GIT Funding Proposal FY23/24. Developing guidance toward a 10 year vision for optimal sampling design integrating water quality sampling assets to support habitat health assessments in Chesapeake Bay.
(PT draft V1. 10-19-2023.)

Hypoxia Collaborative

Discussion

March 4, 2024

- Premise
  - HC has shown our stakeholder community has some diversity
    - Regulatory 303d listing assessments
    - Habitat suitability assessment support
    - Model calibration and validation
    - Academia evaluation, exploration, new insights

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- The diversity of interests suggests a planning need to address the issue of limited resources aligned with multiple user groups

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- Background
  - Several papers in the last decade speak to the issue of sampling designs to track hypoxia and/or assess criteria (e.g., Bever et al. 2014, 2018, Liang et al 2023).

  - Modeling community has expressed interest in the value of fixed monitoring sites for long-term reference in calibration and verification

  - Dissolved oxygen water quality standards in Chesapeake Bay have 3-year assessment windows at annual scales, i.e, 36 continuous months of data requirements to support all habitats (designated uses)

  - Habitat suitability may be interested in seasonal data, duration of data collection has not typically been specified in our discussions.

Suggestion for proposal

- We have limited resources (target of 10 vertical arrays)

- Assuming the 10 arrays can be divided up for meeting multiple stakeholder needs, can we assume up to 3-4 arrays could be committed to criteria assessment deployment needs,
  - remaining arrays committed to blend of habitat suitability assessment and long-term reference site(s).

- Dissolved oxygen criteria assessment needs support from on-shore and offshore data collection.

- Segments are one important framework for habitat ssessments

Suggesting

- Model-based evaluation of monitoring needs on optimizing site locations of 1-3 arrays as applicable for 5-10 priority segments.

- Couple optimization with nearshore continuous monitoring sensors deployments

- Optimize dissolved oxygen condition assessment while accepting limitations due to shipping traffic, infrastructure for continuous monitoring sites.

Expected output

- Stability in work planning with a documented annual deployment strategy for the next 10 years
- Approach to optimization is documented to be applied more broadly after this work to all 92 bay management segments

- Having 5-10 segments where sample designs are pre-determined supports States 303d listing assessment planning for most of the next 10 years with existing array resources.

- The remaining 6-7 instruments could be committed to modeling calibration and verification reference sites (e.g., 2 in mainstem bay) and habitat suitability studies OR support NOAA/academic project interests OR additional 3 year site deployments to support criteria assessments.