

Healthy Stream Initiative

- Protect high quality streams
- Protect threatened streams from degradation
- Set restoration goals for impaired streams



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SWAMP

Surface Water Ambient
Monitoring Program

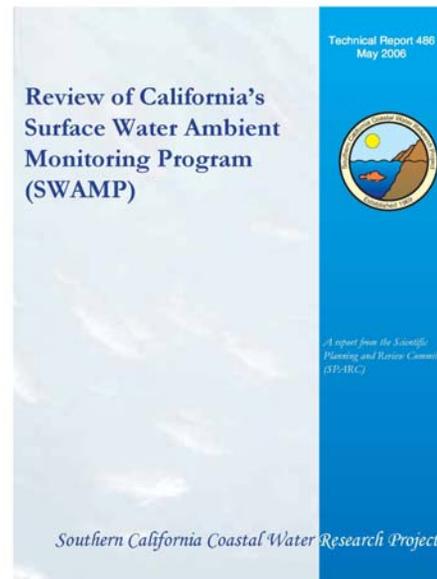
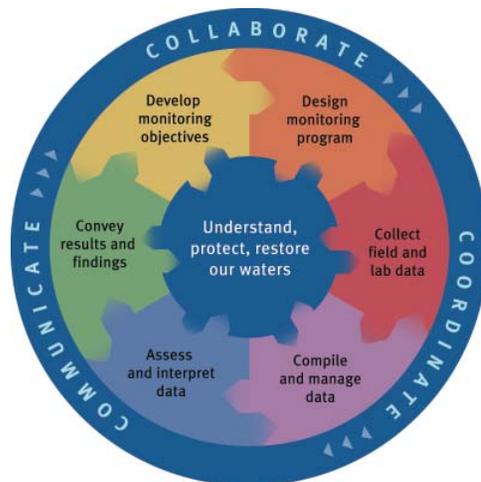
SWAMP: Required by AB 982

- Comprehensive state program (surface water)
- Coordinate all Board ambient water quality monitoring Programs/projects
- High Quality Data (Quality Assurance)
- Comparable data
- Accessible

SWAMP Strategy



State Water Re and Regional Water



10 Elements of a State Monitoring & Assessment Program:

- Strategy
- Objectives
- Design
- Indicators
- Quality Assurance
- Data Management
- Data Analysis and Assessment
- Reporting
- Peer Review
- Program Support and Infrastructure

Biological Indicators

SWAMP Planning Matrix

Water Body Type	Beneficial Use			
	Aquatic Life	"Swimmable"	"Fishable"	"Drinkable"
Wadeable Streams	SWAMP Perennial Streams Survey (2005 – ongoing)	SWAMP-funded monitoring summary (2007-08)		
Large Rivers	EPA Flowing Waters Study (2008-2010)	SWAMP-funded monitoring summary (2007-08)		
Lakes	USEPA Lakes Survey (2007-2009)	SWAMP-funded monitoring summary (2007-08)	SWAMP Lake Study (2007-09)	
Coastal Waters, Bays & Estuaries	ASBS / SQOs	Clean Beach Program	SWAMP 2009-10	NA
Wetlands	CRAM	NA	NA	NA

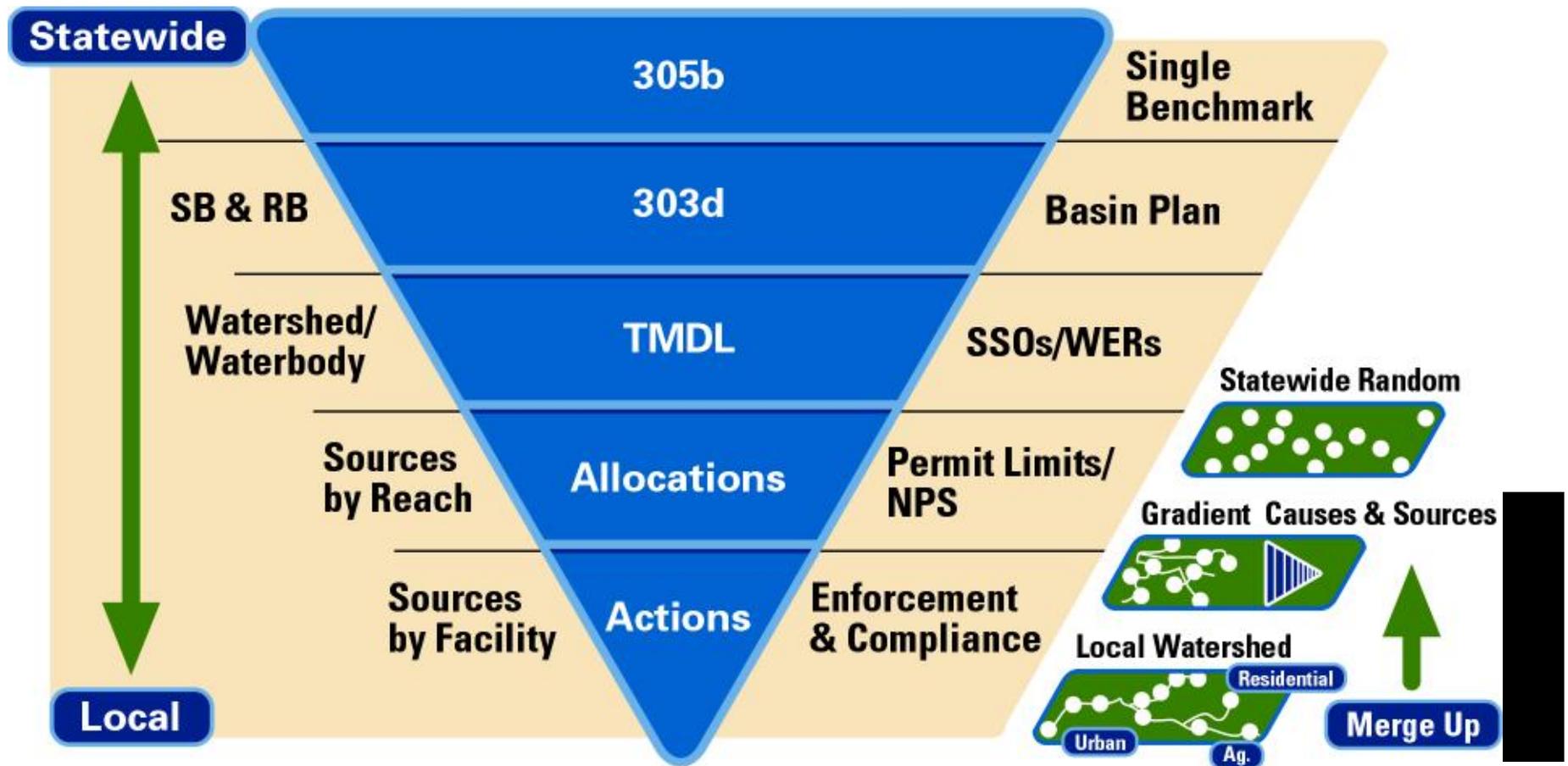
The Surface Water Ambient Monitoring Program

- SWAMP is a state framework for coordinating consistent and scientifically defensible methods and strategies for improving water quality monitoring, assessment, and reporting.

Building Comparability – Assessment Framework

- Common Indicators
- Common Assessment Thresholds (WQOs)
- Application Appropriate Methods
- Quality Assurance Program
- Database w/ metadata
- Information Exchange Network
- Tool Box and Training
- Help Desk

Integrating Across scale and Regulatory Programs

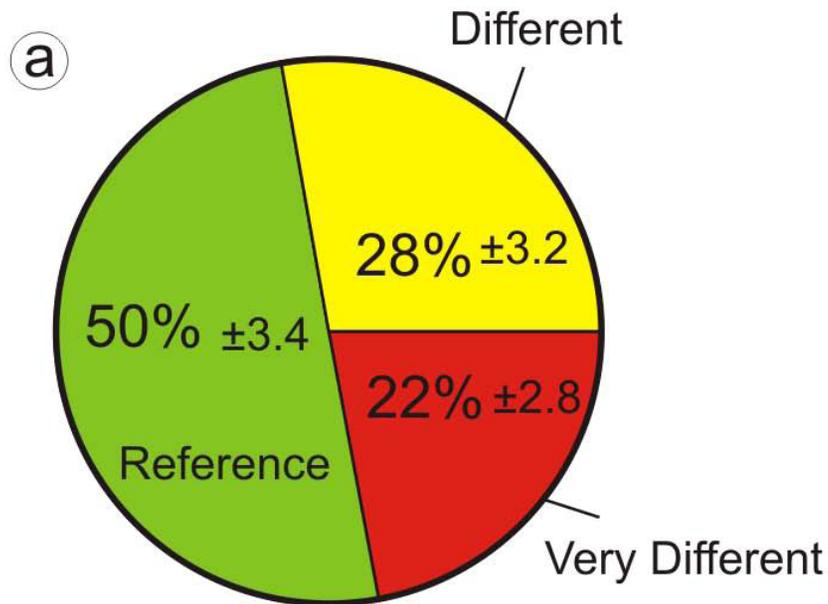


Healthy Stream Initiative

Healthy Stream Initiative (HSI)

HSI is the set of physical chemical and biological objectives along with the programmatic tools to protect the streams of California

- Protect high quality streams
- Protect threatened streams from degradation
- Set restoration goals for impaired streams



Condition of
wadeable perennial
streams in CA

Healthy Stream Initiative is the set of physical chemical and biological objectives along with the programmatic tools to protect the streams of California

Objectives

Chemical Objectives

- CTR
- Basin Plan

Toxicity Objectives

Biological Objectives

- Perennial streams

Habitat Objectives

- Hydromodification
- Riparian Policy (phase 3)

Programmatic Tools

- 305b and 303d Assessments
- NPS
- NPDES
- Stormwater
- 401 Certification; wetlands
- TMDLs
- Compliance/Enforcement
- Antidegradation
- Grant project effectiveness
- Water Rights impact assessment

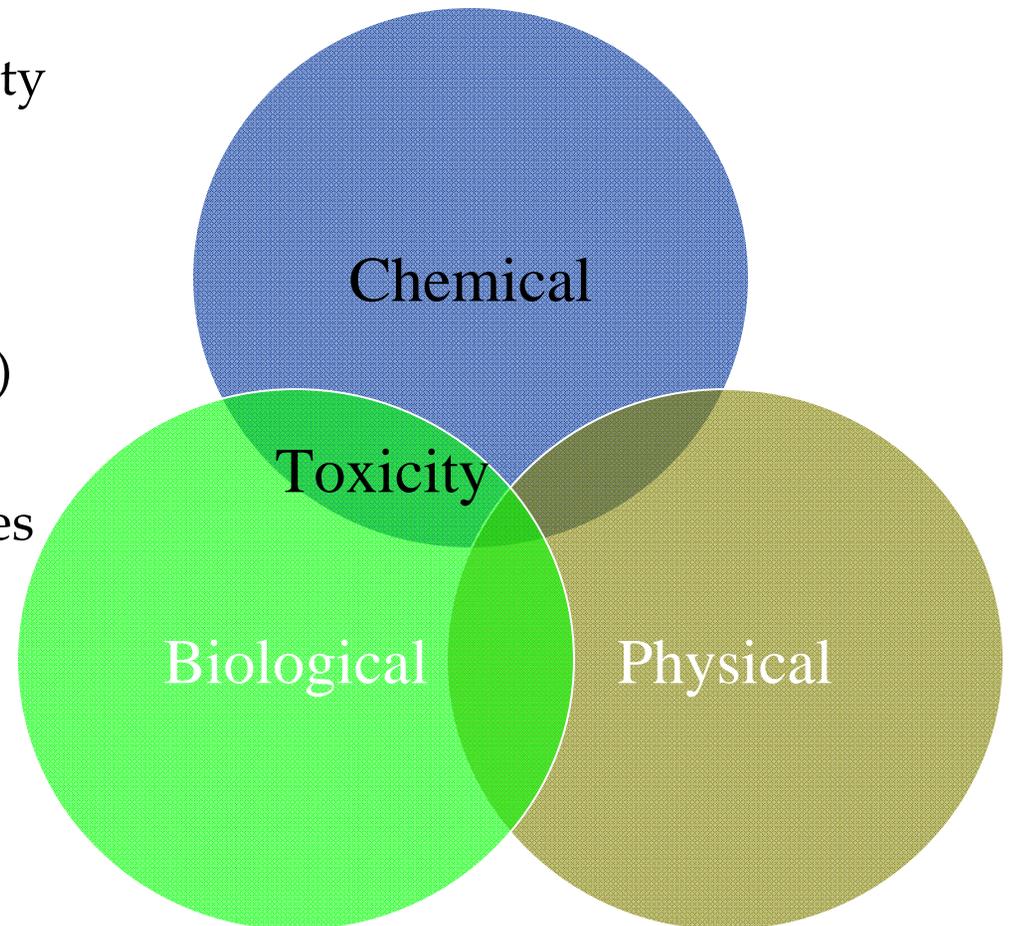
SWAMP Assessment Framework:

- Indicator Development (assessment tools)
- Perennial Stream Survey (background condition)
- Reference Condition (expectation - what should be)
- Statewide Pollution Trends (chemistry; toxicity)



Healthy Streams Initiative to protect physical, chemical and biological integrity of streams

- Chemical Measurement
 - Compliance with water quality objectives
- Toxicity tests
 - Affect on aquatic life
 - Pollutant identification (TIEs)
- Biological
 - Affect on aquatic communities
 - Effectiveness of actions
- Physical
 - Habitat degradation



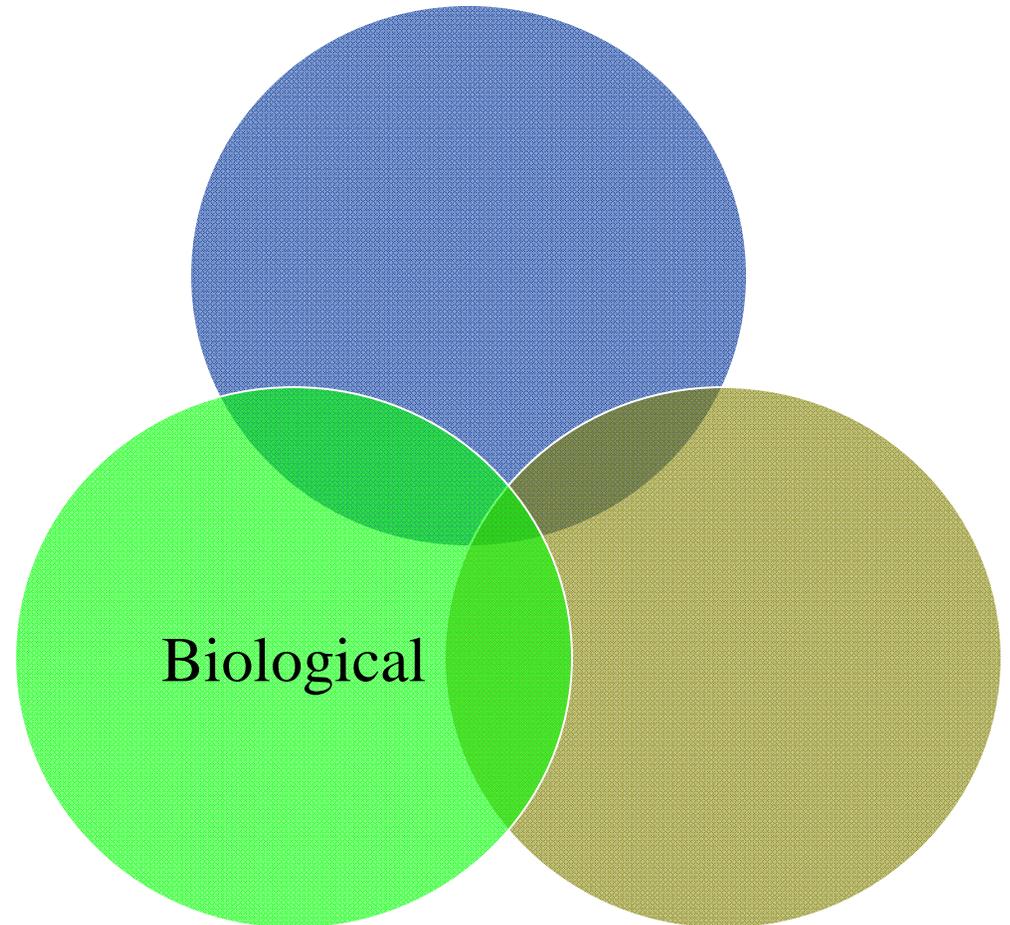
Existing tools to interpret chemistry and toxicity

New tools needed to interpret on biology and alterations to physical habitat

Healthy Streams Initiative- Biology

Provide tools to protect and restore streams

- Perennial Streams Assessment
 - Flow (hydromodification)
 - Status and trends in biological condition
 - Associations with stressors
- Indicator Development
 - Stream invertebrates
 - Algal metrics
 - Wetland
- Reference Condition
 - Provides insight into natural conditions and sets expectations for biological metrics

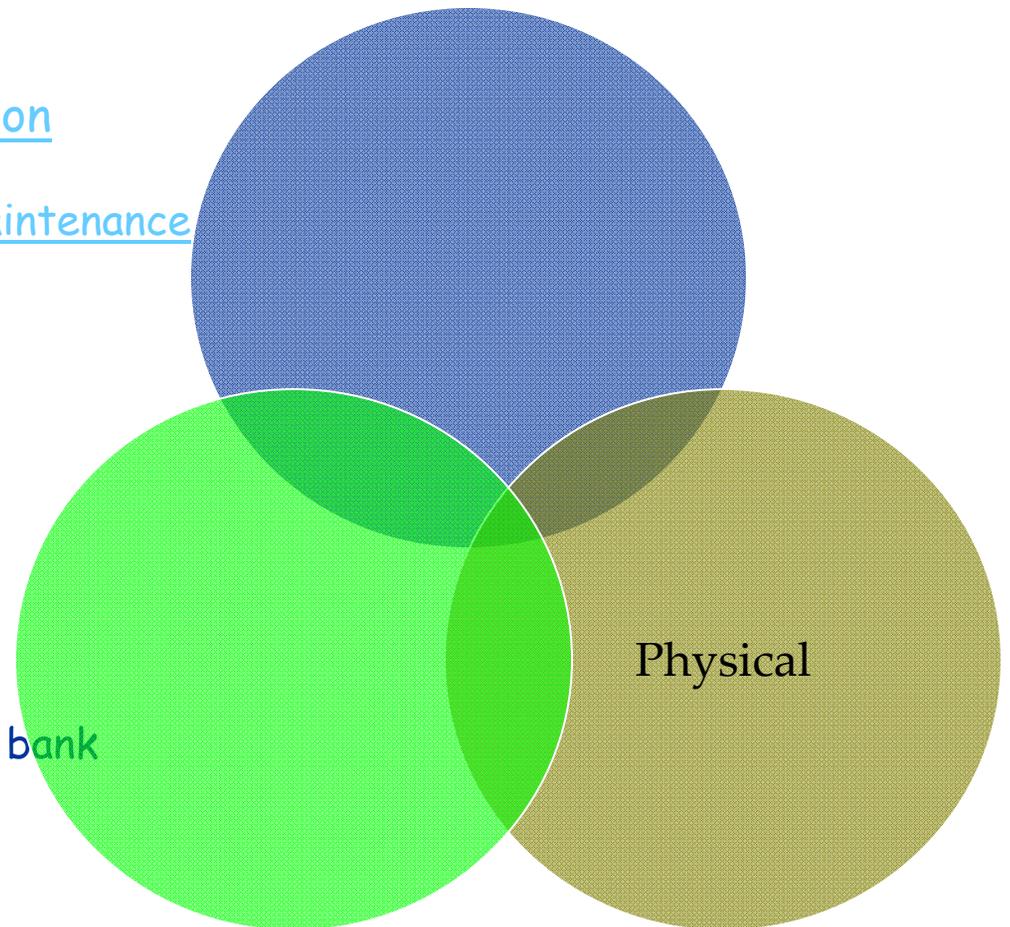


Roughly 50% of streams have biological condition that is different from reference (link to PSA report or fact sheet)

Healthy Streams Initiative- Physical

Provide tools to protect and restore streams

- Hydromodification
 - **Stream Channel Modification**
 - Channelization/Channel Modification
 - Dams and Levees, Construction
 - Dams and Levees, Operation and Maintenance
 - Dams and Levees, Removal
 - **Managing Hydromodification Impacts**
 - Streambank and Shoreline Erosion
 - Flow and Temperature Maintenance
 - Low Impact Development (draft)
 - **Education and Outreach**
 - For Hydromodification
 - **Riparian Policy (Phase 3)**
 - Protection of stream channel, bed and bank
 - Water quality objectives



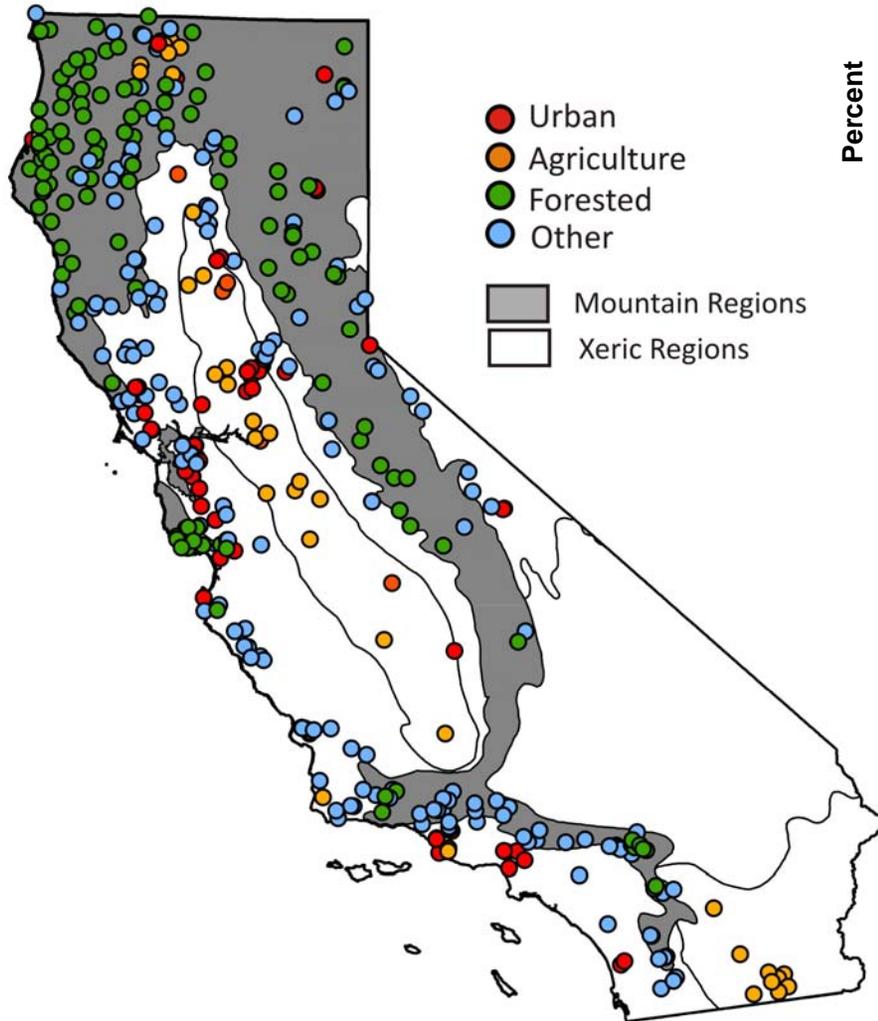
Roughly 50% of streams have some form of habitat impairment

Healthy Stream Initiative – Assessment Framework

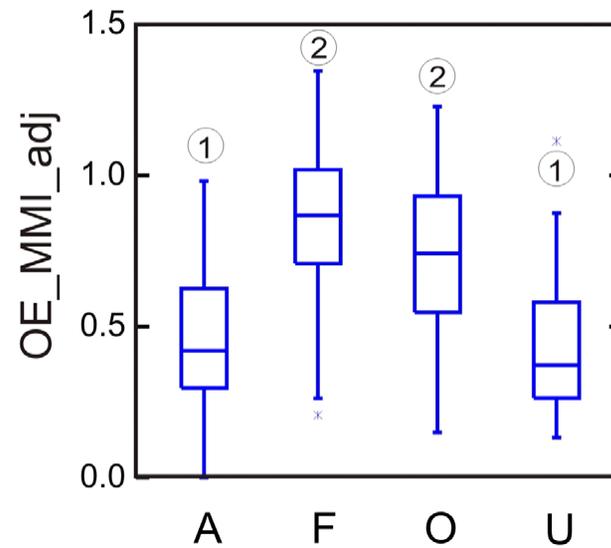
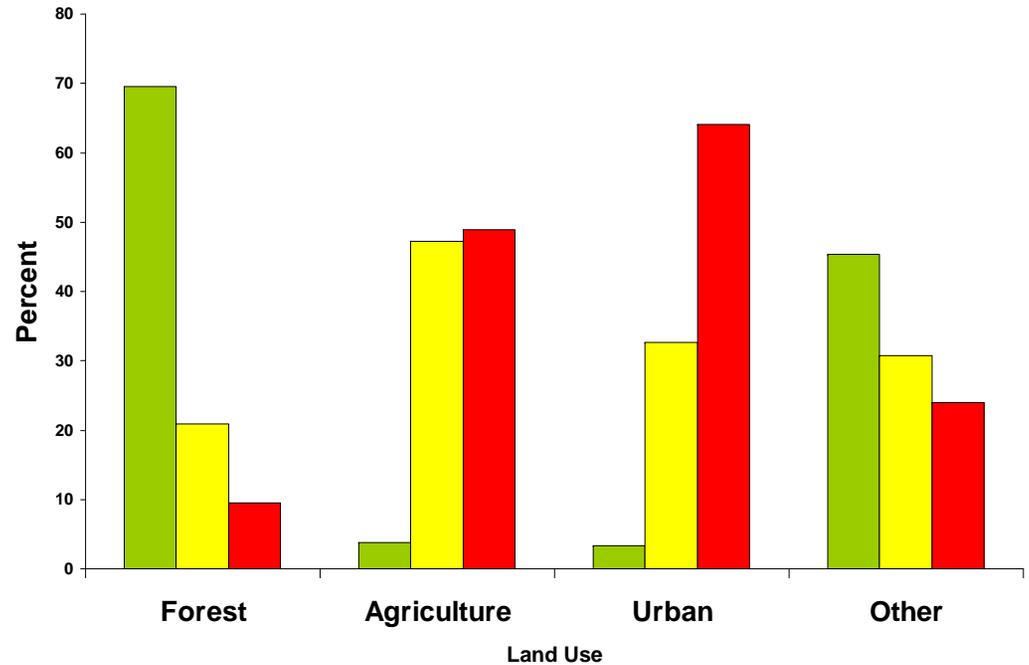
- Indicators- “bugs”; algae; phab. and CRAM
- Assessment Thresholds-Bio-objectives
- Appropriate Methods –SWAMP protocols
- Quality Assurance Program (March 2010)
- Database w/ metadata (March 2010)
- Information Exchange Network-CEDEN
- Tool Box and Training
- Help Desk

SWAMP Perennial Stream Survey

Landuse as a surrogate stressor



Stream Condition by Landuse



Agricultural and urban landscapes have degraded benthic invertebrate assemblages

Extent of Stream Resources in California

60% of California streams are non-perennial streams

Need tools to protect both perennial and non-perennial streams

Starting with HSI with focus on perennial streams

Stream type	Miles	%
Perennial streams	64,438	30%
Non perennial streams	124,615	60%
Canals Ditches	22,059	10%
Total Stream miles	211,513	100%

Perennial streams by Watershed type	%
Forested watersheds (>75% forested land use)	28%
Agricultural watersheds (>50% ag land use)	12%
Urban watersheds (>25% urban land use)	2%
Other watersheds (mixed land use)	57%

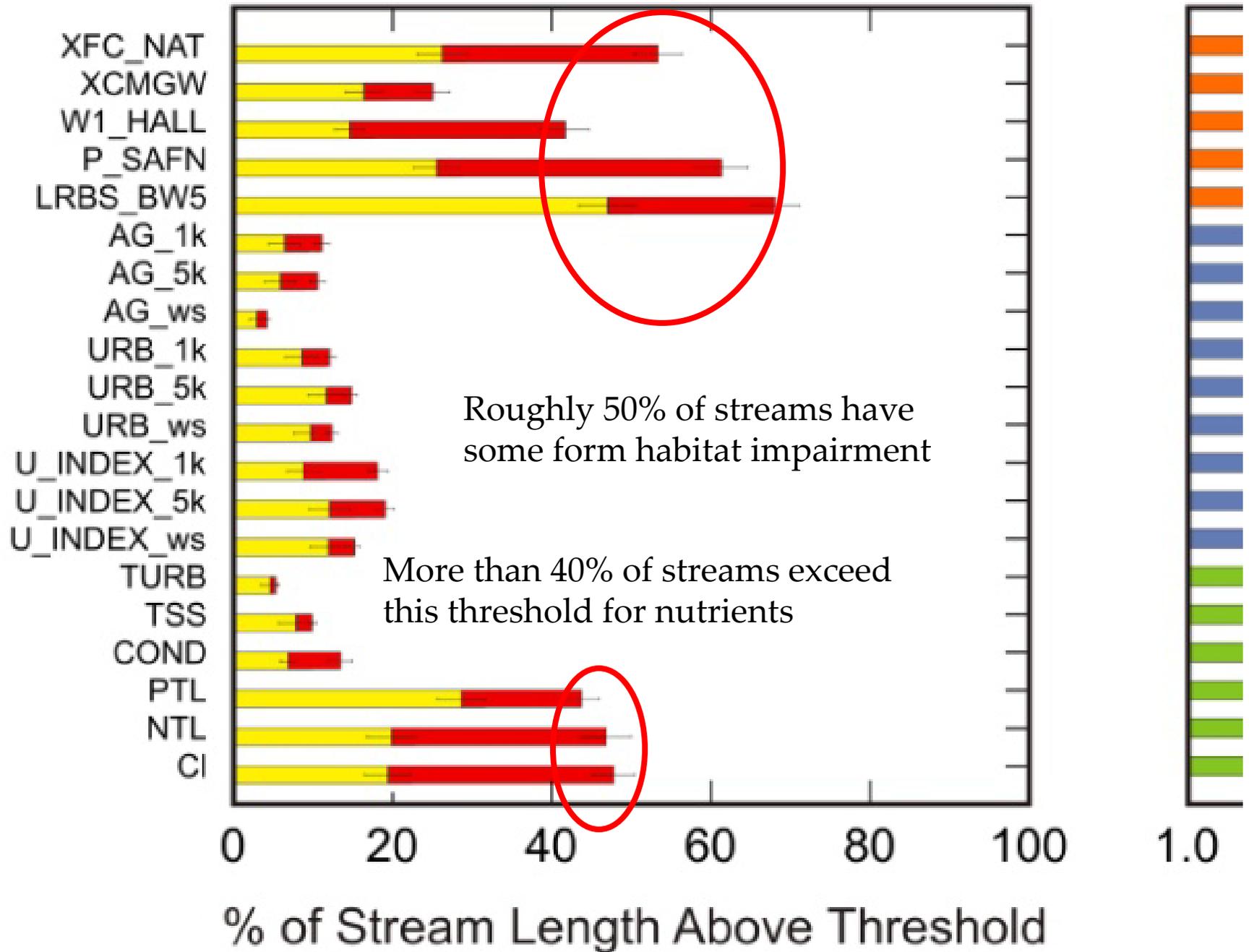
Urban and Ag dominated watersheds are a small portion of perennial streams

These watersheds have

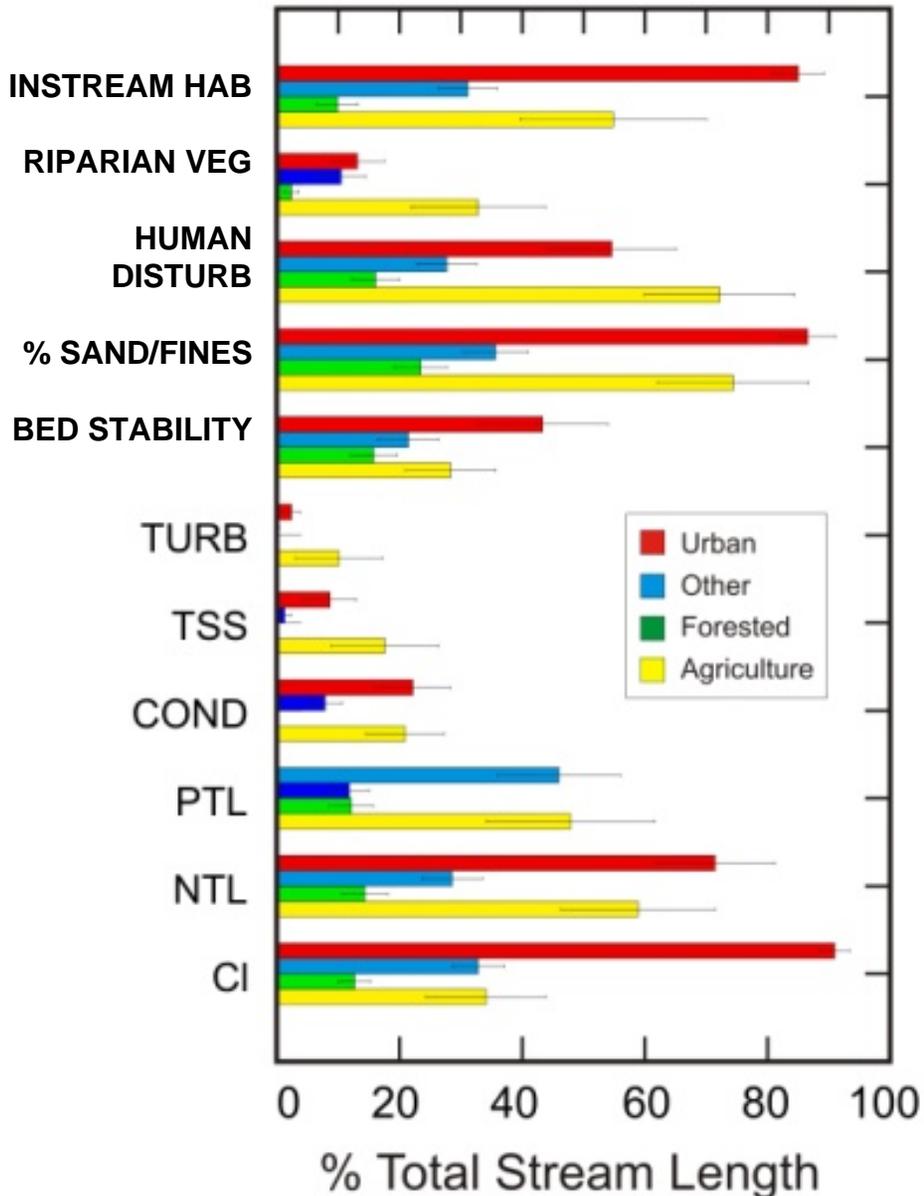
- poorer habitat quality
- poorer water quality
- more degraded biological condition

How do we protect streams in the mixed Watershed from the same fate?

Extent of stressors exceeding moderate thresholds



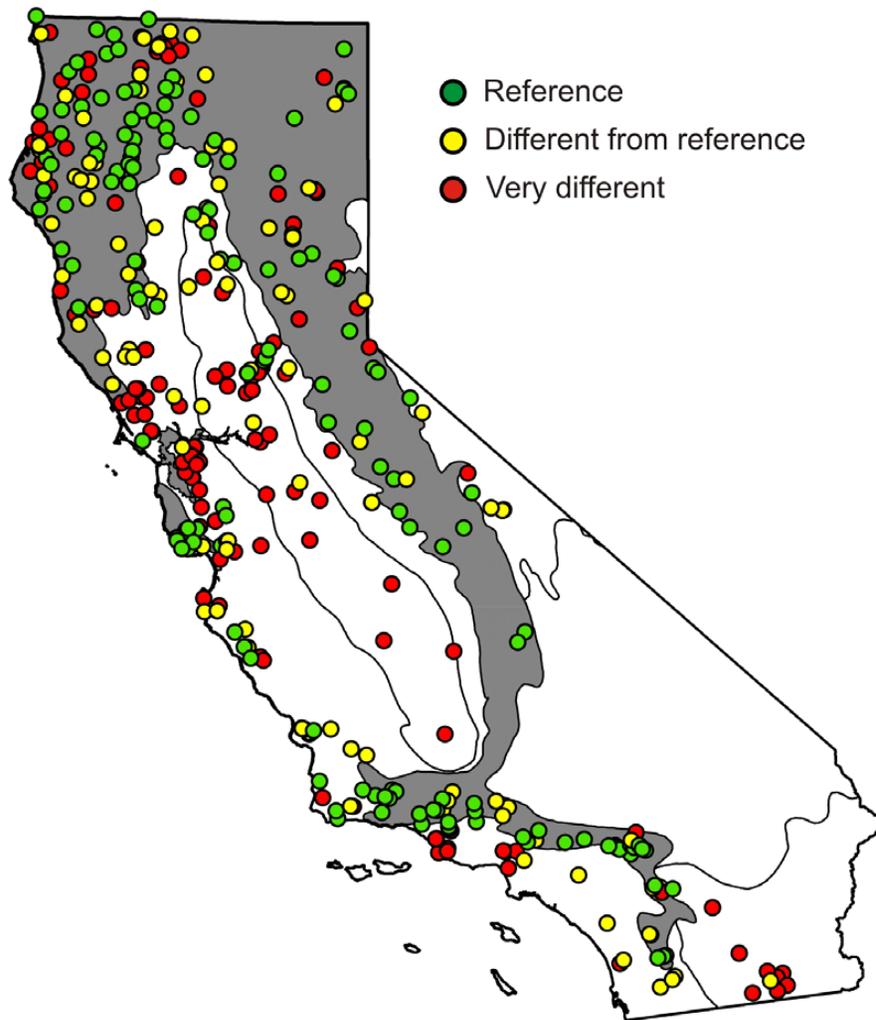
Instream habitat/sediment degradation widespread in both urban and agricultural streams



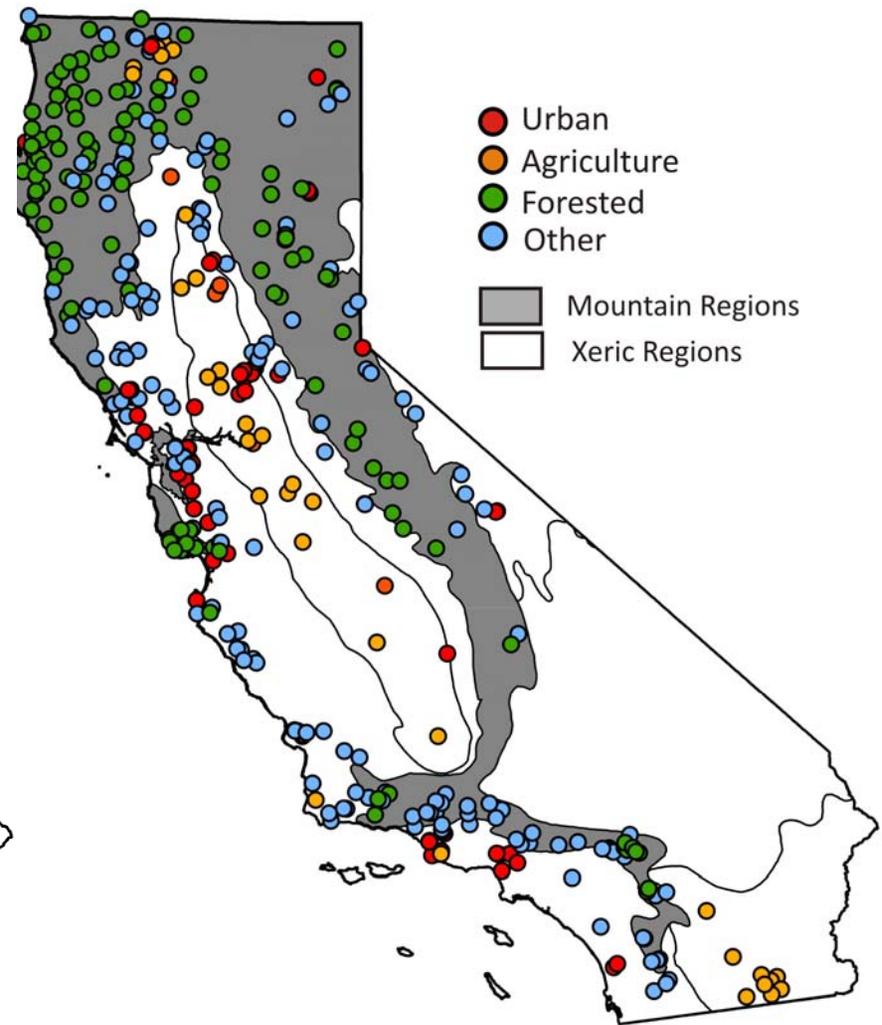
Urban streams about 2% of population
 -85% have poor instream habitat
 - 90% have excess fines
 - 70% have high nitrogen (>0.6 mg/l)
 - 90% have high chlorides

Ag streams about 12% of population
 -55% have poor instream habitat
 - 75% have excess fines
 - 60% have high nitrogen (>0.6 mg/l)
 - 50% have high phosphorus

Where are high quality streams?



Where are streams are at risk?



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