BIOINTEGRITY & BIOSTIMULATORY PROJECT
SCIENCE ADVISORY PANEL MEETING

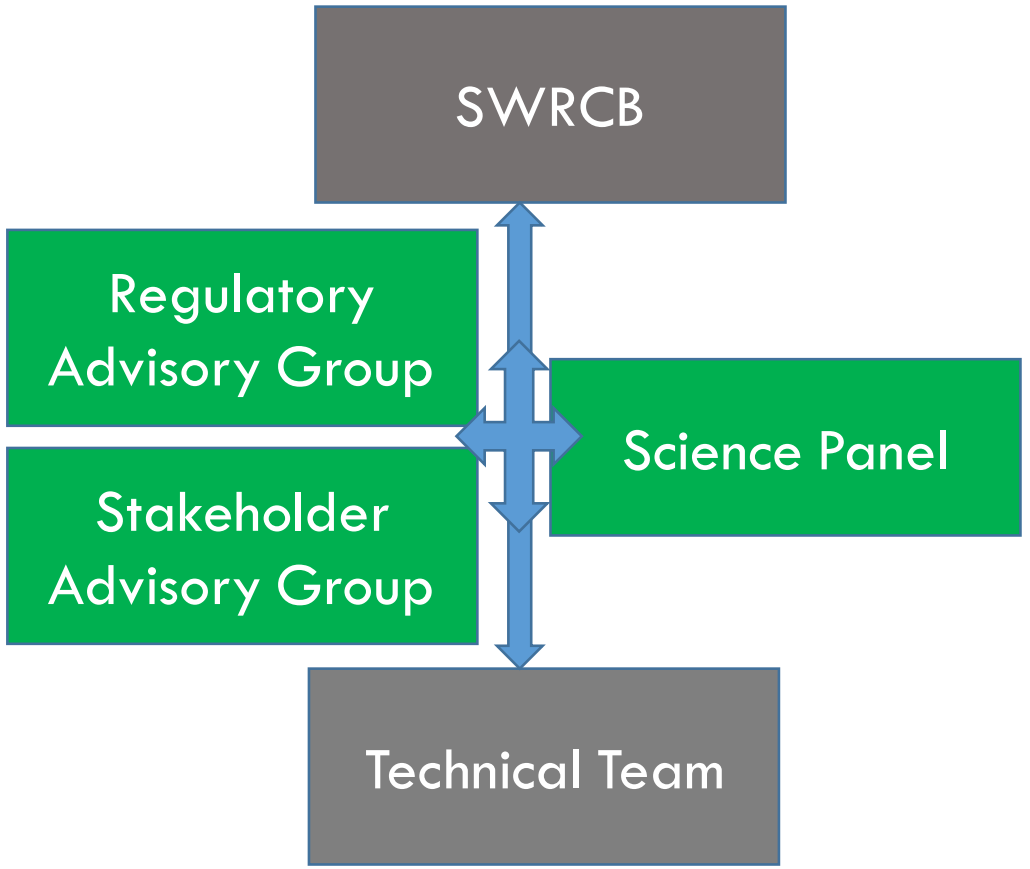
March 9, 8 – 10 am

Introductory Webinar

Background and Context

- Over the past decade, California State Water Resources Control Board has been working on two policies for wadeable streams
  - Biointegrity
  - Biostimulatory (nutrients)

- Organization/governance of projects was identical



Context Continued…

- California State Water Board staff was directed to combine the Biostimulatory substances and Biointegrity projects for wadeable streams
- Organization and governance of this process remains the same
  - We have combined the stakeholder advisory groups

    …And the regulatory advisory groups
  - A combined independent Science Panel will continue to provide ongoing peer review of science that will be used in policy development
- Technical team, led by SCCWRP, has been reformulating science plan to accommodate the combined projects

Meeting Goals

- (Re) Introduce the Team
- Provide an update on Water Board staff rationale and preferred regulatory approach for the combined biostimulatory and biointegrity projects
  - Important context for the science that you will be reviewing
- Review role of SAP and anticipated schedule for meetings
- Cover likely topics, related charge questions, and prep for first meeting

Introductions –Science Advisory Panel

Name	Affiliation	Expertise
Cliff Dahm	Delta Stewardship Council	Biogeochemistry
Chuck Hawkins	Utah State University	Invertebrate Ecology
Ken Reckhow	Duke University	Modeling
Paul Stacey	Grand Bay NEERs	Nutrient Management
R. Jan Stevenson	Michigan State University	Algal Ecology
Lester Yuan	EPA OST	Modeling

Introductions –State Water Board Staff

Name	Role
Nick Martorano	Project Manager
Jessie Maxfield	Lead staff for outreach, Biointegrity Policy
Steve Camacho	Lead staff for Biostimulatory Policy

Introductions –Regulatory Advisory Group

Jessie Maxfield - Facilitator

Agencies Represented

EPA Region 9

State Water Board

Regional Water Quality Control Boards

North Coast	Colorado River
San Francisco	San Diego
Central Coast	Lahontan
Santa Ana	Central Valley
Los Angeles	

Introductions –Stakeholder Advisory Group Facilitator

Brock Bernstein – Facilitator

<u>Sectors Represented</u>

Environmental NGOs

Municipal Wastewater

Stormwater

Agriculture

Land owners

Industrial dischargers

INTRODUCTIONS -TECHNICAL TEAM

SCCWRP

Martha Sutula

Eric Stein

Raphael Mazor

Susanna Theroux

Ken Schiff

CDFW

Pete Ode

Andy Rehn

Tetra Tech

Michael Paul

Benjamin Jessup

Jeroen Gerritsen

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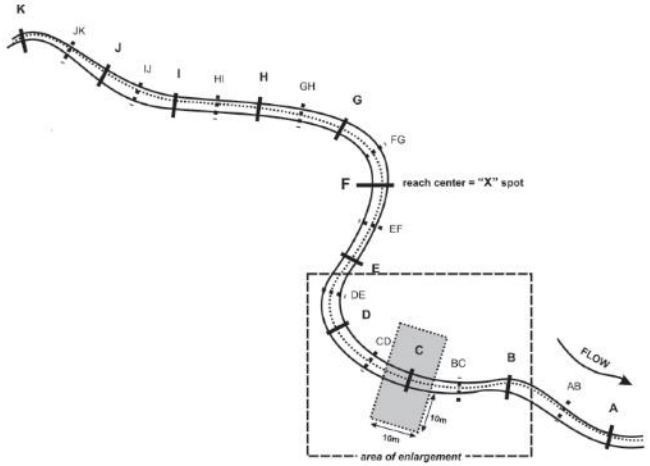
First…a bit of history….

California's bioassessment programs

- Extensive sampling for benthic macroinvertebrates nearly 2 decades with NRSA-like protocols (i.e., representative of all microhabitats)
- Benthic algae sampling since 2008, with protocols derived from BMI
- Standardized protocols for both assemblages, and standardized taxonomy for BMI
- Standardized external QA for both BMI and algae
- Annual trainings and audits for all field crews



Foundation for Biointegrity Policy Development

BIOINTEGRITY PLAN DEVELOPMENT RECAP

- Project initially kicked off in 2010 as an effort to develop numeric Biological Objectives
  - Stakeholder and Advisory groups were formed and technical work began
- 2011-2012 the project focused primarily on technical work
- In 2013 the technical work shared with stakeholders and implementation options were discussed.
- In 2014, focus shifted from developing objectives to developing an implementation plan
- A draft Policy framework was developed
- Work stalled due to staffing changes; new staff assigned in late 2014

Focus since then on "implementation" but no policy has been promulgated

BIOSTIMULATORY (NUTRIENTS) RECAP

- Project initially kicked off in 2000 as an effort to develop numeric nutrient objectives
  - Stakeholder and Regulatory Advisory groups were formed
  - Technical work began
- 2000-2006 the project focused primarily on technical work informing approach
  - Predated availability of bioassessment data
- 2006- 2012, focused on early implementation of preferred regulatory approach through TMDLs.
- In 2014, decision to take advantage of available bioassessment science to fine tune approach
  - Science Panel was formed and met once in June 2015
- Work stalled for one year due to staffing changes; new staff assigned in spring 2016

2014: Preferred Regulatory Approach to Nutrients

- Coined as "nutrient numeric endpoint (NNE) approach"
- Consists of two major components
  - Response indicators with numeric **endpoints** for waterbody **assessment**
  - **Numeric nutrient targets** (e.g. for permits, TMDLs, etc.) established via linkage to assessment endpoints
- Establish statewide assessment endpoints and nutrient targets, with opportunity to refine with "watershed approach"

Algae & Aquatic Plants

Dissolved Oxygen, pH

Fast Forward….last year we decided to combine the two projects

“Amendment to the Water Quality Control Plans for Inland Surface Waters, Enclosed Bays, and Estuaries of California to Establish a Biostimulatory Substances Objective and Program to Implement “Biological Integrity”

Why Combine the Projects?

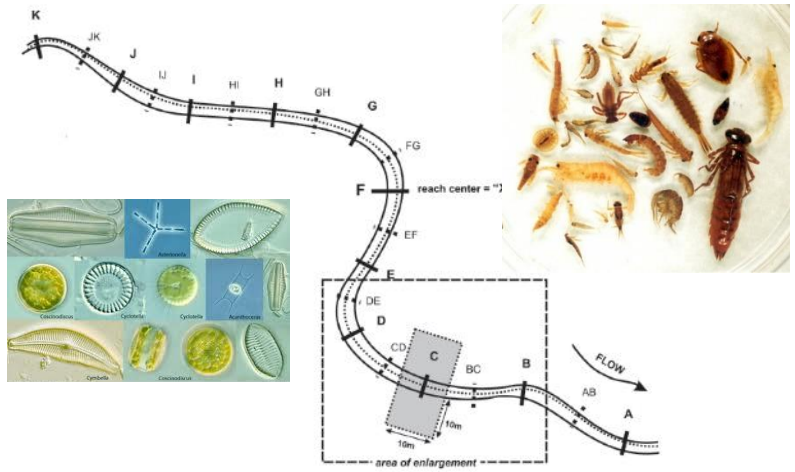
Approaches to Develop Biointegrity and Biostimulatory/ Nutrient Projects Had A Lot of Commonality

- Chemistry data alone insufficient to protect aquatic life.
  - Use biological indicators to assess beneficial use support
    - Benthic Macroinvertebrates => CSCI
    - Algae => ASCI

- Link biological indicators to stressor management
  - Causal assessment (biointegrity)
  - Default nutrient targets (biostimulatory)

Statewide Bioassessment Program and Standardized Indices Make A Combined Policy Feasible

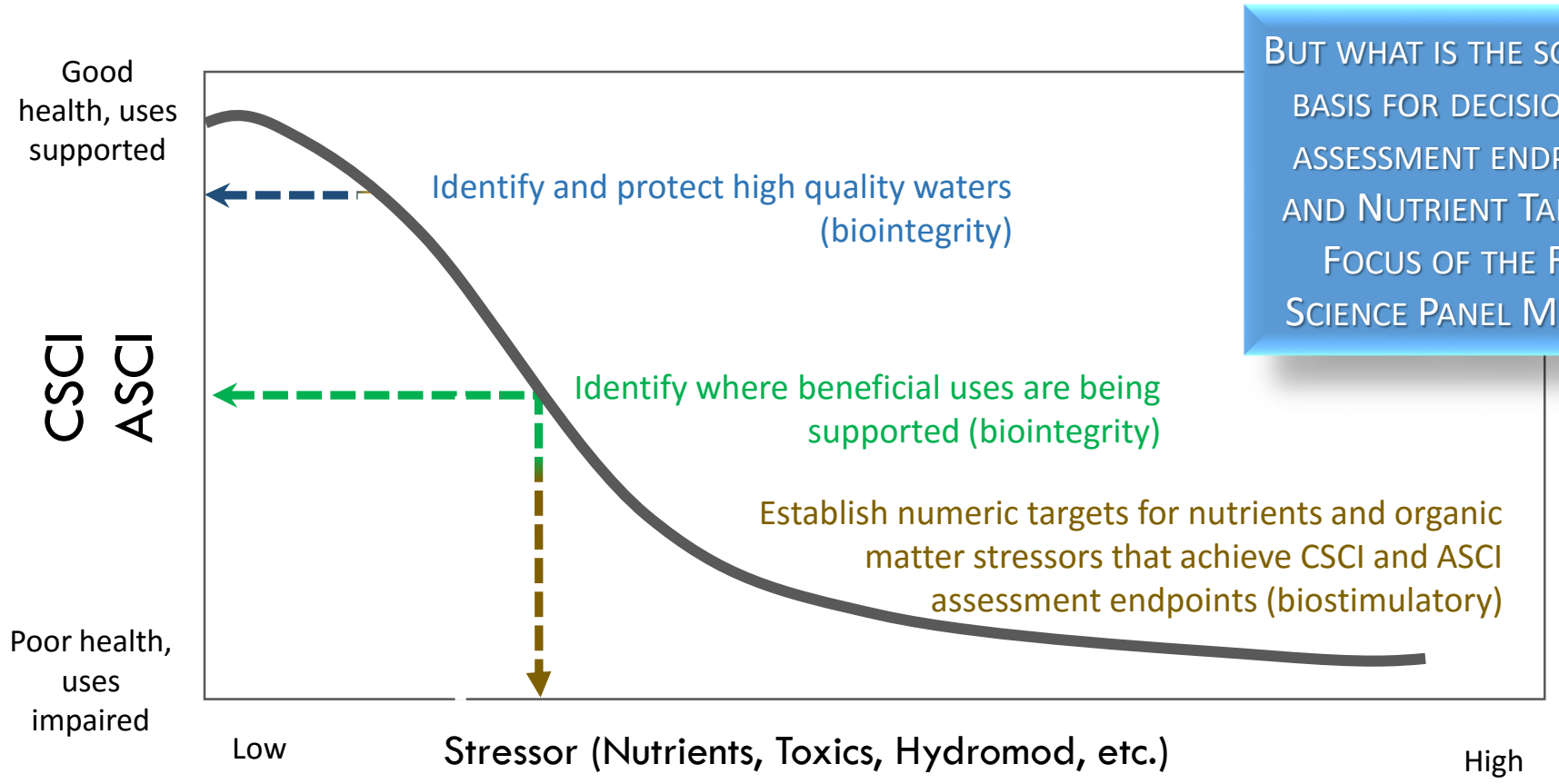
- Standardized protocols and extensive sampling of benthic macroinvertebrates (BMI) & benthic algae
- Statewide scoring tools:
  - California Stream Condition Index (CSCI) for BMI (Mazor et al. 2016)
  - We are now supporting the development of a statewide algal stream condition index (ASCI)
- Assessment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



Revised Goals of Joint Project

- Develop a water quality objective for biostimulatory substances
  - Narrative with numeric translators
  - Protection of aquatic life Beneficial Uses (BUs)
- Develop Implementation Program for biostimulatory substances
  - Source by source = permit by permit based on default
  - Coordinated watershed management approach = Flexibility
- Define a process for assessing Biological Integrity of streams
  - CSCI and ASCI values as assessment endpoints
- Identify, maintain, and protect wadeable streams with high biological integrity.

How to scientifically support "Assessment Endpoints" to Assess Aquatic Life?



But what is the scientific basis for decisions on assessment endpoints and Nutrient Targets? Focus of the First Science Panel Meeting

Focused Stakeholder Outreach

- Ten Focus Group meetings were held during 2016
- Several groups were represented
- Purpose: Present options and gather feedback.
- 2 Elements presented
  - Objectives, Program of implementation/regulatory approach
- Staff is waiting final Policy direction from upper management but is proceeding with the science development.

Tentative Timeline

Task	Description	Target Dates
Focus Group Outreach	Discuss with focus group stakeholders	February - June 2016
Project Outreach with Regulatory Group (RG) and Stakeholder Advisory Group (SAG)	Update the RG, SAG, and Science Panel members of the biostimulatory substances project and the RG and SAG of the bio-integrity project on technical science and the merging of the two projects.	December 2016
Early Public Outreach and/or Scoping Document and Meetings	Scoping Document and Meetings to satisfy the State Water Board's regulations implementing CEQA.	Winter 2017
Draft projects & SED	Develop Draft Biostimulatory Substances/Biological Integrity Amendment language & Draft Supplemental Environmental Documentation	Winter 2018
Public Comment	Release Draft Amendment and SED for public comment	Spring 2019
Public Hearing	Public Hearing to receive oral comments	Summer 2019
State Water Board Response to Comments	Develop written responses to oral and written comments	Fall 2019
Board Adoption	Board meeting to consider adoption	Winter 2019

Questions?

Comments?

Meeting Goals

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Role of Science Panel

- Provide independent technical review of policy development products
  - Includes the workplan and individual tasks

- Provide critical scientific insight based on extensive real world experience
  - Data gaps, alternative approaches, limits of interpretation
  - Potential management implications

- Like the SAG, your role is not approval
  - Its advisory

Appointment Process

- Agreement with advisory groups on desired expertise and attributes of panelist
- List of candidates reviewed by advisory groups
- Finalists contacted for participation
- You have been pulled from previous panels, so no additional review was required

We are extremely grateful that you are willing to continue to serve!

Philosophy in Scheduling and agendizing Advisory Group Meetings vis-à-vis Science

- Four major stages of review
  - Workplan
  - Interim updates (by webinar if necessary)
  - Oral findings
  - Written report
- Written materials to review ~ 1 month in advance (if possible)
- Preview Science Panel charge questions and the science that will be presented to Panel in advance (no surprises)

Philosophy in Scheduling and agendizing Science Panel Meetings

- Same four stages of review
  - 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

Tentative Schedule for SAG Meetings:

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

March 2017- Meeting (South)

- Interim Updates, Science Plan and Panel Charge

July 2017- Meeting (North)

- Oral findings (ASCI, BCG)

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

March 2017 – Webinar orientation

April 2017- Meeting (South)

- Draft 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

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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

Questions?

Comments?