

BIOINTEGRITY & BIOSTIMULATORY PROJECT STAKEHOLDER OUTREACH MEETING

March 17, 2017

SCCWRP Costa Mesa CA

10:30-4:30 pm



CONTEXT FOR TODAY'S MEETING

- At the last Biostimulatory- Biointegrity Project (BBP) SAG meeting, we
 - Discussed the rationale for the combined amendments
 - Proposed a scientific approach and described specific work elements to support the combined amendments (a.k.a science plan)
 - Recommended to you a combined BBP Science Panel
 - Presented a draft science for scientific work, SAG and SAP meetings
- Did not discuss SAG organization and governance

PROGRESS SINCE LAST SAG MEETING

- Provided you with a draft written science plan for your feedback
- Provided you the draft work plan for one of the elements missing in our December 2016 discussion
 - “Predicting biointegrity across of land use gradient”
- Selected the dates of the BBP Science Panel meetings:
 - March 9th, 2017 Introductory Webinar for Panel
 - April 19-20, 2017 In-Person Meeting
- Provided you a draft of Panel charge questions and agenda for April meeting

APRIL 2017 SCIENCE PANEL WILL LIKELY FOCUS ON THREE TOPICS

- Science Plan review
- Approach to develop ASCI
- Statistical approaches to develop “default” targets for nutrient et al. eutrophication indicators

You will see these three topics highlighted in today's meeting goals and presentations

MEETING GOALS

- Discuss organization of stakeholder sectors, representatives and how issues, questions and concerns can be presented to the Science Panel
- Discuss proposed approach to predict bioassessment index scores across gradient of development in California landscapes
- Discuss proposed approach to develop statistical models to establish default targets for nutrients et al. eutrophication indicators
- Discuss stakeholder feedback on Biostimulatory – Biointegrity Science Plan
- Discuss stakeholder feedback on SAP meeting charge questions and agenda

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ELEMENTS OF THE SCIENCE PLAN

1. Conduct and synthesize science supporting development of numeric guidance for wadeable streams
 - 1.1 Develop biological indices indicative of aquatic life use support
 - 1.2 Determine the numeric range of biological indices that correspond to attainment of beneficial uses
 - 1.3. Determine the numeric range of stream nutrients and intermediate eutrophication response indicators that correspond to attainment of beneficial uses
2. Implementation plan technical support

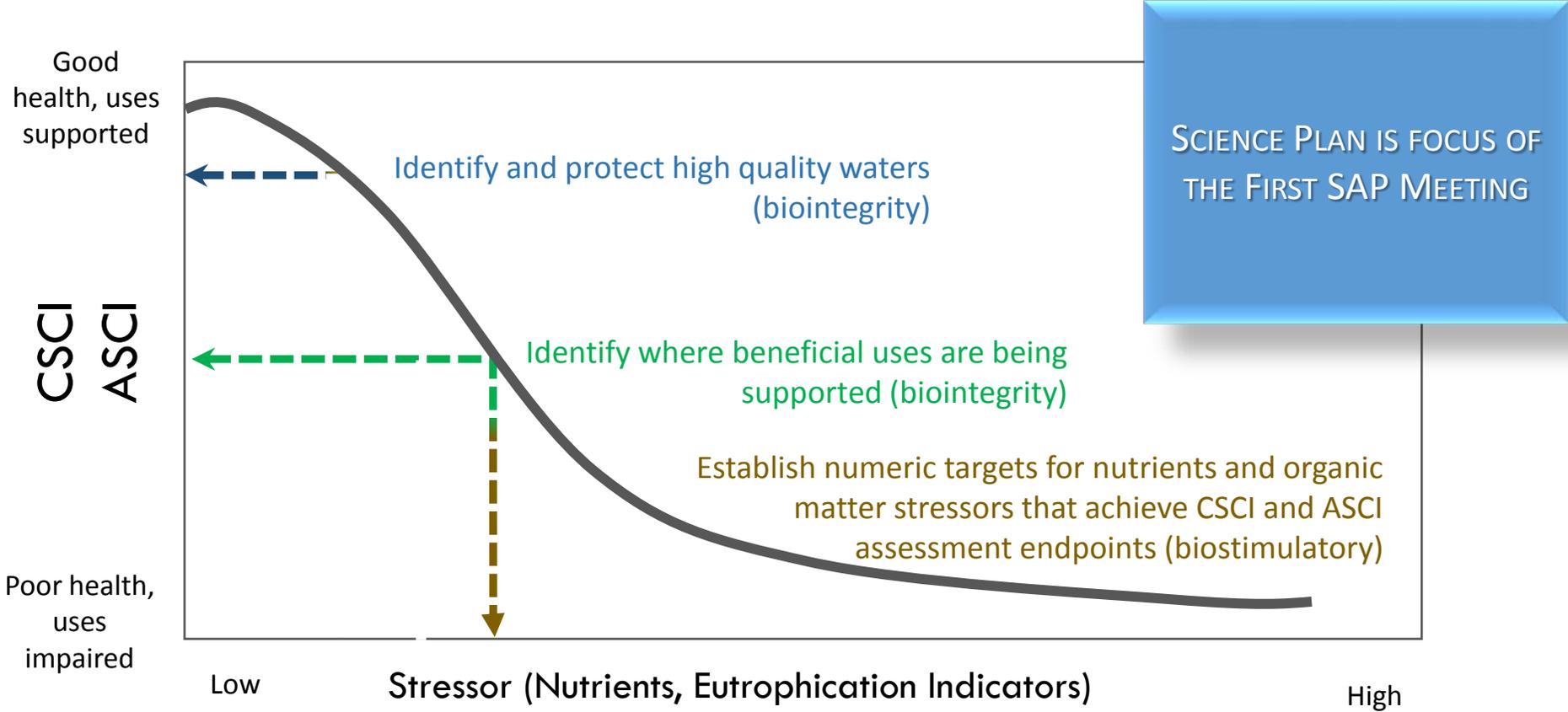
EXAMPLE OF IMPLEMENTATION TECHNICAL ELEMENTS

- Completed
 - Regional study biological conditions in engineered channels
 - Pilot study on spatial representativeness
- Funded and in progress
 - Channels in Developed Landscapes
 - Pilot demonstrations of “watershed approach”, Santa Margarita River watershed
- Future
 - Streamlined causal assessment
 - [Identify these needs on an ongoing basis, with your input]

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DECISIONS ON BIOASSESSMENT INDEX “ASSESSMENT ENDPOINTS” AND BIOSTIMULATORY TARGET FOCUS OF SCIENCE PLAN

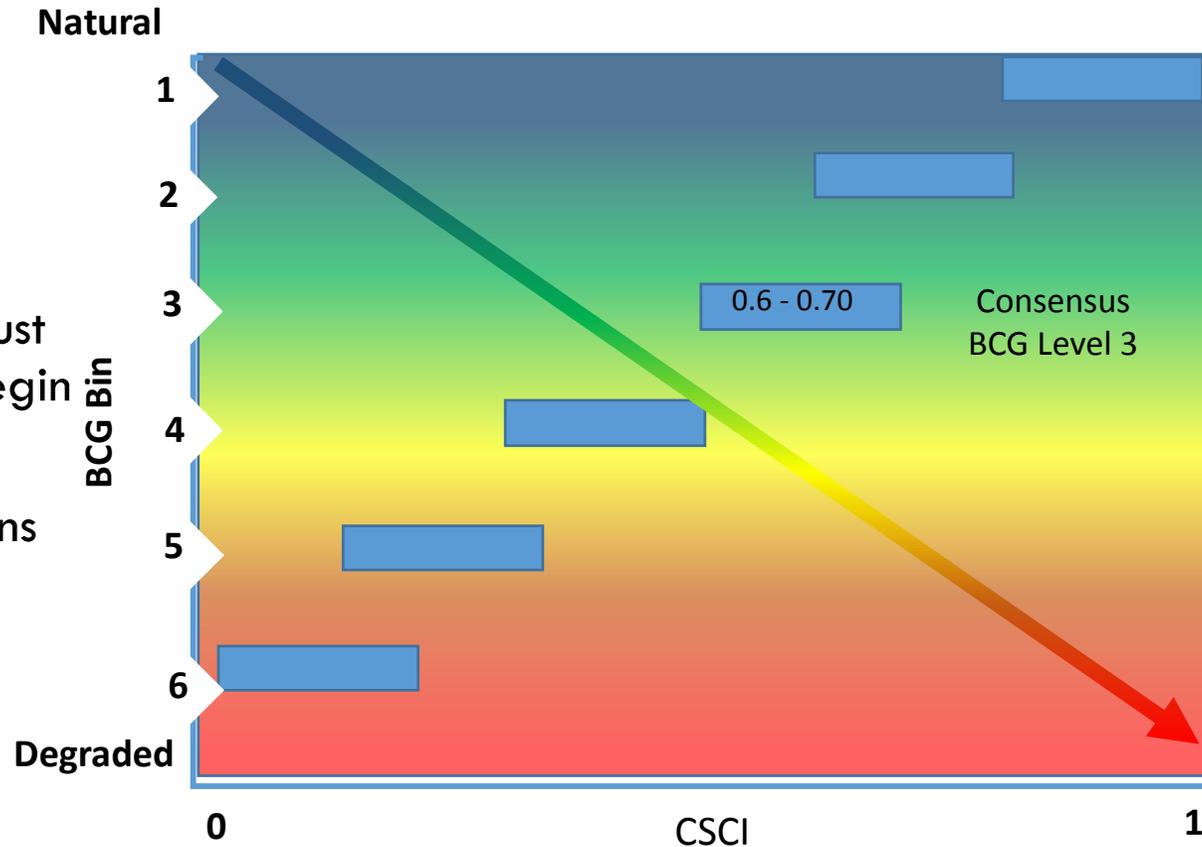


HOW BCG CAN BE USED: SUPPORT POLICY DECISIONS ON ASSESSMENT ENDPOINTS FOR CSCI AND ASCI

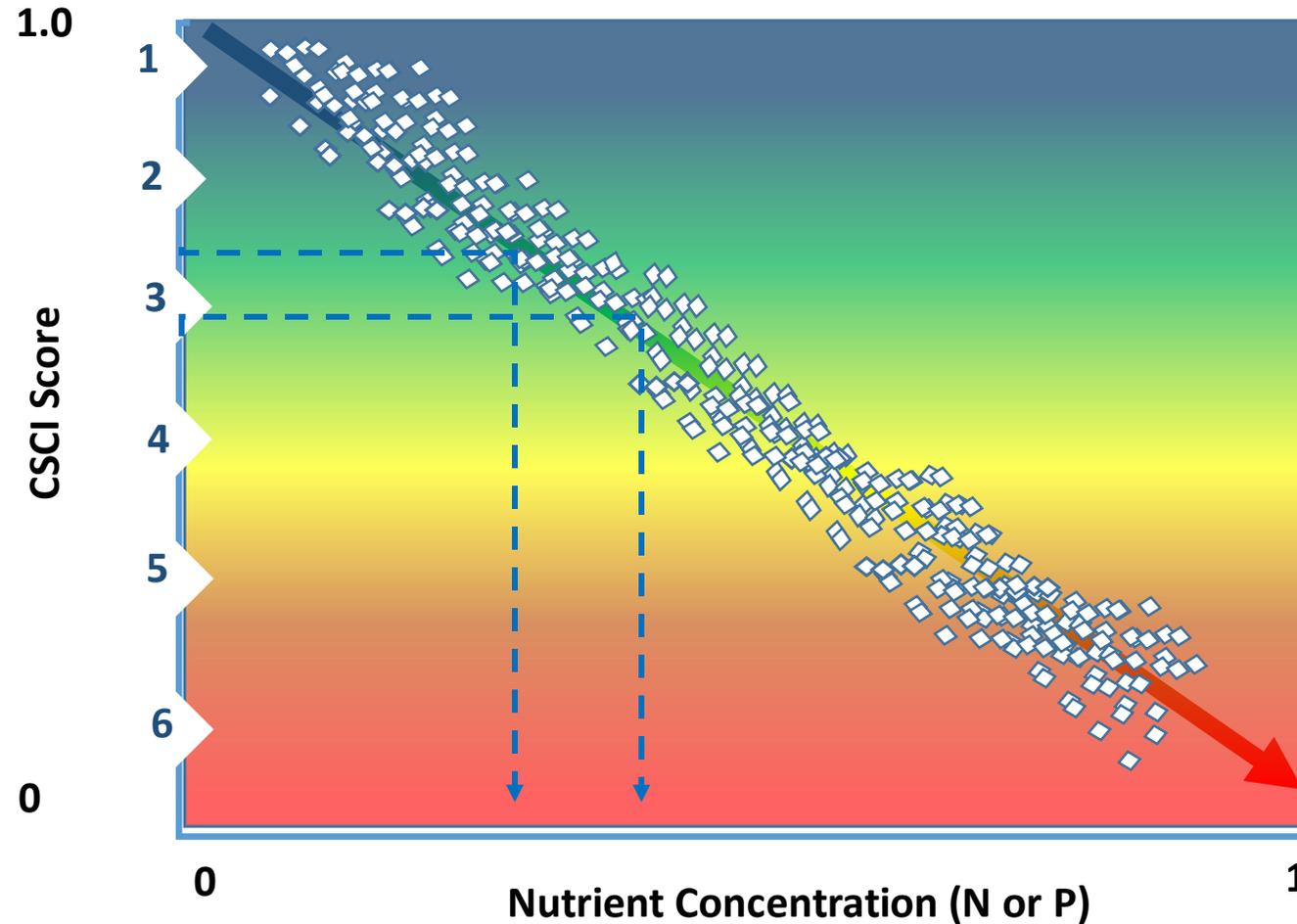
For example:

“A CSCI of 0.6 is associated with a loss of many sensitive taxa and is just above where tolerant taxa may begin replacing these taxa.

Alteration of food web often begins below this as well.”



BASIS FOR DECISIONS ON BIOSTIMULATORY OBJECTIVES: MAP BCG BINS OF INDEX SCORES TO NUTRIENTS ET AL. EUTROPHICATION RESPONSE INDICATORS



WHY COMBINE THE BIOINTEGRITY AND BIOSTIMULATORY/NUTRIENT PROJECTS?

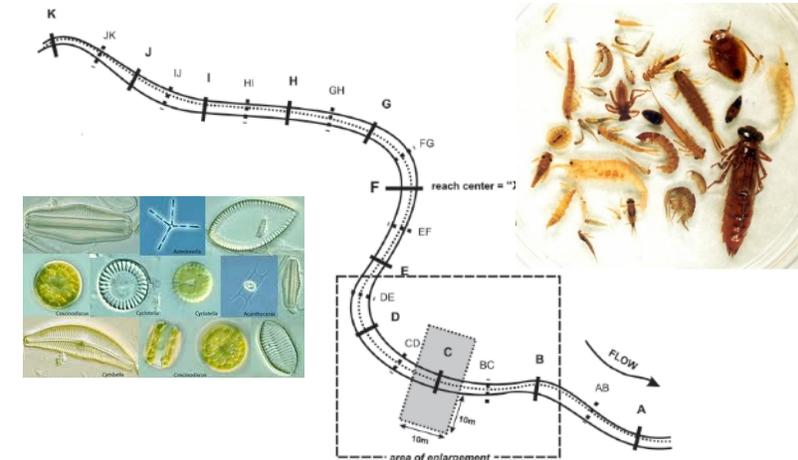
Approaches to Develop Biointegrity and Biostimulatory/ Nutrient Projects Had A Lot of Commonality

- Chemistry alone insufficient to protect aquatic life; use biological indicators to assess beneficial use support
- Link biological indicators to stressor management
 - Causal assessment (biointegrity)
 - Default nutrient targets (biostimulatory)
- Use multiple indicators for more robust assessment
- Statewide consistency, with regional flexibility

Combine for “seamless” policy and streamlined implementation!

STATEWIDE BIOASSESSMENT PROGRAM AND STANDARDIZED INDICES MAKE A COMBINED POLICY FEASIBLE

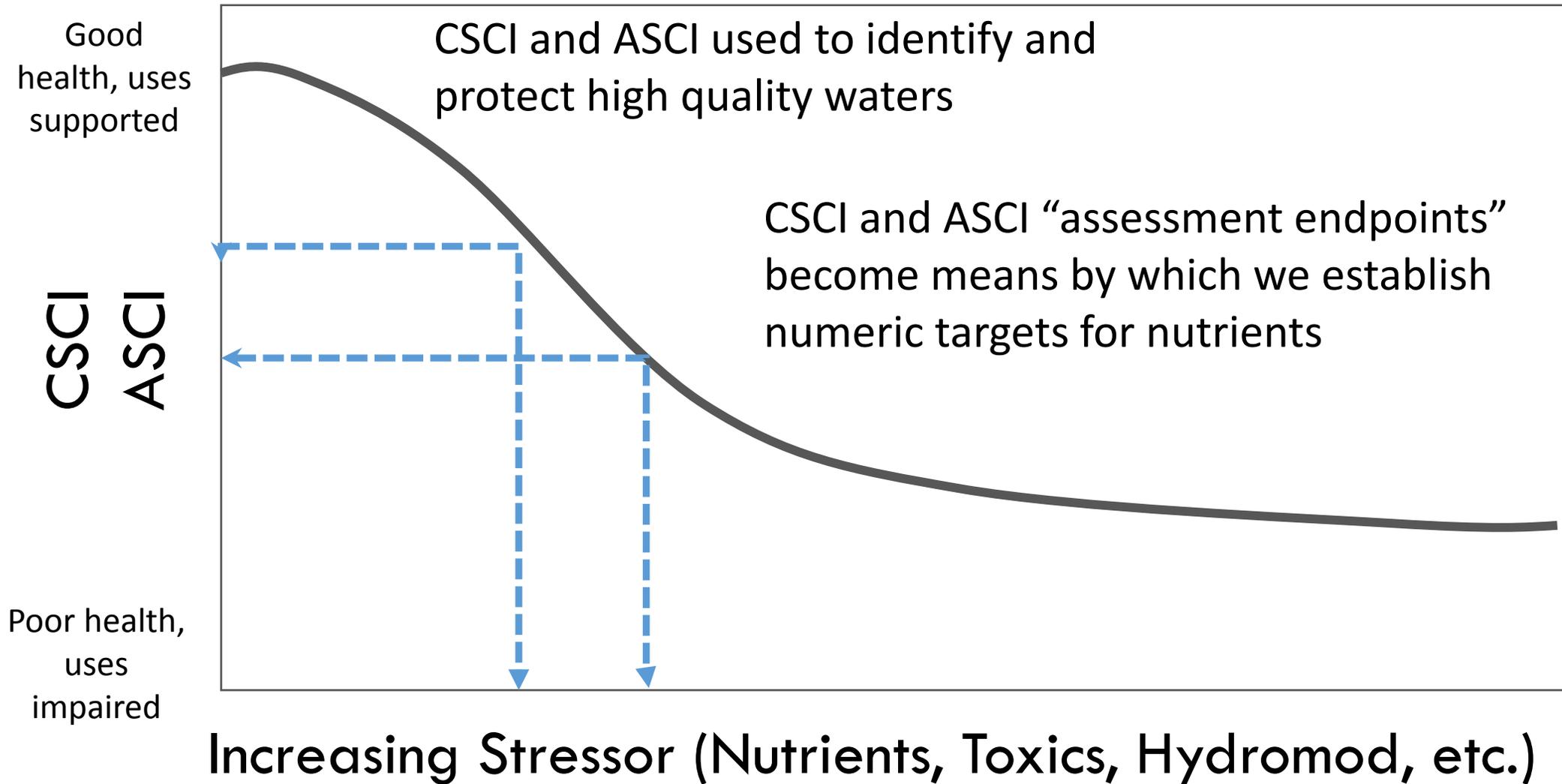
- Standardized protocols and extensive sampling of benthic macroinvertebrates (BMI) & benthic algae
- Statewide scoring tools:
 - California Stream Condition Index (CSCI) for BMI (Mazor et al. 2016)
 - We are now supporting the development of a statewide algal stream condition index (ASCI)
- Assessment of nutrients and biostimulatory conditions relies on these standardized protocols for determining beneficial use support.



REVISED GOALS OF JOINT PROJECT

- Develop Objective for biostimulatory substances
 - Numeric or narrative
 - Protect aquatic life Beneficial Uses (BUs)
- Develop Implementation Program for biostimulatory substances
 - Source by source
 - Coordinated watershed approach
- Develop Statewide plan for assessing Biological Integrity in surface waters
- Establish methods to identify, maintain, and protect Wadeable streams with high biological integrity.

CSCI AND ASCI BECOME THE SURROGATE MEASURES OF AQUATIC LIFE USE AND RELATED BENEFICIAL USES



ELEMENTS OF THE SCIENCE PLAN

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STATISTICAL MODEL APPROACHES TO LINK CSCI AND ASCI TO NUTRIENTS AND ORGANIC MATTER

Recommend regression approaches, with two possible types, depending on policy question

- Nonlinear (e.g. Quantile) regression

“What are the ranges and uncertainty in TN concentration associated with a BCG-binned ranges of ASCI?”

- Logistic regression

“What is the benthic chl-a concentration and associated error that has a probability of 0.5 of CSCI falling below X?”

For either of these approaches, can use classification and regression trees to reduce variability from natural gradients

TODAY' S DISCUSSION IS TO READY YOU TO INTERACT WITH SCIENCE PANEL ON THIS TOPIC

- A bit more detail on approach and process of how we will be working to select an appropriate modeling approach
- Caveat that we haven't started yet....

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*COMMENTS ON SCIENCE
PLAN?*

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PHILOSOPHY IN SCHEDULING AND AGENDIZING SCIENCE

PANEL MEETINGS

- Same four stages of review with other advisory groups
 - Workplan
 - Interim updates (by webinar if necessary)
 - Oral findings
 - Written report
- Public session (Day 1), Closed Session (Day 2), Report out (Day 2)
- Charge questions and written materials to review ~ 1 month in advance (if possible)
- Opportunity for advisory groups to present on issues or concerns during 1st day

PROPOSED FOCUS OF FIRST PANEL MEETING

- **Science Plan review**, with key new components:
 - Development of an algal stream condition index (ASCI)
 - Development of a biological condition gradient model to support policy decisions on thresholds
 - GIS model to predict biological integrity based on land use
- **Appropriateness of approach to developing the ASCI**
 - Additional refinements suggested
 - Trade offs in designing an index tuned to generalized stressor gradient versus specific stressor (e.g. eutrophication)?
- **Suggested statistical modelling approaches** linking bioassessment indices to numeric targets for eutrophication

MEETING PREP- MUST READS

- Science Panel Charge Questions (in draft now, to be finalized 3/17/2017)
- Science Plan, with three attachments for detailed work plans:
 - ASCI
 - BCG model work plan
 - GIS model to predict biological integrity
- Stakeholder comments on science plan and general summary of those comments (available 3/30/2017)

MEETING PREP- IMPORTANT BACKGROUND

- Mazor, et al. 2016. Bioassessment in complex environments: Designing an index for consistent meaning in different settings. *Freshwater Science* 35(1): 249-271
- Fetscher, et al. 2014a. Development and comparison of stream indices of biotic integrity using diatoms vs. non-diatom algae vs. a combination. *Journal of Applied Phycology* 26:433-450.
- Fetscher, et al. 2014b. Improving Tools to Link Nutrients to Adverse Effects on Stream Ecosystem Services in California. U.S. EPA Office of Research and Development Regional Ecosystem Services Research Program (REServe).
- Ode et al. (2016) Evaluating the adequacy of a reference site pool for ecological assessments in environmentally complex regions. *Freshwater Science* 35:1, 237-248.

MEETING PREP- GOOD BACKGROUND, AT YOUR DISCRETION

History of nutrient objective development.

- Tetra Tech 2006. Technical Approach to Develop Nutrient Numeric Endpoints for California. Prepared for: U.S. EPA Region IX (Contract No. 68-C-02-108-To-111).

www.swrcb.ca.gov/water_issues/programs/nutrient_objectives/development/docs/techapproach_freshwater2006.pdf

- http://www.waterboards.ca.gov/water_issues/programs/nutrient_objectives/

History of biointegrity policy development

http://www.waterboards.ca.gov/plans_policies/biological_objective.shtml

*COMMENTS ON PANEL
CHARGE QUESTIONS AND
AGENDA?*

Tentative Schedule for SAG Meetings:

January 2017 and ongoing – Webinars - implementation related work plans and updates

Feb/March 2017- Meeting (South)

- Interim Updates, Science Plan and Panel Charge

July 2017- Meeting (North)

- Oral findings (ASCI, BCG, Biojoint GIS)

September 2017 – Meeting (South)

- Draft reports (ASCI, BCG)
- Oral findings (eutrophication synthesis statistical models linking to nutrients/OM)

November 2017 – Meeting (North)

- Revised reports (ASCI, BCG)
- Draft report (eutro synthesis & linkage to nutrients/OM)

Tentative Schedule for Science Panel Meetings

January 2017 – Webinar orientation

March 2017- Meeting (South)

- Science Plan
- Interim updates (ASCI, BCG, eutrophication synthesis)

October 2017 – Meeting (South)

- Draft reports (ASCI, BCG)
- Oral findings (eutrophication synthesis statistical models linking to nutrients and OM indicators)

January 2018– Meeting (South)

- Revised reports (ASCI, BCG)
- Written report (eutrophication synthesis and linkage to nutrients)
- Implementation Science

NEXT STEPS

- Written feedback on science plans or individualized work plans by March 24th, 2017
- Advisory group feedback will be summarized and sent back out all, including Science Panel, by March 31, 2017
- Next webinar update:
 - ASCI webinar the: March 31, 2017
- Likely to be queued up in May 2017:
 - BCG
 - Biointegrity GIS modeling
 - ASCI