

MAY 2021

Delta Independent Science Board Update

Dr. Stephen Brandt, Chair
Dr. Jay Lund, Past Chair



**Delta
Independent
Science Board**

DELTA STEWARDSHIP COUNCIL

01. OVERVIEW OF THE DELTA ISB

Who We Are?



Dr. Steve Brandt
Chair



Dr. Jay Lund
Past Chair



Dr. James Cloern



Dr. Virginia Dale



Dr. Joe Fernando



Dr. Tanya Heikkila



Dr. Tom Holzer



Dr. Bob Naiman



Dr. Diane McKnight



Dr. Lisa Wainger

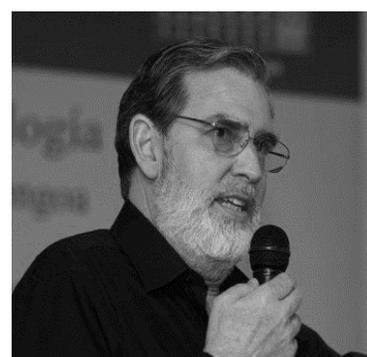
Former Members



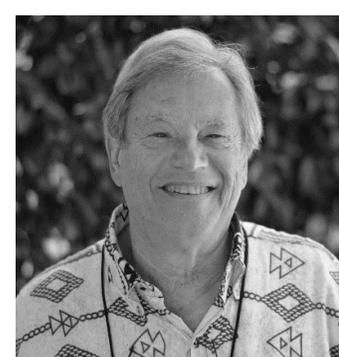
Dr. Liz Canuel



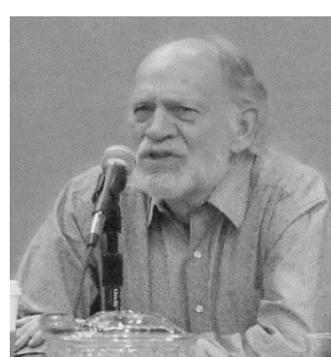
Dr. Tracy Collier



Dr. Dick Norgaard



Dr. Vince Resh



Dr. John Wiens



Dr. Joy Zedler



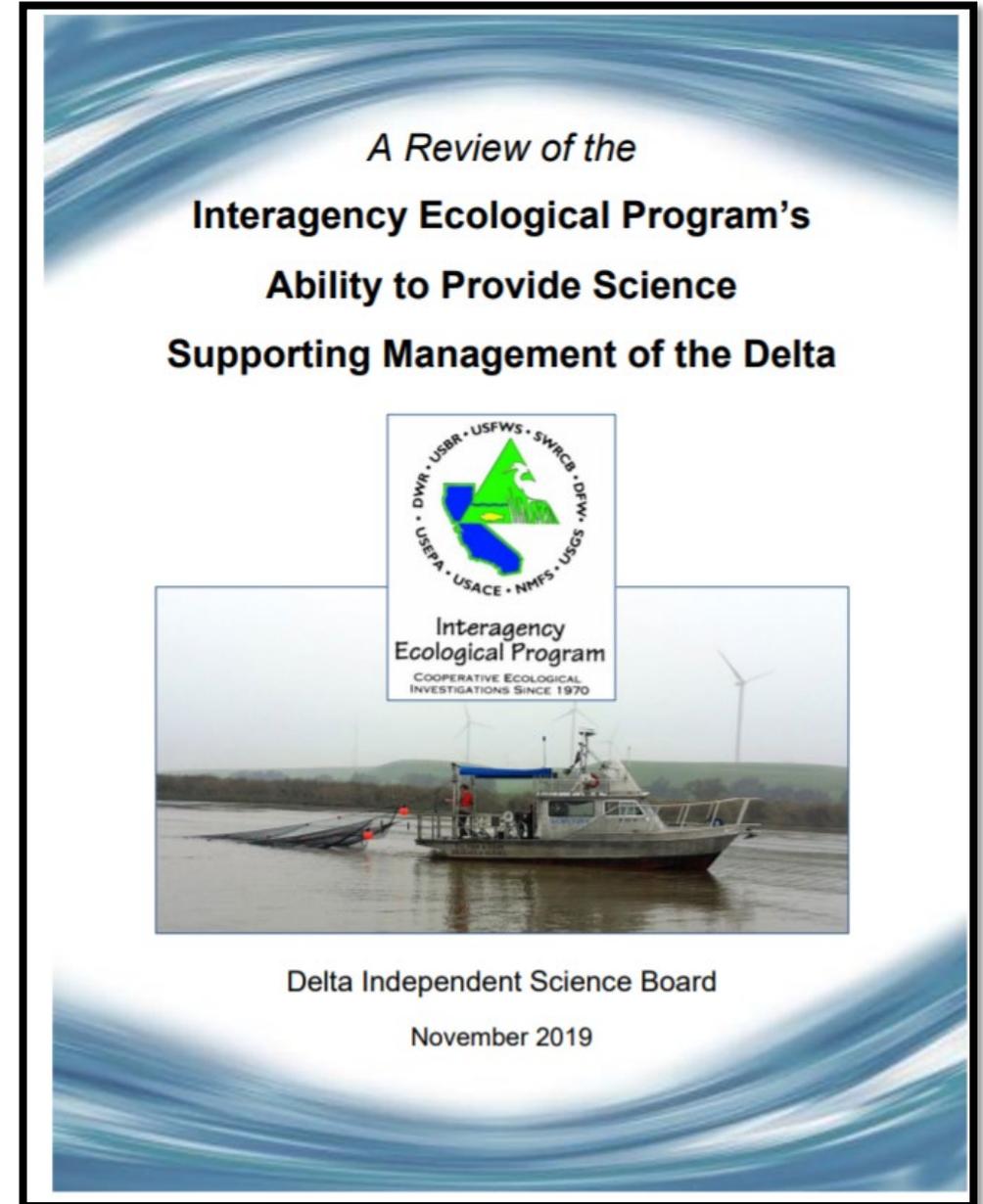
What We Do?

The Delta Reform Act (2009):

- Provide oversight of the scientific research, monitoring, and assessment programs that support adaptive management in the Delta through periodic reviews of each of those programs
- Provide independent advice on the Delta Plan
- Consult with the Council on the appointment of the Lead Scientist

Current Approaches

- Review agency documents (e.g., Delta Science Plan, Delta Plan amendments)
- Review programs by themes. Thematic reviews presented to the Council:
 - 1) Restoration (2013)
 - 2) Fish and Flows (2015)
 - 3) Adaptive Management (2016)
 - 4) Levees (2016)
 - 5) Delta as an Evolving Place (2017)
 - 6) Water Quality (2018)
 - 7) Interagency Ecological Program (2019)



General Review Purpose

- Evaluate the state and adequacy of the science
- Recommend forward-looking strategic science priorities
 - Identify gaps
 - Increase scientific credibility
 - Improve research clarity
 - Advance the debate about Delta issues
 - Seek better connectivity between science, management and policy
- Delta ISB does not make or recommend policy decisions



Current Activities

Drafting Reviews for Public Comments

- Water Supply Reliability
- Monitoring Enterprise

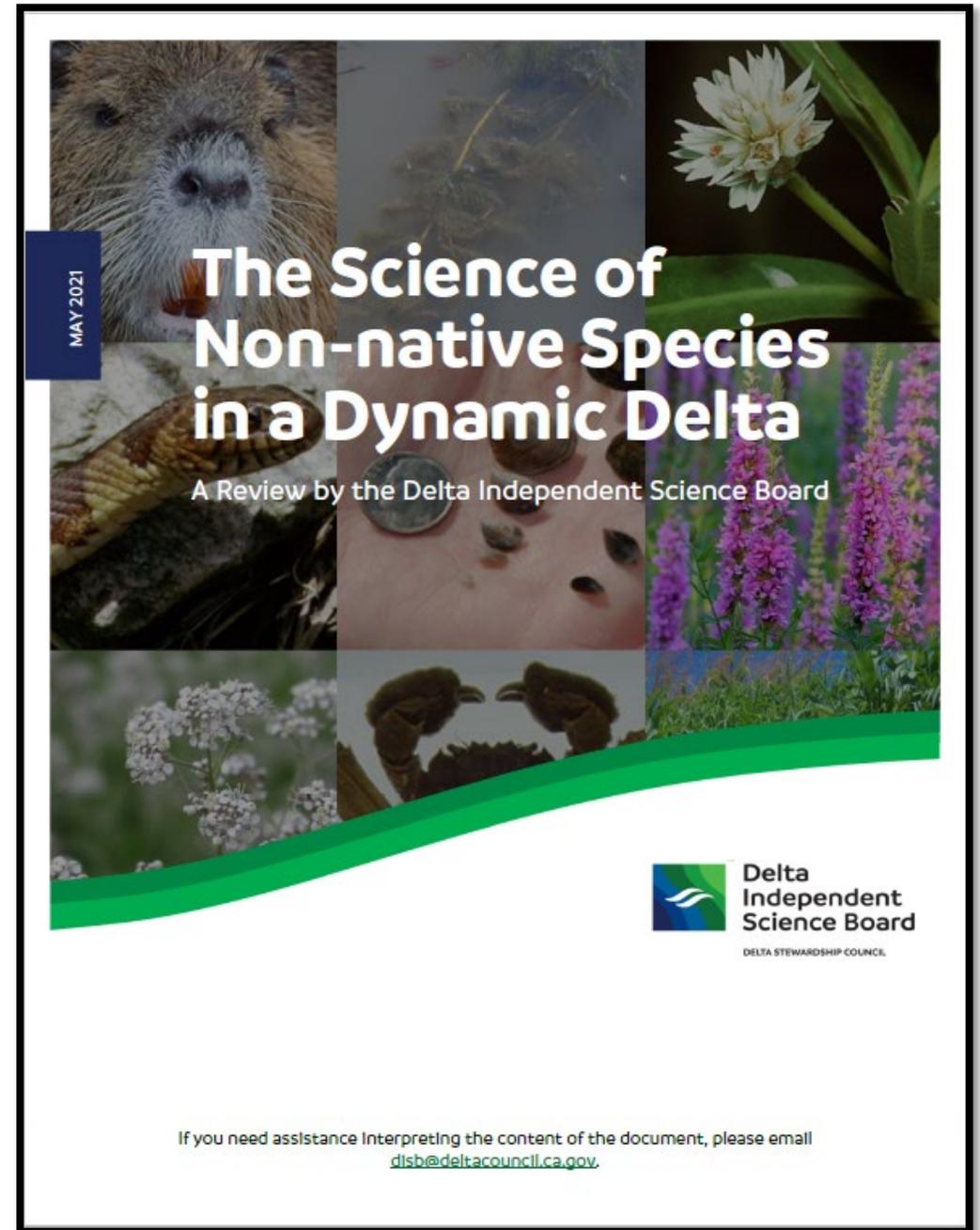
Outreach/Implementation

- Science Needs Assessment
- **Non-native Species Review**

Planning Future Reviews

Upcoming Requests

- Science Action Agenda Update (fall 2021)



General Approach

1. Identify relevant thematic topics
 - Delta Plan Chapter Topics
 - Panels/Discussions
 - Stakeholder Surveys
2. Prospectus on topic, goals, and methods
3. Draft review for public comment
4. Final review and report to the Council
5. Outreach
 - Presentations at conferences
 - Flyers
 - Publications
 - Stakeholder engagement



DELTA ISB REVIEW:

02.

**NON-NATIVES SPECIES IN A
DYNAMIC DELTA**



Why Non-native Species Science?

- One of the greatest global threats to the integrity of ecosystems and one of the 5 drivers of ecosystem change.
- The California Bay-Delta is one of the world's most invaded estuaries.
- Key component in the Delta Reform Act and reducing the impact of non-native species is also one of the core strategies highlighted in the Ecosystem Amendment to the Delta Plan.
- Threatens the achievement of the coequal goal of protecting, restoring, and enhancing the Delta ecosystem...and even defining what an ecosystem is!

DRAFT CHAPTER 4

Protect, Restore, and Enhance the Delta Ecosystem



For assistance interpreting the content of this document, please contact Delta Stewardship Council staff.

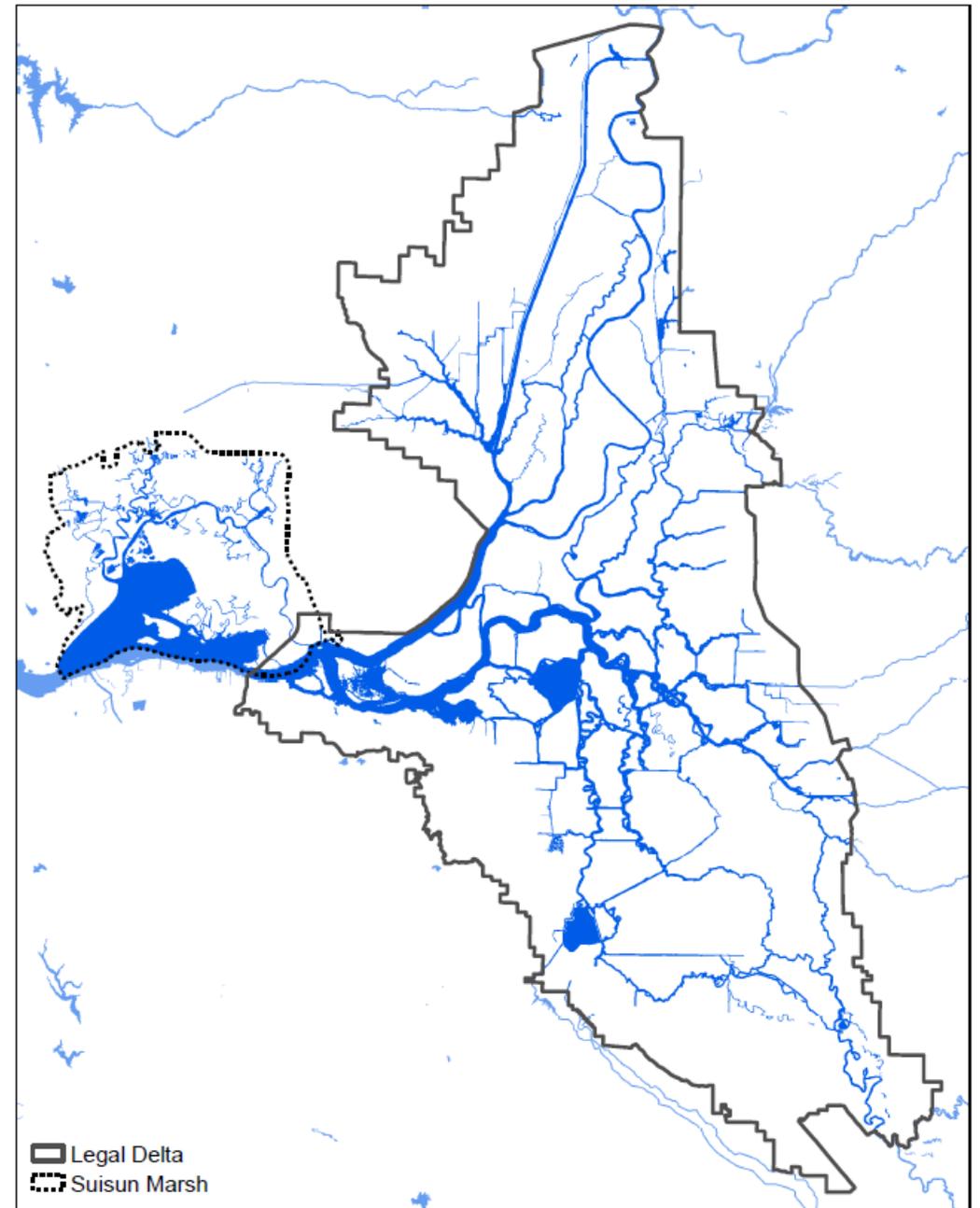
accessibility@deltacouncil.ca.gov

Phone: 916-445-5511

Review Goal

Better understand the scientific needs related to this complex long-term issue.

- Help agencies prevent and manage the threats and consequences of non-native species in Delta lands and waters.
- Focus on Delta-wide needs that span multiple agency responsibilities.
- Science-based prioritization framework to make decisions.





Review Process

- Extensive literature review
- Two panel discussions each composed with five experts who explored the status of science relative to non-native species in the Delta
- Delta ISB deliberations and public comments
- Participation in several workshops and scientific sessions, presentations, and discussions with managers

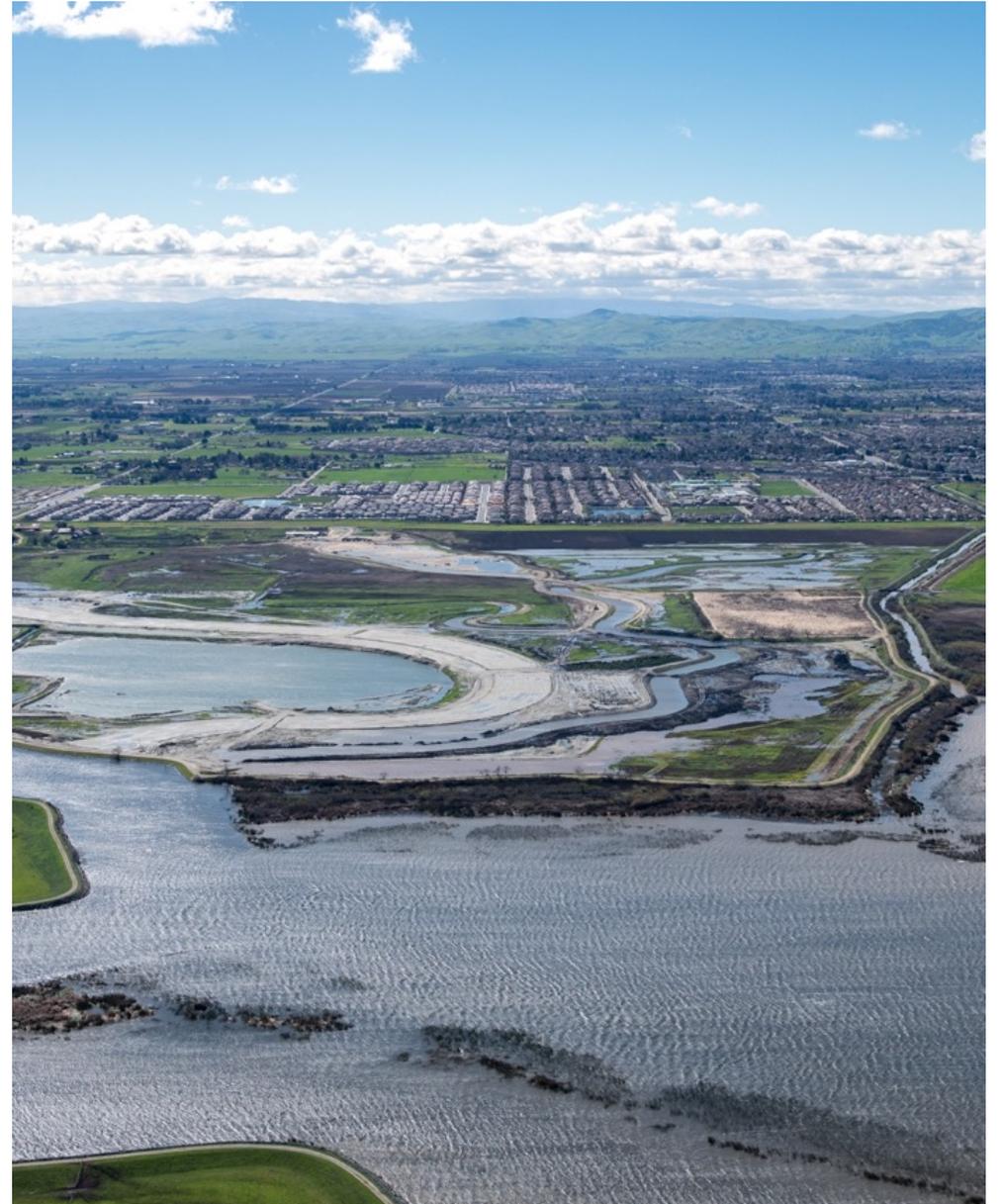
Findings: General

- The science related to invasions and non-native species is extensive and spans 6 decades
- Non-native species impact almost every ecosystem service and ecosystem sustainability
- Basic needs and technologies to better prevent, control and ultimately manage **individual** non-native species are similar across ecosystems
- Science is needed at each point in the management decision process



Findings: Delta

- The Delta is a highly modified ecosystem
- The global and local forces driving environmental changes in the Delta are ongoing, some at an accelerated pace
- These changes affect the vulnerability of the Delta to new invaders
- What is unique in the Delta are the institutional arrangements, responsibilities, scientific collaboration mechanisms, and funding structures to handle this issue



Recommendations

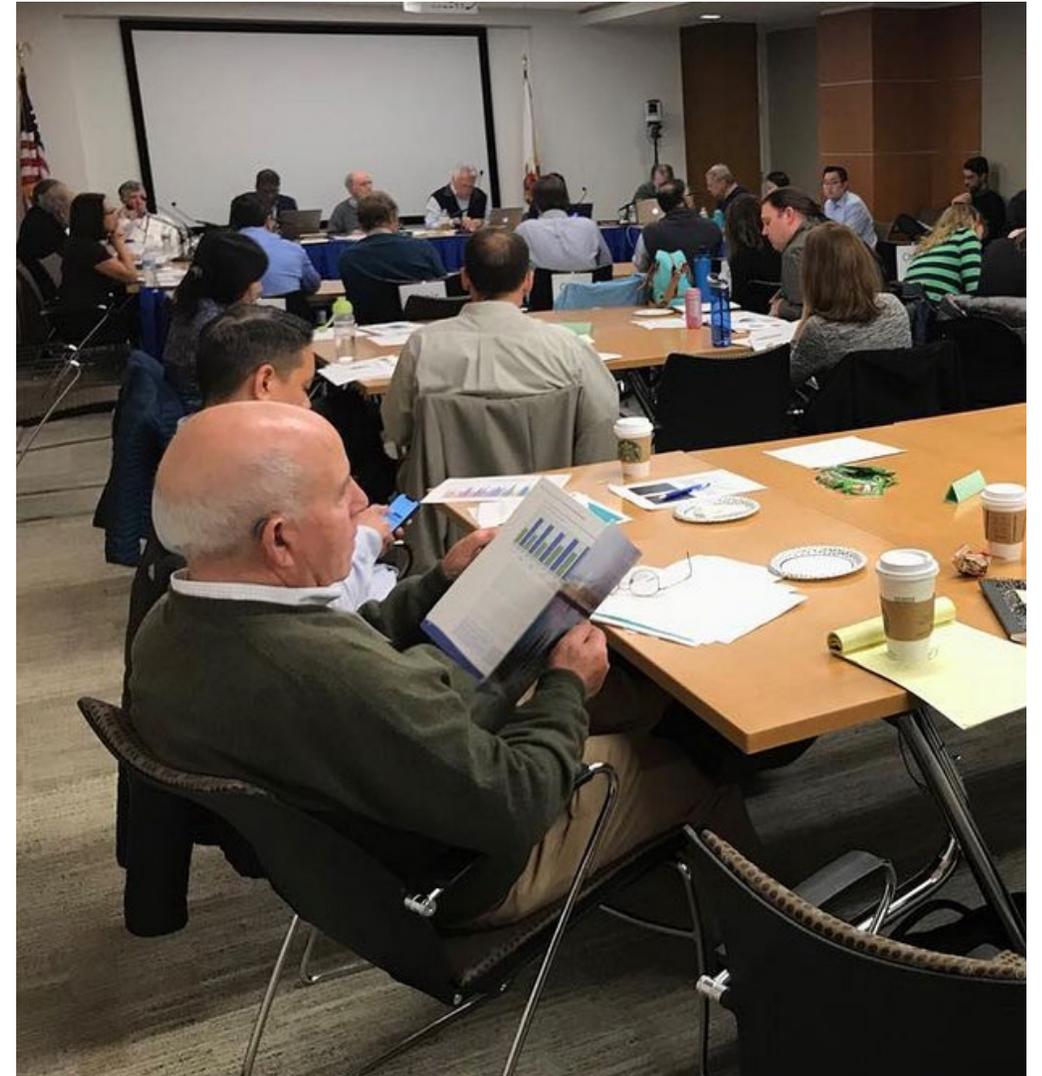
The Delta ISB's overall recommendation is to encourage a more ecosystem-level, forward-looking, integrated approach to non-native species science in the Delta with a specific consideration of climate change.

We offer 7 specific recommendations.

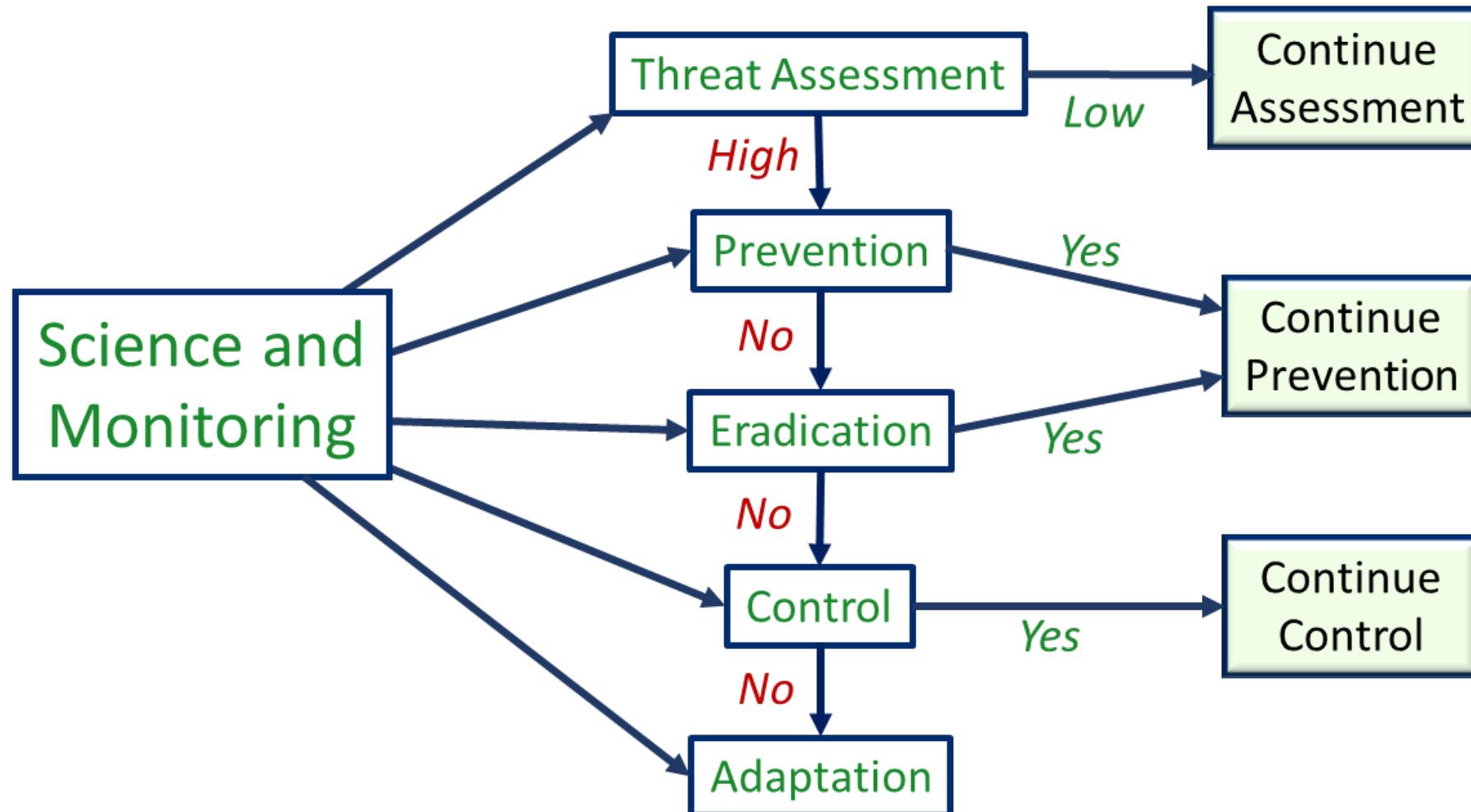


Improve Scientific Capabilities & Understanding in the Delta

1. Develop a comprehensive, spatially explicit, **food-web model** that is Delta-wide in scope and tied to environmental driving forces and conditions.
 - Improve our mechanistic understanding of non-native species currently in the Delta.
 - Predict potential impacts of new invaders.
 - Assess how potential threats of invasive species would be altered by climate change.
2. Define and prioritize detailed short-term and long-term project-level science needs by **conducting a series of focused workshops or syntheses.**



Stages of Management and Science in Dealing with an Individual Potential Invader



Prioritize Current Management Actions: Individual Species

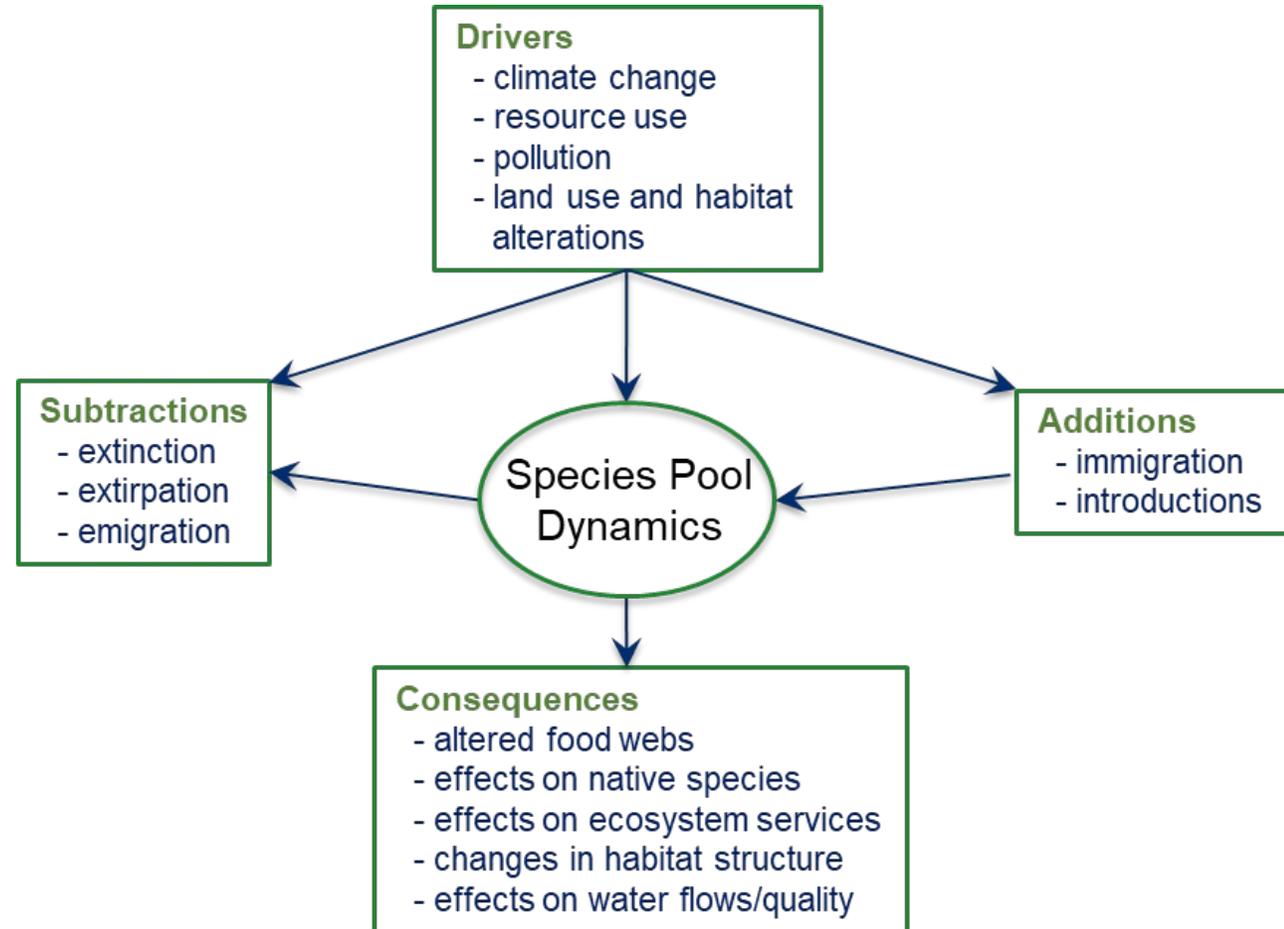
3. Identify and prioritize new species that pose the greatest immediate and long-term threats to the Delta and re-evaluate this list regularly.

This list should be based on an evaluation of the expected ecosystem and economic impacts of each high-risk invader and include an assessment of likely pathways of introduction.



Shift Focus to an Ecosystem Level

- Go beyond individual species management and set ecosystem-level goals that recognize an ever-changing species pool and changing drivers.
 - What are the Delta Ecosystem Goals in the context of changing drivers and species pool?
 - Include the formal implementation of non-native species management and research into **ecosystem restoration activities/programs**.



Consider Ongoing and Future Changes of Drivers in the Delta

5. Evaluate **threat assessments for non-native species** in the context of a changing environment and multiple drivers, especially climate.

- Pathways
- Types of invader
- Susceptibility to invasion
- Ecosystem impact



Implementation: First Steps

6. Develop a **comprehensive multi-agency invasive-species coordination and implementation plan** with the assignment of responsibilities and authorities that span monitoring, rapid response, control, and science expertise.

7. Develop a **single 'go to' science source of expertise** and information with proper authorization and funding.



Conclusions

- Science can be used to better predict, detect, control, or adapt to non-native species and inform management to set ecosystem-level priorities to minimize harm.
- Proactive understanding and monitoring is critical. - ***anticipation***
- Dealing with the surprise invasion of “Newtrina.”

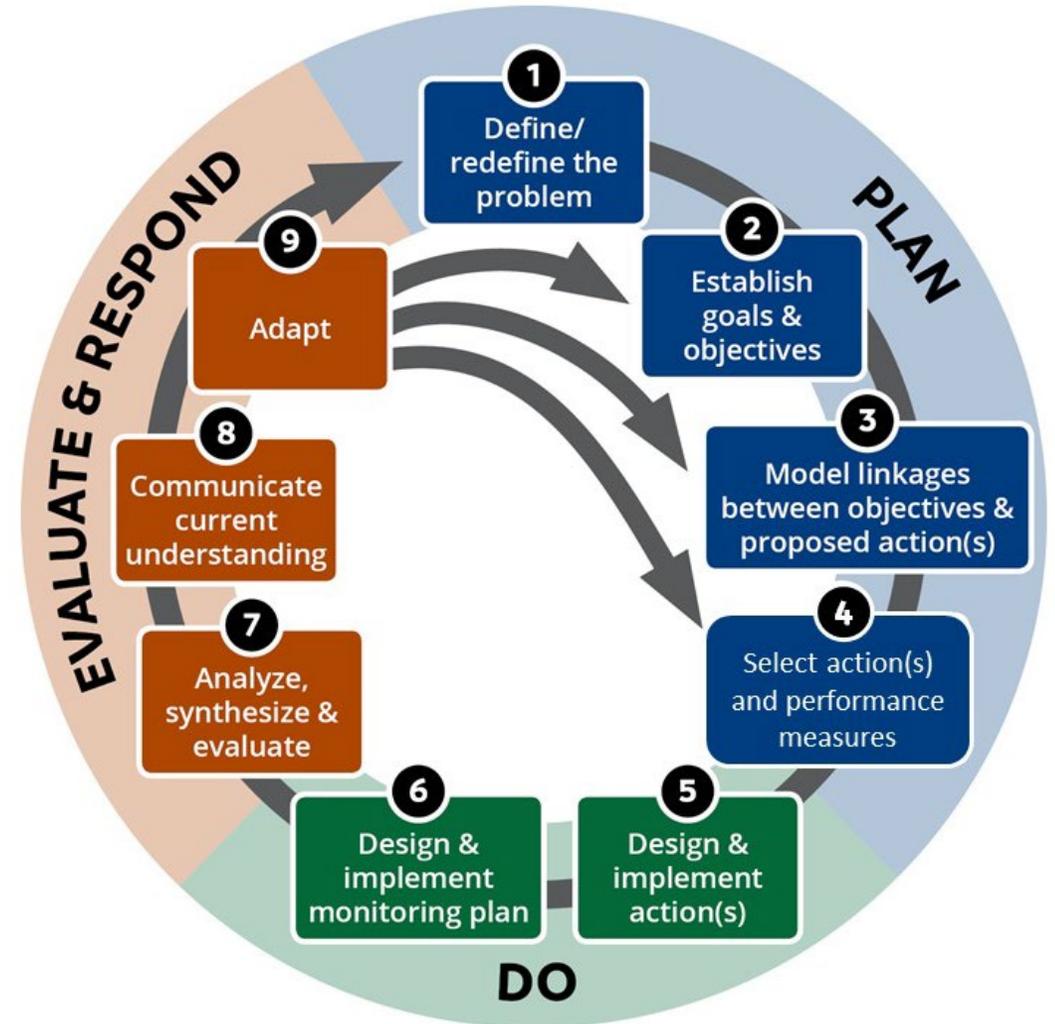


Is this “Newtrina”?

03. FUTURE PLANS

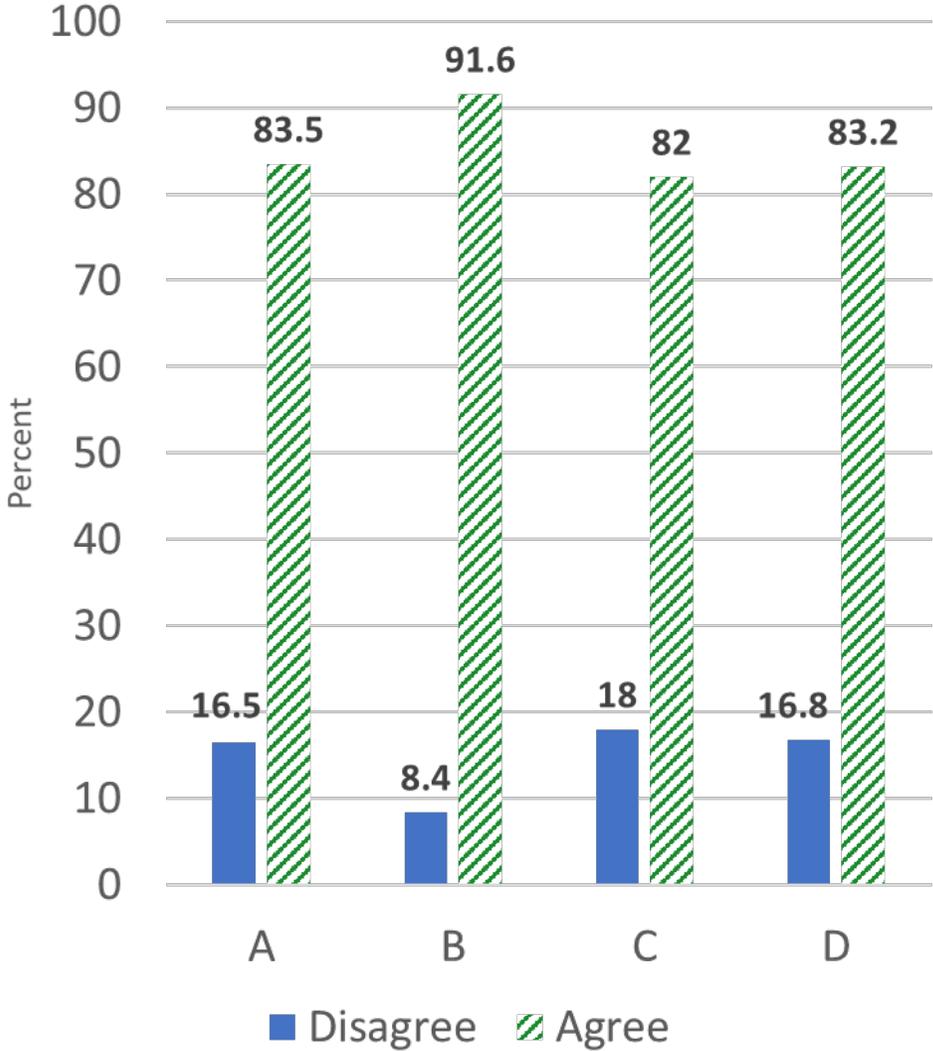
Upcoming Plans: May - August

- Wrap up Monitoring Enterprise Review and Water Supply Reliability Review
- Finish Science Needs Assessment (DPIIC)
- Plan for Future Reviews. Reconsidering the approach based off:
 - Delta Science Program's assessment of the Delta ISB
 - Delta ISB members' experiences
 - Public feedback



Overall Stakeholder Perceptions of the Delta ISB

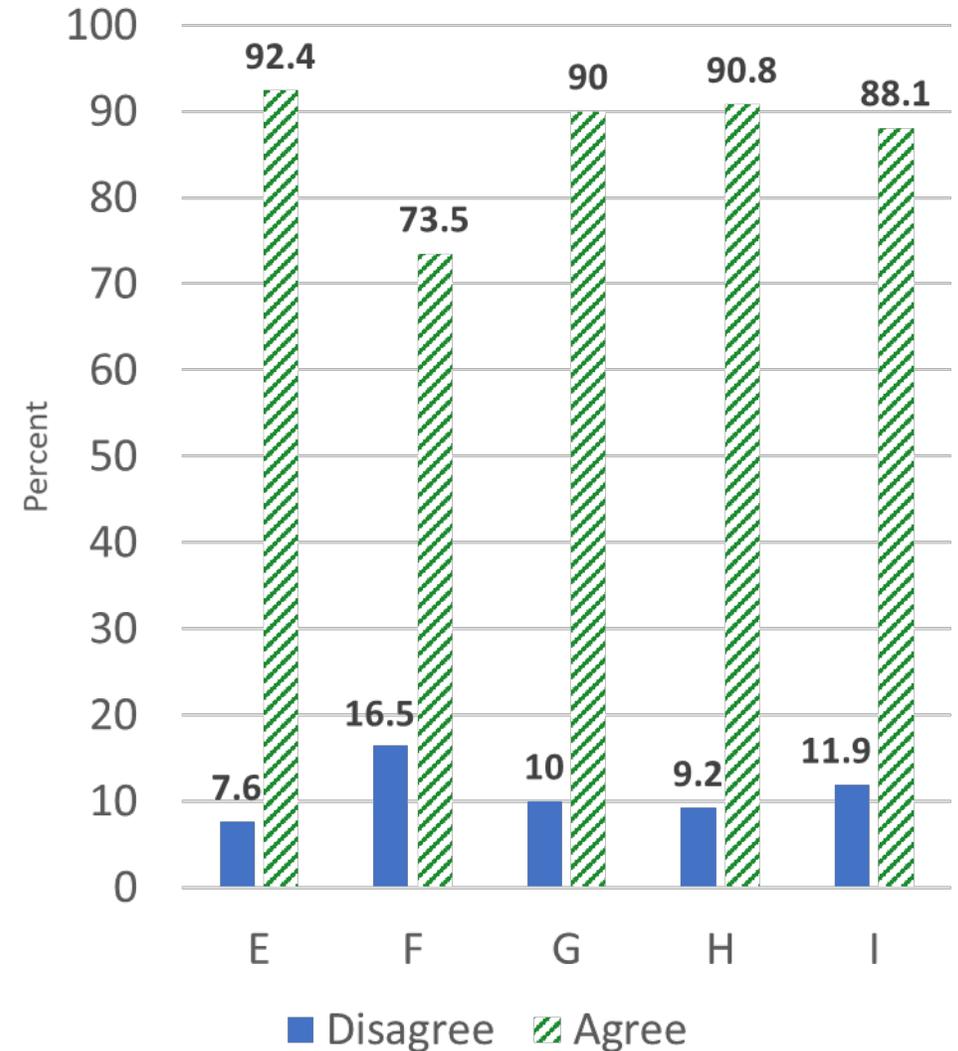
Survey Question	Mean	SD	n
A. The Delta ISB plays an <u>essential</u> role in the Delta	3.22	0.76	115
B. The Delta ISB plays a <u>unique</u> role in the Delta	3.37	0.69	118
C. The Delta ISB <u>does not promote specific political agendas</u>	3.19	0.8	100
D. The Delta ISB provides <u>independent scientific oversight</u> in the Delta	3.15	0.76	119



DRAFT; Taken from the Delta Science Program’s Assessment of the Delta ISB

Overall Stakeholder Perceptions of the Delta ISB Reviews

Survey Question	Mean	SD	n
E. Overall, Delta ISB reviews provide information that is relevant to the Delta management community	3.28	0.6	92
F. Overall, Delta ISB reviews enhance my confidence in science-based decision making in the Delta	3.08	0.81	87
G. Overall, Delta ISB reviews are scientifically rigorous	3.26	0.70	90
H. Overall, I trust the scientific findings reported in Delta ISB reviews	3.29	0.66	87
I. Overall, I think ISB reviews provide good recommendations , even if they cannot be implemented	3.19	0.79	84



DRAFT; Taken from the Delta Science Program's Assessment of the Delta ISB

New Possible Approaches

Problem Focused, Narrower Reviews

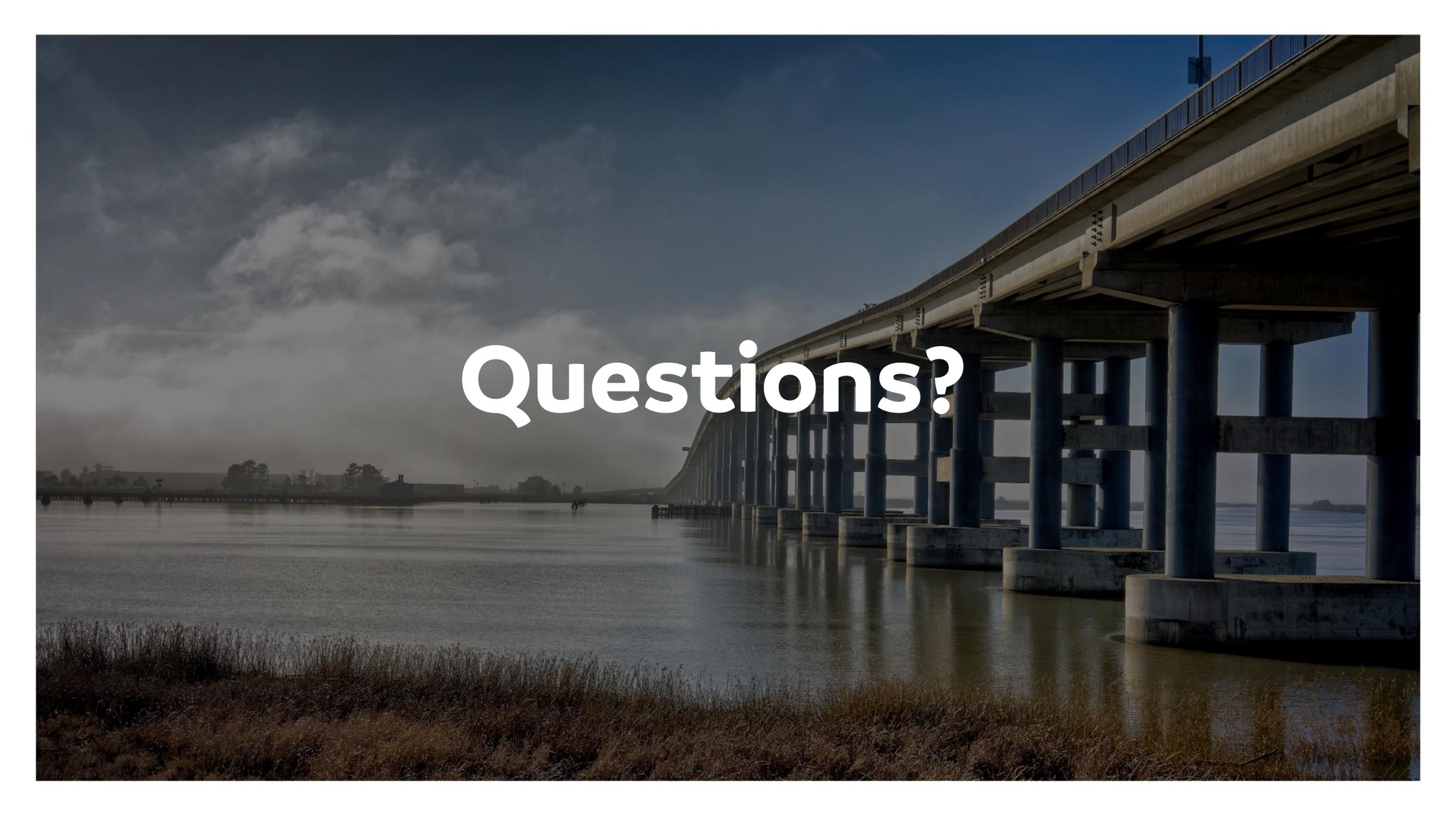
- More focused and less comprehensive than thematic reviews.
- Potential Ideas
 - Harmful Algal Blooms
 - Water Quality and Hydrodynamic Modeling



Agency Program Reviews

- Review individual programs that support adaptive management
- Approach:
 - Ask agencies for their science goals and plans every four years
 - Review the science and make recommendations.



A large concrete bridge with multiple pillars spans across a wide river. The sky is overcast with grey clouds. The foreground shows some dry grass. The word "Questions?" is written in large white letters across the center of the image.

Questions?