Goal of this Morning

Begin process to identify focal areas for our efforts to assess long term system responses to efforts to achieve WQ standards in the Bay
Illustrations: Knowledge Gaps/Uncertainties & System Responsiveness

• Examples of uncertainties and limits in system response

• Examples pulled from previous STAC workshop reports and reviews and conversations

• Purpose: Illustration purposes only: generate discussion for an initial effort to identify areas from which we might focus our collective attention in an SoS effort.
Nutrient Sources/Boundary Conditions

Is the magnitude of current and future nutrient imports adequately accounted for (STAC 12-005)?

- Legacy nutrients and sediment in the landscape
- Manure loads may not be adequately counted (STAC 16-005)
- Atmospheric deposition may be underestimated (STAC 09-001)
- Are urban nutrient inputs adequately counted (STAC 15-001)
- Rainfall patterns, temperature (climate change)
The single biggest challenge to meeting nutrient reduction targets is nonpoint loads and the single biggest component of NPS loads is agriculture.

- Are voluntary cost share programs capable of generating the level and type of participation needed to achieve reduction goals?
- Alternative incentive program designs may improve behavioral responses (STAC 14-002)
Nutrient Removal Effectiveness of BMPs

Uncertainty surrounding effectiveness of BMPs investments to produce expected load reductions:

- Localized high loss source areas not targeted (STAC 17-007)
- Uncertainties about BMP removal efficiency estimates (STAC 18-003)
- Lag times in removal effectiveness (STAC 13-004)
- BMP resilience in face of climate change (STAC 18-004)
- BMP maturity & performance (STAC 13-004)
Limited evidence that management actions are lowering instream nutrient levels:

“Current research suggests that the estimated effects of conservation practices have not been linked to water quality improvements” (STAC 18-005)
Ex. Challenge to predicting DO response, particularly in deep channel, from changing nutrient levels (STAC 15-002; 18-005) and climate conditions (STAC 18-002).


Nonlinear effects and thresholds may impede attainment of WQS (STAC 08-002)
Relationship between Living Resource and WQ Conditions

Food web dynamics may play significant role in recovery (STAC 08-002)

Fishery response to nutrient enrichment, hypoxia (Breitburg March 2009 STAC presentation)
Groups:

- Nutrient inputs/Boundary Conditions
- Watershed (Nutrient Loads, BMPs)
- Estuary
- Living resources
• Identify key scientific uncertainties/knowledge gaps in understanding system response.
• Identify limitations in system responses that pose risk to achievement of desired changes/expected outcomes.
• Prioritize uncertainties/knowledge gaps/limitations that have the most potential risks to achieving expected system response.