CAUSAL ASSESSMENT

Questions For The Panel

- Did the Science Team conduct an adequate evaluation of CADDIS?
- What aspects of CADDIS will provide useful information for California to implement Biological Objectives?
- What aspects of CADDIS need improvement for California to implement Biological Objectives?
- How can California refine monitoring requirements to better support causal assessment?

Why Causal Assessment?

- Not every stream is going to meet biological objectives
- When a stream is non-compliant, site-specific causes need to be determined for remediation
- Causal assessment approaches have not been well-vetted in California

Project Goal

- Produce a Guidance Document as a resource for stakeholders and regulatory agencies

- Provide recommendations for future activities
  - Optimize causal assessment designs for California
  - Distinguish tools that work (or don't work)
  - Identify data gaps or new tools that need to be refined/created

We're Lucky To Have Partners

- US EPA has, over the past 15 years, developed a causal assessment approach
  - www.epa.gov/CADDIS
- EPA (ORD-National Center for Environmental Assessment) joined our Science Team
- Utilized three case studies
  - Interactive relationship with local stakeholders

Our Three Case Studies

- **Selection criteria**
  - Representativeness, stressor diversity, data availability, willing partners
- **Garcia River in Northern California**
  - RWQCB, Nature Conservancy
- **Salinas River in Central California**
  - RWQCB, Agriculture collaborative
- **Santa Clara and San Diego Rivers in Southern California**
  - RWQCBs, Sewage Treatment Plant, Municipal Stormwater

Progress To Date

- Training, Scoping — Feb
  - All three cases together
- Working meetings, data analysis — Jun
  - Each case individually
- One-on-one interactions — Jun - Sep
- Summary of results — Oct
  - All three cases together

CUMULATIVE LIST OF CANDIDATE CAUSES

- Flow alteration
- Physical habitat loss or alteration
- Temperature
- Dissolved oxygen
- Conductivity, TDS
- Sediment
- Nutrients
- Trace metals
- Pesticides
- PAHs
- Invasive species

ROAD MAP FOR TODAY

- Introduction to CADDIS
- Case study summaries
  - Site descriptions
  - Example data analysis
  - Summary scoring tables
  - Lessons learned
- Synthesis
  - Recommendations for California

Case studies here…..

The Science Team's Evaluation

- Bioobjectives needs a causal assessment component to be successful
- CADDIS is an appropriate framework, but it isn't perfect
- A guidance manual can be written
  - Because California has some unique issues, implementing the recommendations will be important

Synthesis Based On Our Three Case Studies

- CADDIS Strengths for California
- CADDIS Weaknesses for California
- Some of our recommendations
- The Science Team's Assessment

CADDIS Strengths For California

- Already built and documented
  - Creates a solid foundation for regulatory interactions
- Adept at ruling out candidate causes
- Wonderful communication tool

CADDIS Weaknesses For California

- Don’t expect to always find the smoking gun
  - nonpoint, cumulative stressors are difficult to diagnose
- Challenges finding appropriate comparator sites
- Need for additional data analysis tools

Recommendations

- Comparator site selection requires additional support
  - Take advantage of our large statewide data set
- Data analysis tools need to be built and/or refined
  - Almost all would be data from outside the case
- Monitoring recommendations to ensure adequate data collection

Improved Comparator Site Selection Process

- Comparator site attributes
  - Similar natural setting
  - Different (better) biology
  - Stressor data availability
- Our vision is a tiered or staged site selection process
- Start within your catchment, but could expand to watershed, regional, or statewide scales

New and Improved Data Analysis Tools

- Critical for increasing speed and reducing costs
  - Increasing certainty in the outcome
- We have some great data sets to learn from
  - Favors correlative approaches
- Additional lab studies that examine cause-effect will be crucial

Non-Technical Considerations You Might Want To Comment On

- Who should do the causal assessment?
- Should the comparator sites always be reference sites?
  - Compliance vs. incremental improvement
- When do you have enough certainty to act on the causal assessment?

The Guidance Manual

- Target audience are Stakeholders and RWQCB staff ("Informed managers", but not biologists)
- Describe CADDIS (not a cookbook, pointers to website)
- Case Study summaries (utilize as teaching illustrations)
- Important considerations (insights for California users)
- Recommendations (describe needs for future improvements)

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