

APR 2024

Agenda Item: 9  
Meeting Date: April 25, 2024

# Delta Independent Science Board Update

Dr. Lisa Wainger, Chair



**Delta  
Independent  
Science Board**

DELTA STEWARDSHIP COUNCIL



# Who We Are?



Dr. Lisa Wainger  
Economics



Dr. Inge Werner  
Ecotoxicology



Dr. Tom Holzer  
Geology



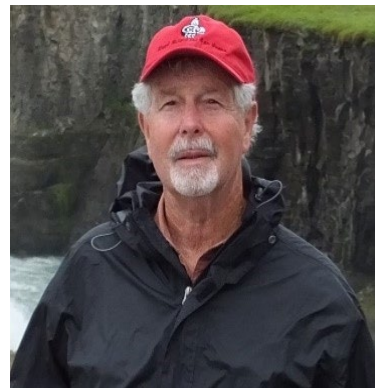
Dr. Virginia Dale  
Landscape Ecology



Dr. Tanya Heikkila  
Governance



Dr. Diane McKnight  
Biogeochemistry



Dr. Bob Naiman  
River Ecology



Dr. Jayantha Obeysekera  
Engineering



Dr. Anna Michalak  
Engineering



Dr. Kenny Rose  
Fisheries





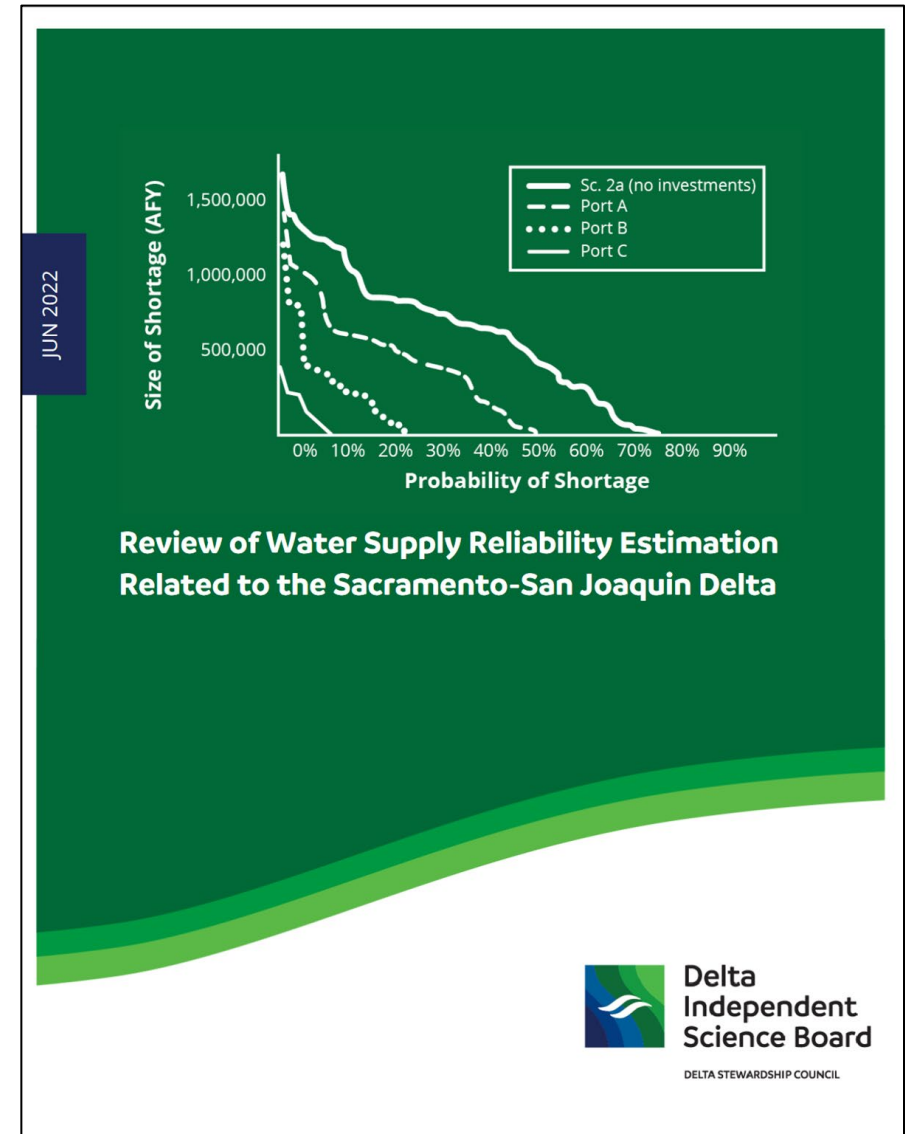
## What We Do?

### **The Delta Reform Act (2009):**

- Provide oversight of the scientific research, monitoring & assessment programs that support adaptive management in the Delta
- Provide independent advice on the Delta Plan
- Consult with the Council on the appointment of the Delta Lead Scientist

# Current Process

- Review Delta science by themes. Thematic reviews presented to the Council:
  - 1) Water Supply Reliability Estimation (2022)
  - 2) Monitoring Enterprise (2022)
  - 3) Non-native Species (2021)
  - 4) Interagency Ecological Program (2019)
  - 5) Water Quality (2018)
  - 6) Delta as an Evolving Place (2017)
  - 7) Levees (2016)
  - 8) Adaptive Management (2016)
  - 9) Fish & Flows (2015)
  - 10) Restoration (2013)
- Review agency documents





# General Purpose for Thematic Reviews

- Evaluate the state & adequacy of the science
- Recommend forward-looking strategic science priorities
  - Identify science gaps
  - Seek better connectivity between science, management & policy
- Delta ISB does not make or recommend/endorse policy decisions





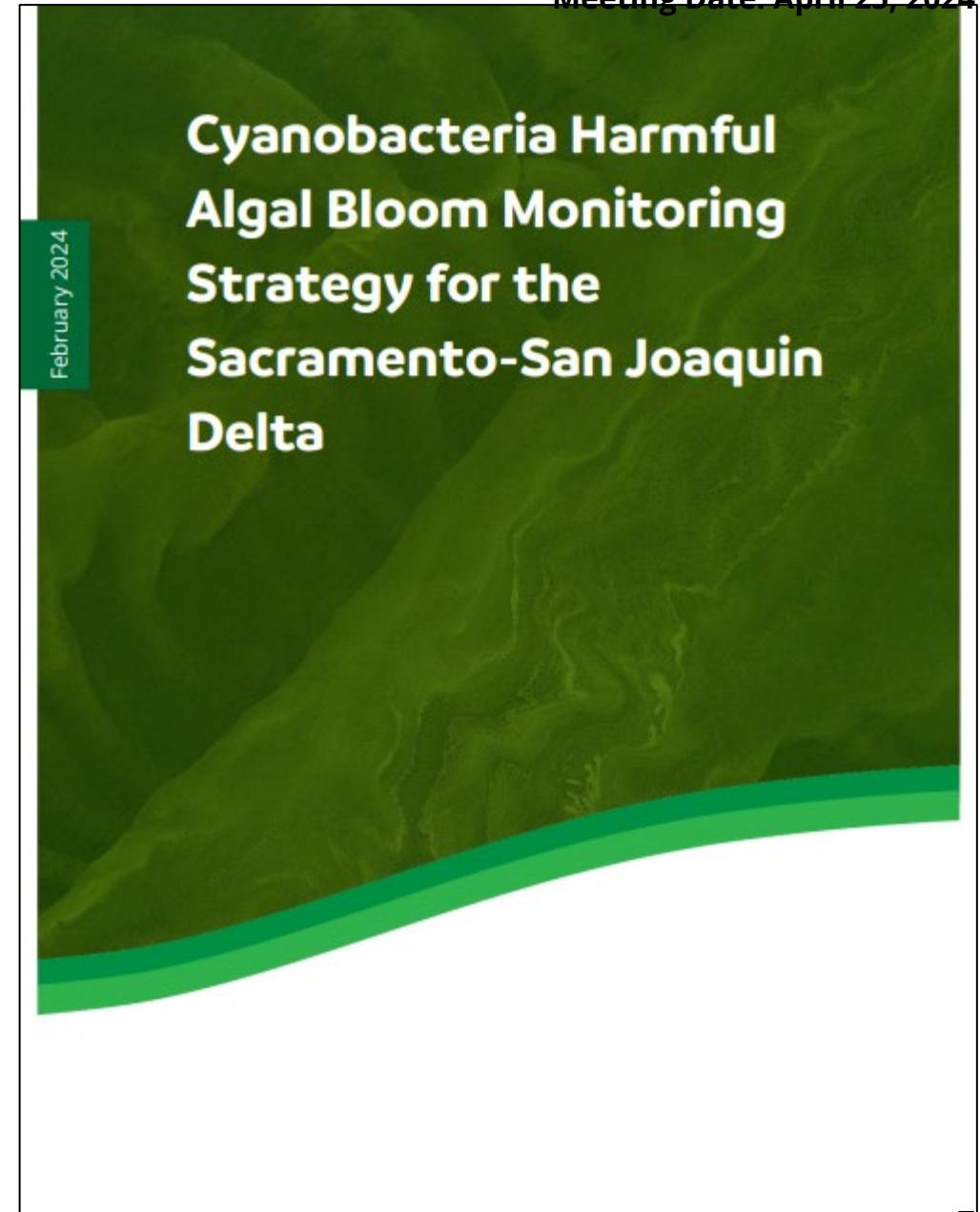
# Review Process

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




## Completed review since last update to the Council

- Development of the Strategy was facilitated by the Delta Science Program
- CHABs have been a major nuisance in the Delta for decades, and many studies have been conducted
- No formal monitoring program specifically for CHABs exists in the Delta.



# Some Strengths

- Includes a good review of many of the environmental drivers impacting the occurrence and severity of CHABs and of current programs that monitor CHABs in the Delta
- Provides a valuable overview of the heterogeneity of conditions across the Delta system as they pertain to the incidence and severity of CHABs



DELTA STEWARDSHIP COUNCIL

March 28, 2024

Delta Stewardship Council  
Delta Science Program  
715 P Street, 15-300  
Sacramento, CA 95814

Delivered via email: [collaborativescience@deltacouncil.ca.gov](mailto:collaborativescience@deltacouncil.ca.gov)

**RE: Review of draft Cyanobacterial Harmful Algal Bloom Monitoring Strategy for the Sacramento-San Joaquin Delta**

Dear Delta Science Program:

The Delta Independent Science Board (Delta ISB) examined the draft of the Cyanobacterial Harmful Algal Bloom Monitoring Strategy for the Sacramento-San Joaquin Delta. The draft strategy covers many of the important factors motivating the development of a robust strategy for monitoring cyanobacterial harmful algal blooms (CHABs) in the Delta. The draft strategy also includes a good review of many of the environmental drivers impacting the occurrence and severity of CHABs and of current programs that monitor CHABs in the Delta. In addition, the draft strategy provides a valuable overview of the heterogeneity of conditions across the Delta system as they pertain to the incidence and severity of CHABs. The draft strategy also outlines 19 special studies that would help to inform the development of a detailed monitoring plan.

In reviewing the draft strategy, we noted several elements that could strengthen the draft strategy and that we encourage the authors to consider as they prepare the final version of the strategy.

1. The executive summary should better reflect the context and scope for the report. The summary is vague in outlining the reasons for which CHABs were identified as "most problematic in Delta waterways" during the Delta Science

715 P Street, 15-300  
Sacramento, CA 95814  
916.445.5511  
DELTA.COUNCIL.CA.GOV

**CHAIR**  
Lisa Wainger, Ph.D.

**CHAIR-ELECT**  
Inge Werner, Ph.D.

**PAST CHAIR**  
Vacant


**MEMBERS**  
Virginia Dale, Ph.D.  
Tanya Heikkila, Ph.D.  
Thomas Holzer, Ph.D.  
Diane McKnight, Ph.D.  
Anna Michalak, Ph.D.  
Robert Naiman, Ph.D.  
Jeyantha Obeyesekere, Ph.D.  
Kenneth Rose, Ph.D.

1



# Some Weaknesses

- Covers many of the primary drivers of CHABs but does not address interactions between them to a sufficient degree
- Focuses strongly on the growth rates and abundance of cyanobacteria and much less so on the concentrations of toxins produced by the cyanobacteria
- A very large number of new studies are proposed in the report without identifying high priorities, which is needed to manage funding limitations



715 P Street, 15-300  
Sacramento, CA 95814  
916.445.5511  
DELTACOUNCIL.CA.GOV

CHAIR  
Lisa Wainger, Ph.D.

CHAIR-ELECT  
Inge Werner, Ph.D.

PAST CHAIR  
Vacant

MEMBERS  
Virginia Dale, Ph.D.  
Tanya Heikkila, Ph.D.  
Thomas Holzer, Ph.D.  
Diane McKnight, Ph.D.  
Anna Michalak, Ph.D.  
Robert Naiman, Ph.D.  
Jayantha Obeyesekere, Ph.D.  
Kenneth Rose, Ph.D.

March 28, 2024

Delta Stewardship Council  
Delta Science Program  
715 P Street, 15-300  
Sacramento, CA 95814

Delivered via email: [collaborativescience@deltacouncil.ca.gov](mailto:collaborativescience@deltacouncil.ca.gov)

**RE: Review of draft Cyanobacterial Harmful Algal Bloom Monitoring Strategy for the Sacramento-San Joaquin Delta**

Dear Delta Science Program:

The Delta Independent Science Board (Delta ISB) examined the draft of the Cyanobacterial Harmful Algal Bloom Monitoring Strategy for the Sacramento-San Joaquin Delta. The draft strategy covers many of the important factors motivating the development of a robust strategy for monitoring cyanobacterial harmful algal blooms (CHABs) in the Delta. The draft strategy also includes a good review of many of the environmental drivers impacting the occurrence and severity of CHABs and of current programs that monitor CHABs in the Delta. In addition, the draft strategy provides a valuable overview of the heterogeneity of conditions across the Delta system as they pertain to the incidence and severity of CHABs. The draft strategy also outlines 19 special studies that would help to inform the development of a detailed monitoring plan.

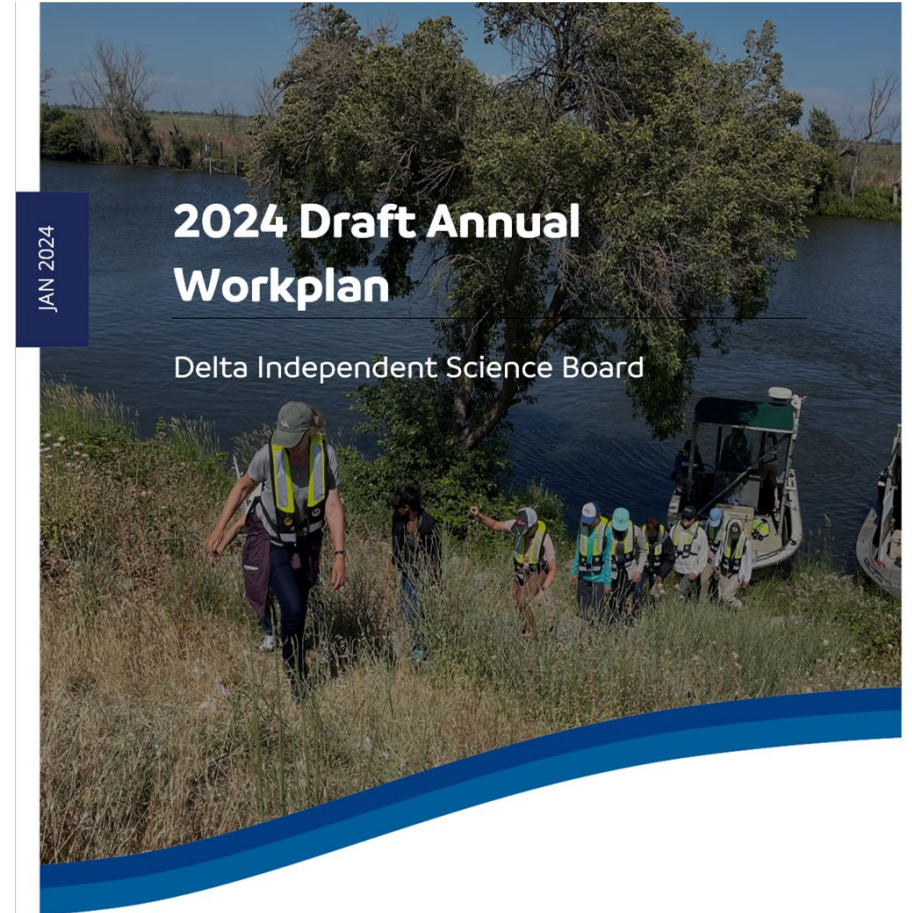
In reviewing the draft strategy, we noted several elements that could strengthen the draft strategy and that we encourage the authors to consider as they prepare the final version of the strategy.

1. The executive summary should better reflect the context and scope for the report. The summary is vague in outlining the reasons for which CHABs were identified as "most problematic in Delta waterways" during the Delta Science

1

# Update on 2024 Plans

- Completing three thematic reviews
  - Subsidence
  - Food-webs
  - Decision-making Under Deep Uncertainty
- Final Environmental Impact Report for the Delta Conveyance Project
  - Prepare memo assessing DWR responses to Delta ISB comments
- Plan Future Reviews & Activities





# Food-webs Review Now Out for Public Comments

- **Goal:** To assess how to better incorporate and advance food web knowledge in managing the Delta’s ecosystems and to identify what tools are available or should be developed
- Food webs describe the trophic (feeding) relationships and flows of energy and nutrients among species in an ecosystem
- Upper trophic levels, the focus of this review, include fish, particularly those (e.g., salmon) being actively managed in the ecosystem
- We found that an improved mechanistic understanding of the entire food web in the Delta is essential to predicting the impacts of the environment and management actions

DRAFT (DO NOT CITE)

**Exploring scientific and management implications of upper trophic level food webs in the Delta**

*An assessment of the scientific needs to inform management actions in the Delta*

Delta Independent Science Board

Draft - Do Not cite (April 17, 2024)

If you need assistance interpreting the content of this document or would like to provide public comments, please e-mail [disb@deltacouncil.ca.gov](mailto:disb@deltacouncil.ca.gov).

All links in this document have been created with meaningful text. If you have a printed copy of this review, you can find the electronic version of this report on the [Delta ISB's meetings webpage](https://deltacouncil.ca.gov/delta-isb/meetings) for the April 22, 2024, meeting: <https://deltacouncil.ca.gov/delta-isb/meetings>.

**Table of Contents**

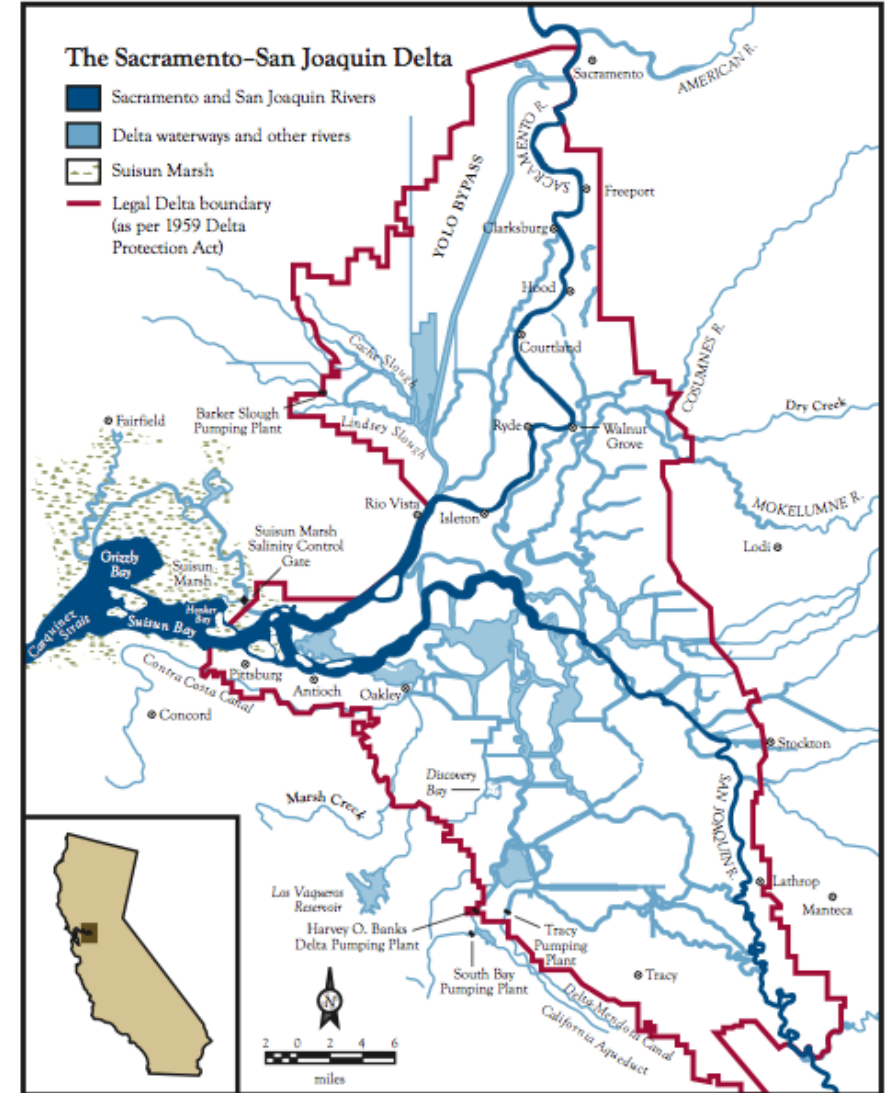
Executive Summary .....	3
The Review Process.....	4
Current Food Web Science in the Delta .....	5
Applying Food Web Science to Management .....	6
Food Web Science Gaps in the Delta.....	7
Recommendations .....	8
Conclusion.....	12
Background and Purpose.....	13
Approach.....	14
Importance of Food Webs to Management .....	14
Food Webs in the Sacramento-San Joaquin Delta .....	19
General Food Web Modeling Approaches.....	21

1

# Upcoming Review: Contaminant Monitoring and Ecological Risk Assessment in the Delta

Chemical contaminants enter Delta waters from diverse sources that include urban and agricultural runoff, treated industrial and municipal wastewater, atmospheric deposition, and chemicals applied directly to surface waters for invasive plant and pest control.

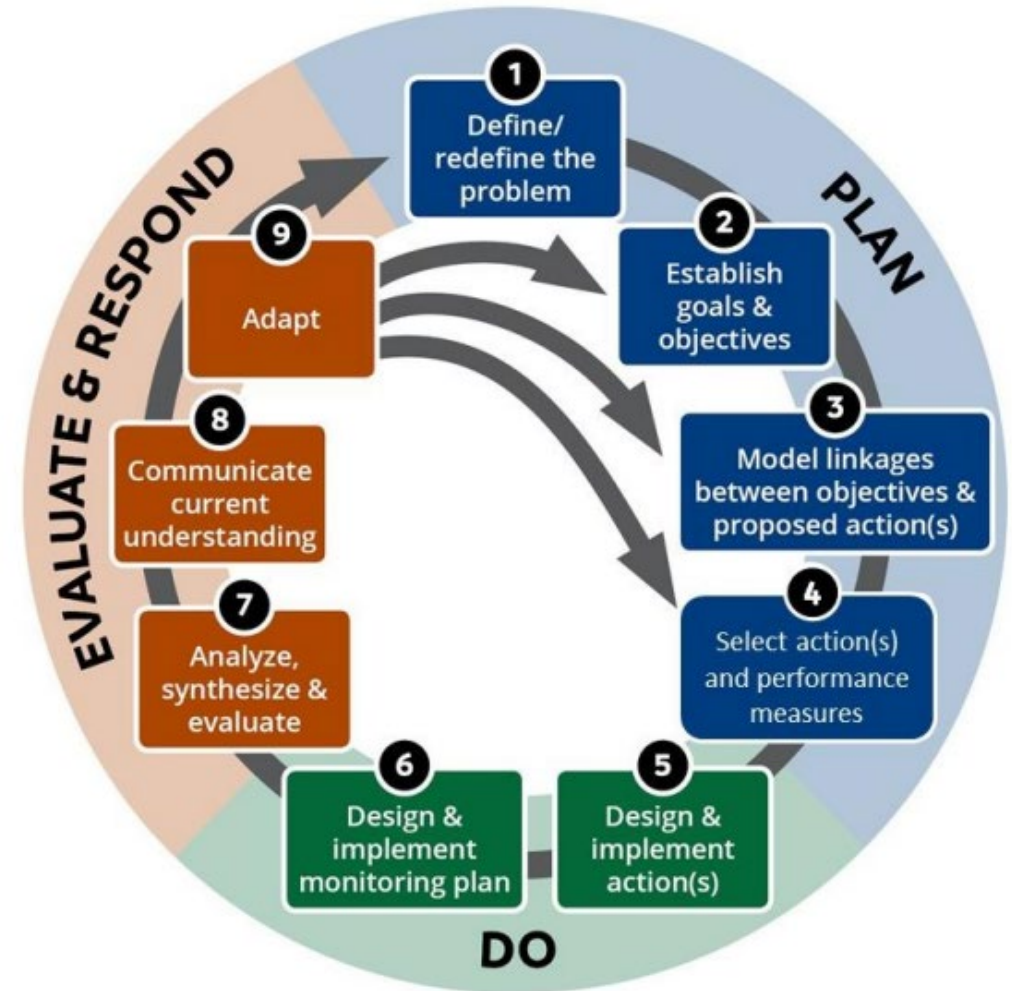
They include metals, pesticides, pharmaceuticals, industrial chemicals, tire particles, microplastic, flame retardants and others.





## Why we care?

- Numerous contaminants have been shown to pose an ecological risk in aquatic environments, in particular some pharmaceuticals, metals and pesticides.
- However, the sheer number of chemicals and potentially affected species continue to present challenges for monitoring and risk assessment.
- It is therefore important to use the most innovative methods, and adaptively manage contaminant monitoring and risk assessment programs.







# Potential Approach

- ❑ Collect information on existing monitoring and assessment programs for contaminants and toxicity in the Delta
- ❑ Review target chemicals and methods used
- ❑ Identify potential gaps relevant for the Delta
- ❑ Provide recommendations

