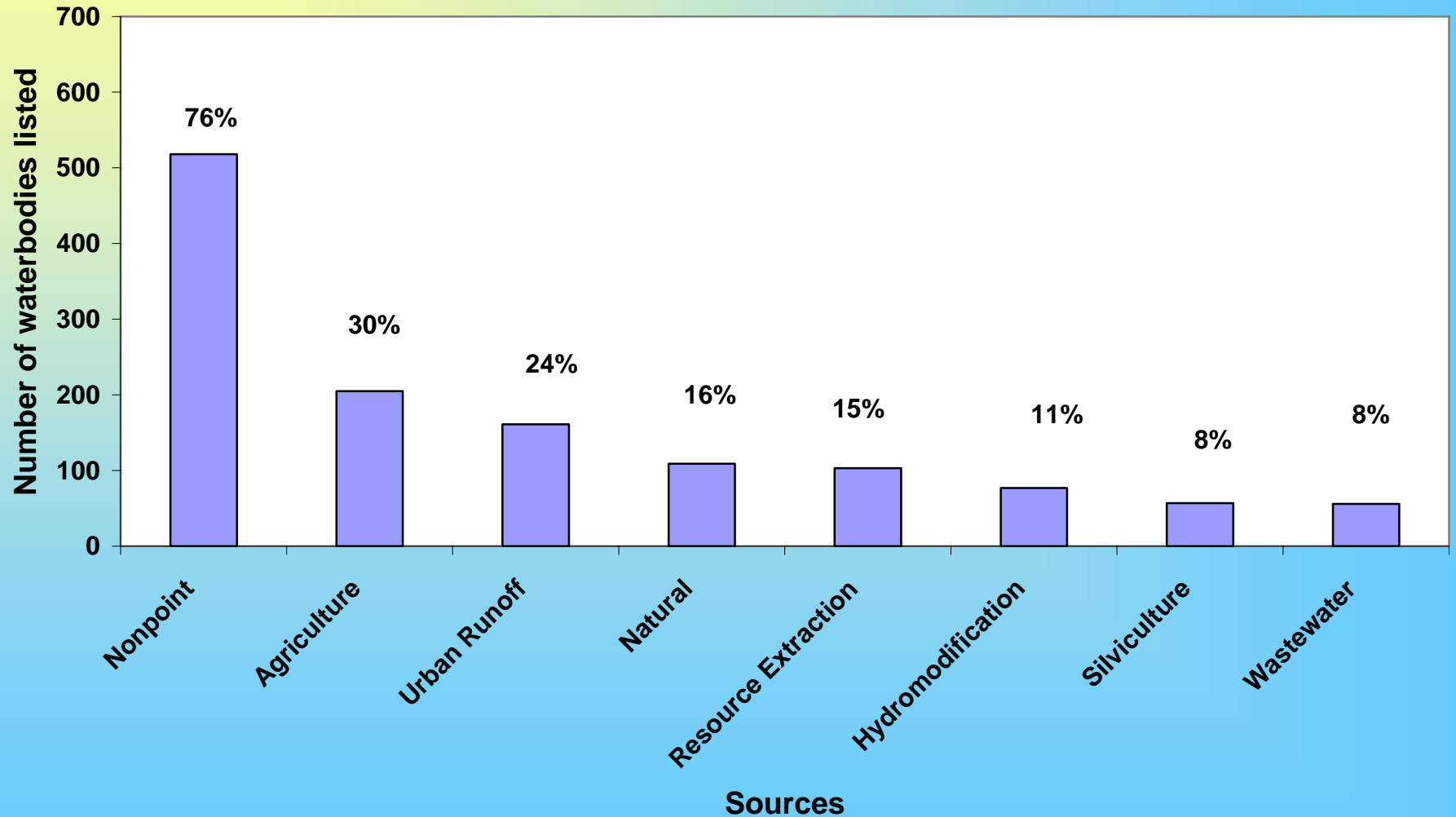
# What is the extent of impairment due to nonpoint sources?

**NPS is associated with 76% of all waterbody listings**



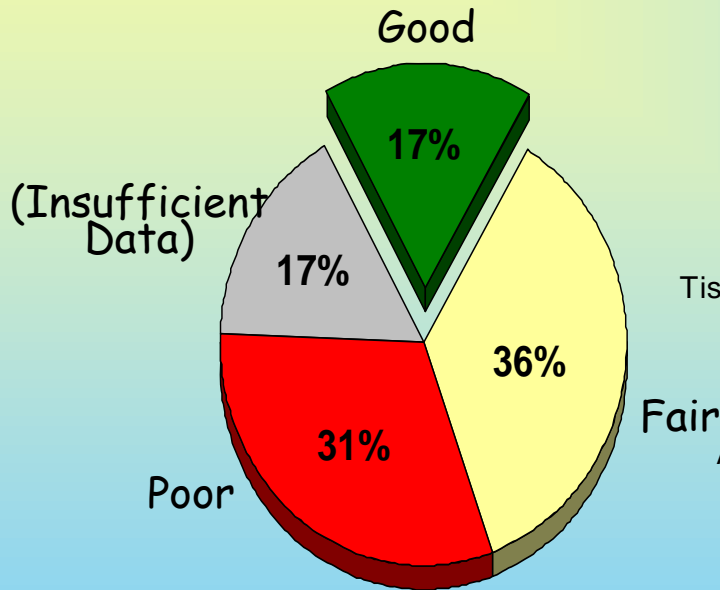
Which nonpoint source activities are impairing the waters?

## Summary of impairments in California from 2002 California 303(d) List



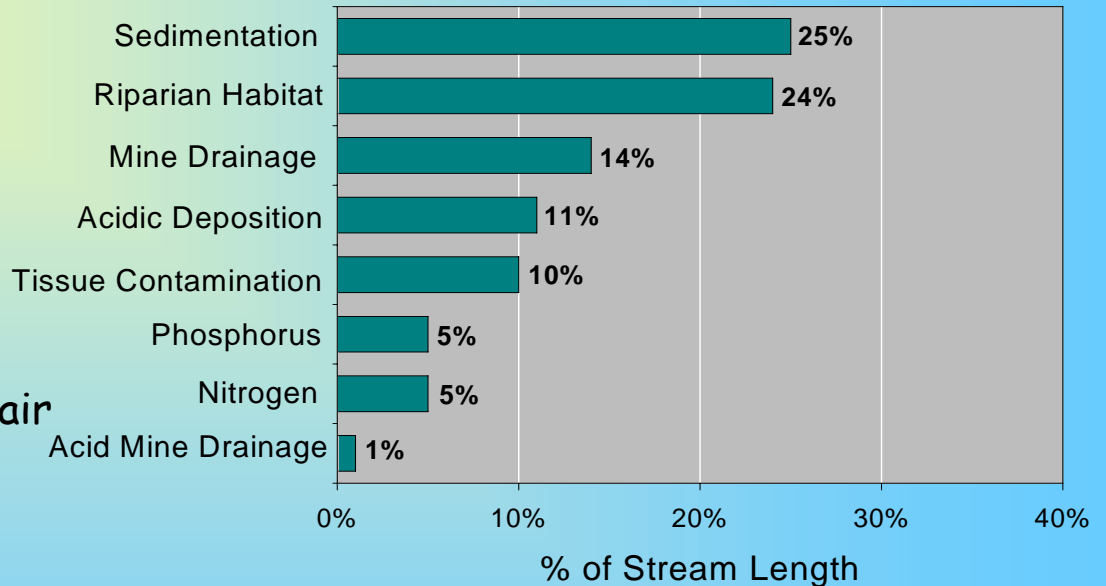
# EMAP Program looks for associations between impairments and stressors

## IBI Results

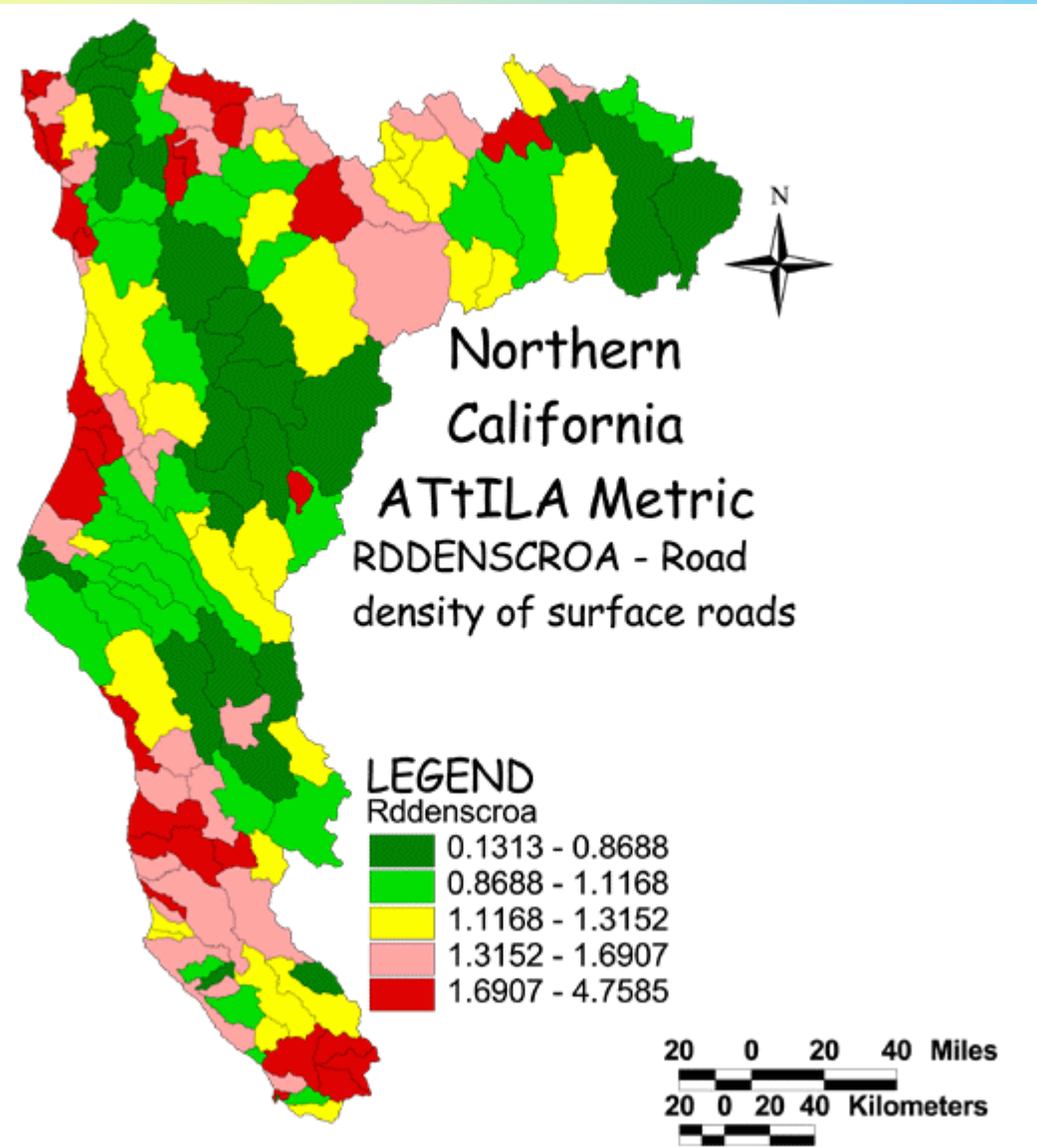


Proportion of Stream Length

## Ranking of Potential Stressors



(Example from EMAP in Mid-Atlantic)











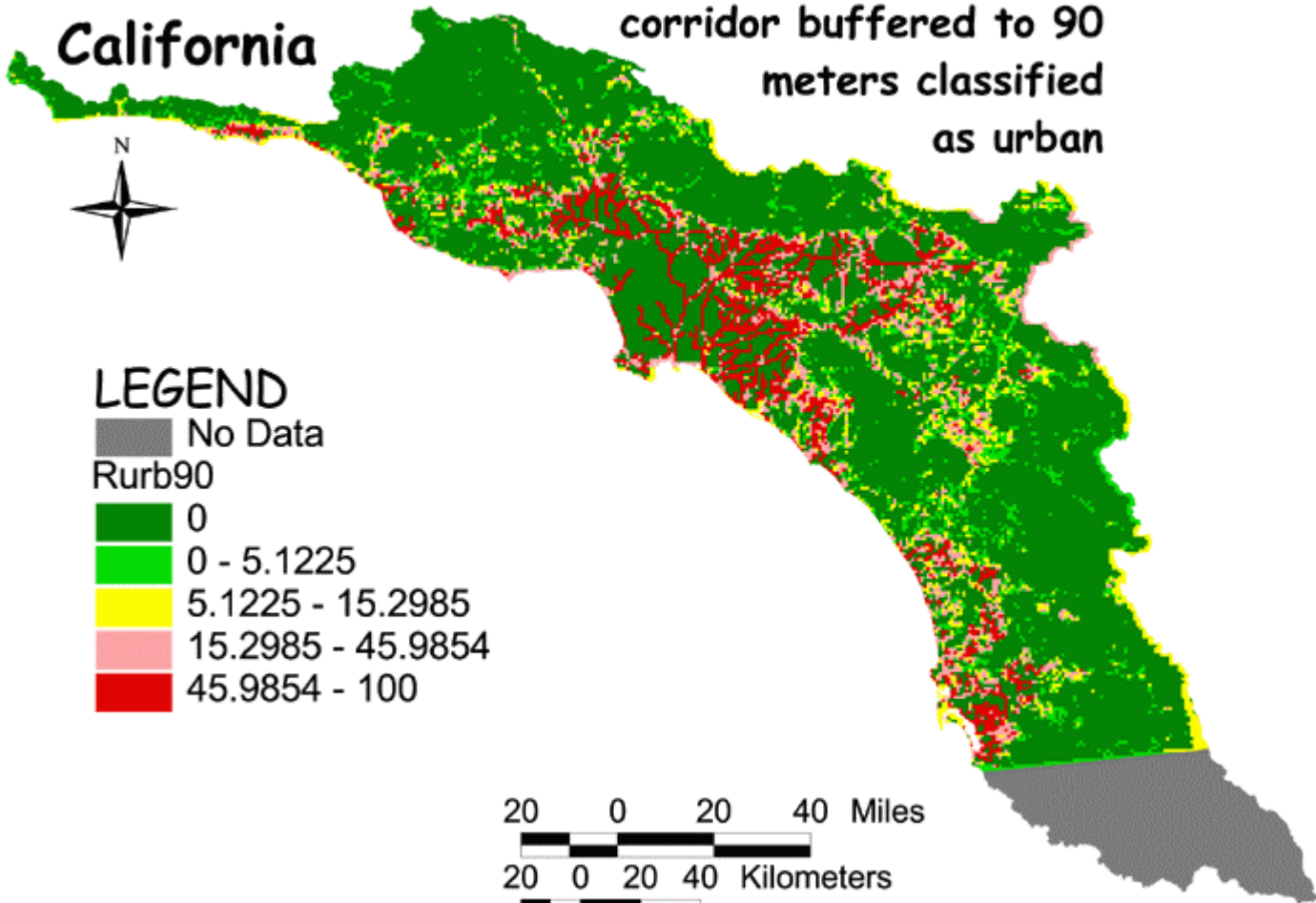
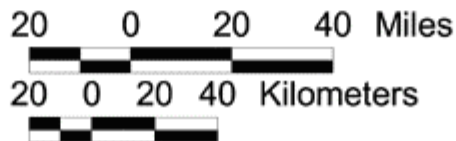
# Southern California

RURB90 - Percentage of stream corridor buffered to 90 meters classified as urban



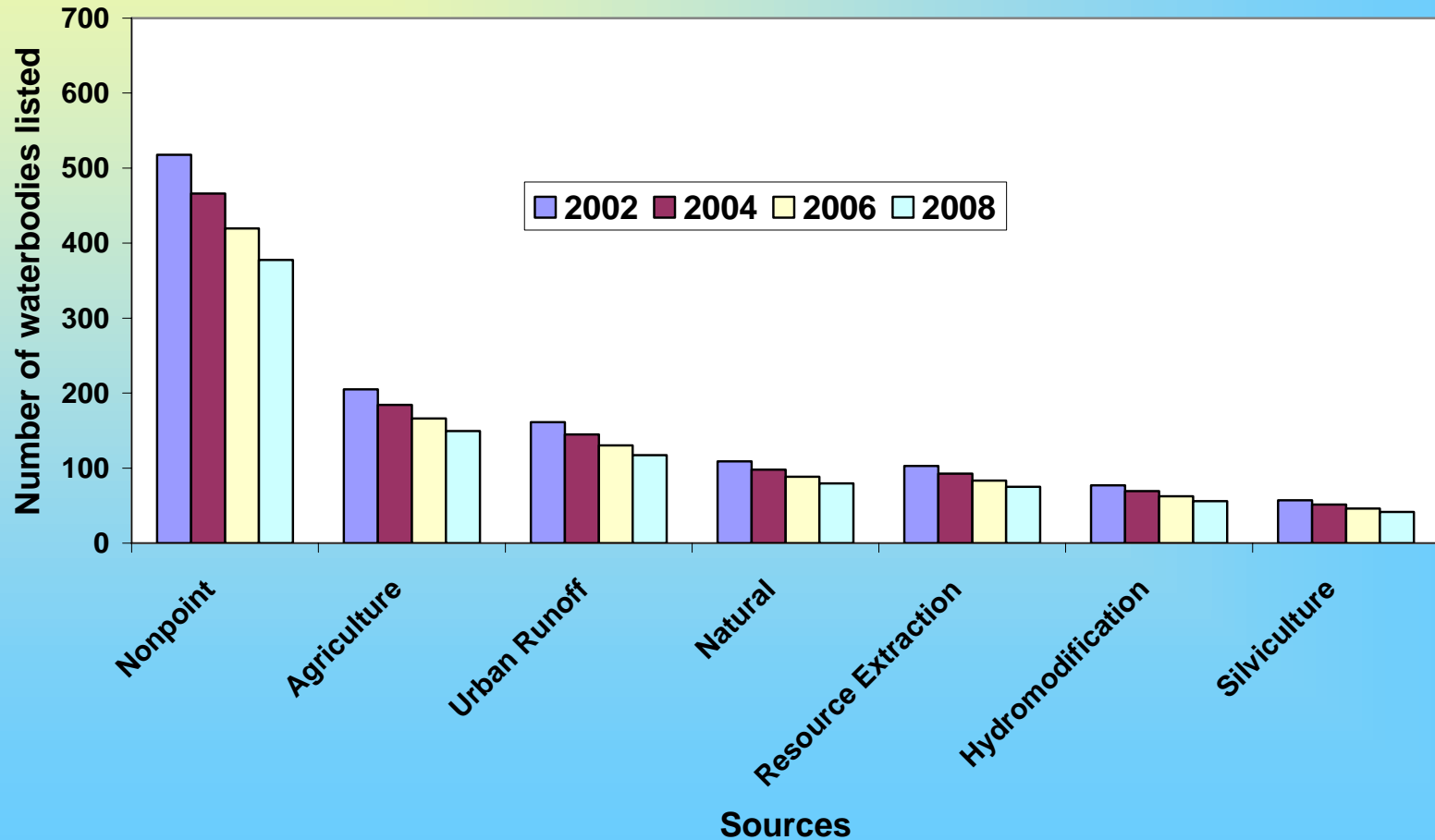
## LEGEND

-  No Data
- Rurb90
-  0
-  0 - 5.1225
-  5.1225 - 15.2985
-  15.2985 - 45.9854
-  45.9854 - 100



# Is water quality getting better over time?

## Reductions in impairments from NPS in California from future California 303(d) Lists



# Big Management Questions

**Are we investing the NPS resources  
in the right places?**

**Are the NPS measures effective?**



# Remember the Six NPS Questions



1. What is the quality of water in California?
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4. Is water quality getting better or worse?
5. Is NPS Program investing resources consistent with water quality problems?
6. Are NPS investments effective in protecting and restoring water quality?

# **Approach to Answering Questions for CA NPS Program**

## **1. Strengthen SWAMP as a resource for NPS Program**

- a) Develop **C**MAP, other monitoring and assessment mechanisms**
- b) Incorporate data from other reliable sources**

## **2. Develop MM/MP geographically-based tracking mechanisms**

## **3. Marry the information to assess water quality as it relates to MM/MP implementation**

# **CMAP FOCUS: 1<sup>st</sup> Year**

- **Develop a Conceptual Plan**
- **Articulate Objectives & Monitoring Design**
- **Analyze and Assess EMAP data**
- **Initiate Monitoring for Year One**

# CMAP Objectives

- **Estimate the current status and trends in indicators of the condition of surface water with known confidence.**
- **Evaluate the associations between observed biological effects and physical and chemical stressors.**
- **Prioritize stressors**
- **Develop indices of biotic integrity**

# Study Design

## Key Elements:

- probability-based
- Sample size: 50 sites
- Stratified by stream order, land use
- each specified land use category: 12 sites/year
- analysis for statewide: annual
- analysis for land use: every 3 years



# EMAP Indicators

## •Water Chemistry

(pH, Conductivity, True Color, Turbidity, ANC, TSS, DOC, DIC, NH<sub>3</sub>, SiO<sub>2</sub>, TN, TP, Cl<sup>-</sup>, NO<sub>3</sub><sup>-</sup>, SO<sub>4</sub><sup>-</sup>, Ca, Na, K, Mg, Zn, Se)

## Physical Habitat

## •Periphyton Diversity

(Chlorophyll, Ash-free Dry Mass)

## Fish Tissue

(Zn, As, Cd, Pb, Se, Hg)

## Benthic Macroinvertebrae



# CMAP Indicators

- Similar to EMAP, but being further developed
- May include organochlorines in fish tissue

Water Body Type	Human uses			Fish and Wildlife
	Drinking	Swimming	Fishing	Wildlife
<b>Rivers</b>	Chemical Bacteriological	Bacteriological	Chemical-Tissue	<b>Physical Habitat</b> <b>Water chemistry</b> <b>Macroinvertebrate, Fish, Periphyton</b>
<b>Lakes</b>	Chemical Bacteriological	Bacteriological	Chemical-Tissue	Physical Habitat? Chemical? Biological?
<b>Beaches</b>	NA	Bacteriological	NA	NA?
<b>Bays/Harbors/Marinas</b>	NA	Bacteriological	Chemical-Tissues	Sediment Chemistry Benthic Invertebrate Sediment toxicity Water Column Fish trawls, Fish tissue
<b>Ocean</b>	NA	Bacteriological		
<b>Wetlands</b>	NA	NA	NA	Physical Habitat Plant community Invertebrates? Fish?
<b>Groundwater</b>	Chemical	NA	NA	NA

# **OTHER DATA SOURCE IDEAS:**

- 1. Monitoring data from State Funded 319(h) Projects.**
- 2. Data from Proposition 40, 50 and other Bond Funded projects.**
- 3. Monitoring Data resulting from other intra-agency programs (TMDL, Waiver Programs, Storm Water, Clean Water Team...)**
- 4. Utilization of Interagency Coordinating Committee (IACC), for data from other State Agencies (DWR, DOHS, Fish and Game...)**
- 5. Utilization of IACC for obtaining data from Federal or local programs.**

# Next Steps:

- **Develop the State Monitoring Strategy**
- **Initiate **C**MAP**
- **Begin On-the-Ground Project Monitoring**
- **Secure 319 funding for monitoring**
- **Cultivate more participation with Strategy**

# *QUESTIONS...?*



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**Thank You For Listening!**