

Proposed Process Revisions

Technical Reviews, Workshops, and other Responses

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Special Guest: Andy Miller

March 10-11, 2020

What is supposed to happen?

- Reports are required within 90 days of the workshop
- STAC writes a letter to the Chair of the Management Board requesting a reply from the MB to the recommendations that also identifies several other CBP groups
- STAC receives a response within 90 days

Here's what does happen:

- Reports are written within a year
- STAC writes a letter to the Chair of the Management Board requesting a reply from the MB to the recommendations that also identifies several other CBP groups
- I draft a skeleton of a letter and identify the most appropriate person to write the letter
- They ignore the request
- I ask again
- They ignore the request
- I ask again
- They write the letter and eventually get it through a workgroup via email
- I send it to the Management board staff
- The management board generally is busy with more immediate concerns and may not get to the letter for a long time
- STAC receives a letter that is woefully out of date that few have looked at

Year 1

Year 2

Year 3

Year 4

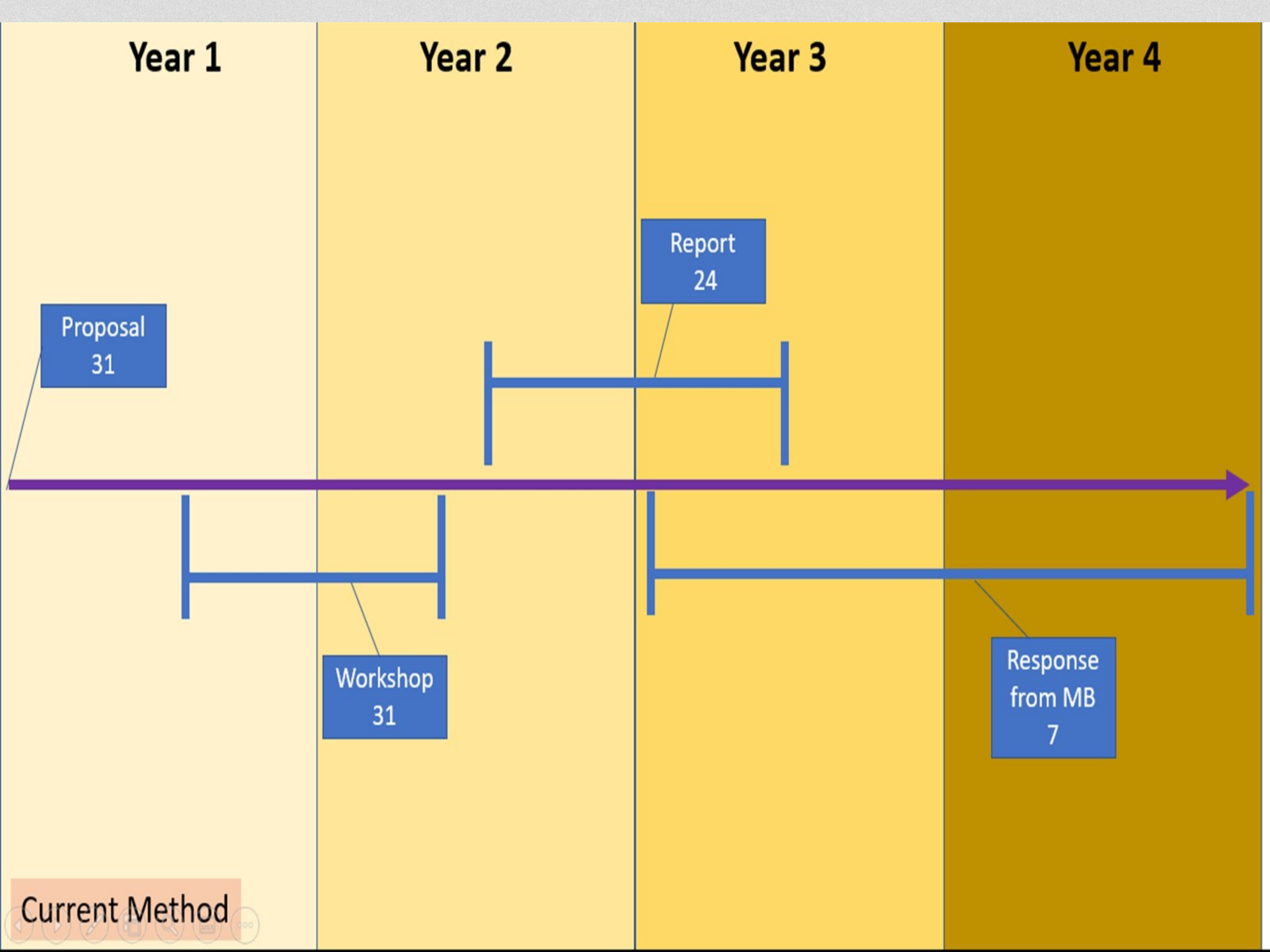
Proposal
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Response
from MB
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Current Method



The Loading Dock Model is not working

Items are on back order!



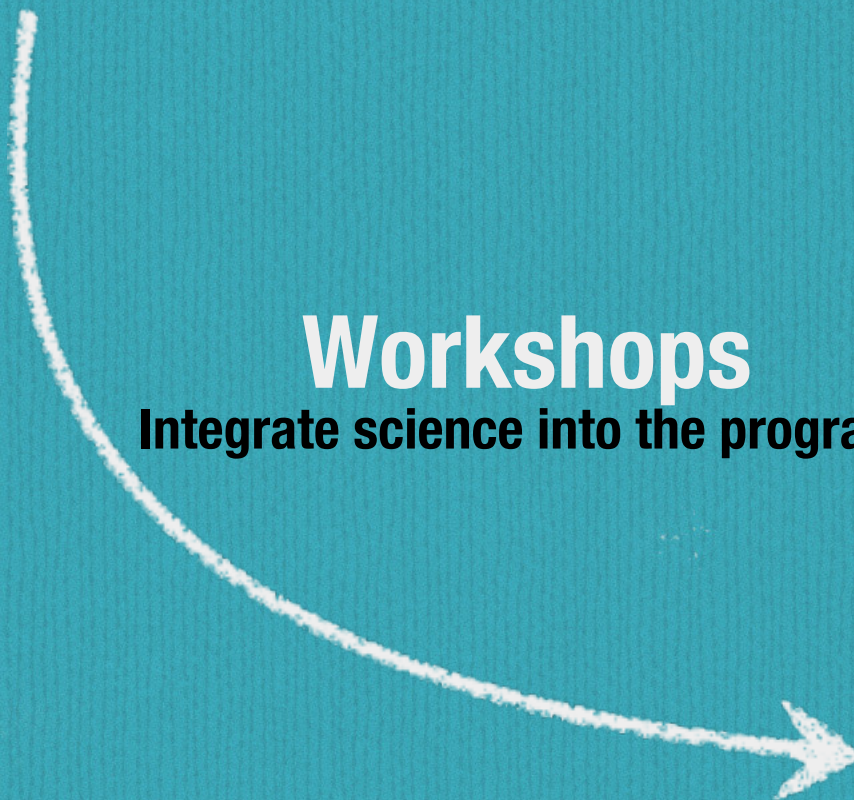


**State of Science
Synthesis
Technical Review**

Is tool good enough to make a decision?



Workshops
Integrate science into the program



Technical Review

- **Objective: Is the tool appropriate for decision-making?**
- **Recommendation: what is future recommended action for the tool (e.g., further development, conditions for usage)**

Workshops

- **Objective: Integrate relevant science into the CBP**
- **Recommendations: How, when, where to integrate**

What's in the Box of a Workshop Report?

Gathering

Findings

Identify gaps to be filled

Compare to GIT science needs

How, where, when to integrate

Recommendations

Check against CRC database

Workshop Recommendations: SPURR

- **S - Specific and granular**
- **P - Programmatic partner**
- **U - Urgency**
- **R - Risk (of not taking action)**
- **R - Resources and timing**

Microplastics Recommendations

Microplastics in the Chesapeake Bay and its
Watershed: State of the Knowledge, Data Gaps,
and Relationship to Management Goals



STAC Workshop Report
April 24-25, 2019
Woodbridge, VA



STAC Publication 19-006

- **Recommendation #1: Establish a Plastic Pollution Action at Team at the CBP;** The CBP should create a cross-GIT Plastic Pollution Action Team to address the growing threat of plastic pollution to the bay and watershed. **S; P**
- **Recommendation #2: Researching Effects on Living Resources;** STAR should immediately incorporate development of ERAs of microplastics into the CBP strategic science and research framework, and the Plastic Pollution Action Team should oversee the development of the ERAs focused on assessment of microplastic pollution on multiple living resource endpoints. **S; P; U**
- **Recommendation #3: Complete a Technical Review of Terminology;** STAC should undertake a technical review of terminology used in microplastic research, specifically size classification and concentration units, and recommend uniform terminology for the CBP partners . **S; P**
- **Recommendation #4: Address Sources;** ERAs.. should not preclude the Plastic Pollution Action Team from leading an effort to develop a source reduction strategy for the bay and watershed. **U; R**
- **Recommendation #5: Monitoring;** We recommend that the Plastic Pollution Action Team and STAR team, and/or other technical experts, collaborate on the development of a monitoring design to identify and answer the distribution of microplastics. **S; P; R**

Workshop Recommendations: SPURRR

- **S - Specific and granular**
- **P - Programmatic partner**
- **U - Urgency**
- **R - Risk (of not taking action)**
- **R - Resources and timing**
- **R - Redundancy**

Multiple Models for Management - 2014

- Executive summary that an executive will read

Executive Summary

In early 2012, the Director of the Chesapeake Bay Program (CBP) asked the Program's Scientific and Technical Advisory Committee to consider how the CBP might use multiple models. That request resulted in two workshops. The first detailed a pilot multiple modeling project for the Bay's shallow waters (Friedrichs et al. 2012). The second workshop, summarized here, sought to develop more general recommendations on how the CBP could utilize multiple models in management decisions. The workshop considered case studies of multiple models in environmental regulation, the perception of multiple models by the public and decision makers, and legal issues associated with multiple modeling in regulatory settings. This report presents the Findings (factual conclusions or the consensus of workshop experts about the use and benefits of multiple modeling) and four Recommendations that the CBP could initiate to begin realizing those benefits:

Findings

1. Using multiple models offers many documented advantages over analyzing one model of an environmental system.
2. There are different ways to implement multiple models (multi-model ensembles, using other models to assess a decision model, modular community modeling, and model comparisons in pilot studies or testbed areas). The common principle is that findings are stronger when multiple lines of evidence, multiple data sets, or multiple algorithms agree.
3. Analyzing multiple models increases knowledge and understanding of underlying processes.
4. Average predictions from a set of models typically perform better than those from any single model.
5. Information from multiple models can help quantify model uncertainty, which is critical to sound science and rational decision-making.
6. Modeling is inexpensive compared to the costs of monitoring, implementation, and poor decisions.
7. Properly framed multiple models can be a legal asset rather than a liability.
8. Managers and the public are poorly informed about modeling, model uncertainty, multiple models, and the value of investments in modeling.
9. Multiple modeling can expand opportunities for additional technical experts and non-technical stakeholders to participate in modeling, fostering greater understanding and acceptance of models and the decisions based upon them.
10. Multiple models of the Chesapeake Bay and its watershed already exist and they could be integrated into CBP modeling to improve knowledge and decision-making.

Recommendations

1. The CBP should implement a multiple modeling strategy for each major decision-making model of the Bay (airshed, land use, watershed, and estuary) and analyze the output to quantify skill, advance knowledge, and inform adaptive management.
2. The CBP should exercise the multiple model systems developed under Recommendation 1 to quantify model uncertainty and confidence in key predictions used in decision-making.
3. The CBP should estimate and better communicate the appropriate levels of spending on monitoring, modeling, and research relative to the costs of implementation and the cost of poor decision-making.
4. The CBP should implement ways to better communicate modeling, uncertainty, and multiple model results to partners, decision makers, and the public.

SPURR Recommendations

- **S - Specific and granular**
 - **Recommendation - The CBP should implement a multiple modeling strategy for each major decision-making model of the Bay (airshed, land use, watershed, and estuary)**
- **P - Programmatic partner**
 - **CBPO Modeling team was on steering committee and attended workshop**
- **U – Urgency and Risk**
 - **Findings – Multiple models are more accurate and a legal asset**
- **R - Resources and timing**
 - **Findings - Multiple Models already exist**
 - **Many ways to accomplish multiple modeling**

Results

- **Modeling results**
 - **Airshed model was already a good example**
 - **Watershed model completely redesigned to accommodate existing multiple models and lines of evidence in most sub-models**
 - **Estuarine model compared with other estuarine models**
- **Programmatic results**
 - **Models were more accurate**
 - **Scientific and management confidence in models increased**

Proposed Process

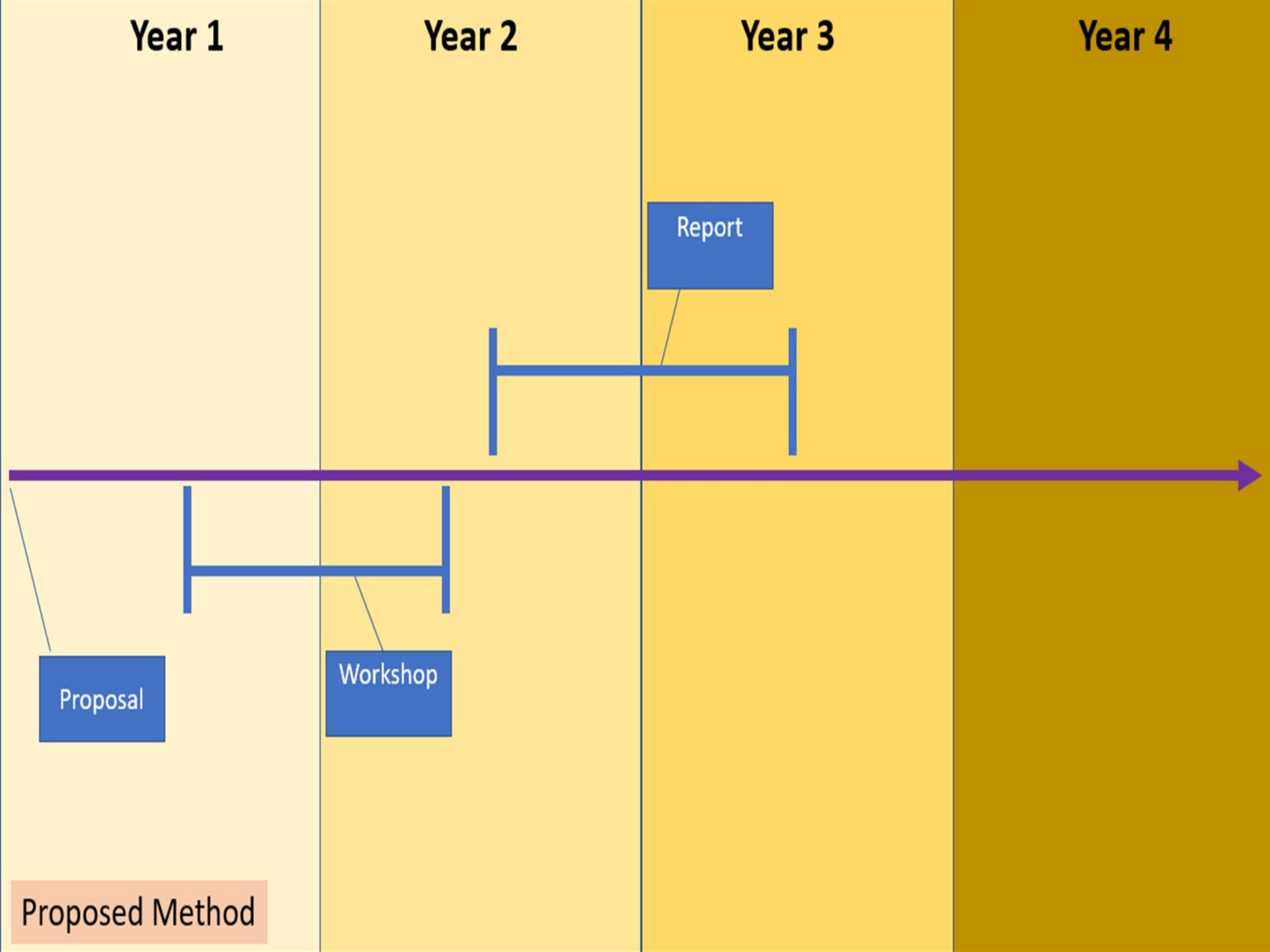
- **Science needs would be appropriately matched to tools (technical reviews, workshops, STAC mini-reviews***
- **Potential programmatic partners are identified as part of workshop planning**
- **Workshop recommendations would follow SPURR format**
- **Workshop report is presented to 1-5 GITS or other programmatic partners**
- **Presentation to Management Board is last step**
- **CBP response to workshop recommendations documents presentation to, and response from, Management Board**

Year 1

Year 2

Year 3

Year 4



Proposal

Workshop

Report

Proposed Method

Year 1

Year 2

Year 3

Year 4

Response
planning

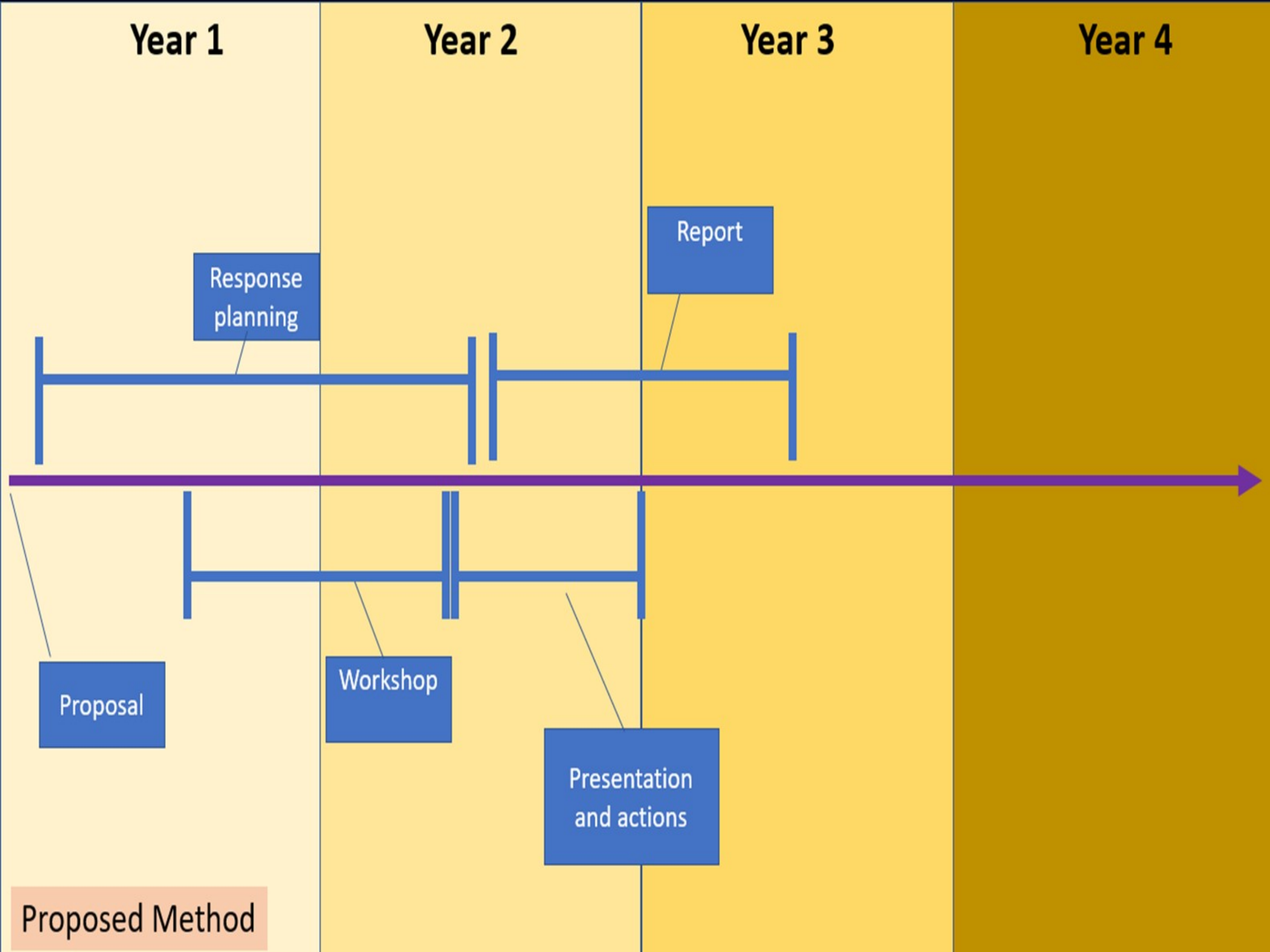
Report

Proposal

Workshop

Presentation
and actions

Proposed Method



Piloting the Process

The AEIOU Workshop Report



AEIOU Executive Summary

- The CBP should move to set program goals and assessing progress through “eutrophying units” that characterize algal and hypoxia effects, *as soon as feasibly possible*.
- *Because this transition may take some time, it is critical that the CBP begin working towards this goal in 2020, and not wait until 2025.* For example, speciation is well understood in wastewater treatment effluent, providing a good starting point for differential credit.
- An appropriate analytical framework for implementing eutrophying units is needed to ensure desired water quality outcomes will be achieved.

AEIOU Executive Summary

- **The effects of land use, Best Management Practice (BMP) type, and transport effects in the watershed will need to be incorporated.**
- **The effects of load location relative to environmental endpoints will need to be tracked.**
- **Both the dissolved organic nitrogen (DON) reactivity formulations and the N and P species limitations in the CBP estuarine water quality model need to be re-examined and updated with results from current research.**
- **The hydrodynamic model must be improved in the shallow waters where considerable nutrient transformations occur.**
- **Conceptual models that synthesize existing science can suggest important endpoints and processes to track.**

AEIOU Recommendations

- **Analyze the potential magnitude of effect of speciation on environmental outcomes with conceptual models and existing science**
- **Consider trade-offs associated with controlling organic and inorganic species and jointly meeting the Bay TMDL and upstream water quality and habitat goals.**
- **Identify and quantify the spiraling and retention properties associated with N/P speciation that are important relative to each endpoint.**
 - **Synthesize research, including identifying gaps.**
 - **Convene a group to list stream characteristics that would be useful in understanding and mapping in-stream capacity for N/P transformation/speciation.**
 - **Convene a group which would identify the data collection necessary to characterize in-stream processes.**