



CALIFORNIA'S BIOLOGICAL ASSESSMENT PROGRAM 10 Years Toward Biocriteria

Jim Harrington
WPCL Bioassessment Laboratory



STATE OF CALIFORNIA
RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME
FISH AND WILDLIFE
WATER POLLUTION
CONTROL LABORATORY

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DFG Aquatic Bioassessment Laboratory

Rancho Cordova and Chico State Laboratory



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Staff Environmental Scientists

Research/Taxonomy

Dr. Pete Ode
Dr. Andrew Rehn

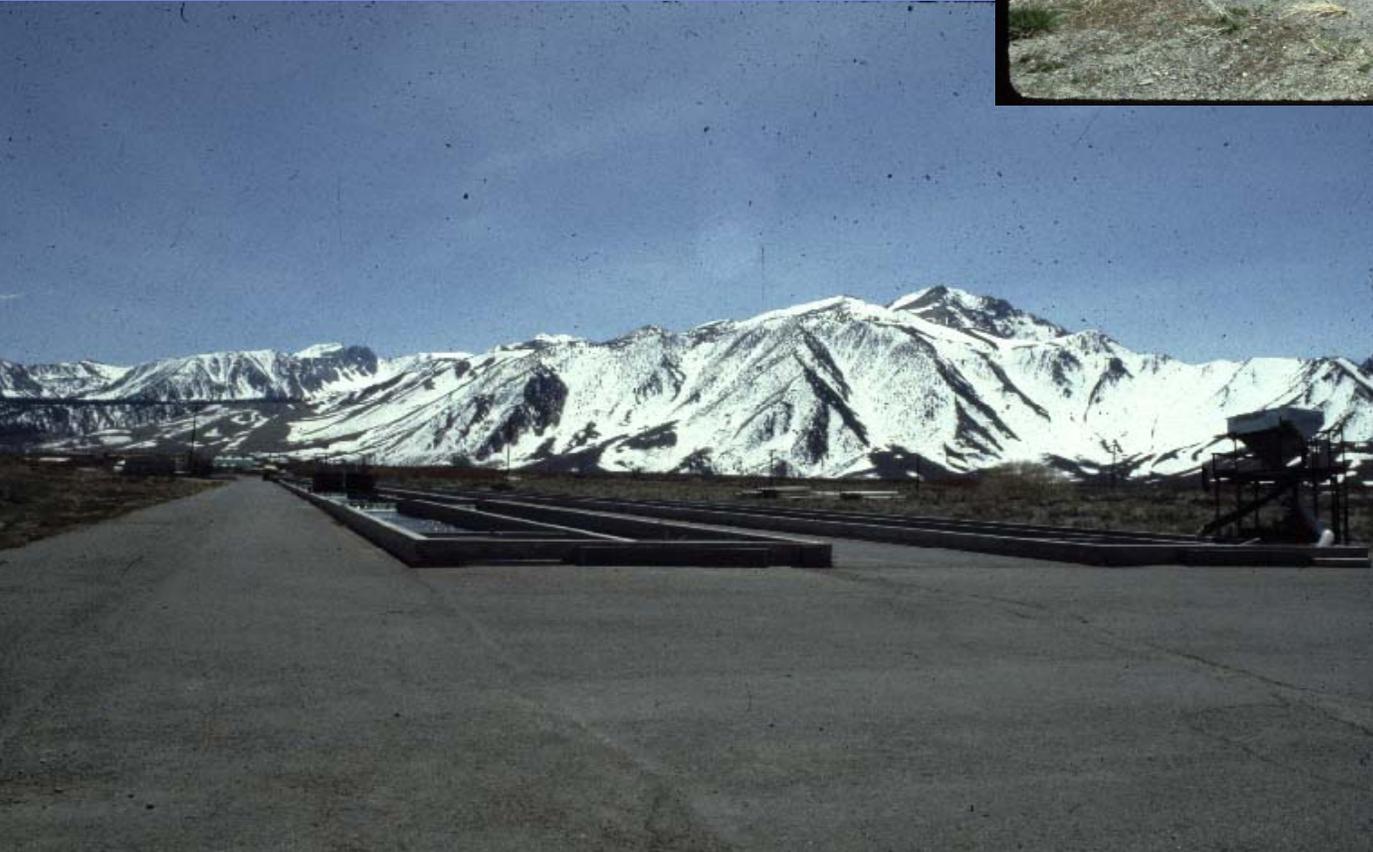
Enforcement
Angie Montalvo
Amy Tsuji

EMAP/Field
Mike Dawson
Jennifer Lenz
Shawn McBride
Glenn Sibbald
Nathan Brosius
Tim Mulloy

Taxonomist
Doug Post
Dan Pickard
Brady Richards
Joe Slovark
Lab Techs
Stacy Kraus
Jennifer Moore
Ryan Brosius
Rueben Mahnke

California Department Of Fish and Game

Use of Bioassessment



**Fish Hatchery NPDES
Permit Requirements**

**Hot Creek Hatchery
1993
1999-2003**

Enforcement of DFG Code 5650

Spill Response



Natural Resource Damage Assessment (NRDA)



or *Bucks for Bugs*



DFG Efforts Toward Developing Biocriteria in California

Just Do It

Communicate and Educate

Join Forces to Build Capacity

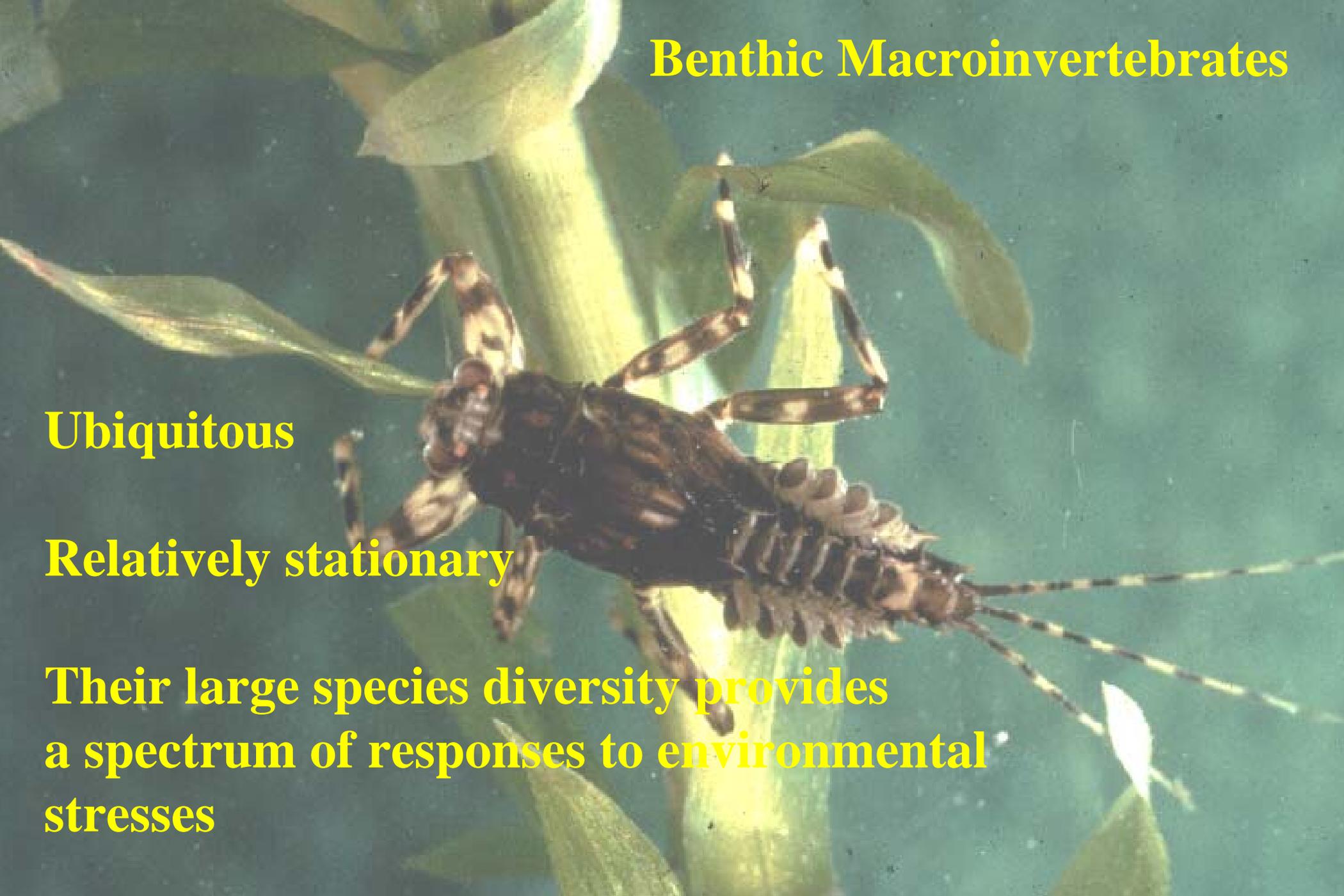
Regroup and Strategize for Future

Benthic Macroinvertebrates

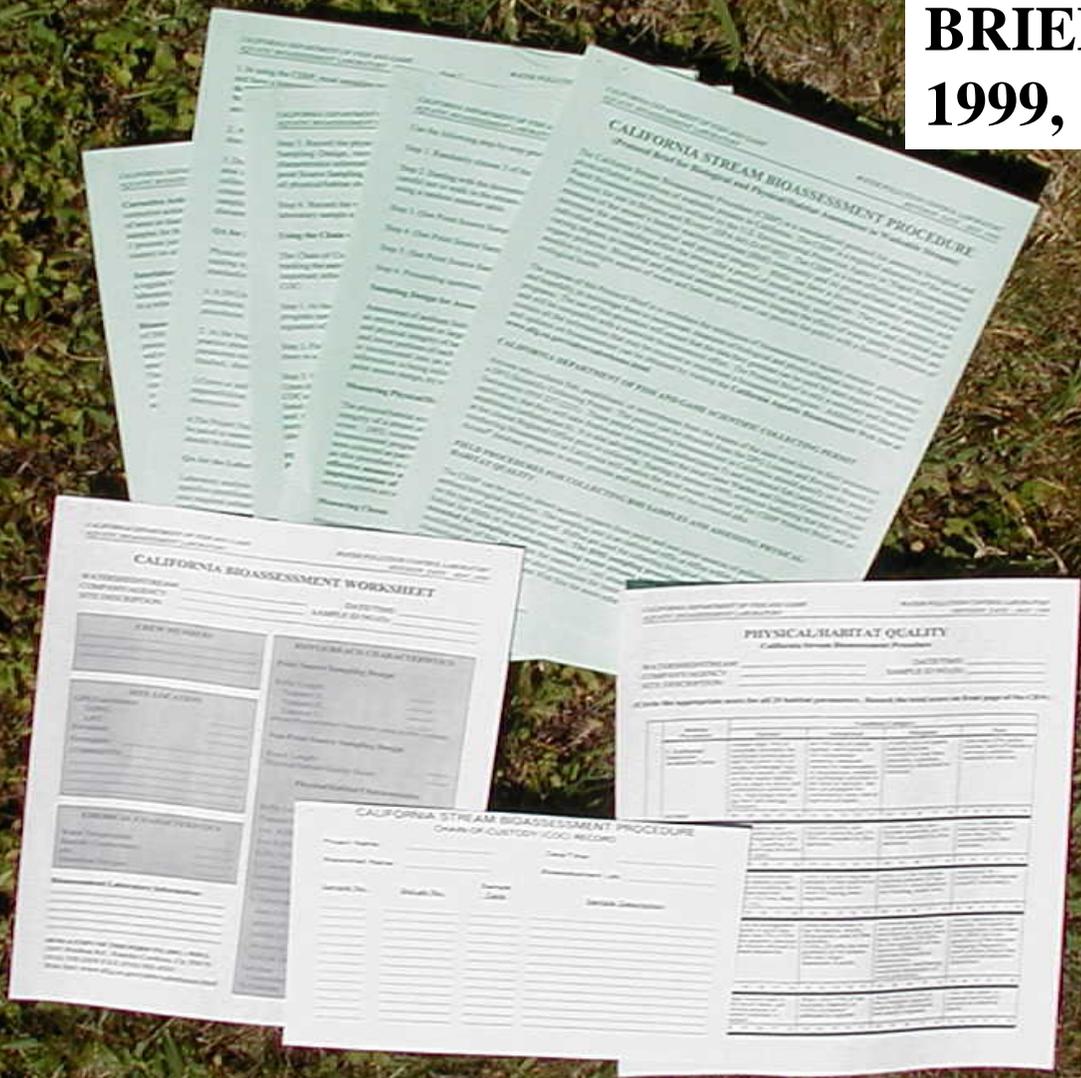
Ubiquitous

Relatively stationary

**Their large species diversity provides
a spectrum of responses to environmental
stresses**



CSBP PROTOCOL BRIEF – 1993, 1996, 1999, **CSBP 2003**



Rapid Biological Assessment California Stream Bioassessment Procedure (CSBP) for High and Low Gradient Streams

Cost effective

**0.5 mm Mesh
D-frame Net
Richest Habitat (Riffle)
Sample 18 ft² Habitat
3 Replicate Samples or
1 Composite**



**Benthic
Macroinvertebraes**

Rapid Biological Assessment

Rapid Physical/Habitat

U.S. EPA RBP

Quantify:

Canopy Cover

Stream Size

Substrate

Flow



08 21 2001



DFG's success in developing and promoting a standardized and consistent field and laboratory protocol can be attributed to...

California Aquatic Macroinvertebrate Laboratory Network (CAMLnet)

Inter-laboratory QA/QC Program

CalEDAS Database Development



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California Aquatic Bioassessment Workgroup

to bring together all entities involved in bioassessment in California, disseminate information on implementing biocriteria and providing a forum for scientific review of protocols used to develop biocriteria in California



California Aquatic Bioassessment Workgroup

- 1994** Established as a forum to communicate and exchange information
- 1995** Finalization of the California Stream Bioassessment Procedures (CSBP)
- 1996** Formulate the process for developing biocriteria in California
- 1997-1999** Provided a forum for updating attendees on bioassessment and gave examples of current projects
- 2000- 2003** Conduct various workgroup sessions, platform presentation and panel discussion

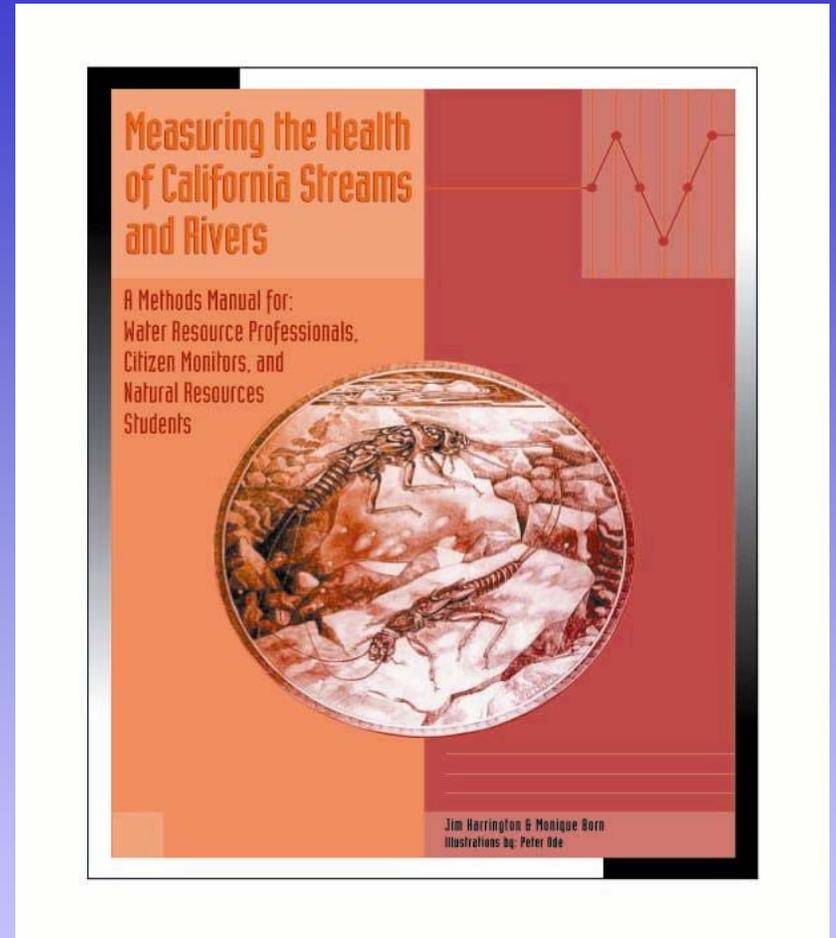


6-day Professional Training
sponsored by
American Fisheries Society
SETAC
Sustainable Land Stewardship Institute

Measuring the Health of California Streams and Rivers

A Methods Manual for:
Water Resource Professionals,
Citizen Monitors, and
Natural Resources Students

www.slsii.org



Jim Harrington & Monique Born
Illustrations by Peter Ode

**SLSI
Training
for
Citizen
Monitors**



**Professional
Level CSBP**

**Family Level
Taxonomy or
Professional**

SOP QAPP

**How to Work
with RWQCB**

**Scientifically
Sound
Environmental
Activism**



DFG Efforts Toward Developing Biocriteria in California

Just Do It

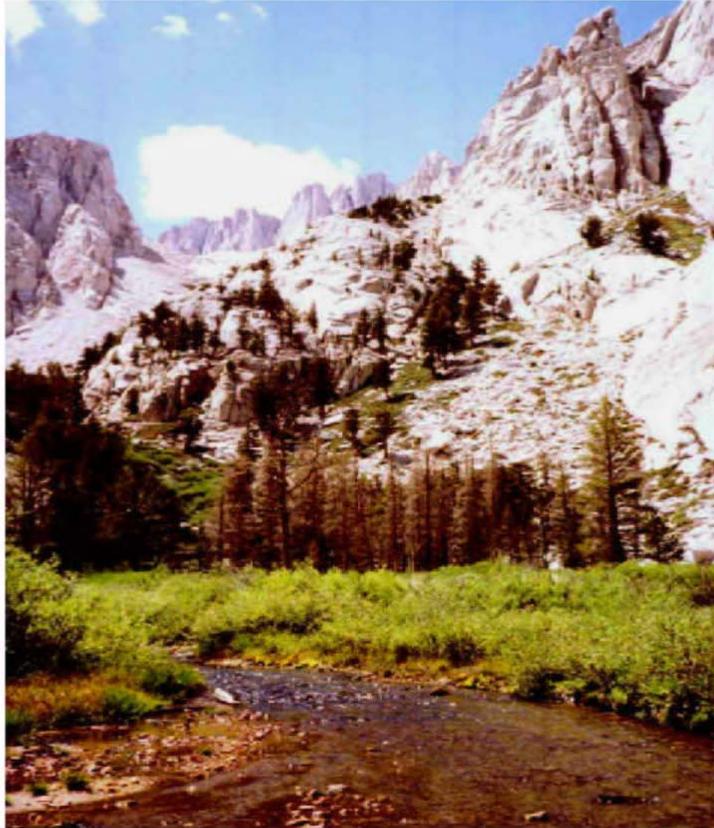
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MONITORING PROGRAMS IN CALIFORNIA

The Status and Future of Biological Assessment for California Streams

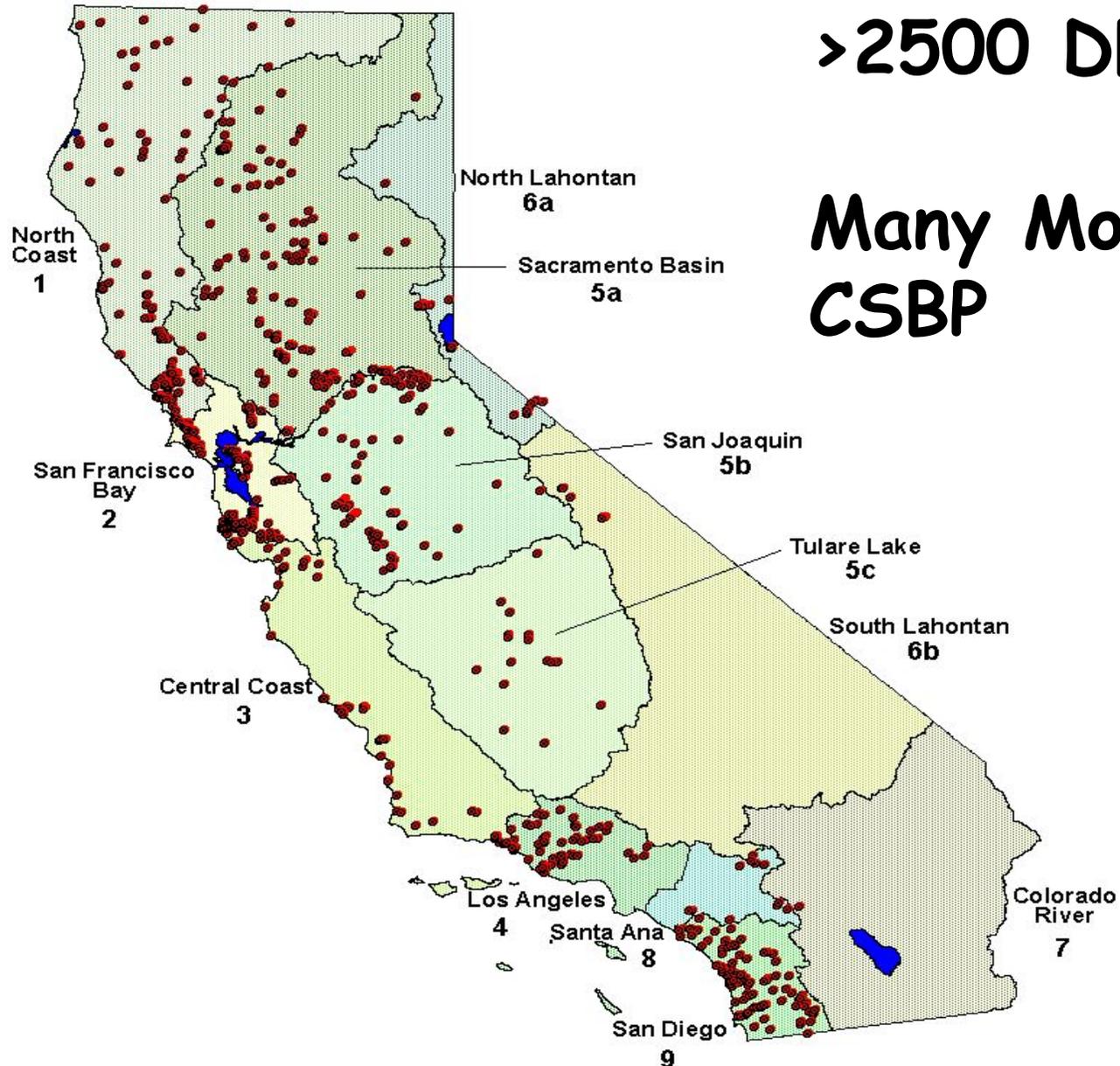


California State Water Resources Control Board
Division of Water Quality
January, 2003
Final Report



DFG Bioassessment Lab
EPA Western Pilot EMAP
USFS Bioassessment Program
USGS NAWQA Program
DWR Northern Division
Santa Clara Valley Project
UC Davis ATL
Hoopa Valley EPA
Yurok Tribe WQ Program
Ventura River Bioassessment Program
Marin County Bioassessment Program
Upper Putah Creek Citizen
Dry Creek Conservancy
Truckee River Aquatic Monitors

ABL Sites by SWQCB Region



>2500 DFG sites

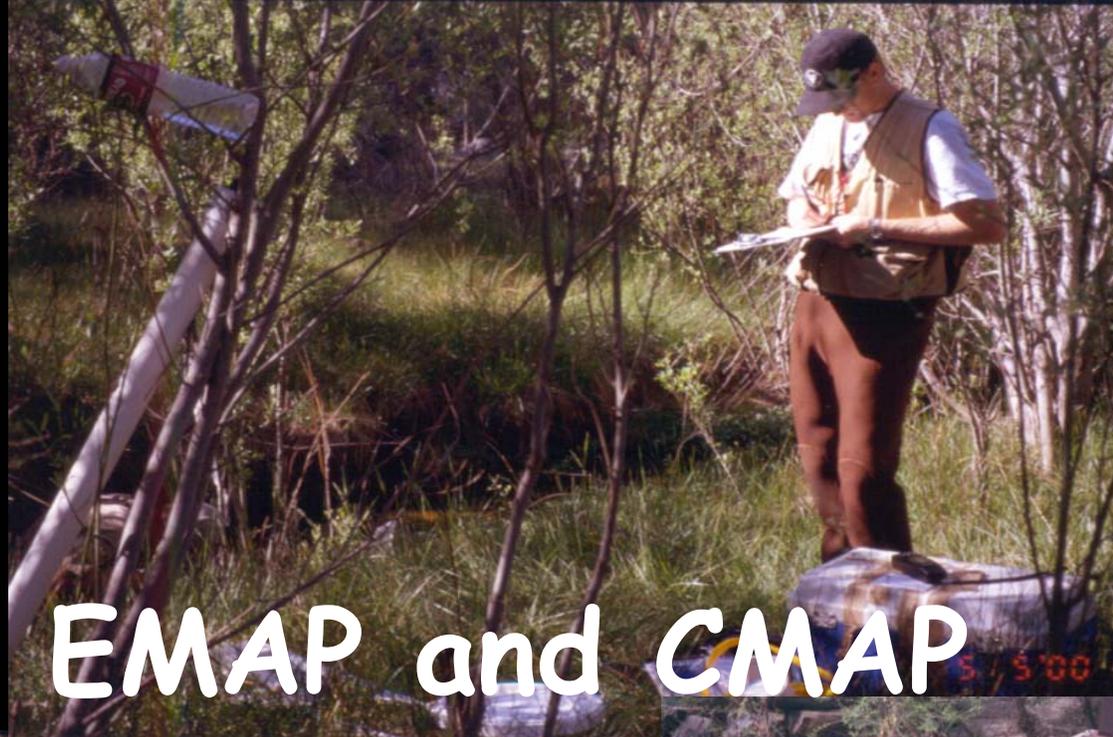
Many More Using
CSBP



Starting 2000

60 sites/year
Probabilistic

Western Pilot EMAP and CMAP



CDFG
U.S. EPA
SWRCB
RWQCB



California Monitoring and Assessment Program (CMAP)

Agriculture, Timber and Urban

Finished State-Wide Reference Sites

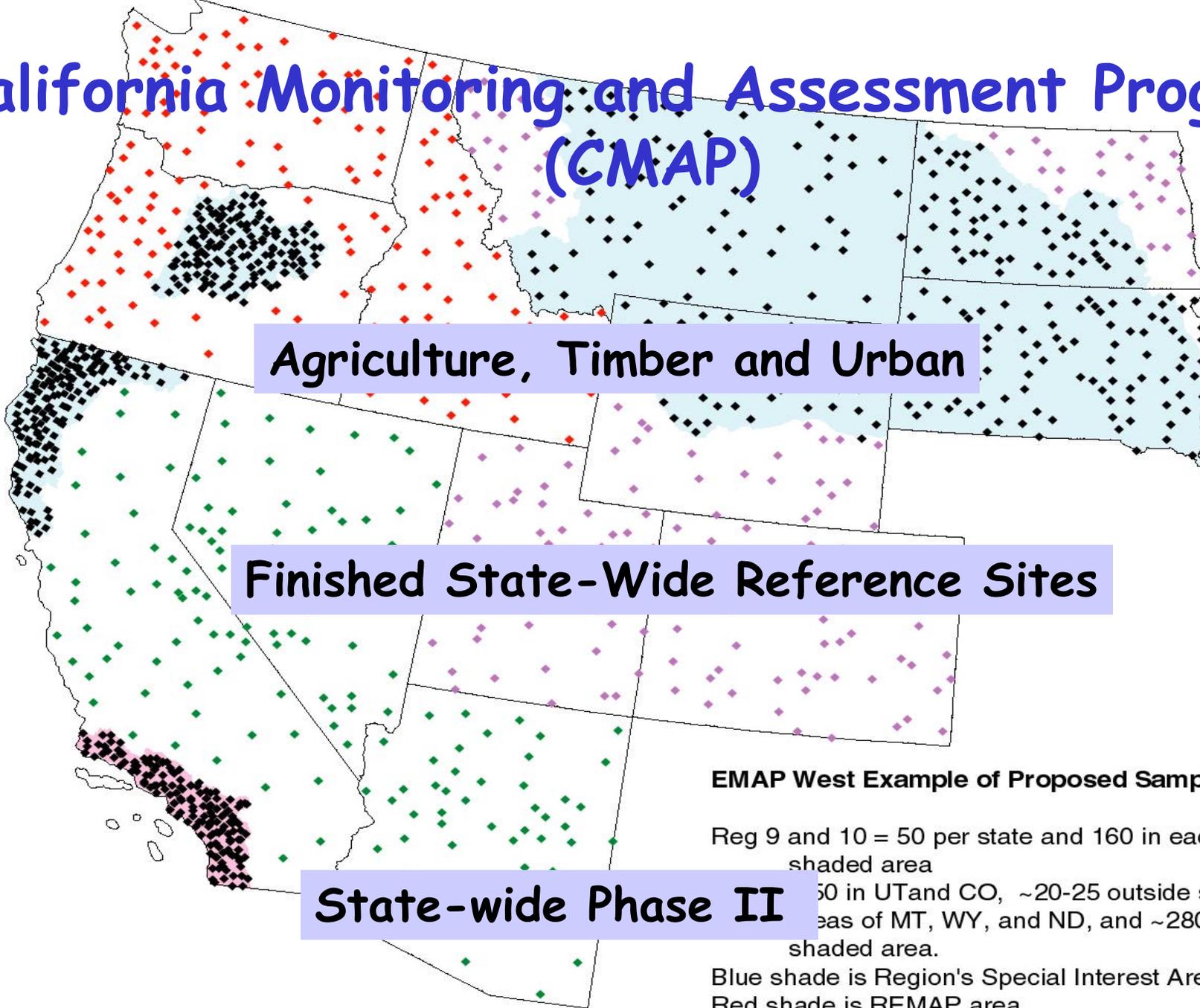
State-wide Phase II

EMAP West Example of Proposed Sample scheme.

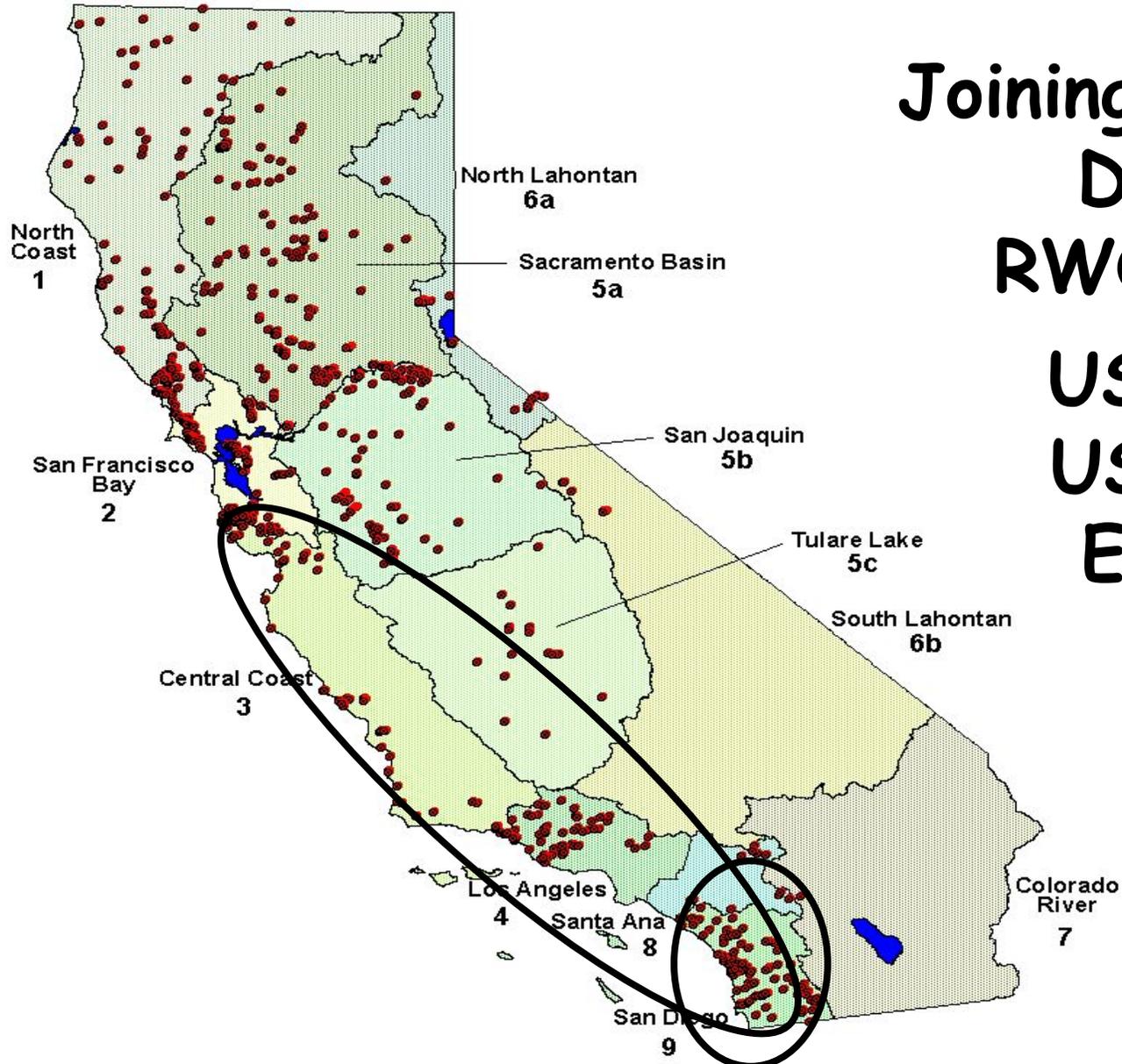
Reg 9 and 10 = 50 per state and 160 in each shaded area

50 in UT and CO, ~20-25 outside shaded areas of MT, WY, and ND, and ~280 within shaded area.

Blue shade is Region's Special Interest Areas
Red shade is REMAP area

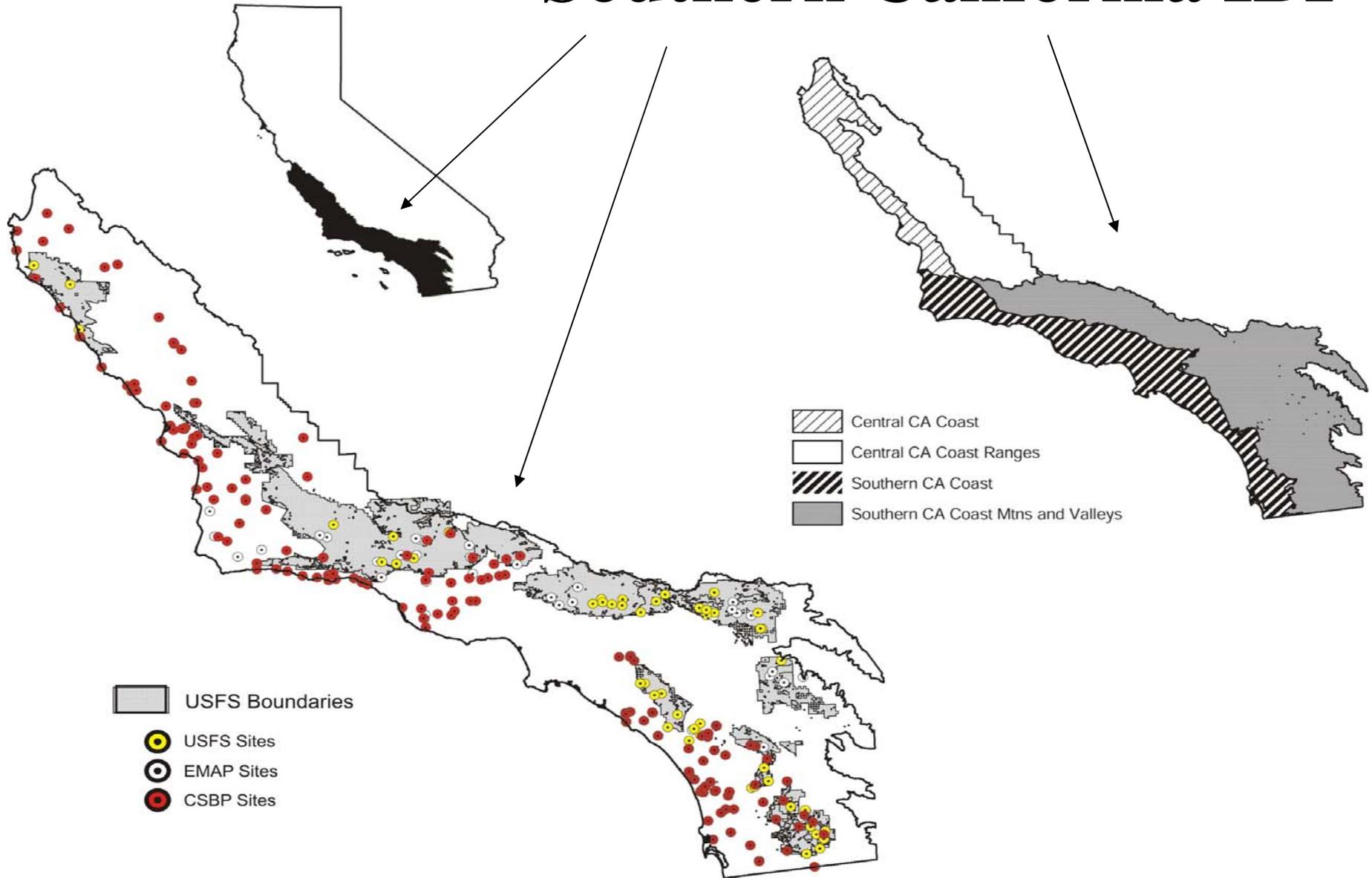


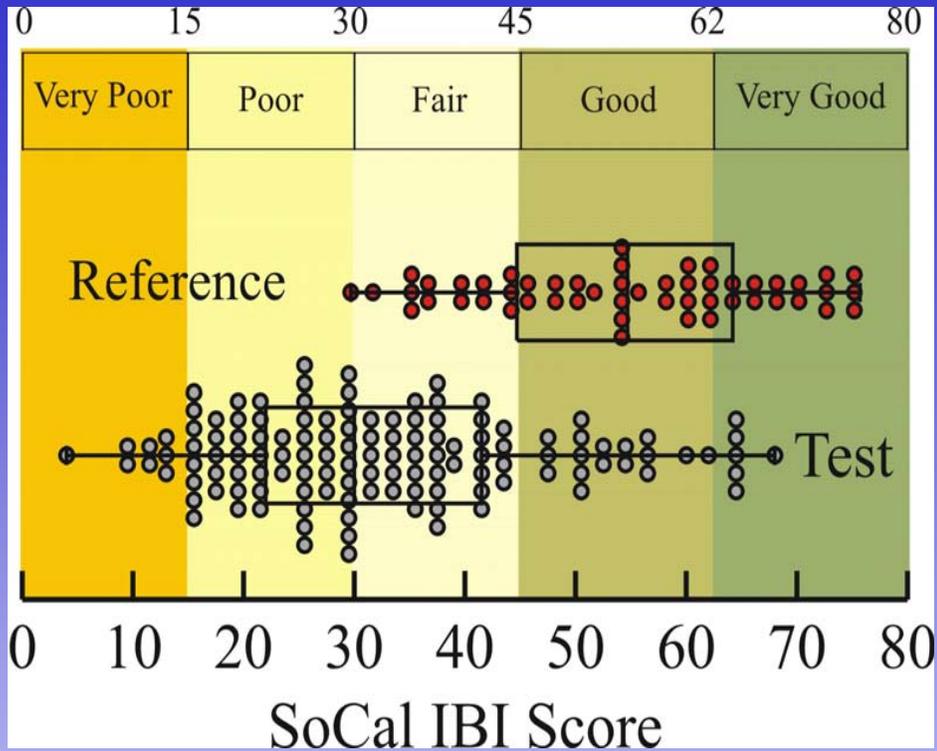
Southern California IBI



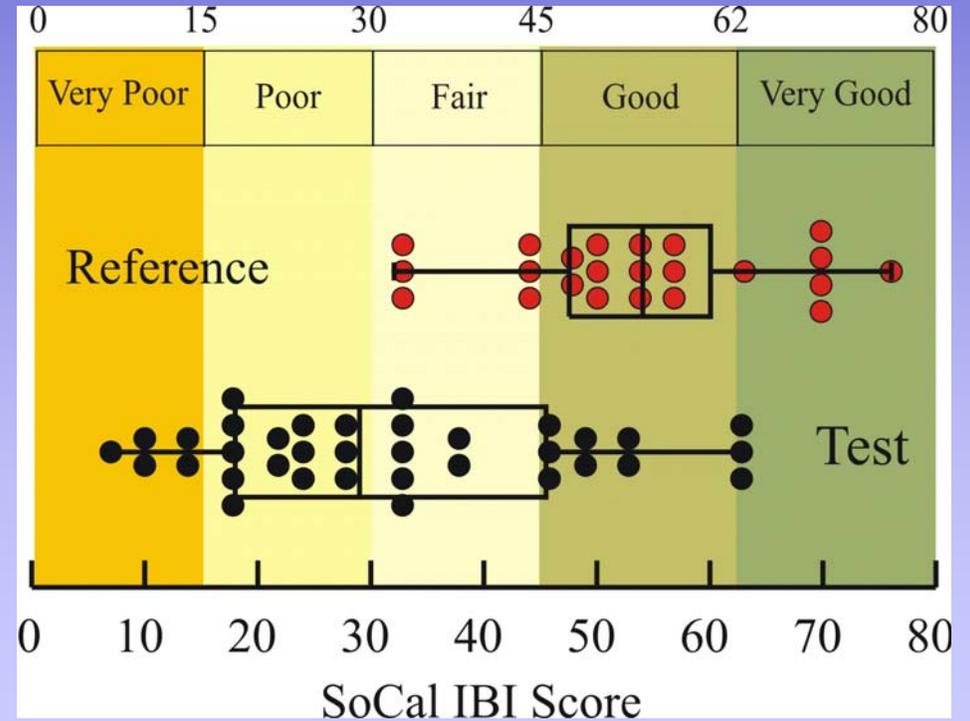
Joining Forces
DFG
RWQCBs
USGS
USFS
EPA

Southern California IBI





Developmental Data Set



Validation Data Set



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Integrated Water Resource Monitoring Network

**Status
Monitoring**

**Regional (Basin)
Monitoring and
Assessment**

**Regulatory
Monitoring**

Status Monitoring

305b Report

NPS 319h

State Report Card

BMP Effectiveness

Regional (Basin) Monitoring and Assessment

SWAMP by RWQCBs

Stressor ID

Watershed Man.

303d Listing and Delisting

Regulatory Monitoring

NPDES

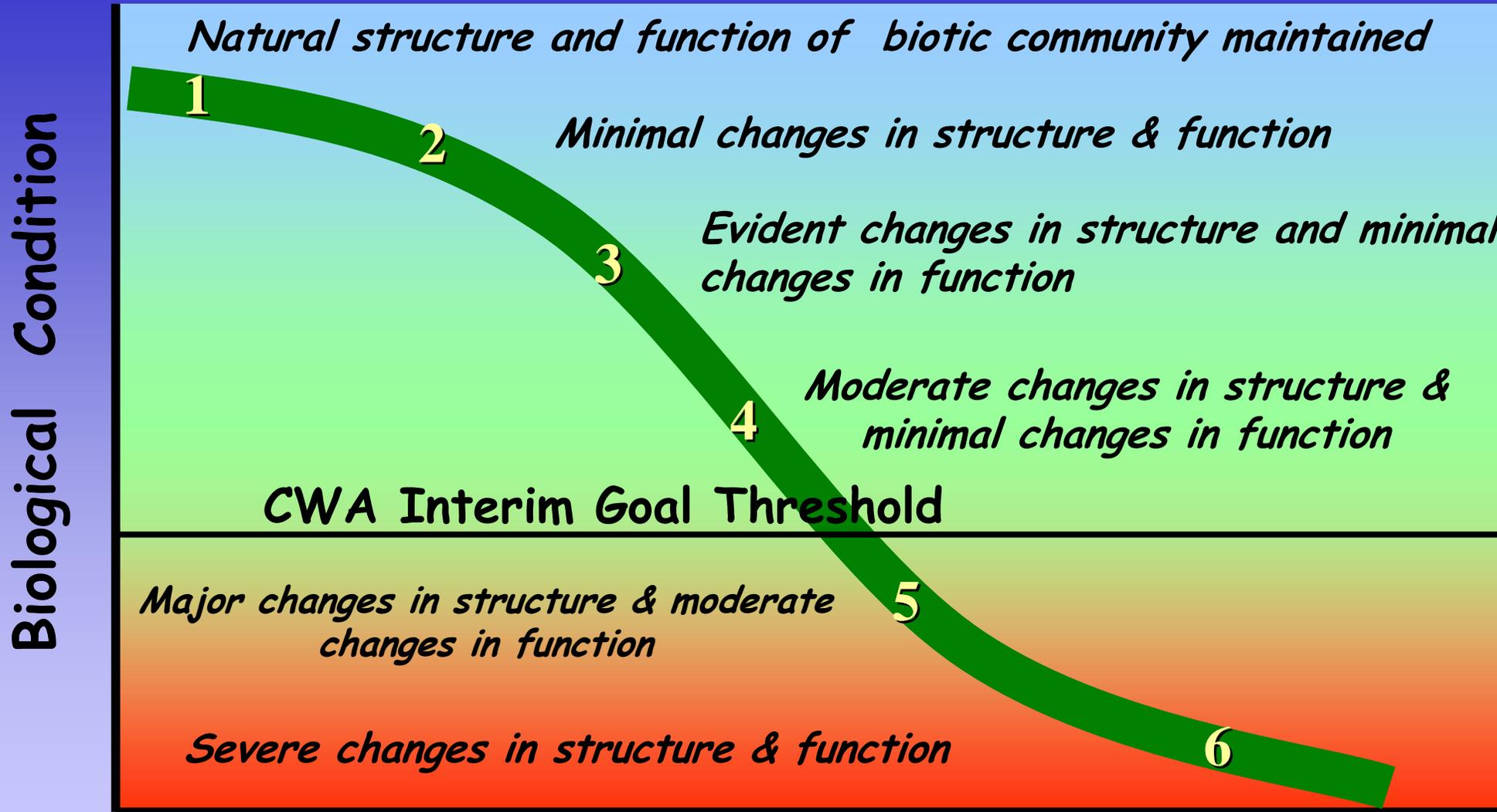
Stormwater

Ag. Waver

Spill Response

FERC/Hydro

The Biological Condition Gradient



Increasing Effect of Human Activity



An underwater photograph showing a school of fish swimming in a shallow, clear water environment. The fish are silvery with a hint of blue. The background is filled with green algae and seaweed. The text "Thanks for Listening" is overlaid in white, bold, sans-serif font in the center of the image.

Thanks for Listening