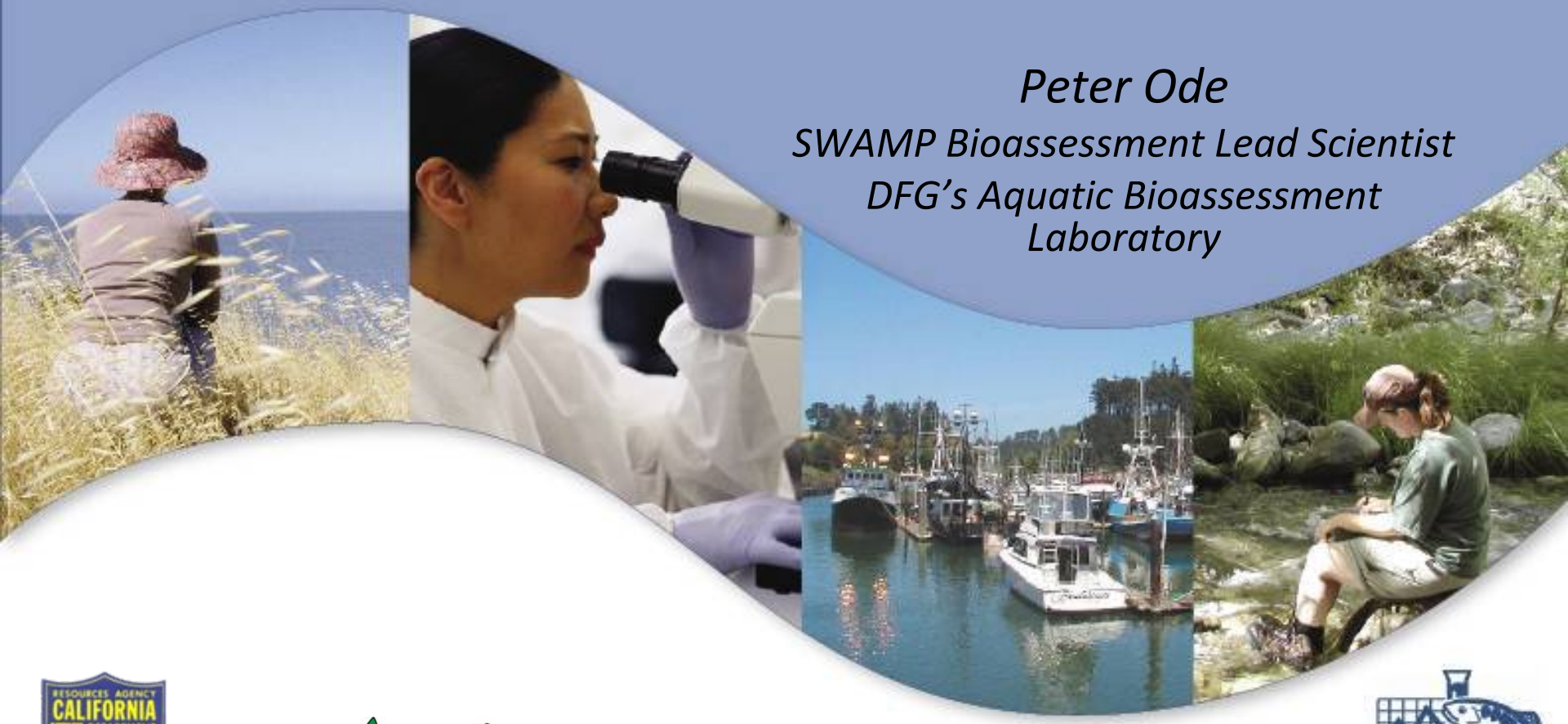
Moving toward regulatory biocriteria in California



Peter Ode

SWAMP Bioassessment Lead Scientist

DFG's Aquatic Bioassessment Laboratory

RESOURCES AGENCY CALIFORNIA DEPARTMENT FISH&GAME

Aquatic Bioassessment Laboratory

Water Boards

SWAMP Surface Water Ambient Monitoring Program

from Bioassessment to Biocriteria

Biocriteria Goal:

For 15 years, our (CABW, ABL, SNARL, EPA, etc.) goal has been to assimilate biological integrity monitoring into California's state and regional WQ regulatory programs

Assimilation (two related concepts):

1. Assimilate ecological condition data into regulatory programs (i.e., develop regulatory structure for measuring / protecting biological integrity = **BIOCRITERIA**)
2. Assimilate traditional WQ monitoring into an ecological condition monitoring framework (i.e., use chemical, toxicological data to support and interpret biological condition data)

These two concepts have the potential to revolutionize the way CA measures and monitors the health of its waterbodies

from Bioassessment to Biocriteria

SB WQ monitoring leadership (*see presentations by Jon Bishop and Val Connor*) is now making a real commitment to implementing biocriteria in CA

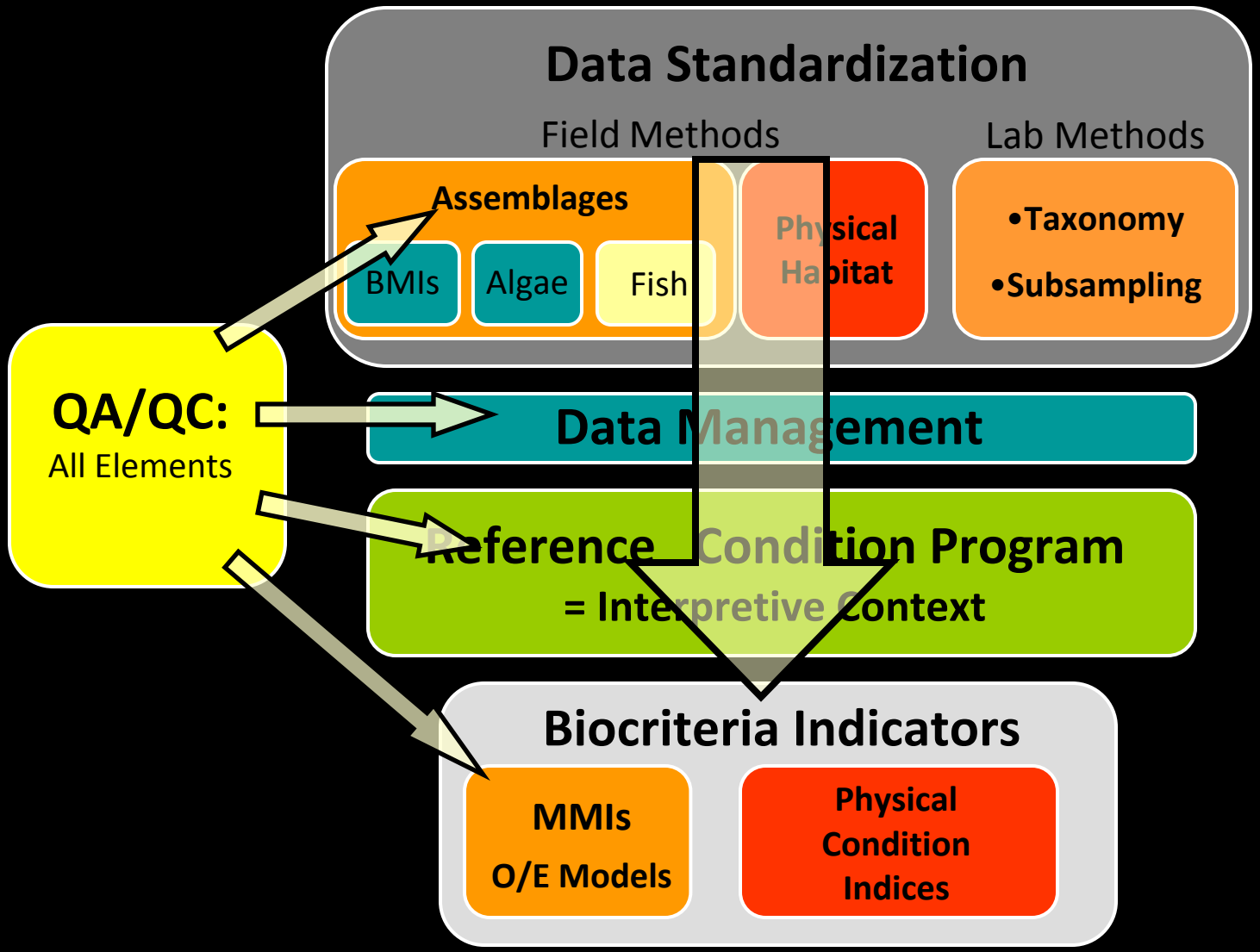
Dave Gibson: examples of how biocriteria can be applied in regional board programs *… special thanks to Dave Gibson and others at R9 and Tom Suk at R6 for their leadership and willingness to act as guinea pigs for the rest of the state*

<u>SWAMP's Role</u>:

Develop the technical tools/infrastructure needed by managers to use biological data in regulation/ assessment …

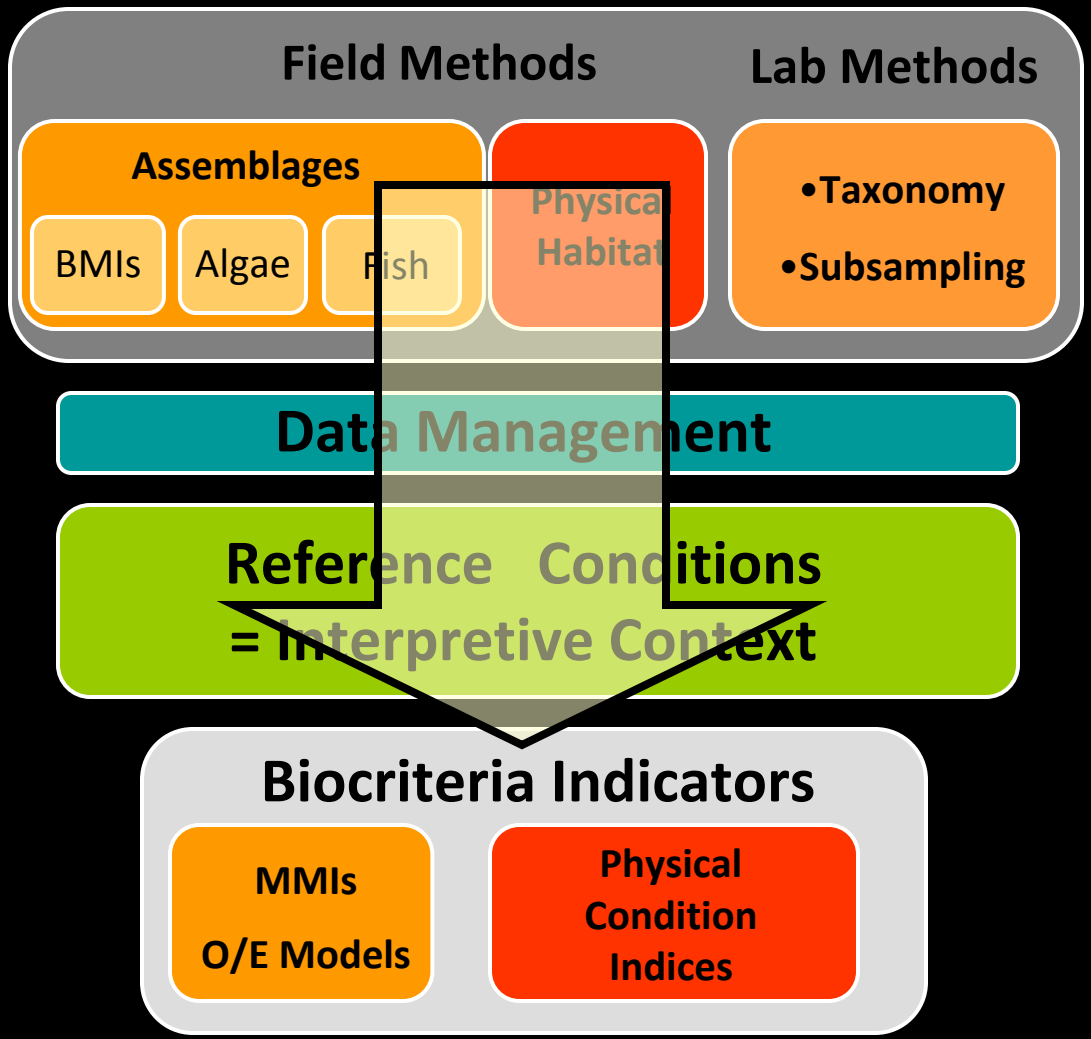
- CABW has focused on getting pieces in place so we're ready when CA is ready to move forward on policy … SWAMP is now devoting considerable resources to this effort
- *Note: Bottom up approach is unusual among states*

SWAMP's Bioassessment Infrastructure Plan:
How technical elements fit together

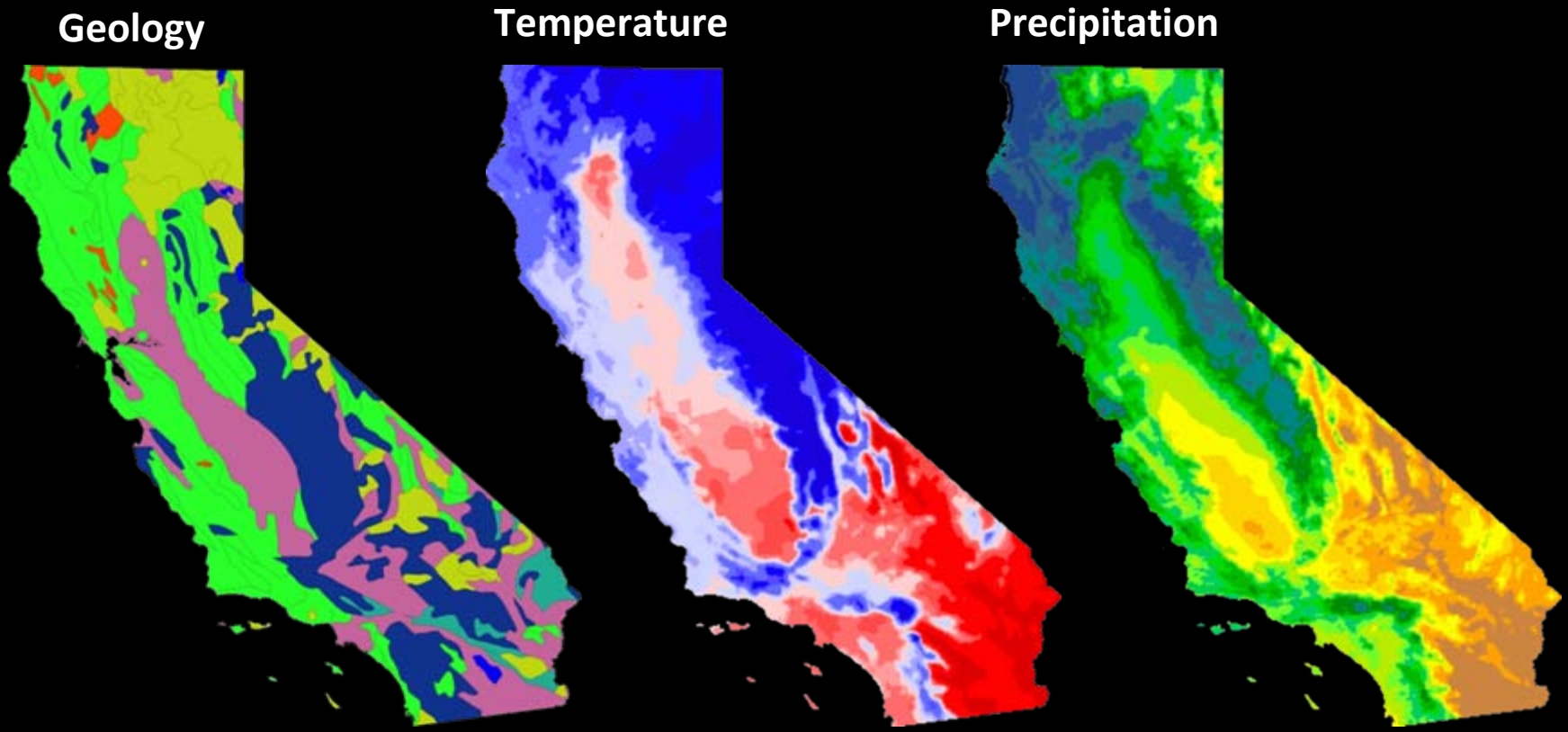


Reference conditions are our highest priority:

there can be no defensible biocriteria without an objective definition of biological expectations



CHALLENGE: Strong environmental gradients result in a large degree of **natural variation** in biological expectations



Management of biological variability requires good representation of biology at reference sites across major gradients

Reference site selection process is complicated by extreme modifications to landscape/ hydrology across large regions

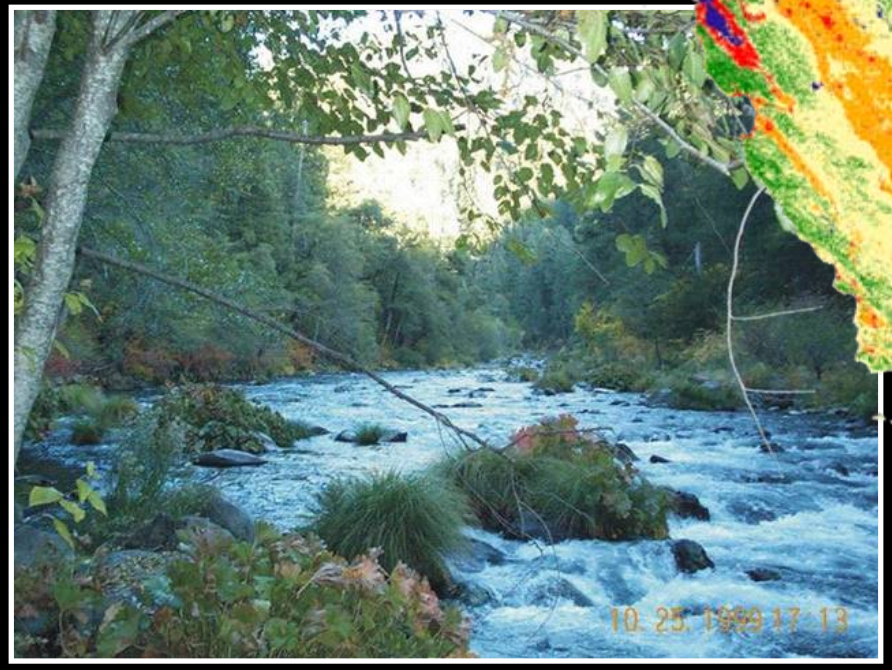
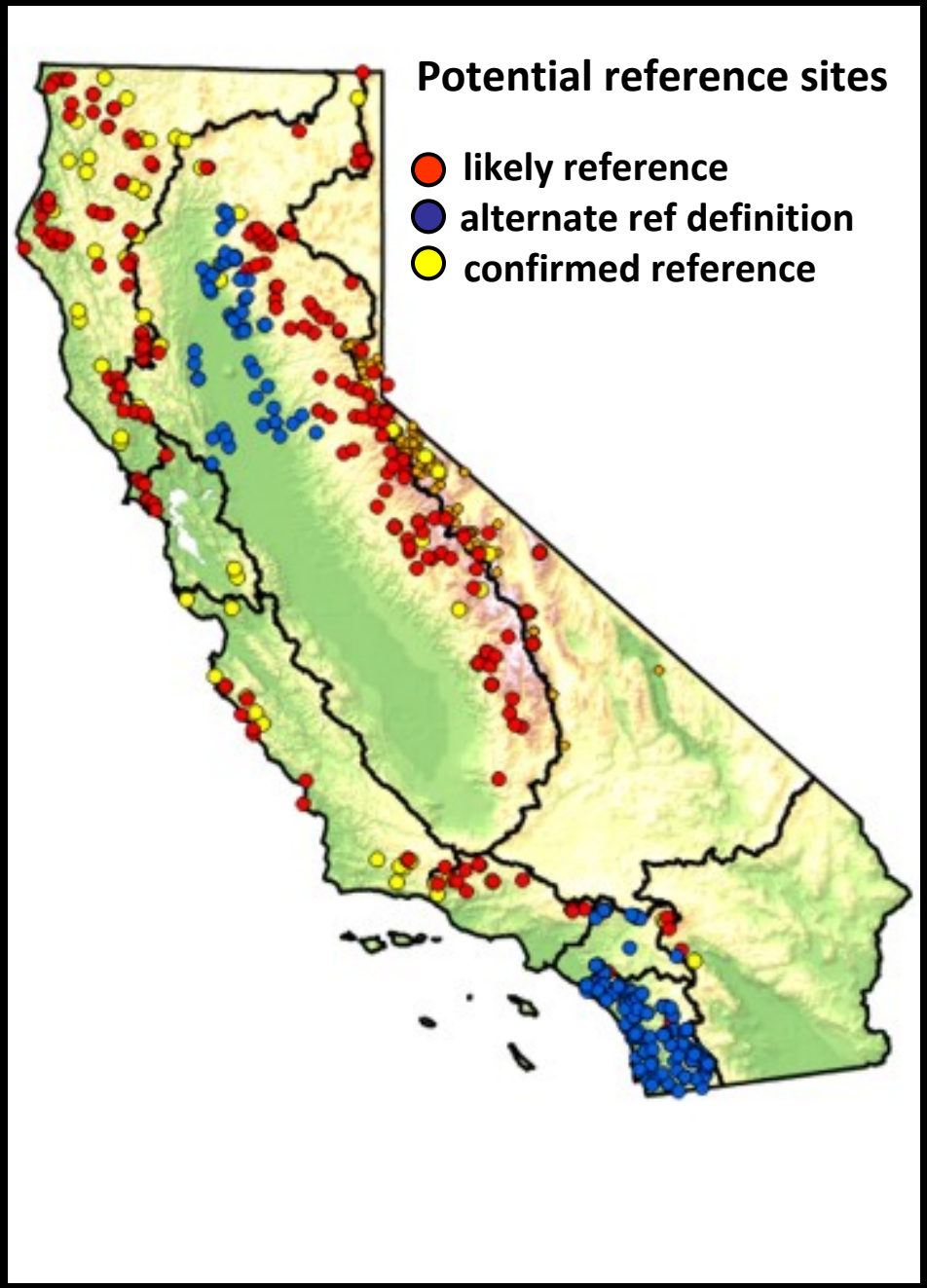


photo courtesy Larry Brown



Sampling for reference conditions (2008, 2009)

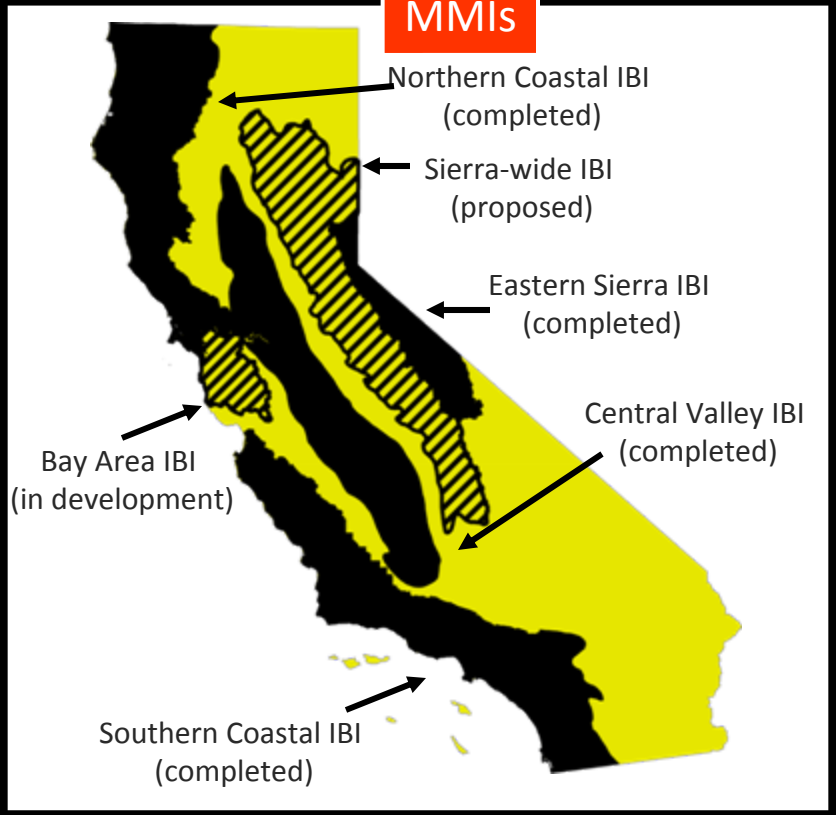
Priorities

1. Locate and sample new reference sites in **UNDER-REPRESENTED AREAS**, especially chaparral regions
2. **RED:** resample likely high quality sites to collect better local screening data (chemistry, habitat)
3. **BLUE:** Highly modified regions; identify candidate best available sites
4. **YELLOW:** resample confirmed high quality sites for trends

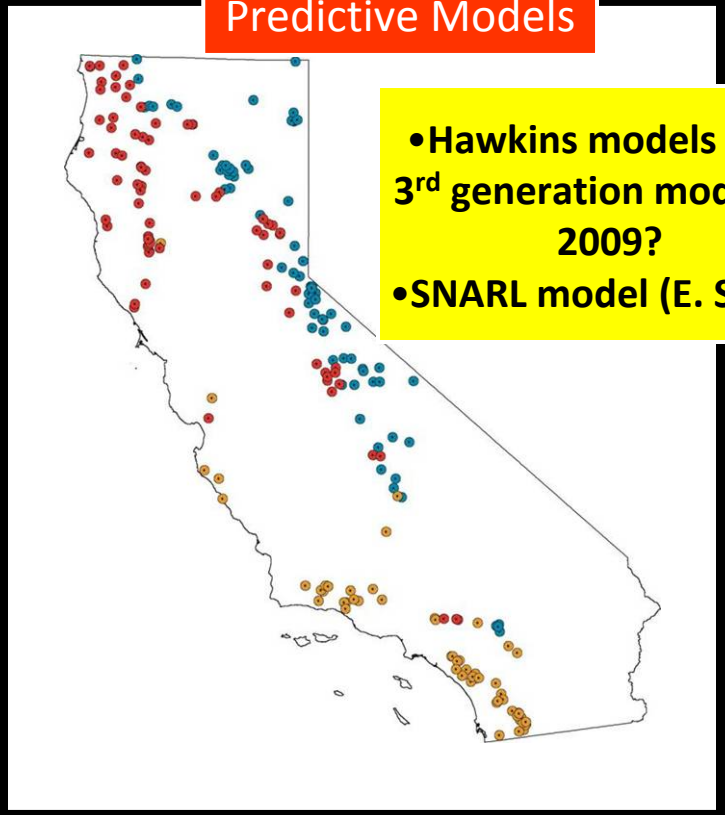
Coordinated Indicator Development

Strategy: develop multiple indicators (multiple assemblages, multiple scoring tools)…. "multiple lines of evidence"

MMIs



Predictive Models



- **Hawkins models (CA); 3rd generation models in 2009?**
- **SNARL model (E. Sierra)**

Coordination of Indicators

- BMI MMIs introduced independently over several to meet developing needs
- Algae MMIs, likewise developed in Eastern Sierra, now in central and southern CA
- New efforts for both groups will focus on standardization of MMI development process and scoring thresholds

Algae: 2nd biological indicator

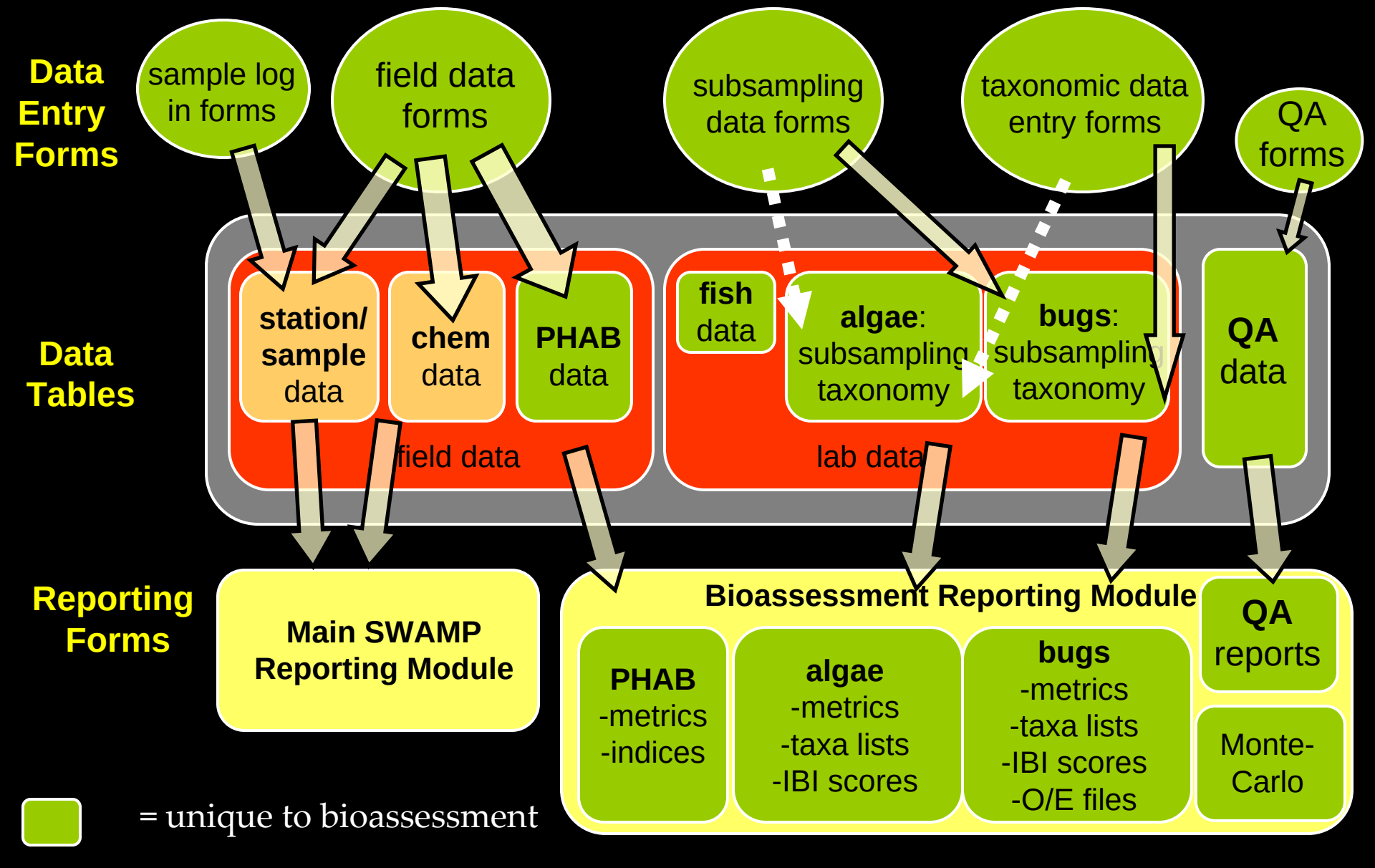
- SWAMP Algae Plan:

  Provides guidance for SWAMP re: steps needed to develop algae as second biological indicator (led by Betty Fetscher, SCCWRP)

- SWAMP Bioassessment: algae subcommittee (chair, Lilian Busse, R9)
  - Standard Field/Lab Methods
  - Taxonomic Standards Group

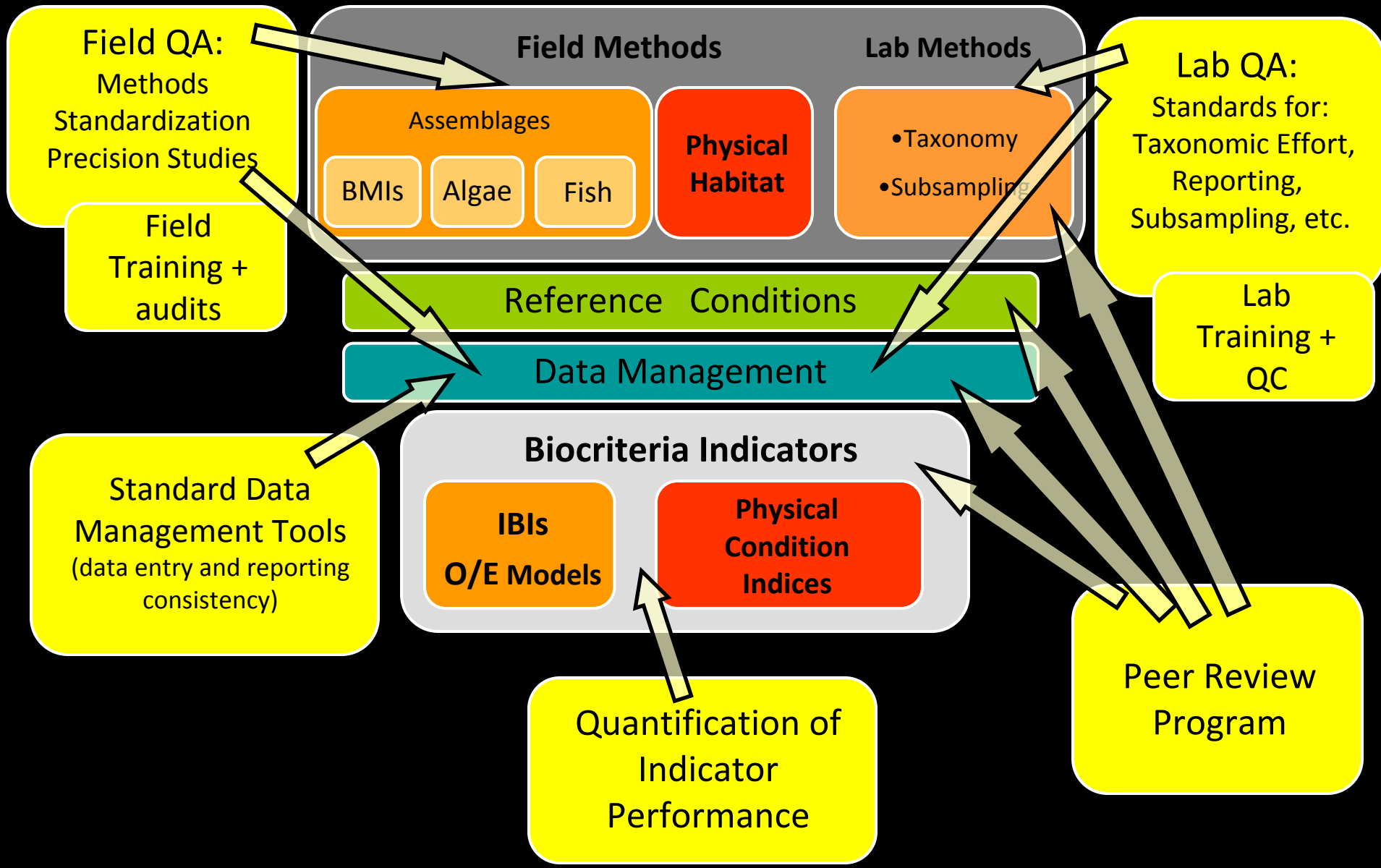
- Two large grants awarded for developing algal indicators for Southern CA and Central Coast (>$2 m); SWAMP representatives on the coordinating TAC

Bioassessment Module for SWAMP/CEDEN Databases: Major Design Elements



Quality Assurance Components for Technical Elements

(coordinating with Bev van Buuren/ SWAMP QA Team/ SCCWRP)

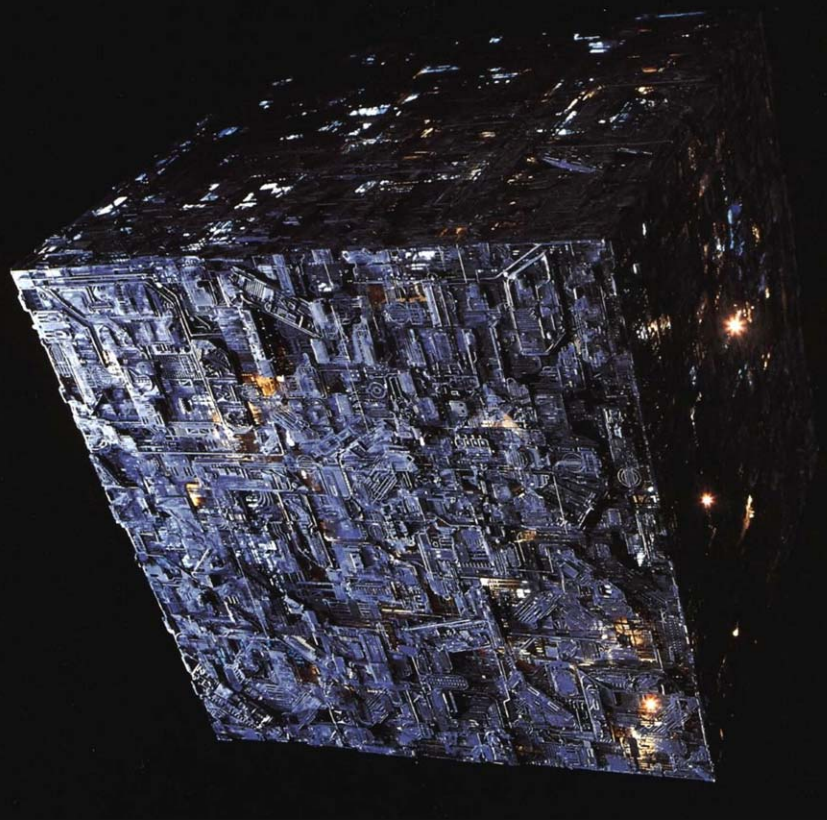


Critical Elements Review

- What is CER?
  - Standardized process for evaluating state/tribal progress toward biocriteria - **Barbour, M.T., and C. O. Yoder. 2007.** Critical Technical Elements of a Bioassessment Program. USEPA, Office of Water, Washington, D.C.

- Why did CA ask for a CE review (Terry Fleming, EPA)?
  - SWAMP places a premium on external program review
    - Two previous reviews
      - **Barbour, M.T. and C. Hill. 2003.** The Status and Future of Biological Assessment for California Streams. California State Water Resources Control Board, Division of Water Quality
      - **SPARC 2005** (comprehensive review of State Water Board's SWAMP program) … SPARC recommended a review of bioassessment program
  - Vehicle for advancing the conversation on the regulatory side
    - The review process brings together both technical and policy staff for discussions
    - Provided us with an opportunity to open dialog with regulatory staff

Resistance to assimilation…



is futile

… friendly operators standing by…