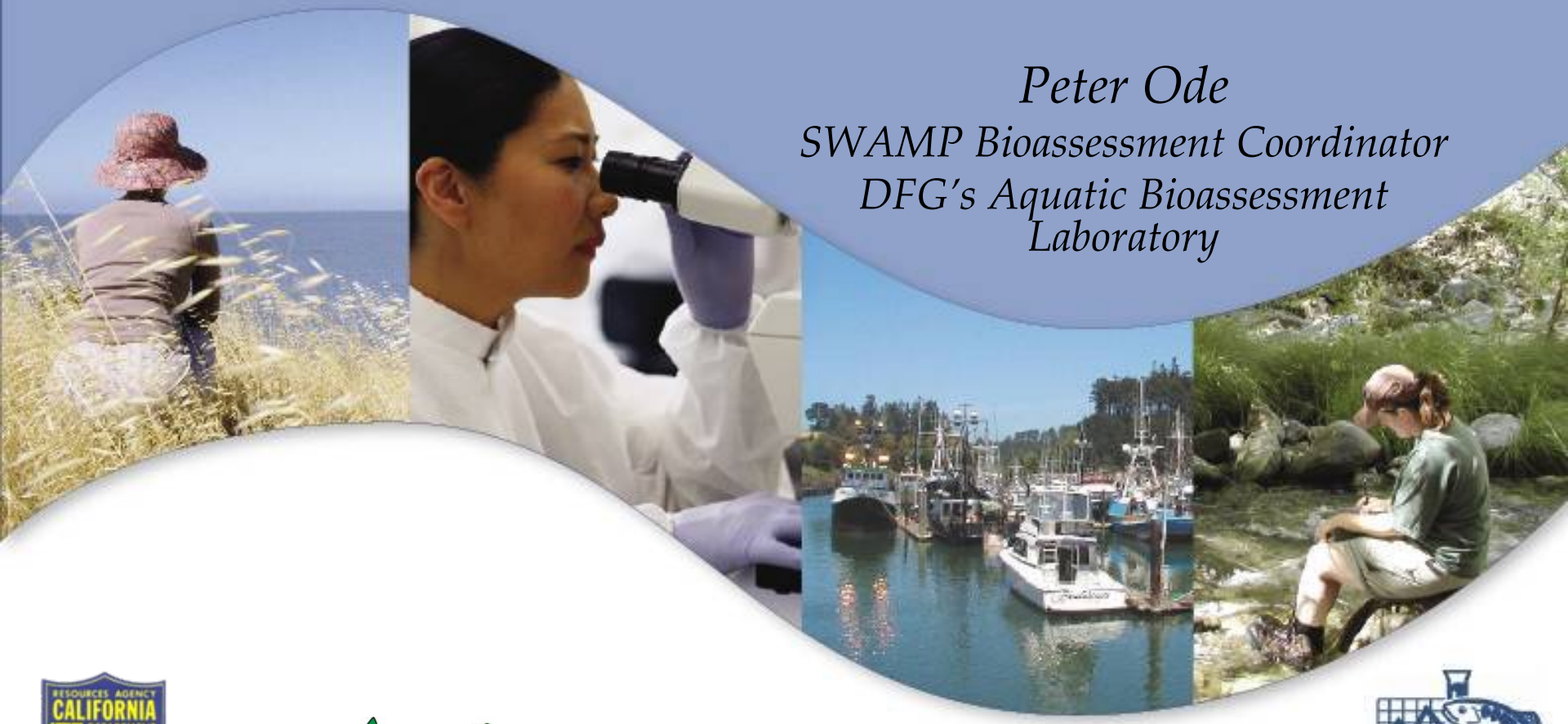
SWAMP Biocriteria Update

CABW Meeting, 29 November 2007



Peter Ode

SWAMP Bioassessment Coordinator

DFG's Aquatic Bioassessment Laboratory

RESOURCES AGENCY CALIFORNIA DEPARTMENT FISH&GAME

Aquatic Bioassessment Laboratory

California Water Boards

SWAMP Surface Water Ambient Monitoring Program

Last year, we presented an overview of SWAMP's efforts to move CA toward biocriteria implementation

- Review of overview
- What's new since last CABW
- What's coming next

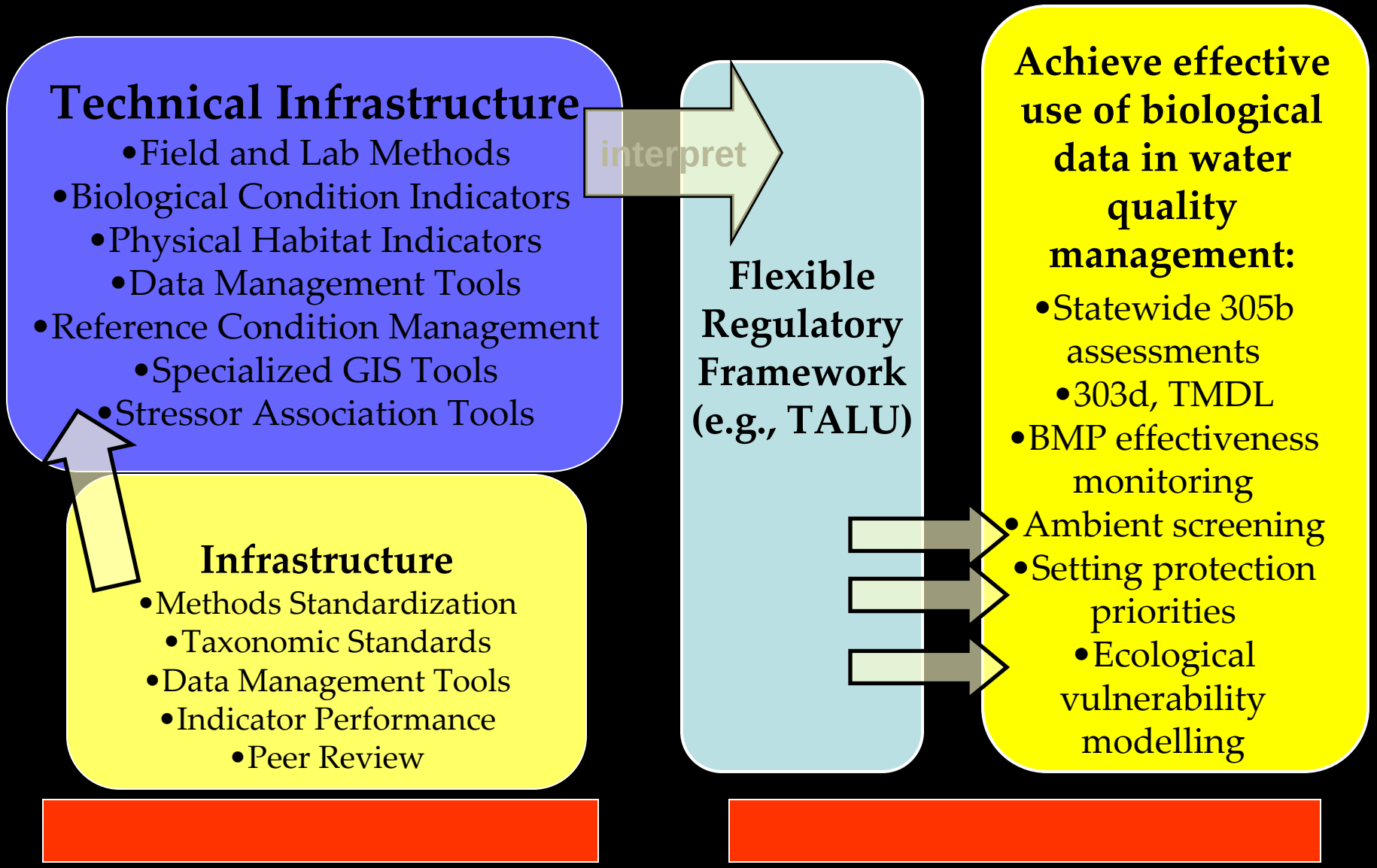
Fiscal Context

- SWAMP is now committing a significant portion of its resources to developing biomonitoring tools:
    1. FY 06/07 ~ $1.2 m + $0.7 m for probability survey
    2. FY 07/08 ~ $1.7 m + $0.5 m for probability survey

Past 2 years investment of ~$4 m represents ~25-30% of SWAMP's discretionary funding

- Not clear how long this level of support will be available to SWAMP, so we're moving quickly to establish infrastructure for supporting regulatory bioassessment and biocriteria….

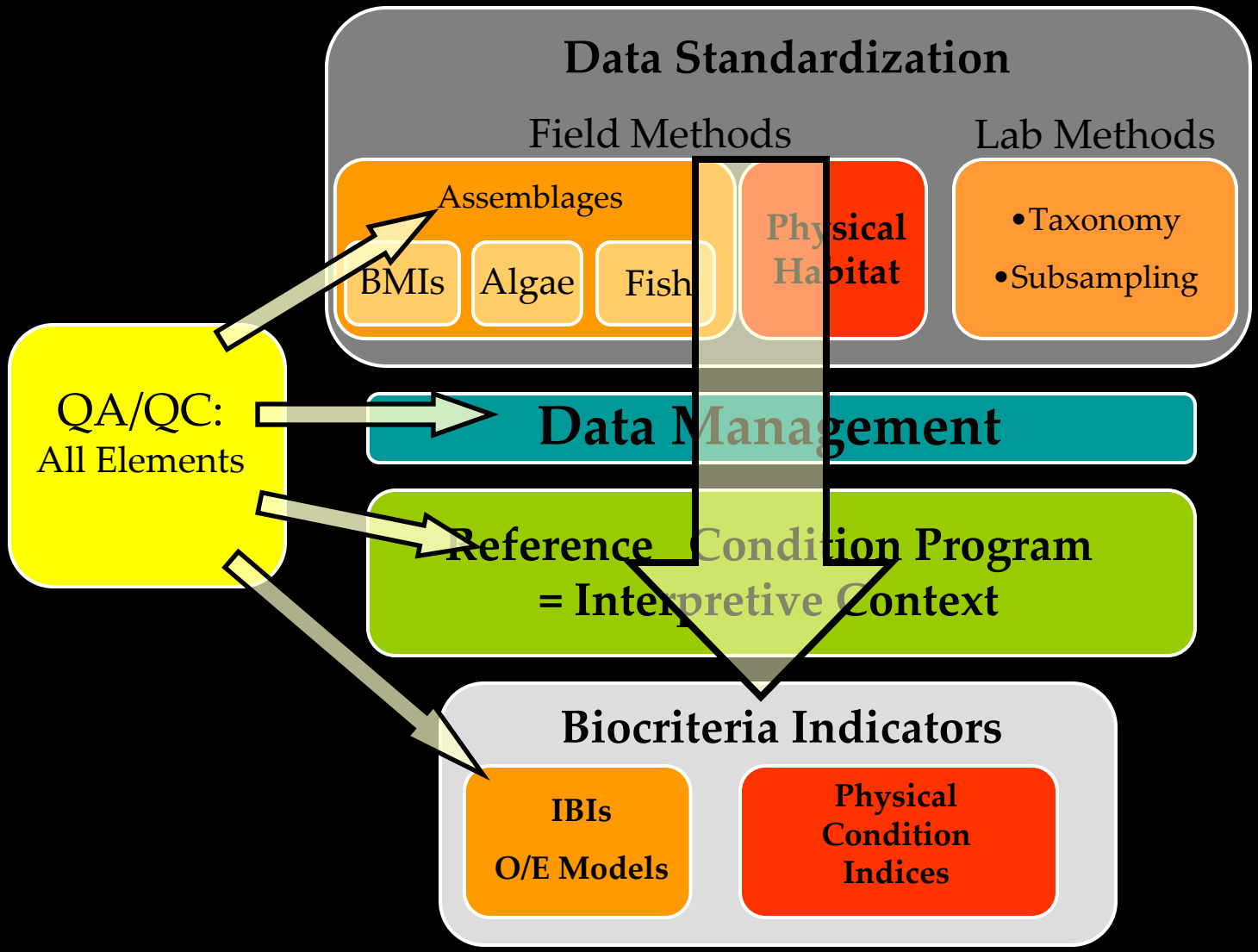
quick review of how elements of biocriteria program fit together…



Plan for establishing technical components of SWAMP's bioassessment program

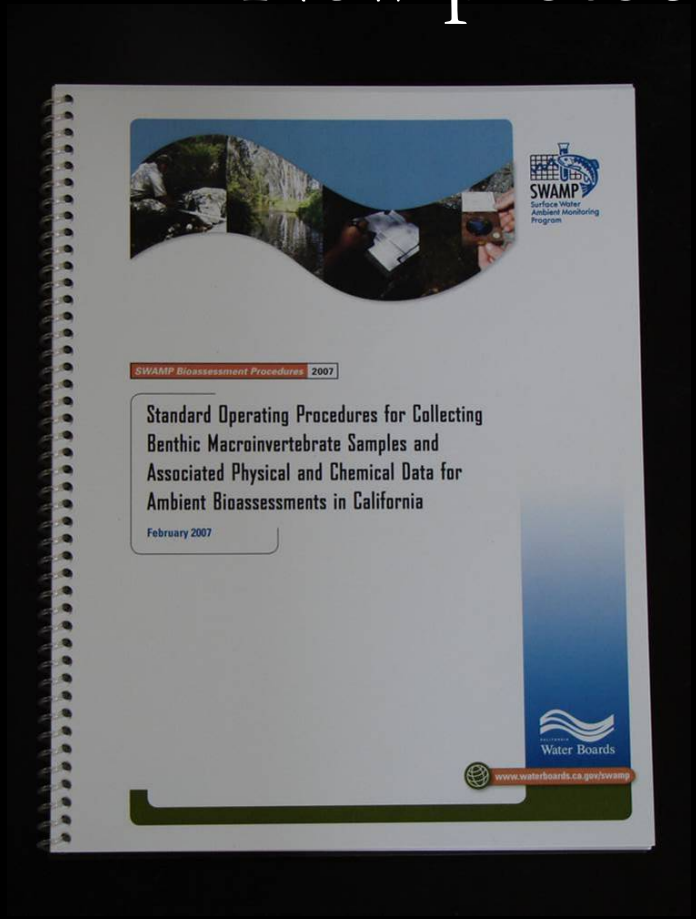
Plan for biocriteria implementation

Bioassessment Program Review: How technical elements fit together



What's new since last CABW
…highlights

New protocols and field forms



- SOP and field forms for BMIs and habitat released in February 2007
- Jim Harrington's trainings underway

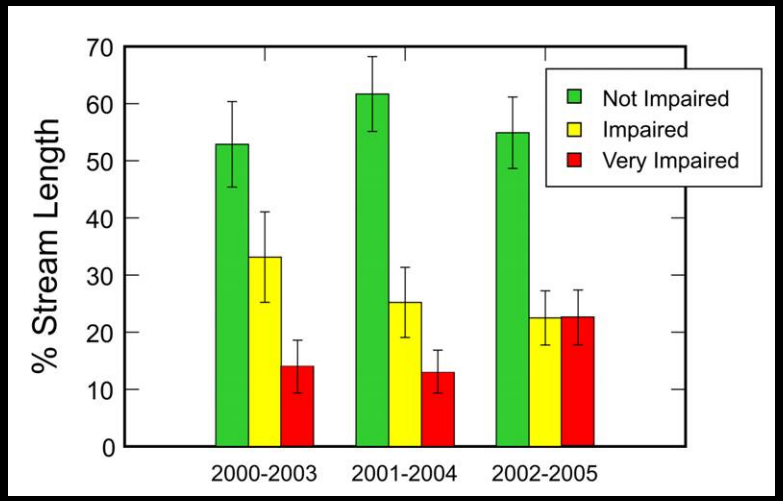
We're developing electronic versions of field forms (collaboration between ABL/SCCWRP/ DWR and SWAMP DMT)

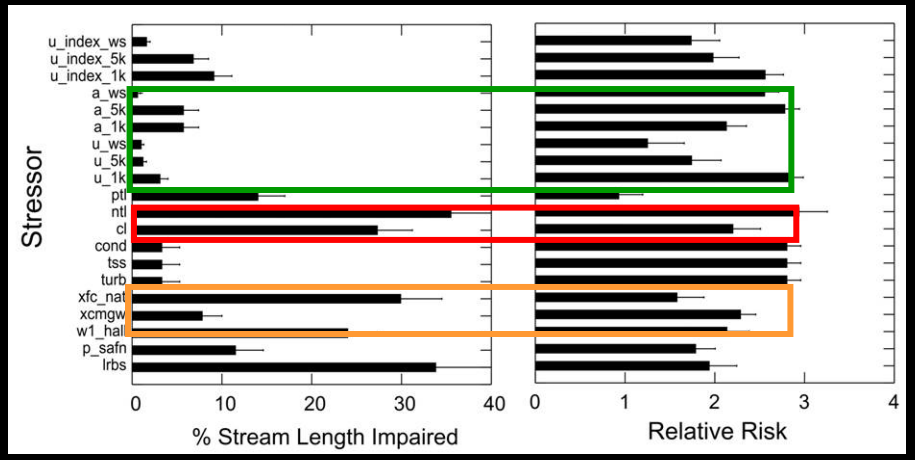
ß-versions available by spring 2008

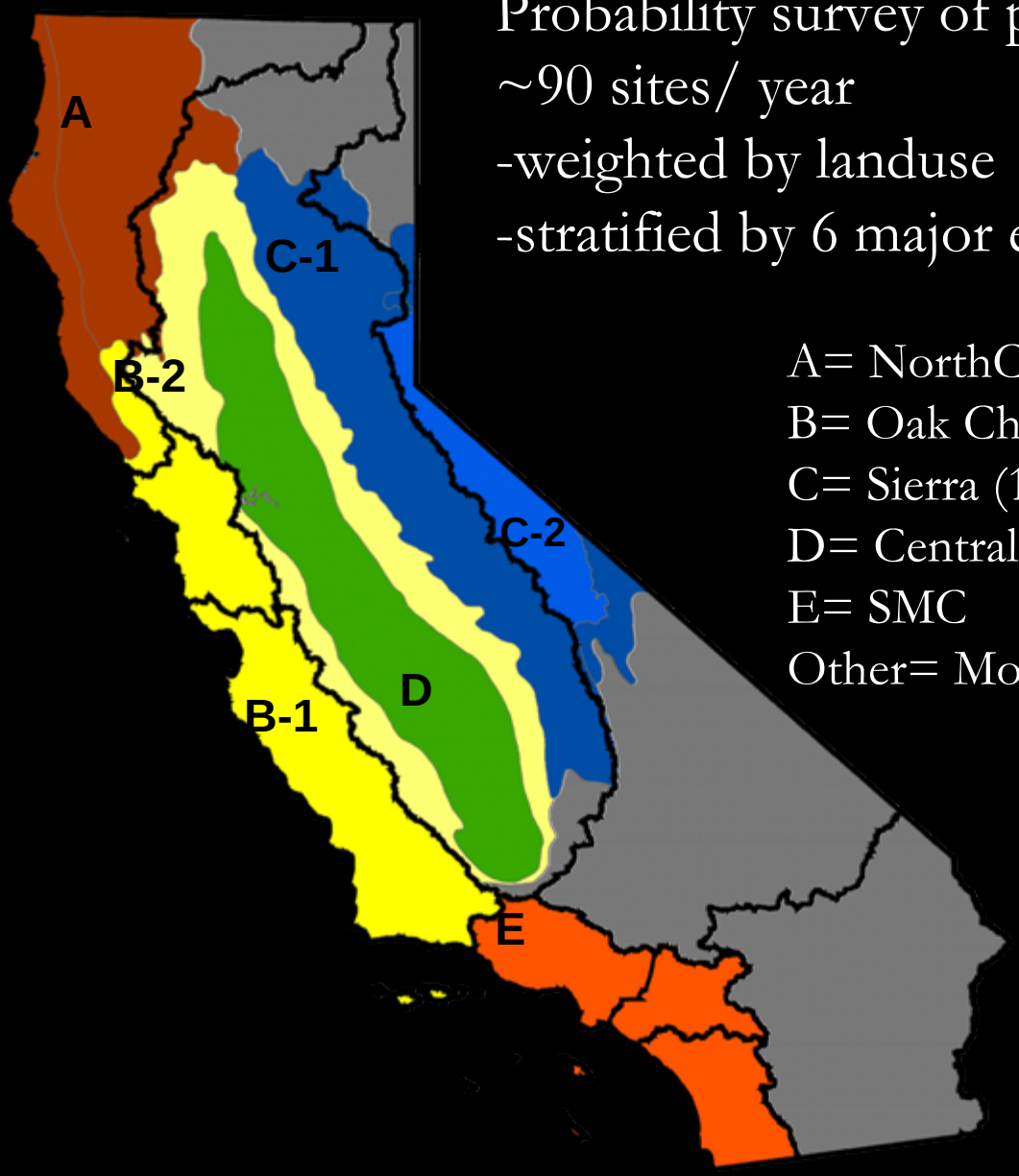
(see Doug Post for a glimpse of the current version)

SWAMP Perennial Stream Assessment (PSA)

- Probability survey building on 8 years of EMAP and CMAP monitoring
- Produces statistically defensible estimates of ecological condition of streams, extent of stressors + relative risk to biology
- Gives SWAMP a logical foundation for setting statewide and regional monitoring priorities and interpreting targeted monitoring data







Probability survey of perennial wadeable streams:
~90 sites/ year
-weighted by landuse
-stratified by 6 major ecological regions

A= NorthCoast
B= Oak Chaparral (1= coastal, 2=interior)
C= Sierra (1= West Sierra, 2= East Sierra)
D= Central Valley
E= SMC
Other= Mojave/Sonora + Modoc Plateau

Sampling Goal: ~15 sites/region/year

Suite of Indicators for PSA Survey

- Biological Indicators
  - Benthic macroinvertebrates
  - Algae (diatoms + soft algae, also Chl_a and AFDM)
  - Wetland/riparian condition indicators (California Rapid Assessment Method, CRAM)

- Physical Habitat (new SWAMP protocols)

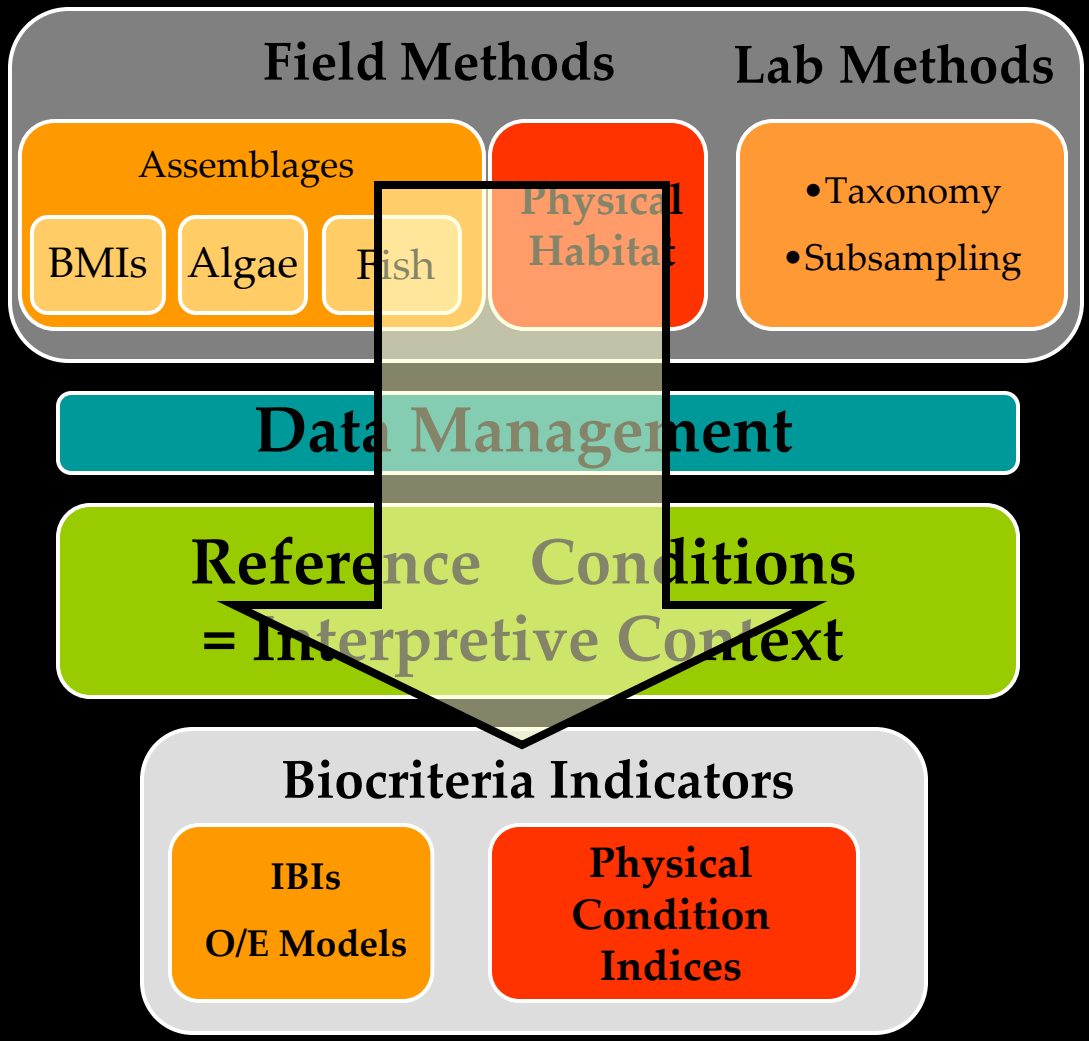
- Chemical Indicators
  - SSC, turbidity, pH, conductivity, hardness
  - Cl, $S0_4$
  - Nutrients (N, P, Si)
  - Organic carbon

Reference Condition Management Plan

- In bioassessment, reference conditions define the biological and physical expectations for sites that we are trying to assess

- Since all our tools for scoring biological condition derive from reference sites, a sound reference condition management program is essential to defensible biocriteria

Reference conditions provide an essential interpretive context for biocriteria



Reference site selection process is complicated by CA's ecological diversity, but also by extreme modifications to landscape and hydrology… selection process must work in a variety of settings

SWAMP Reference Condition Panel

- 10 national and CA bioassessment scientists met in Santa Ana, October 17-19, 2007 to help develop guidance for SWAMP's reference condition monitoring
- guidance document will be finished by April 2008; we start reference sampling in summer 2008

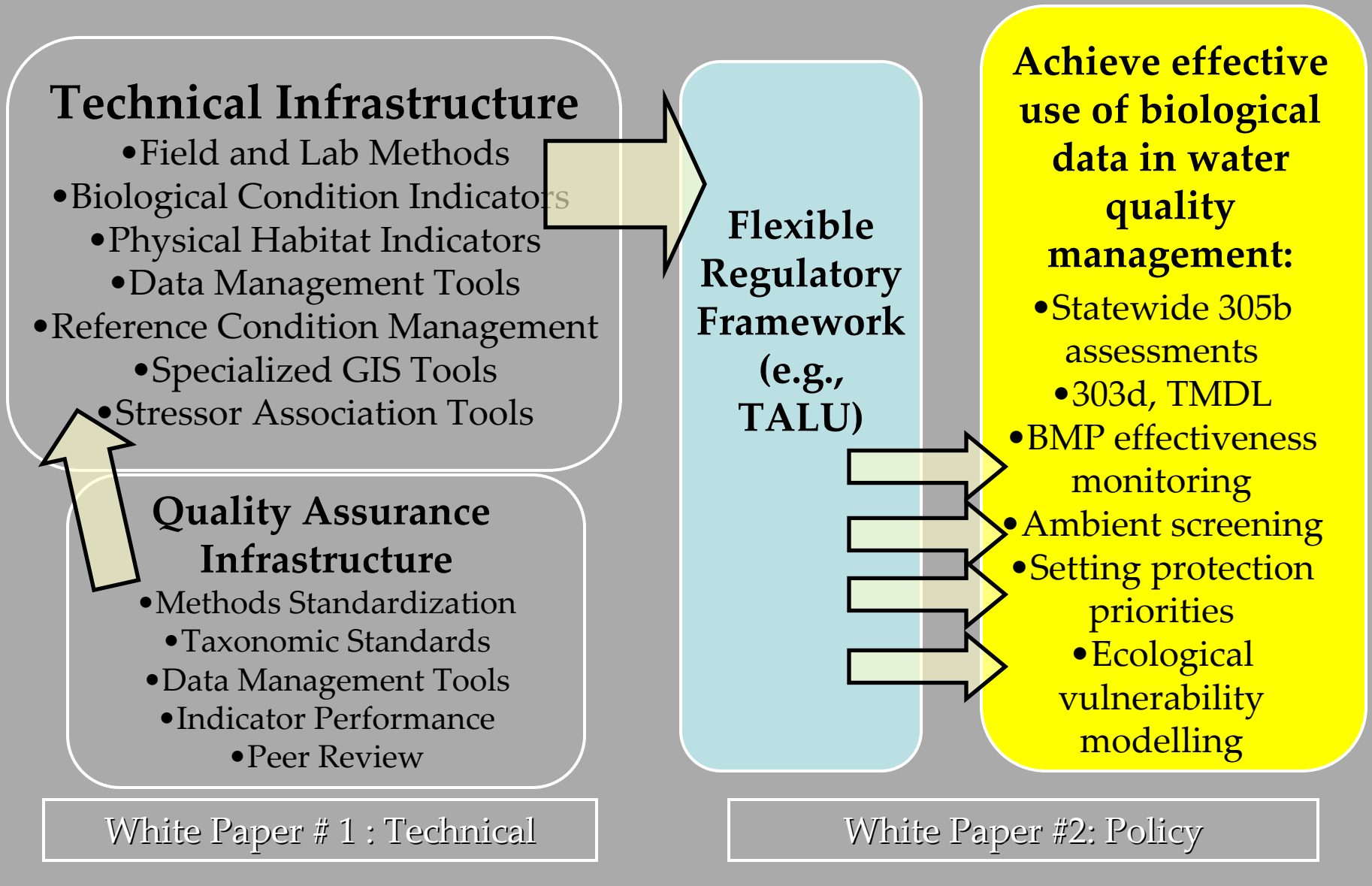
Periphyton: 2nd biological indicator

- SWAMP Periphyton Plan:
  Provide guidance for SWAMP: what steps needed to develop algae as second biological indicator?
  TAC (Betty Fetscher, SCCWRP)

- SWAMP bioassessment committee: periphyton subcommittee (Lilian Busse, R9)

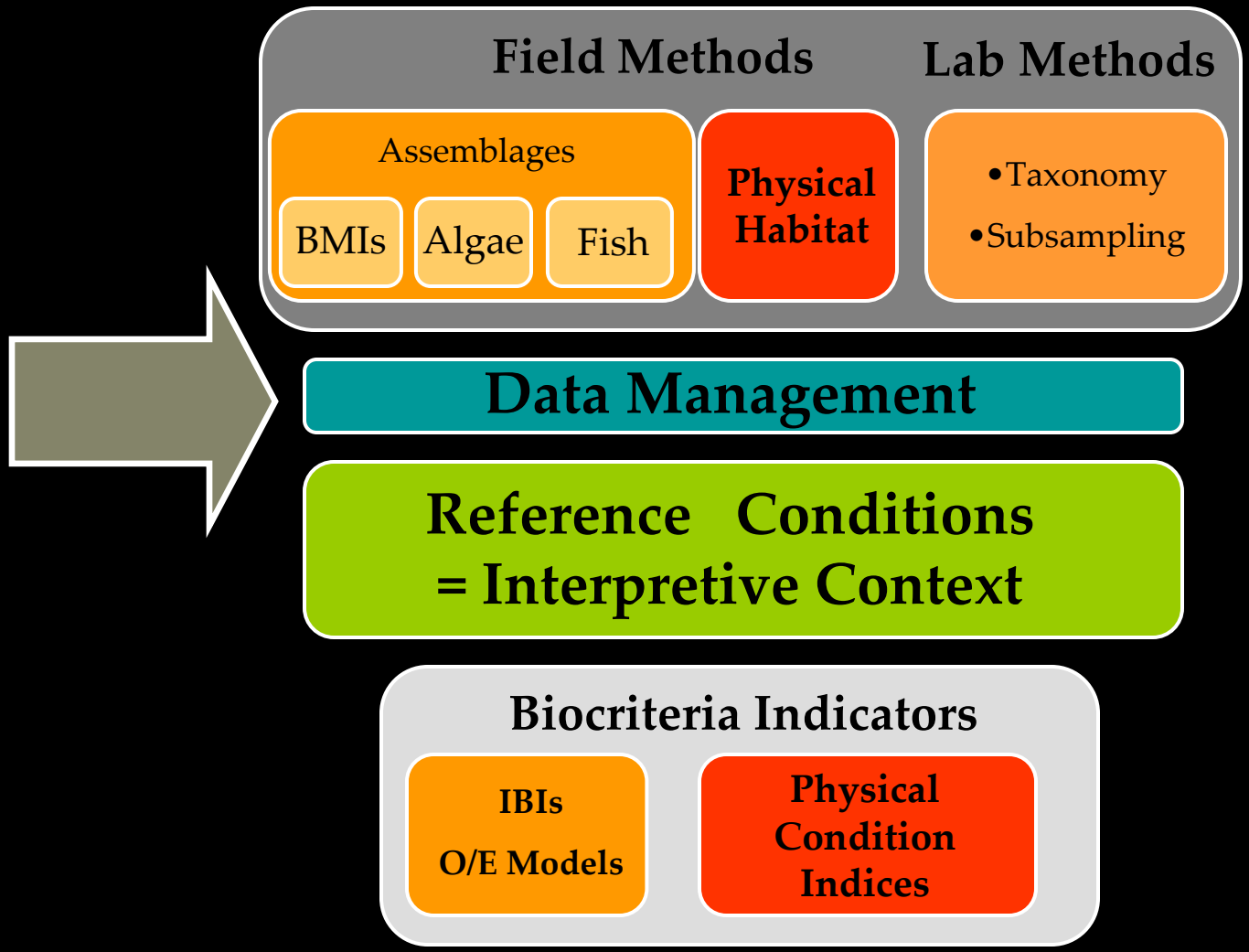
- Two large grants awarded for developing periphyton indicators for Southern CA and Central Coast (~$2 m); SWAMP representatives on the coordinating TAC

What’s Next?

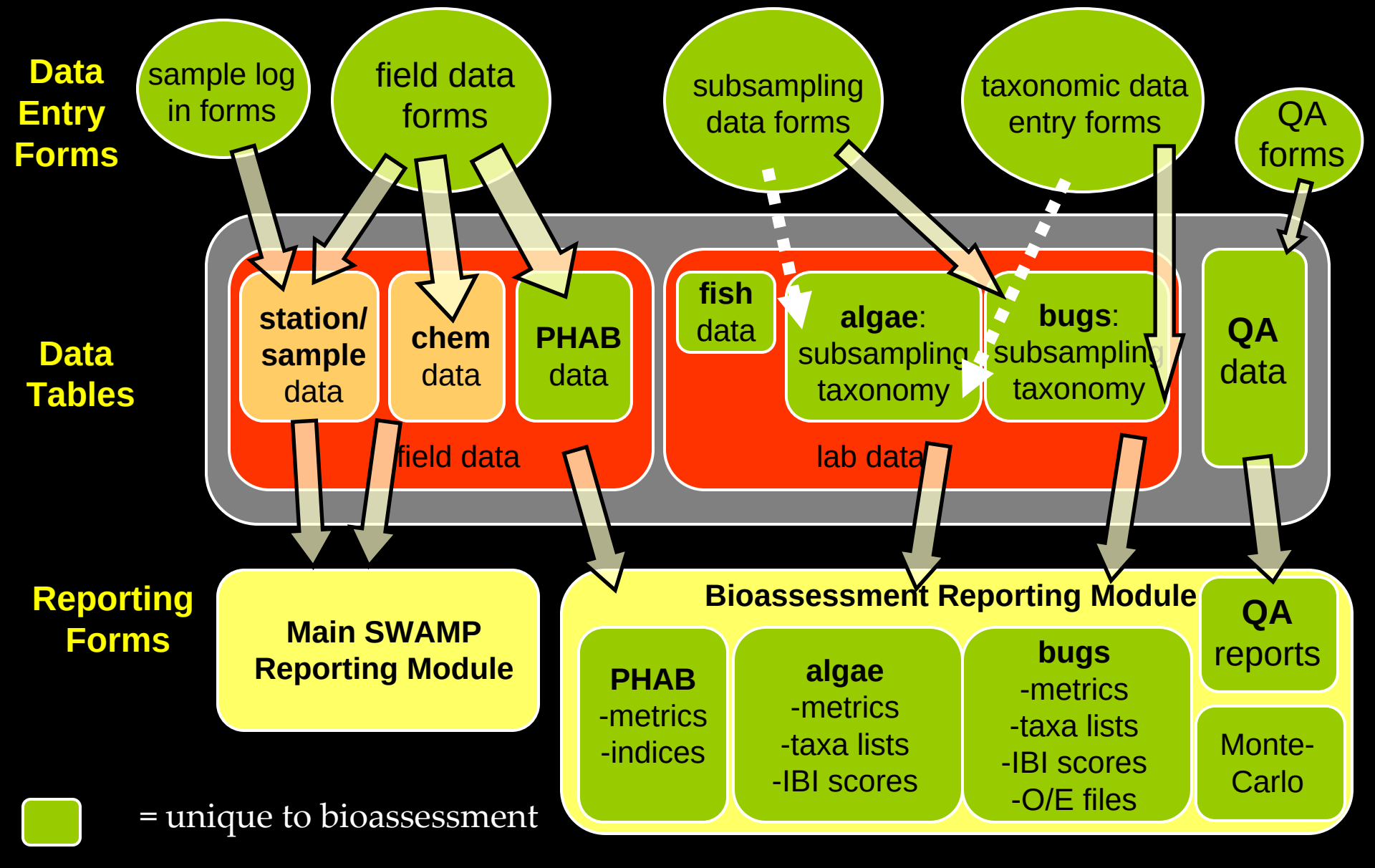

Technical Infrastructure
•Field and Lab Methods
•Biological Condition Indicators
•Physical Habitat Indicators
•Data Management Tools
•Reference Condition Management
•Specialized GIS Tools
•Stressor Association Tools
Quality Assurance Infrastructure
•Methods Standardization
•Taxonomic Standards
•Data Management Tools
•Indicator Performance
•Peer Review
Flexible Regulatory Framework (e.g., TALU)
Achieve effective use of biological data in water quality management:
•Statewide 305b assessments
•303d, TMDL
•BMP effectiveness monitoring
•Ambient screening
•Setting protection priorities
•Ecological vulnerability modelling
White Paper # 1 : Technical
White Paper #2: Policy
Plan for establishing technical components of SWAMP's bioassessment program
Plan for biocriteria implementation

Implement Plans:

- Perennial Streams Assessment (PSA)
- Reference Plan
- Periphyton Plan

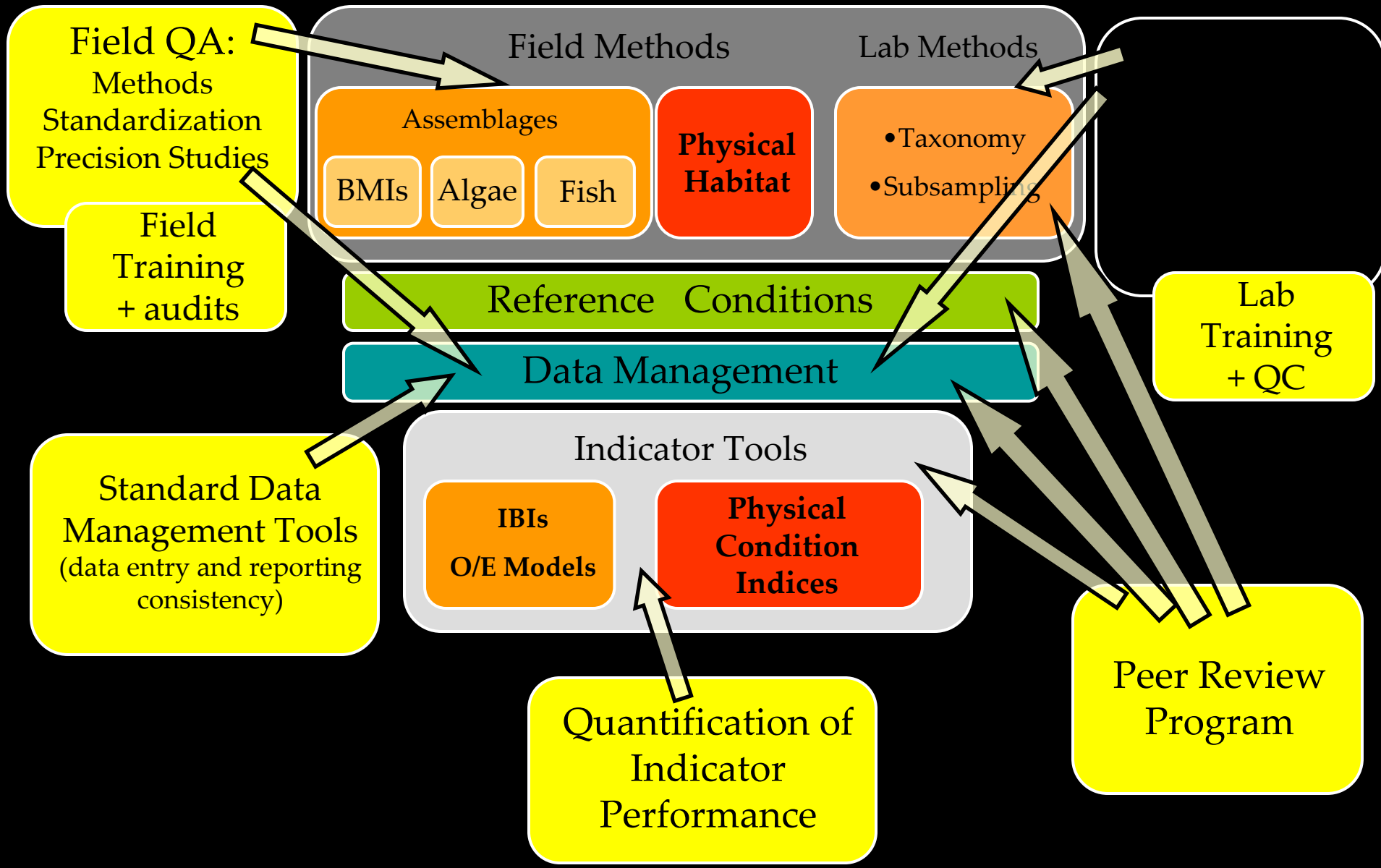

Field Methods
Lab Methods
Assemblages
BMIs
Algae
Fish
Physical Habitat
•Taxonomy
•Subsampling
Data Management
Reference Conditions
= Interpretive Context
Biocriteria Indicators
IBIs
O/E Models
Physical Condition Indices

Bioassessment Module for SWAMP/CEDEN Databases: Major Design Elements



Quality Assurance Components for Technical Elements

(coordinating with Bev van Buuren/ SWAMP QA Team)

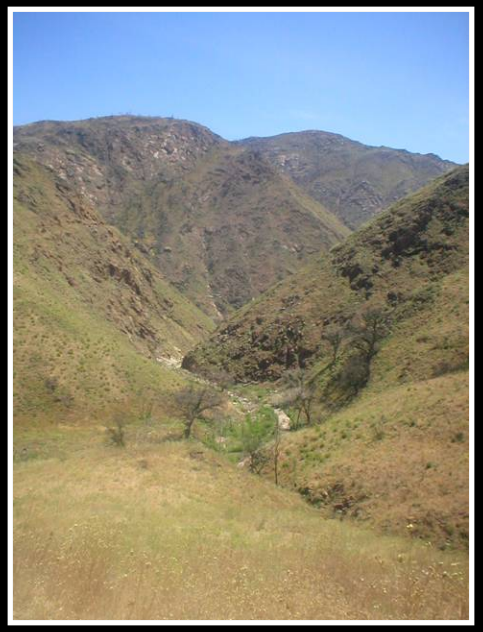


Much of the bioassessment QA effort is in the laboratory … (e.g., taxonomic standards, laboratory practices, data management practices, etc.)

Southwest Association of Freshwater Invertebrate Taxonomists (SAFIT)

~see presentation by Joe Slusark and Dan Pickard, up next

Non-Perennial Streams



- NP streams also fall under SWAMP's mandate
- challenging to monitor ALU
- SWAMP is providing seed money to extend grant funded pilot studies in San Diego to other parts of CA