A Proposed Lentic Benthic Bioassessment Procedure for California: A Case Study from the Aquatic Pesticide Monitoring Program (APMP)

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Rationale for Protocol

- Lentic water bodies under-represented in statewide assessment
  - Streams focus
  - Lack of standardized protocol
- 305b requirements (SWAMP)
- Need cost-effective rapid assessment tool
Presentation Goals

- Body of work to build upon
- Initiate review and discussion
- Build user consortium
- Can protocol be expanded for universal use? Adaptable for SWAMP?
APMP Bioassessment

- Funded by CA SWRCB
- Diagnostic monitoring of aquatic pesticides
- Two year dataset:
  - Develop research lentic protocols
  - BMI, Epiphytic Invertebrate, Phytoplankton monitoring
  - Multi-metric analyses
  - Peer-review: Brian Anderson, Jim Harrington, Victor DeVlaming, Charles Goldman, Bruce Thompson
Proposed Lentic Protocol

• Lakes, reservoirs, ponds
• BMI’s only
• Random, standardized sampling design
• Ambient monitoring
Sampling Summary

• Habitat: Sublittoral zone in 2-4 m water depth
• Gear: Petite Ponar or Ekman (tall)
• Sieve size: 0.5 mm mesh
• Sampling Coverage:
  – 3-6 transects per site/sampling area if <500ac, 6-10 transects if >500ac
Big Bear Reservoir 2003
2300 acres

Cumulative Number of Species

Cumulative Area Sampled (M2)
Replication Rationale

- Protocol: 3 replicate grabs at one station/transect
- APMP:
  - 1st yr - 3 reps
  - 2nd yr - 4 reps
- No decrease in variability with increased replication
- High intra and inter-station variability
Habitat Measures

- Rapid, qualitative measurement
- Physical Habitat
  - Other efforts - CRAM
- Water Quality
- Sediment Quality
  - Qualitative vs. quantitative
Laboratory Processing

• Sub-sampled to 300 organisms
  – 10% QA/QC

• Taxonomy to Genus
  – Most groups- CAMLnet Level 1
  – Chironomid to genus - EPA WEMAP
  – Oligochaetes to genus
  – 10% QA/QC

• Data analysis
  – BMI Taxa List & Counts by Site
  – Metrics
Protocol Considerations

- Index Period
- Inclusion of other biological assemblages
- Lentic IBI’s / Reference condition
- Extensive physical habitat
- Acceptable levels of variability
Questions??