Development and Implementation of Biological Objectives for California

General Outline of presentation

1. Why Needed?
2. Steps toward development
3. Thoughts about implementation

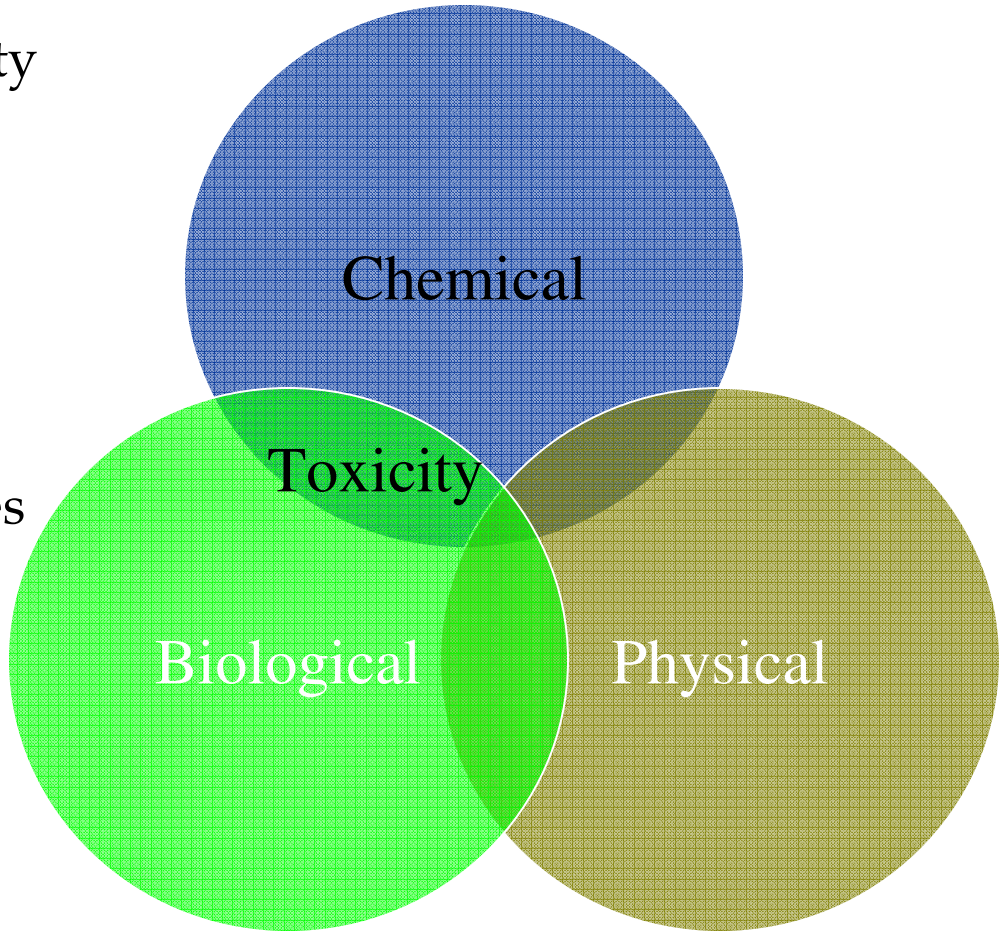
Development of Bioassessment Tools in California

	Habitat	Algae	Invertebrates	Fish
Ephemeral	Y			
Intermittent	Y	?	?	?
Perennial	pHab CRAM	% cover Biomass Algal IBI	IBI or O/E	?
Rivers	pHab CRAM	Y	Y	Y
Lakes/Reservoirs	pHab CRAM	Y	Y	Y
Bay/Estuaries	CRAM	Y	BRI,	Y
Coast/Ocean		Y	So Cal BRI	So Cal Fish Index

Why do we need biological objectives?

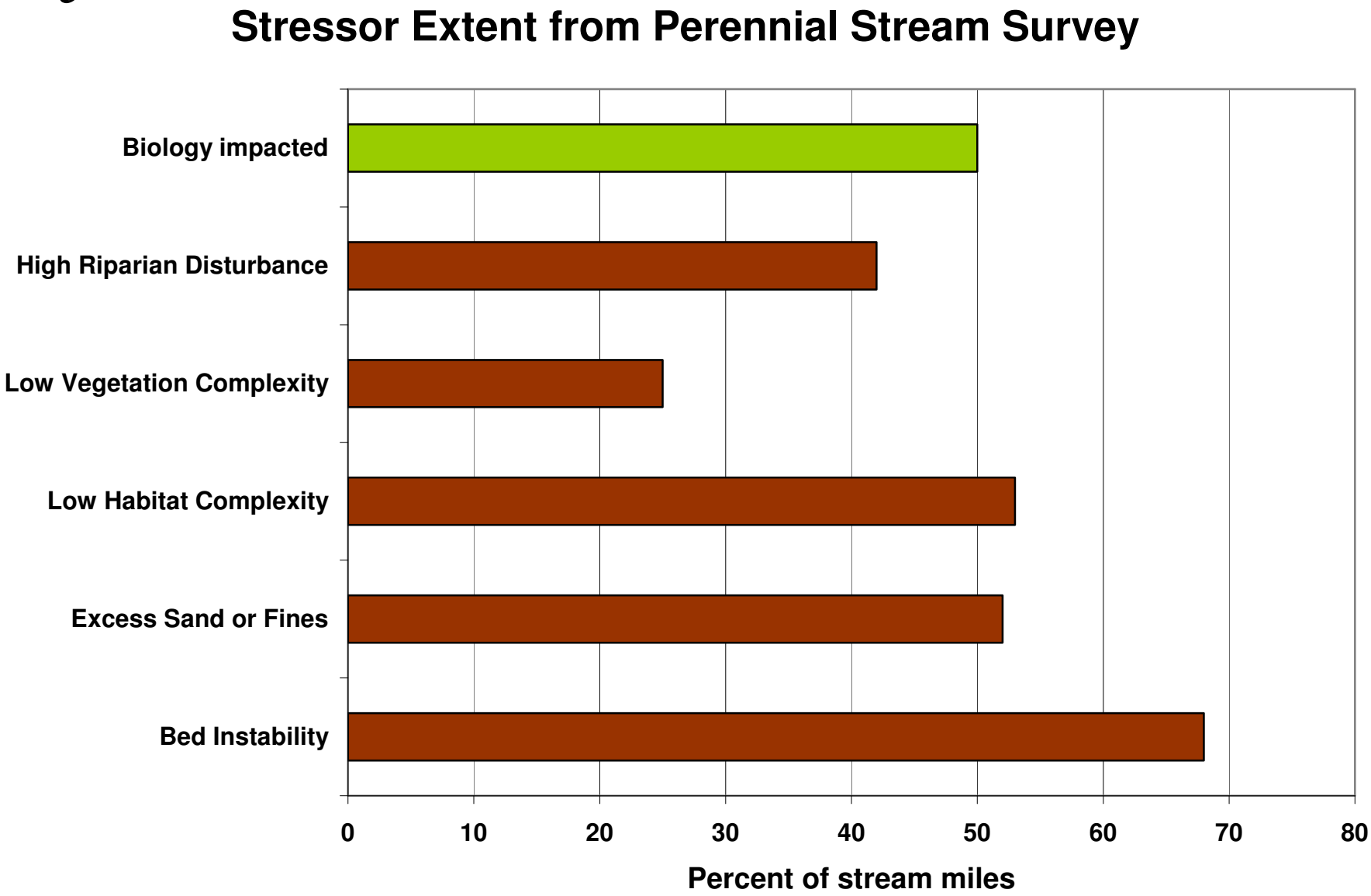
Clean Water Act : Protect physical, chemical and biological integrity of the Nations Waters

- 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
  - Flow (hydromodification)
  - Habitat degradation



Existing tools to interpret chemistry and toxicity
New tools needed to interpret on biology and alterations to physical habitat

Why needed?



Roughly 50% of streams are different from reference
Roughly 50% of streams have some form of habitat disturbance

Water Quality Standards

- Uses
  - What uses are we trying to protect?
- Objectives
  - Narrative vs Numeric?
  - Use of multiple indicators?
- Antidegradation
  - What implications for implementing the policy?
- Implementation Guidance
  - Use in 305(b) or 303(d) assessments?
  - Use in permits for compliance/enforcement?

Workplan to develop biological objectives

1. Reference condition
2. Waterbody classification
3. Assessment tool development
4. Methods standardization
5. Information management
6. Stressor identification
7. Program linkages
8. Rulemaking
9. Outreach
10. Training

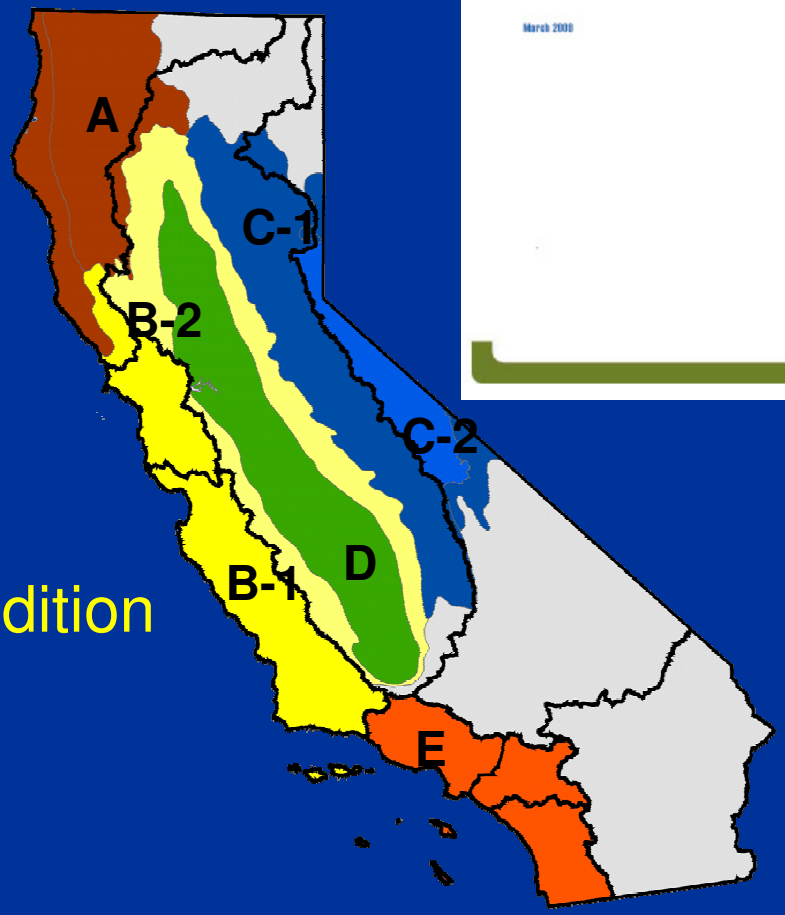
Funding

$600 K in Stimulus funds

$500 K from SWAMP

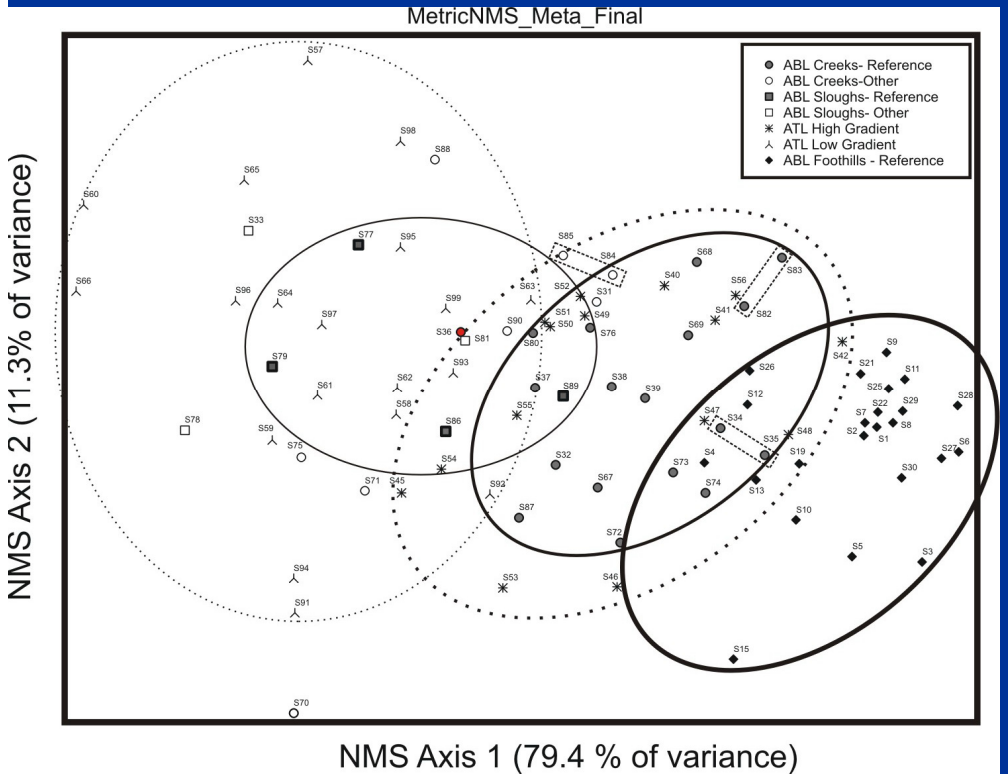
1. Reference Condition

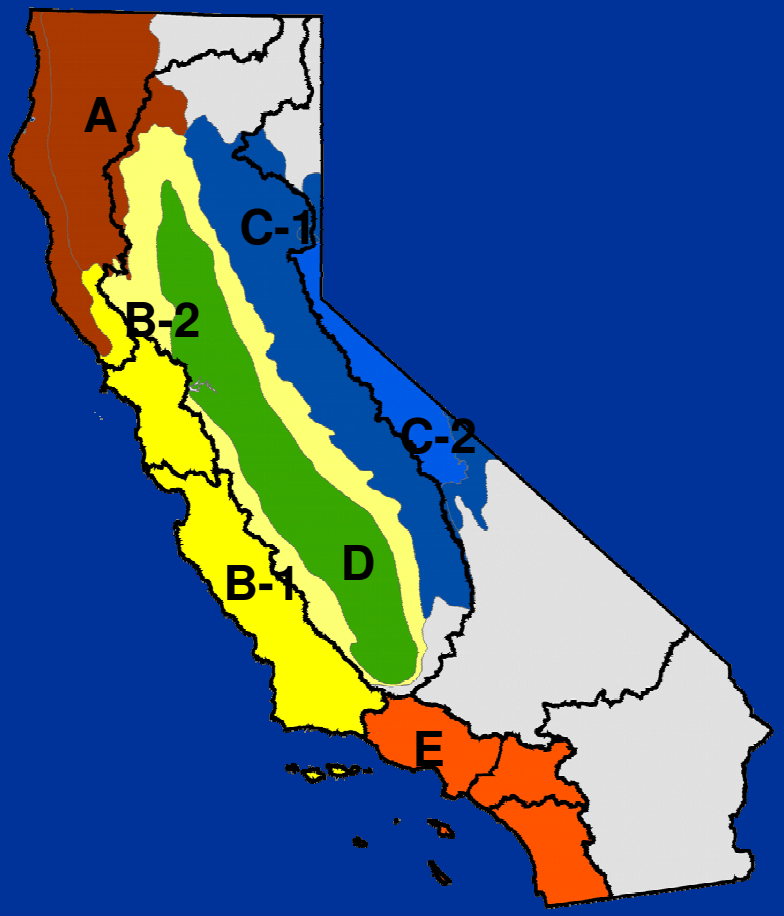
- Crucial to establish biological expectations
- Capture differences in environmental setting
  - Ecoregions
- SWAMP Reference Condition Management Plan
  - Standardized approach
  - Special areas approach



2. Waterbody Classification

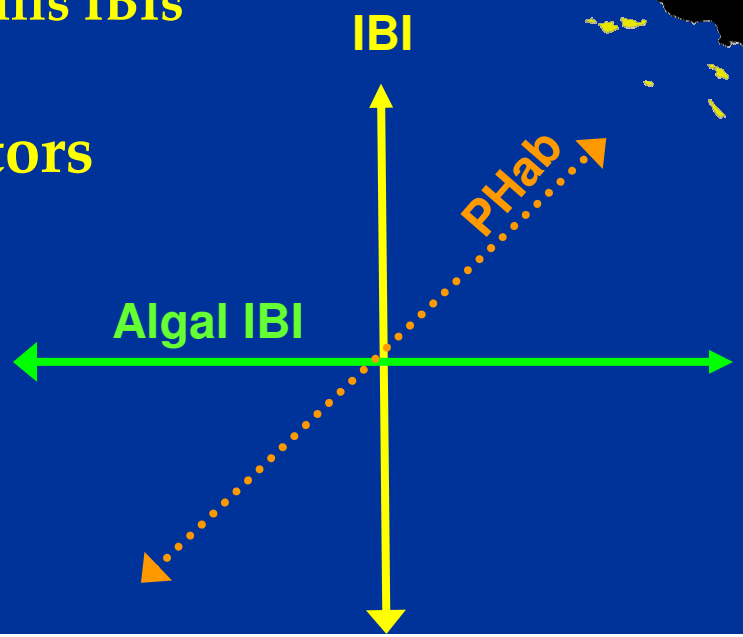
- Can we map all waterbody segments with physical attribute and stressor definitions
- Can we assigns biological expectations to every stream segment
- Groundtruthing for confirmation





3. Assessment Tools Development

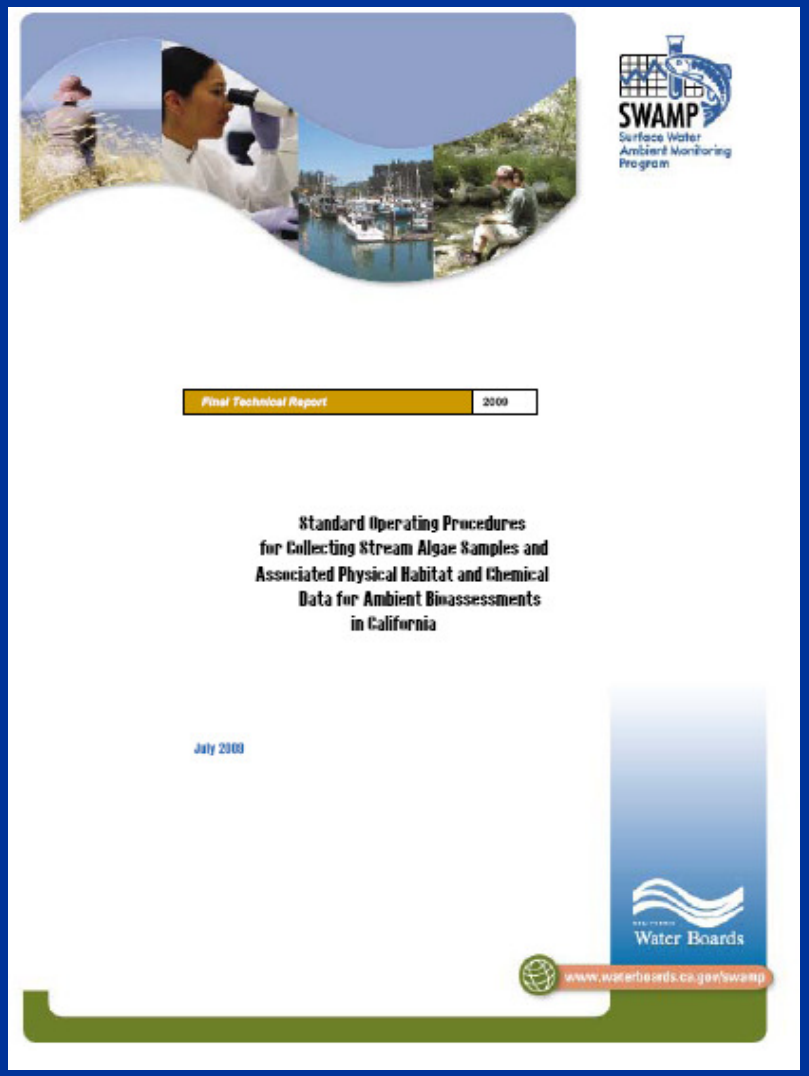
- **Aquatic Life Use Support**
  - **Is it Healthy Bugs or Healthy Streams?**
- **How many tools do we need?**
  - **Statewide O/E Model (3 models)**
  - **So Cal IBI, No Cal IBI**
  - **Central Valley, Eastern Sierra IBIs**
  - **Bay Area and Sierra Foothills IBIs**
- **Developing other indicators**
  - **pHab (In dev?)**
  - **Riparian (CRAM)**
  - **Algae (In dev)**
  - **Fish (selected areas?)**



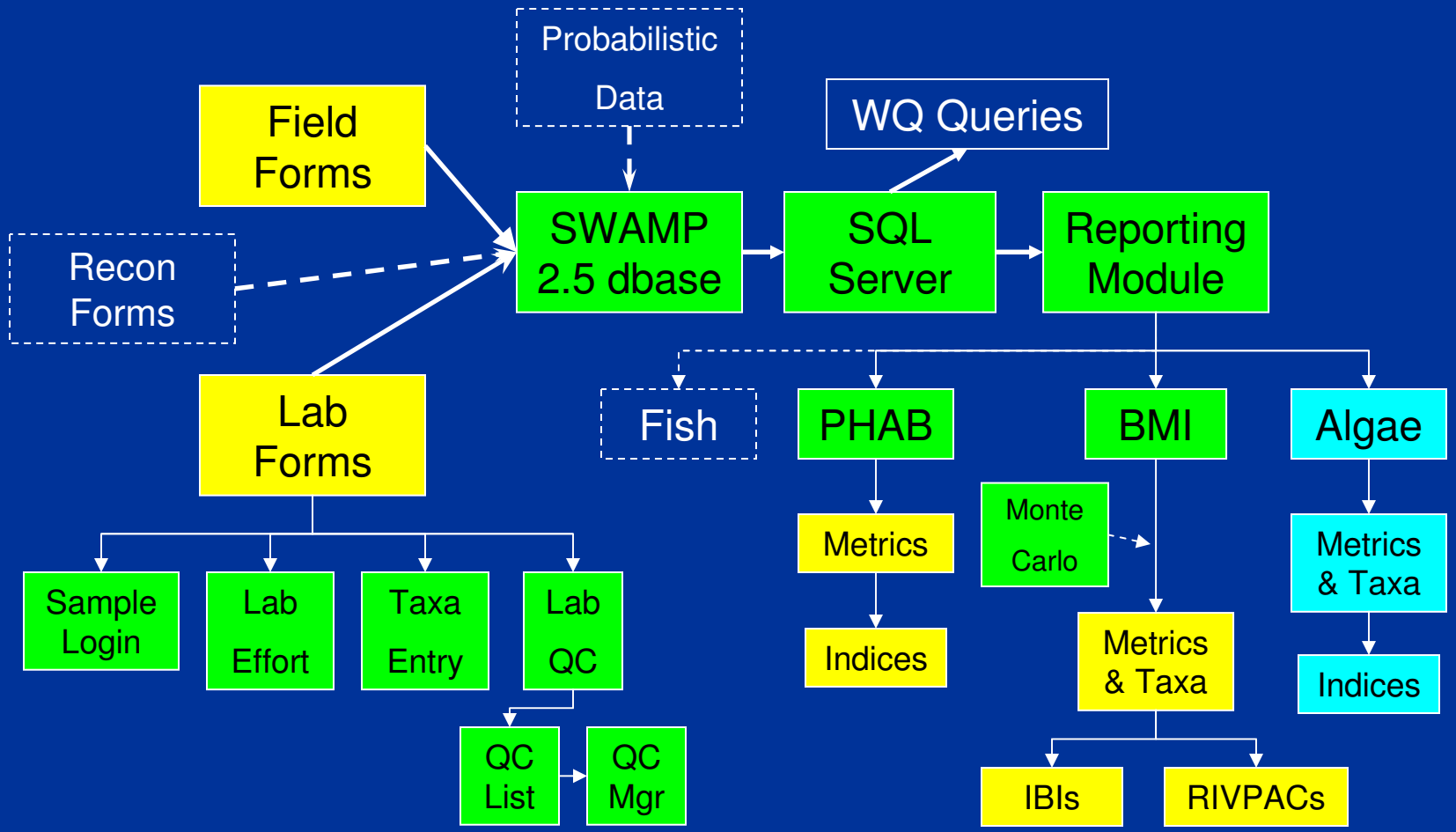
4. Methods Standardization

"How to" manuals for statewide implementation

- Standard SWAMP methods for BMIs, PHAB
- SWAMP SOP for freshwater algae
- Standard method for wetlands (CRAM)
- Rigor of method for tool development may not be same as needed for implementation of biological objectives
- Need to develop "How to" manuals for statewide implementation



5. Information Management



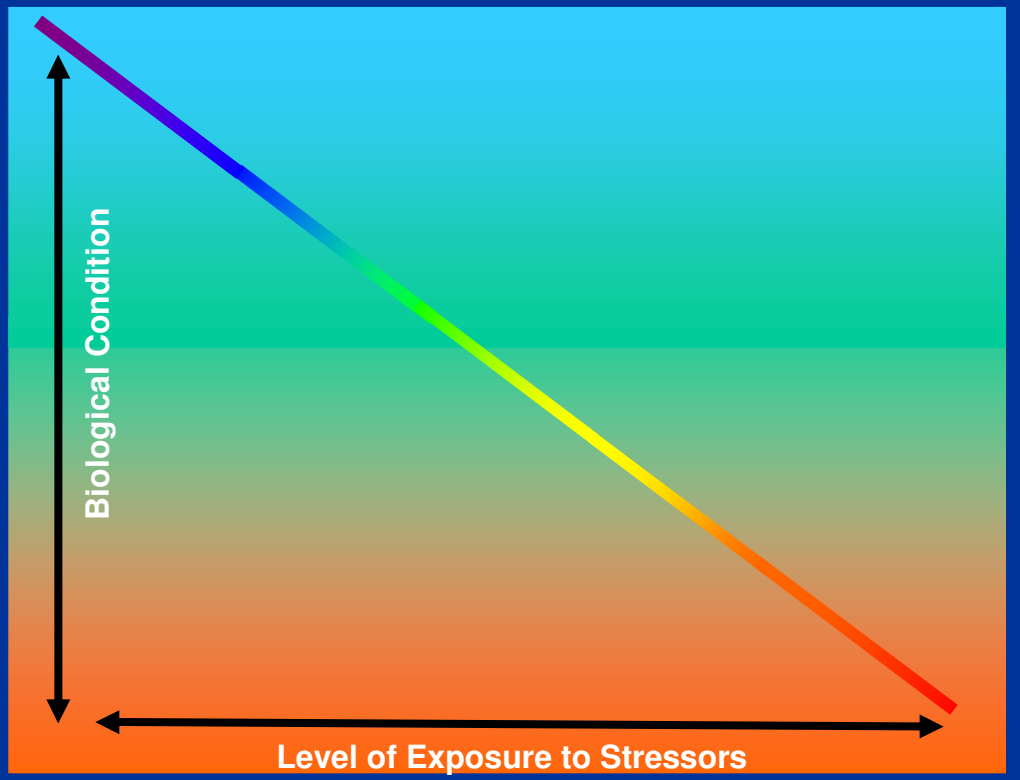
SWAMP building the information management infrastructure

** Need to make it user friendly (Data In Assessments Out)*

6. Stressor Identification

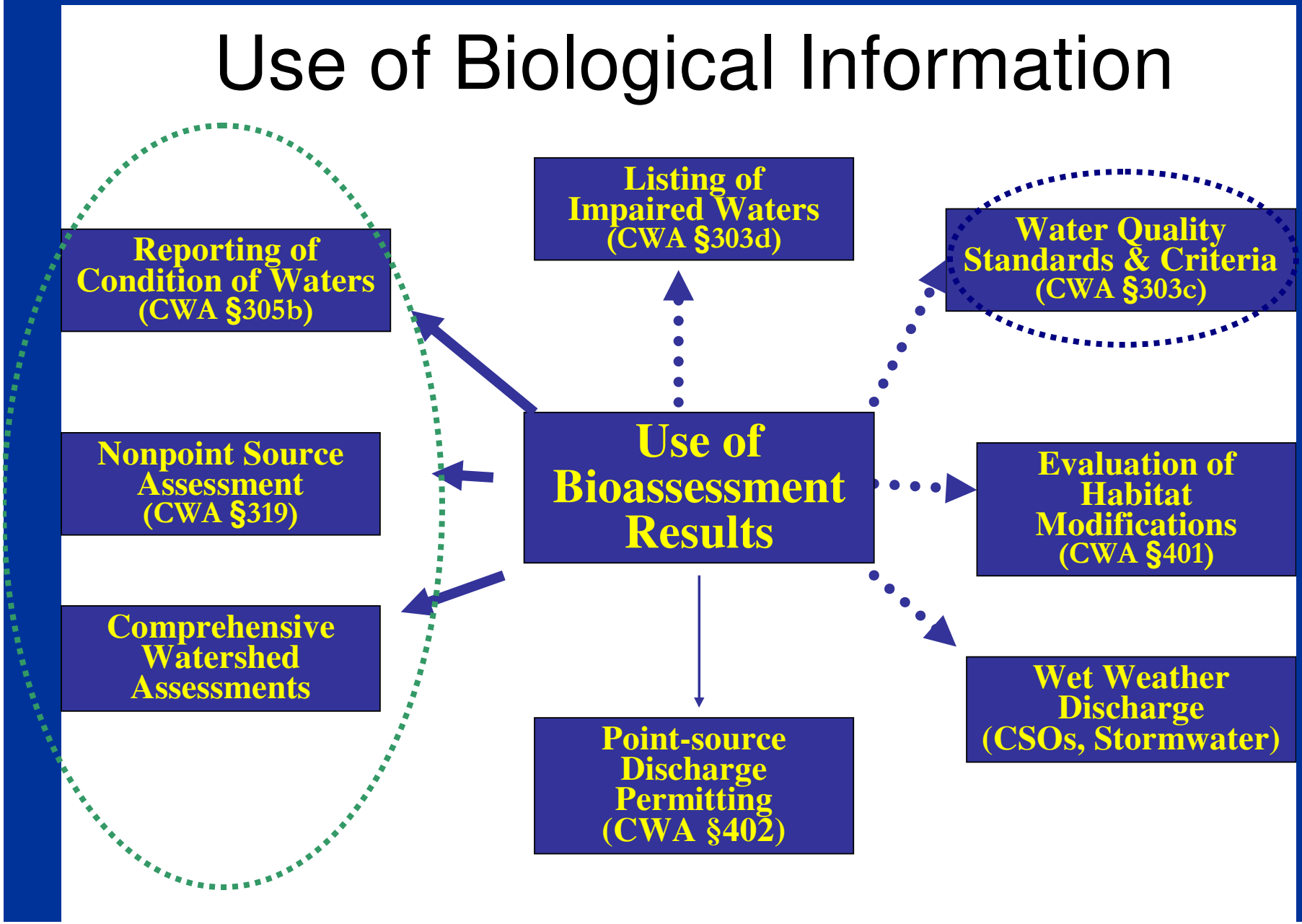
- **Multiple approaches**
  - **Correlations**
  - **Relative Risk**
  - **Tolerance Values**
  - **Mechanistic approaches**
- **Test each using CA data**
- **Recommendation for future stressor identification development**

How does biology respond to stressors?



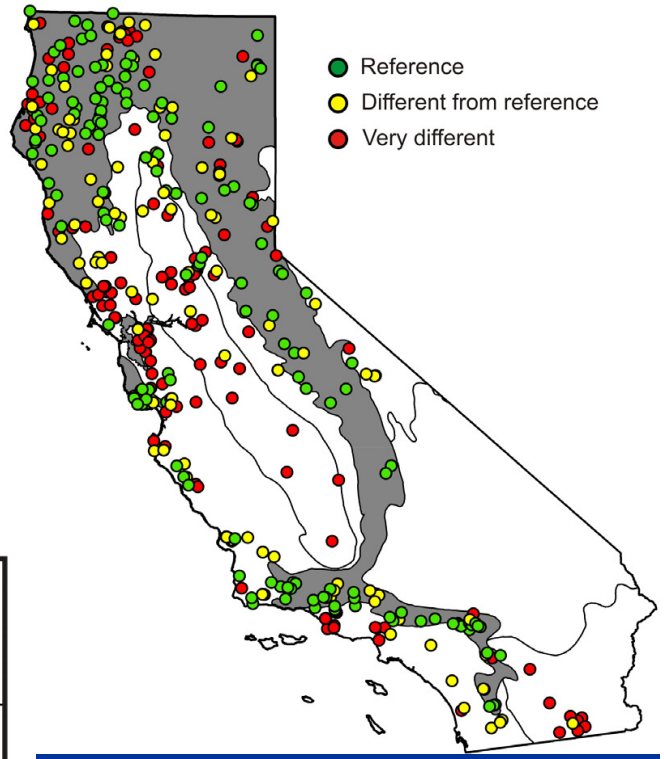
Knowing how the biology responds, helps us know what to fix

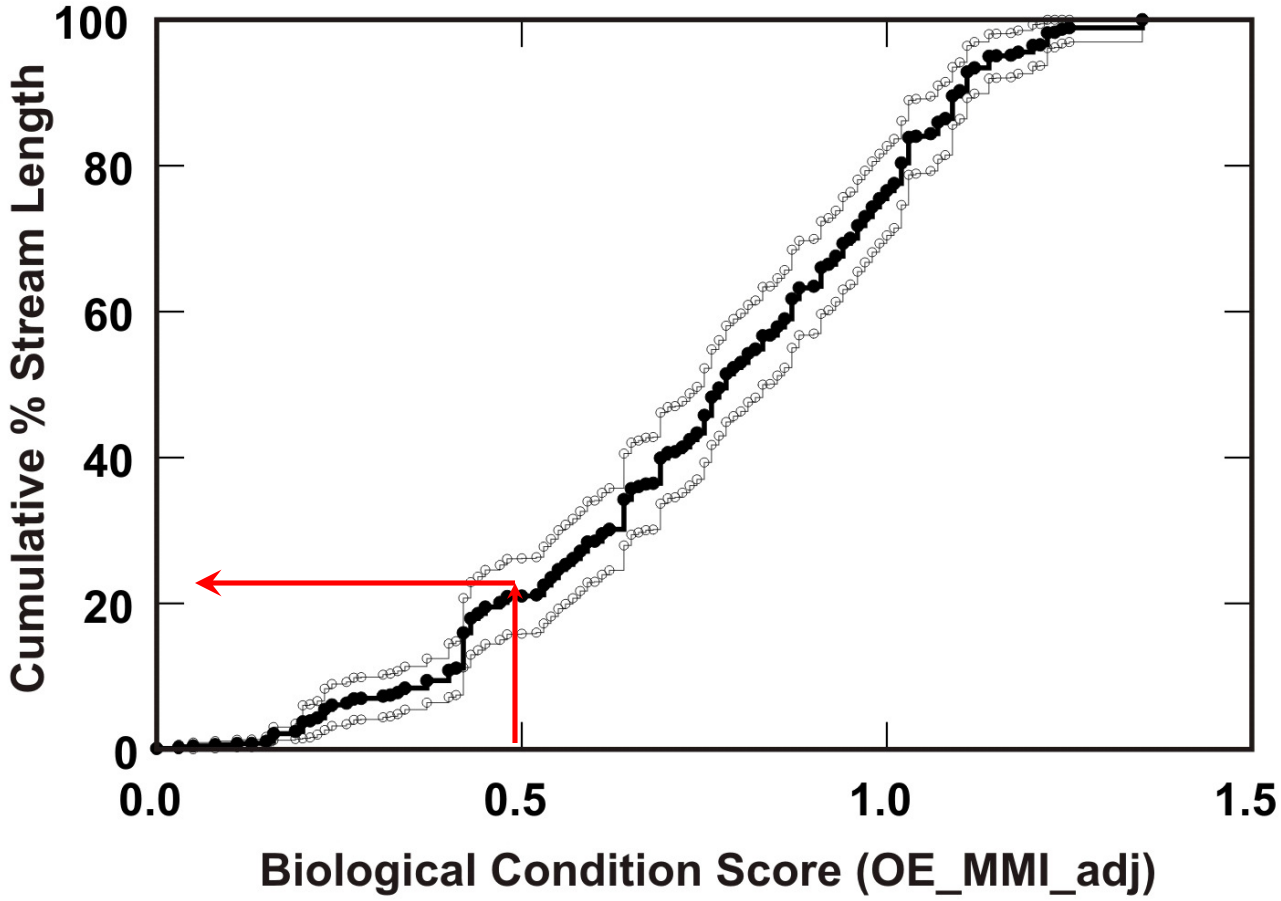
7. Program Linkages (Regulatory and Non-Regulatory)



8. Rulemaking

- **Legislatively defined process**
  - **Staff Equivalent Document**
  - **Supporting materials**
- **CEQA documentation**





SWAMP Stream Surveys can be used to support CEQA documentation

9. Outreach

- **Critically important step for transparency, communication, and input**

Regulatory Review Committee

Stakeholder Review Committee

Scientific Steering Committee

Three subcommitees work in combination to enhance communication, policy building, and minimizing road blocks

10. Training

- **Post adoption needs to ensure implementation success**
- **Curriculum**
  - **How to collect data**
  - **Data interpretation**
  - **How data will be used in regulation**
  - **What to do if one fails**
- **Series of workshops**
  - **Regulatory**
  - **Regulated**
  - **NGOs**

Timeline	Task
3 months	Workplan Complete
	Stakeholder Committee Formation
8 months	Regulatory Committee Formation
9 months	Scientific Steering Committee Formation
	• Technical Work Element Review and Approval
15 months	Scientific Steering Committee review
	• RCMP, Method Standardization, IM
21 months	Scientific Steering Committee review
	• Bioassessment Indices, Segment Classification
27 months	SSC Final Buy-off on written Technical Reports
30 months	Final draft documents to Stakeholder Committee
33 months	SWRCB Workshop on Bio-objectives Process
After Wkshop	CEQA, Economic Analysis, Training
	SWRCB Adoption Workshop

BUDGET

TASK	SWAMP (SFY 06,07,08)	SWAMP SFY 09	Stimulus Funds	SFY 10?
1. Reference condition	$1,250K	$750K		$500K
2. Waterbody classification			$325K	$325K
3. Assessment tool development	$320K	$425K		$20K
4. Methods standardization	$538K	$50K		$20K
5. Information management	$200K	$75K		
6. Stressor identification	$70K			$750K
7. Program linkages				$100K
8. Rulemaking				$250K
9. Outreach			$275K	
10. Training				$135K

Doesn't include perennial stream survey costs

Implementing the Standard

1. Identify and restore degraded waters

   Basis for identifying degraded waters (303(d) list)

   Basis for setting restoration goals that can be implemented through regulatory processes (e.g., TMDLs)

2. Identify and protect threatened waters

3. Identify and protect high quality waters

Identifying and Restoring Impaired Waters

California Listing Policy

- BIOASSESSMENT is an assessment of biological community information *along with* measures of the *physical/habitat quality* to determine, in the case of water quality, the integrity of a waterbody of interest.

Identifying Impaired Waters
(3.9 Degradation of Biological Communities)

- A water segment shall be placed on the section 303(d) list if the water segment exhibits:
  - significant degradation in biological populations and/or communities as compared to reference site(s)

and

  - is associated with water or sediment concentrations of pollutants (e.g., Chem, Temp, DO or Trash).

6.1.5.8 Evaluation of Bioassessment Data

1. Identify appropriate reference sites within water segments, watersheds, or ecoregions.

2. Document methods for selection of reference sites.

3. Evaluate bioassessment data at reference sites using water segment-appropriate method(s) and index period(s).

4. Document sampling methods, index periods, and Quality Assurance/Quality Control procedures for the habitat being sampled and question(s) being asked.

5. Evaluate bioassessment data from other sites, and compare to reference conditions.

6. Evaluate physical habitat data and other water quality data, when available, to support conclusions about the status of the water segment.

7. Calculate biological metrics for reference sites and develop Index of Biological Integrity if possible.

Identifying and restoring waterbodies

Site Exceedance

a

Waterbody Assessment

b

Impaired

Not Impaired

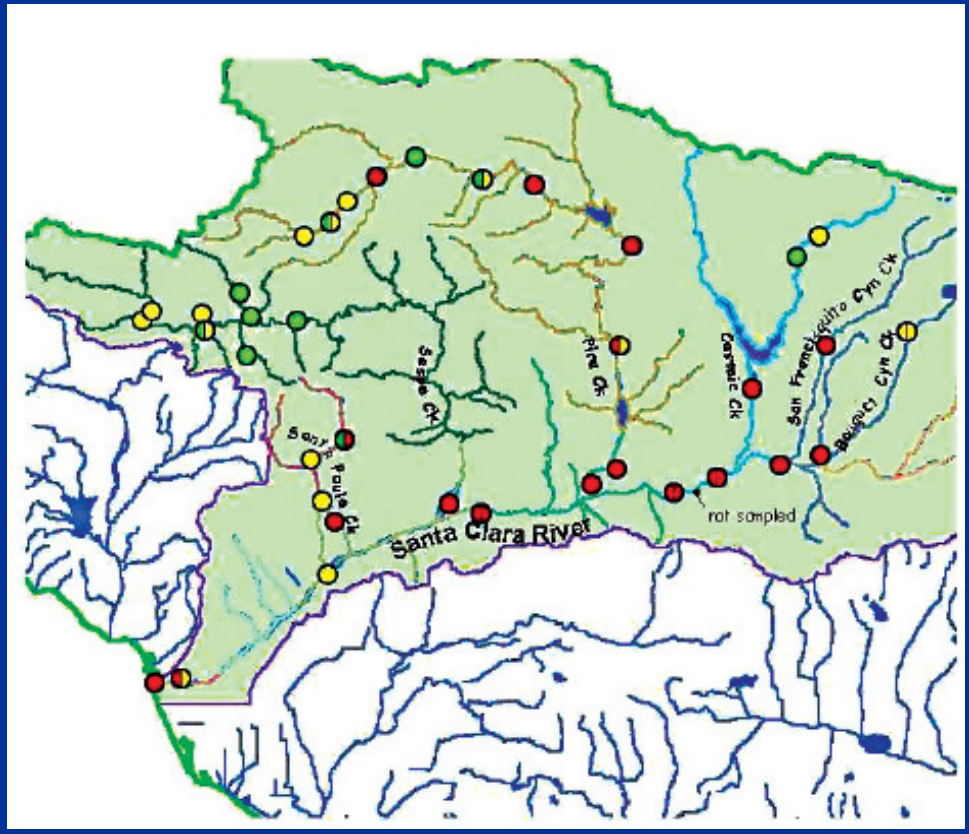
b

TMDL needed

Other program will fix

Impairment not due to pollution

Santa Clara River Watershed



a. How do you go from site to waterbody assessment?

b. Where does stressor identification fit in the process?

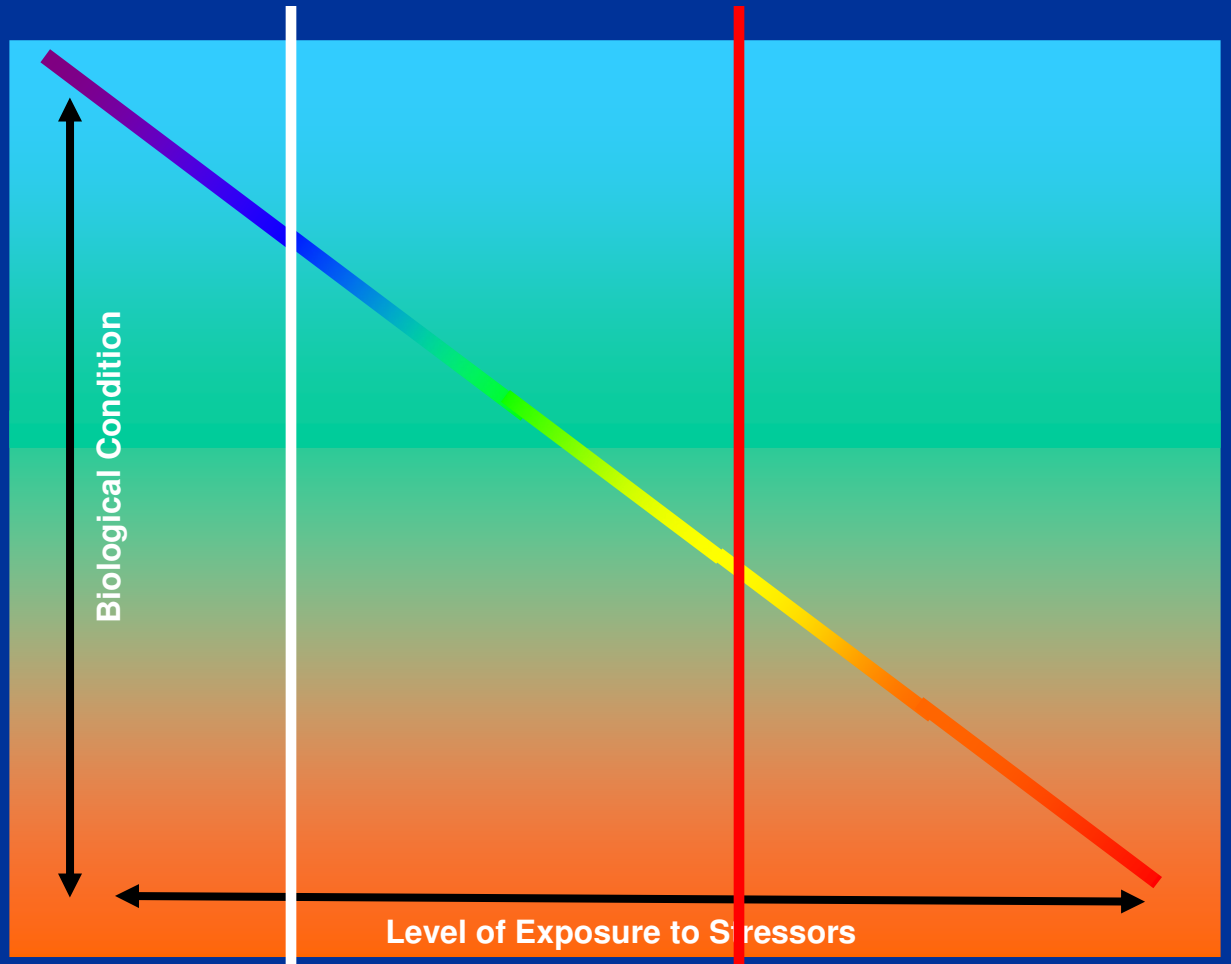
Implementing the anti-degradation policy*

1. Identify and restore degraded waters
   - Basis for identifying degraded waters (303(d) list)
   - Basis for setting restoration goals that can be implemented through regulatory processes (e.g., TMDLs)

2. Identify and protect threatened waters
   - Above the listing threshold but not as good as can be
   - Above the listing threshold but in an area subject to future stress

3. Identify and protect high quality waters
   - Above the threshold and worthy of additional protection

Implementing an Anti-degradation Policy

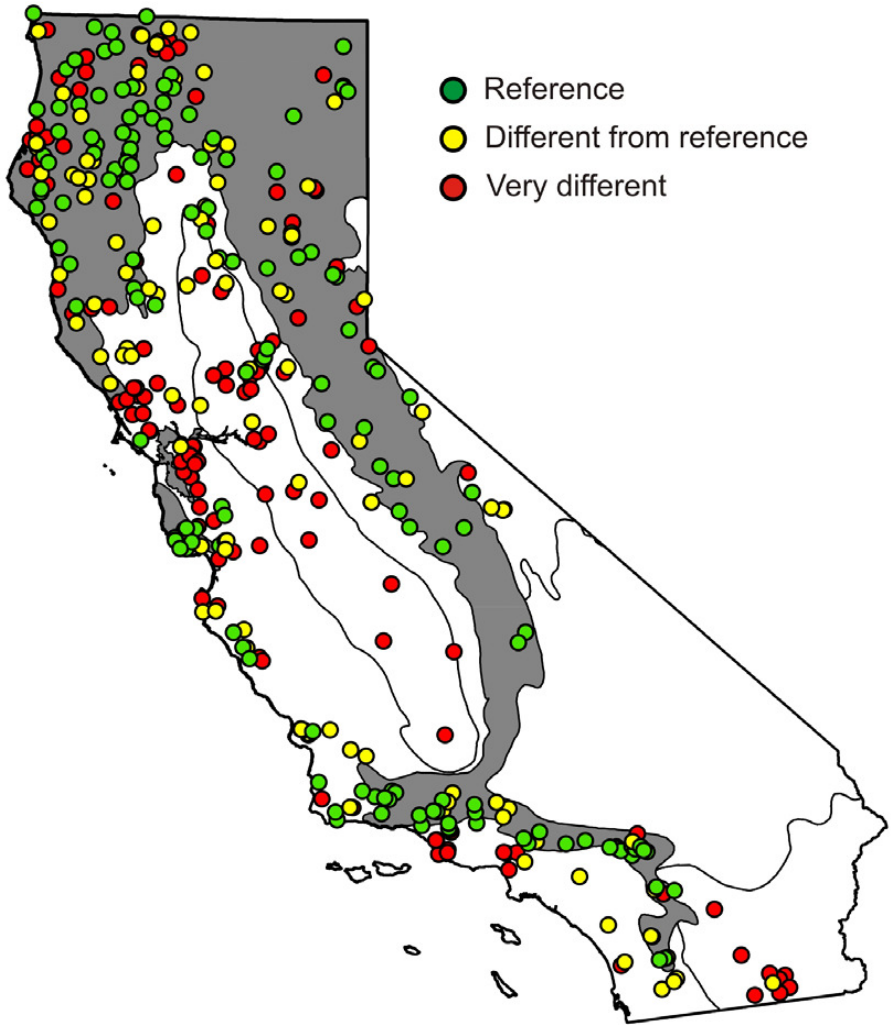


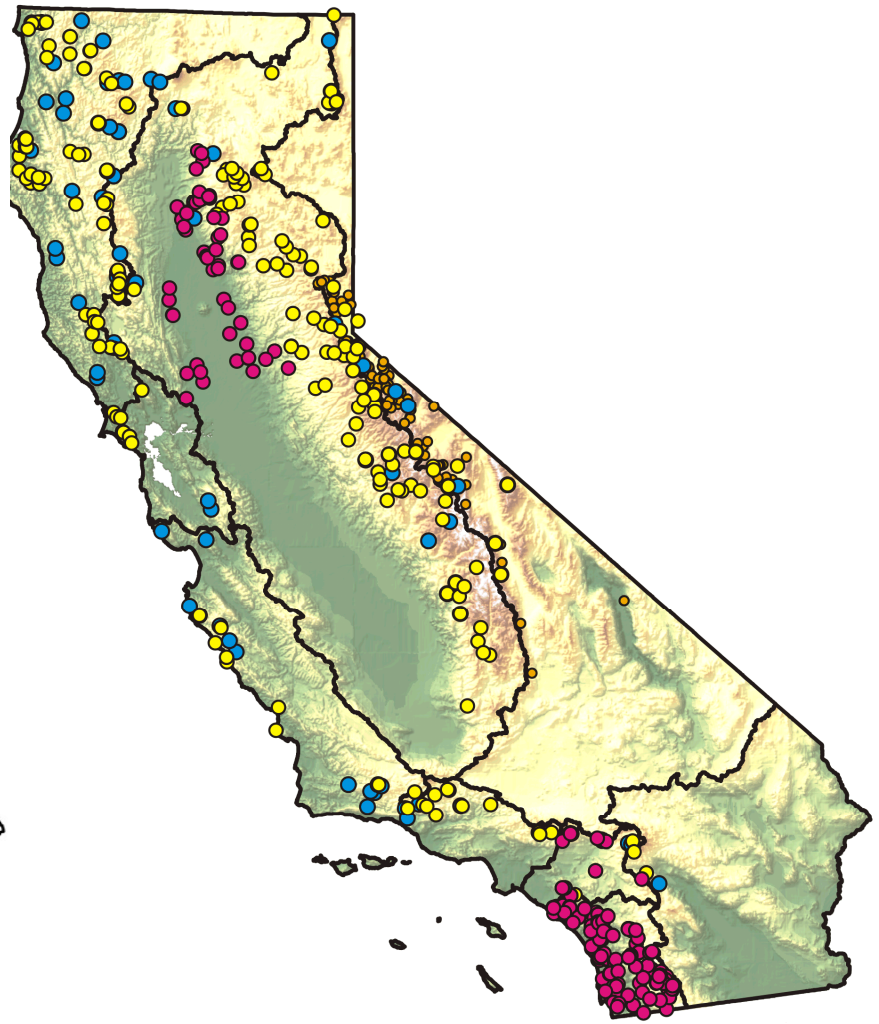
Tier 3
High Quality Waters
No Degradation

Tier 2
Meeting Uses
Antidegradation
analysis required

Tier 1
Impaired Waters
No further degradation

Identifying high quality streams in California

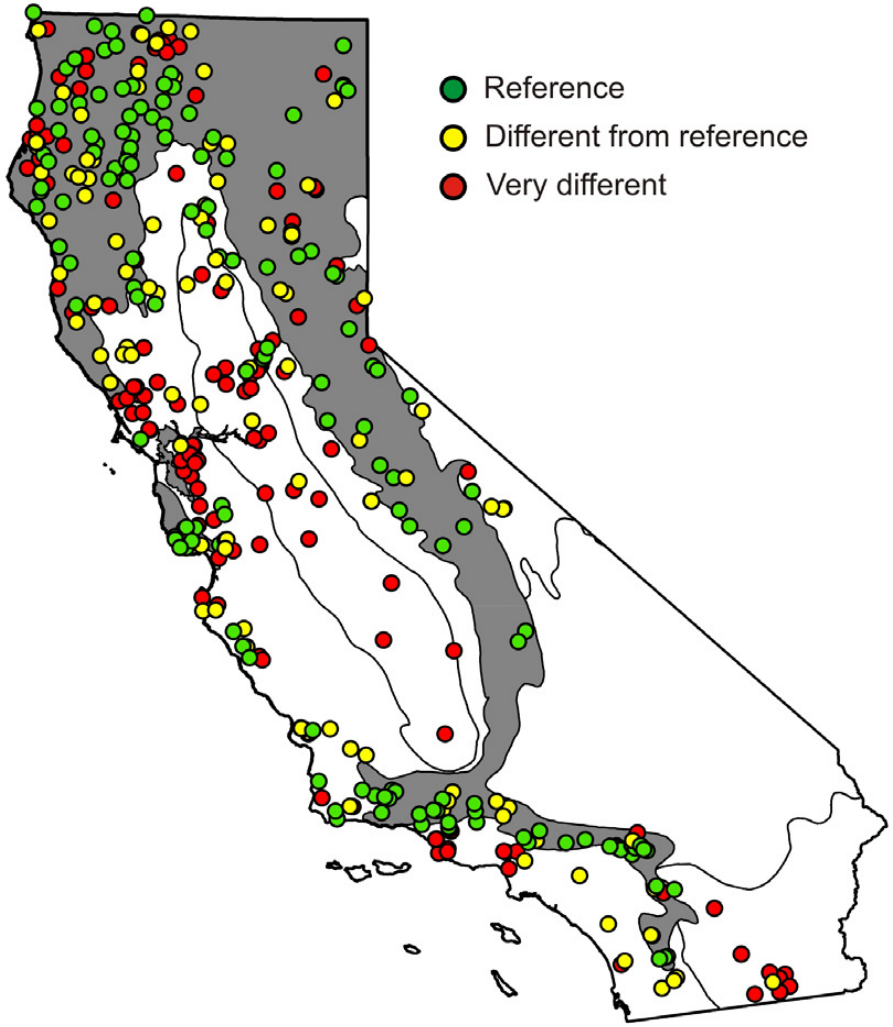




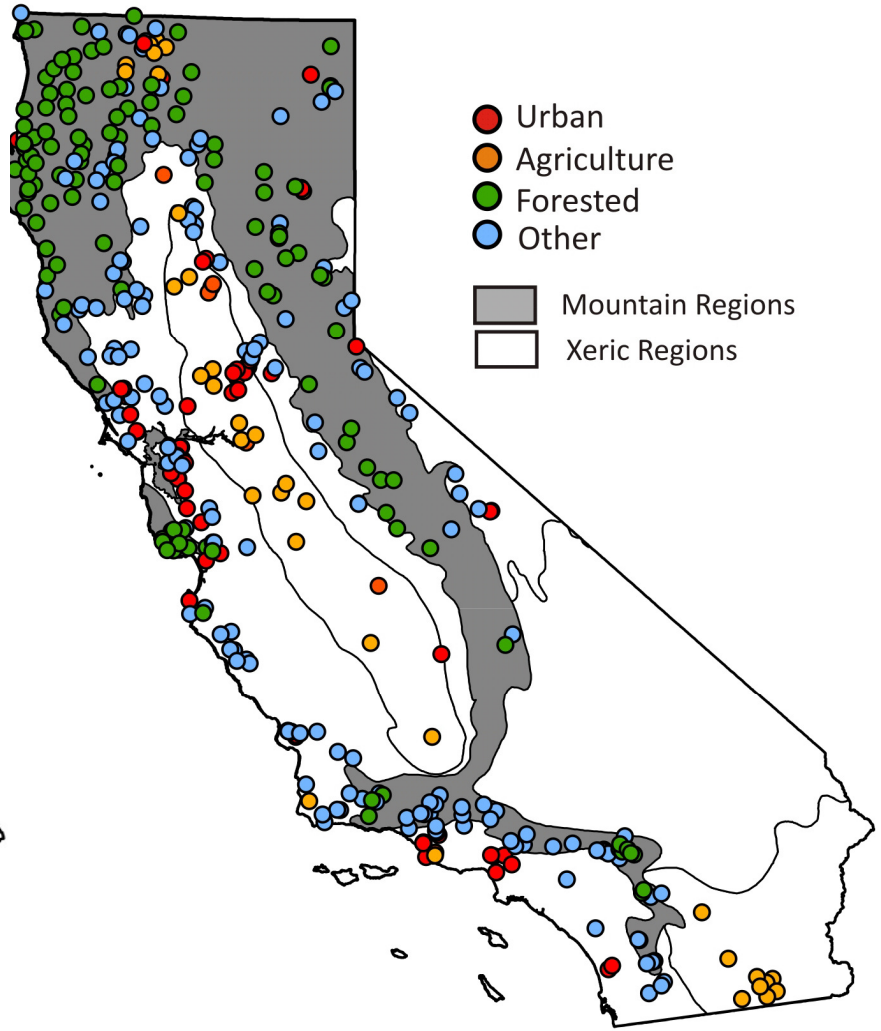
Results from the stream surveys

Reference Site Screening

Identifying threatened streams in California

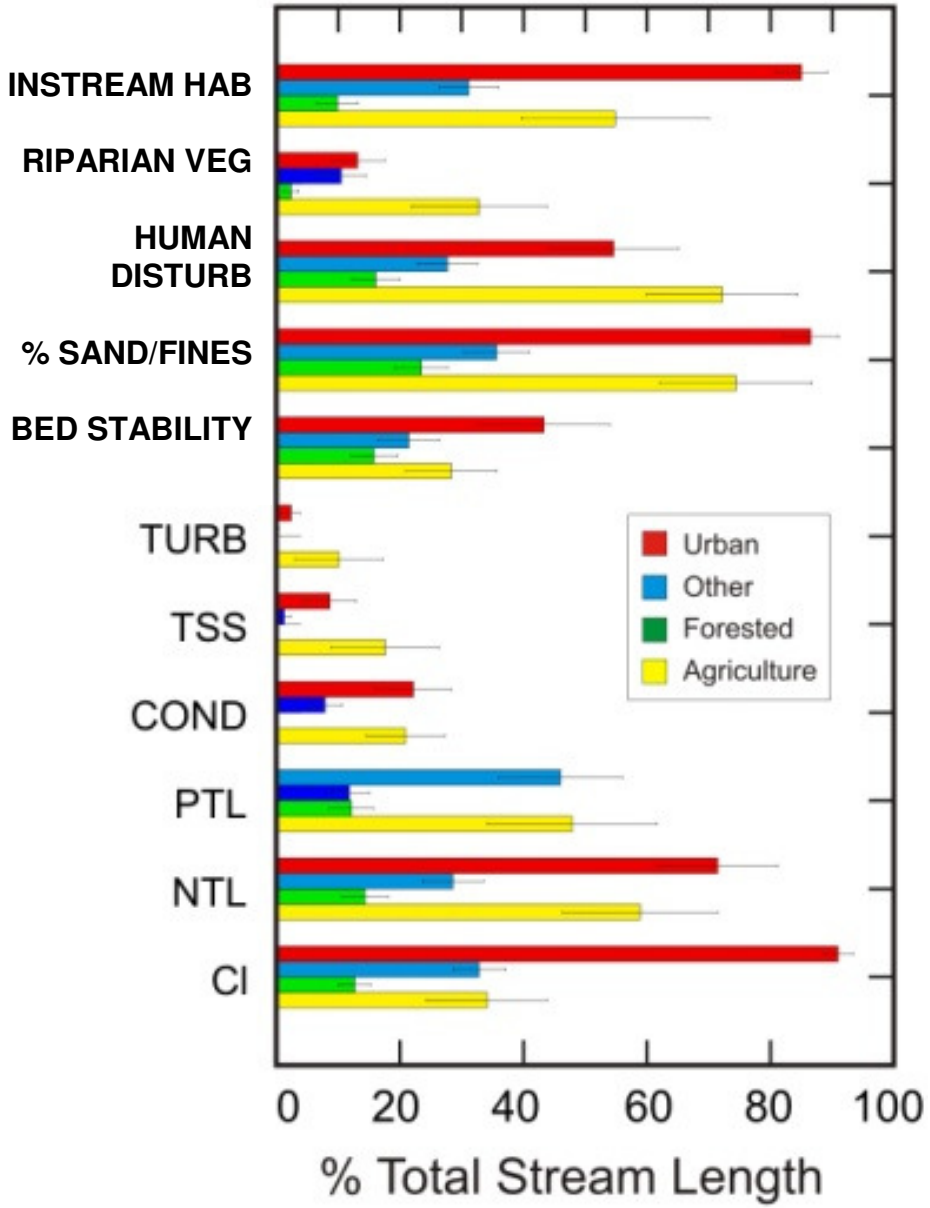


Where are the threatened streams?
(above but not as good as could be)



Where are streams are at risk?
(areas at risk for development)

Stressor Extent by Landuse from the perennial stream survey



Streams in Urban watersheds (2%)
- 85% have poor instream habitat
- 90% have excess fines
- 70% have high nitrogen (>0.6 mg/l)
- 90% have high chlorides

Streams in Ag watersheds (12%)
- 55% have poor instream habitat
- 75% have excess fines
- 60% have high nitrogen (>0.6 mg/l)
- 50% have high phosphorus

Relative Risk Calculations

3x as likely to have bad bugs if watershed >50% Ag or >25% Urban

4x as likely to have bad bugs if Ag + Urban > 40% of watershed

Why Develop Biological Objectives?

- It's time
  - We've spent years and millions developing bioassessment
    - We've got a good program (Critical Elements Review said so)
    - Time to take the next step (Jon Bishop said so)
- It's urgent
  - The resources are at risk (our stream surveys say so)
    - We need regulatory tools to protect the resources
    - We need to get these tools to practitioners and decision makers
- It provides regulatory framework stream protection
    - Impaired streams (303(d) Listing process)
    - Threatened streams (Antidegradation analyses)
    - High quality streams (Protection under antidegradation)