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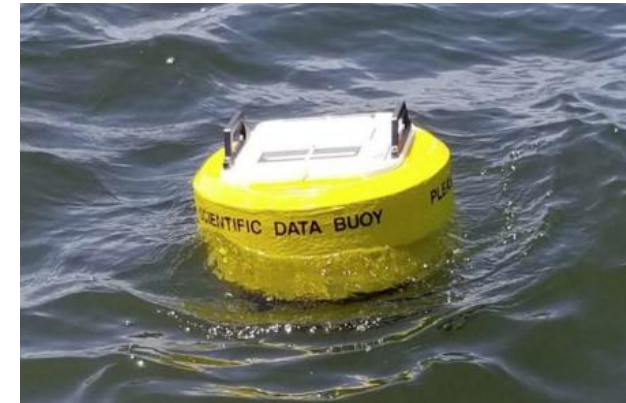


Chesapeake Bay Water-Column Hypoxia Monitoring Update

Enhancing Chesapeake Bay Program Monitoring Networks
May 18, 2023
Kevin Schabow

Developing a Real-time Hypoxia Monitoring System

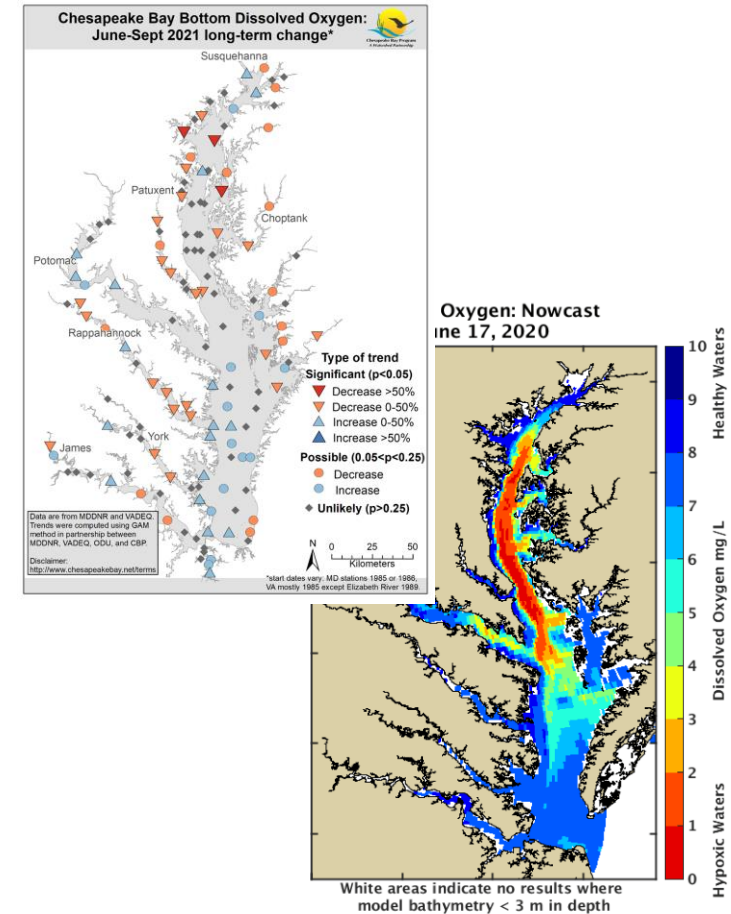
- What: Develop a 10 station monitoring network across mainstem and tributaries
- Why: Improve Assessment of water quality and fish habitat
- Who: EPA, NOAA, Chesapeake Bay Program Hypoxia Collaborative
- Where: Phased deployment in targeted locations
- How: EPA funding, maintained and operated by NOAA; data used by modelers and scientists



<https://www.chesapeakebay.net/who/group/hypoxia-collaborative-team>

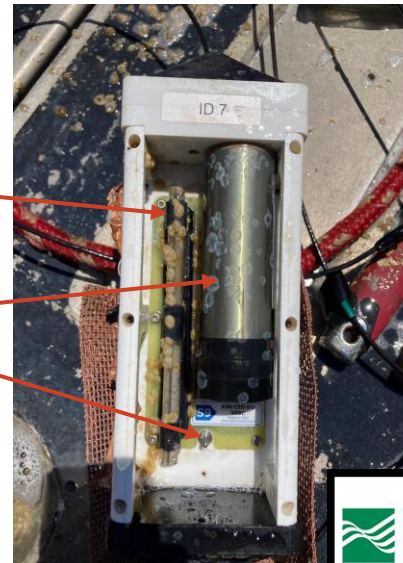
Expected Outcomes

- Increase understanding of temporal and spatial variability of dissolved oxygen in deep and shallow water
- Improve validation for the models used in annual hypoxia reporting
- Establish sampling design and monitoring needed to assess TMDL water quality attainment criteria
- Provide data to develop improved habitat suitability models for multiple species (Striped bass, forage, blue crab)

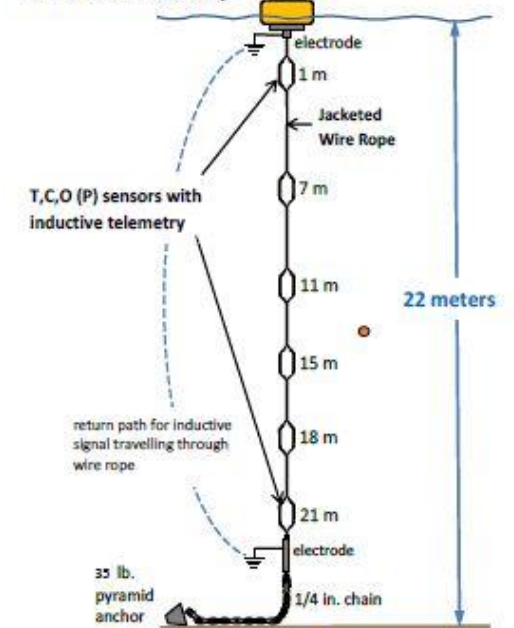


System Hardware

- A station consists of
 - buoy/controller/cellular modem
 - some number of sensors on an inductive wire
 - mooring
- XIM-CTD-DO Sensor
 - conductivity cell
 - temperature sensor
 - pressure sensor
 - dissolved Oxygen sensor
 - barnacles not included

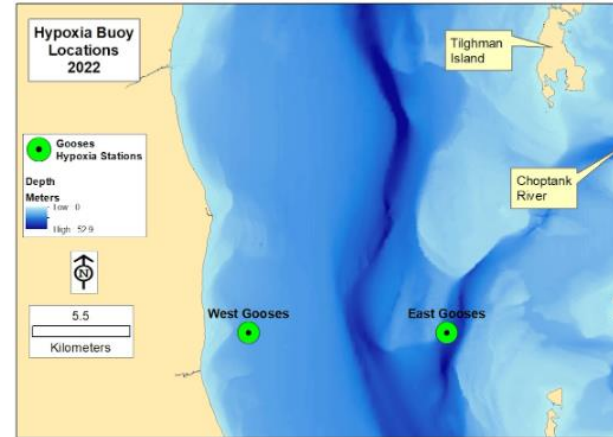


- Soundnine Ultribuoy with:
- Inductive Underwater Telemetry
 - GPS
 - Cellular Data Telemetry



2022 Summer Deployment

- 3 ½ Months of Data collected on 2 Stations
 - East Gooses preliminary data shared with CBP
- Lessons on seasonal biofouling
 - April showers bring May (& June) barnacles?
 - Mild vs Severe fouling
 - Mitigation
 - More frequent visits
 - More sensors to swap
- Quality Control-Flagging
 - Validation casts & tank
 - IOOS QARTOD

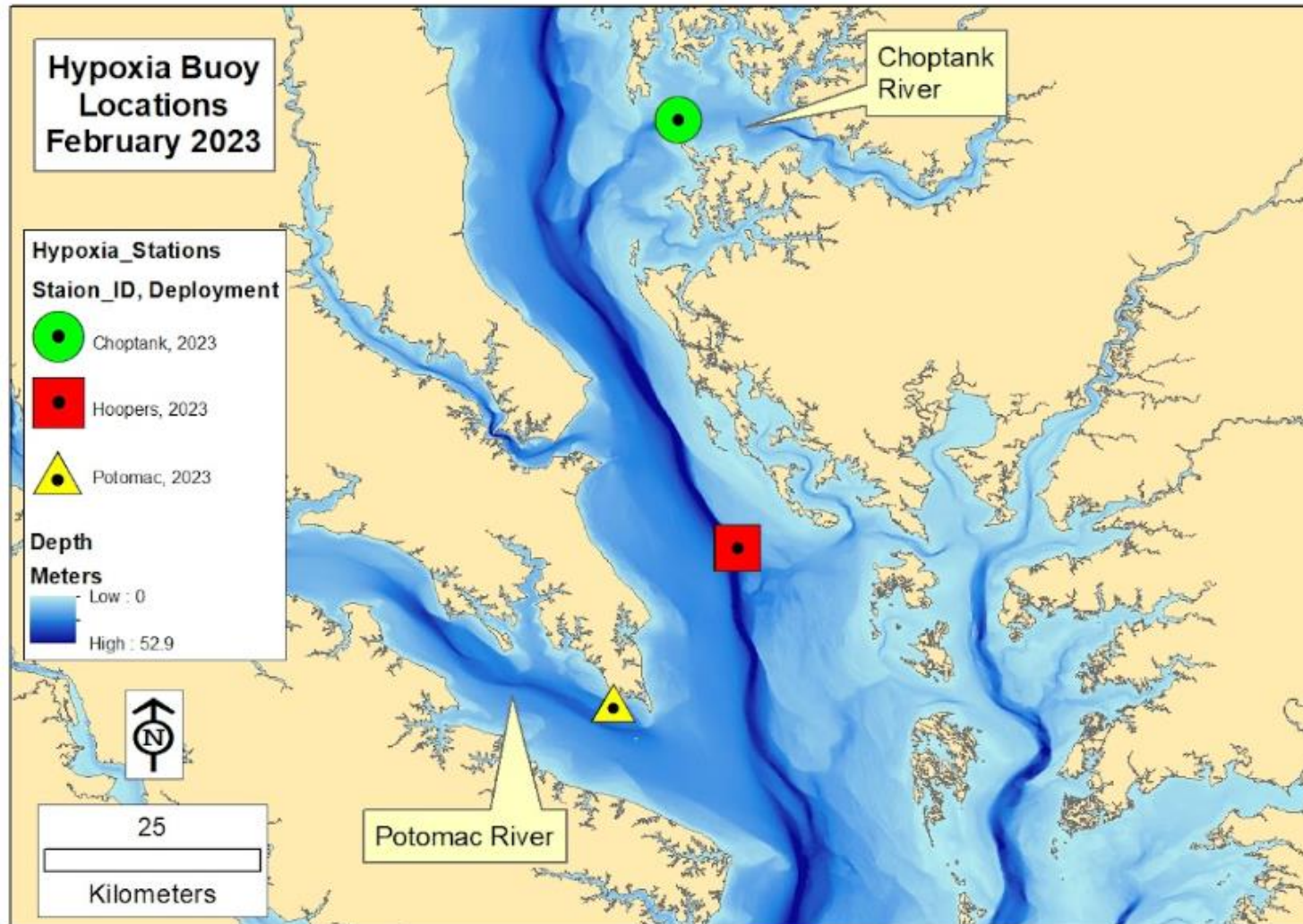


2023 Activities

- Understand 2022 dataset contributions to Hypoxic condition reporting
 - How does continuous data (increased temporal resolution) change what we think we know about Hypoxic conditions?
 - Consider how these data can tie into fisheries specific projects
- Produce final 2022 datasets for CB 4.3 E&W
- Deployment of 3 stations in spring, add another in mid-summer
 - Start with 3-4 sensors per station
 - Increase vertical resolution as equipment is delivered
- Manage O&M
 - Stay ahead of biofouling
 - Increase staffing



Implementation Plan- Phased



- 3 Monitoring Stations in spring 2023
 - ~20m depth adjacent to deep channel (1 of ~3 eventually)
 - ~10m depth tracking DO migration into Lower Choptank (1 of 2)
 - ~10m depth observing Variability in Lower Potomac (1 of 2-3)
- 5-7 Stations in 2024
 - Build off of existing network
 - & knowledge gained
- 10 Stations in 2025
 - TBD



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Oxygen: Dissolved Oxygen Concentration

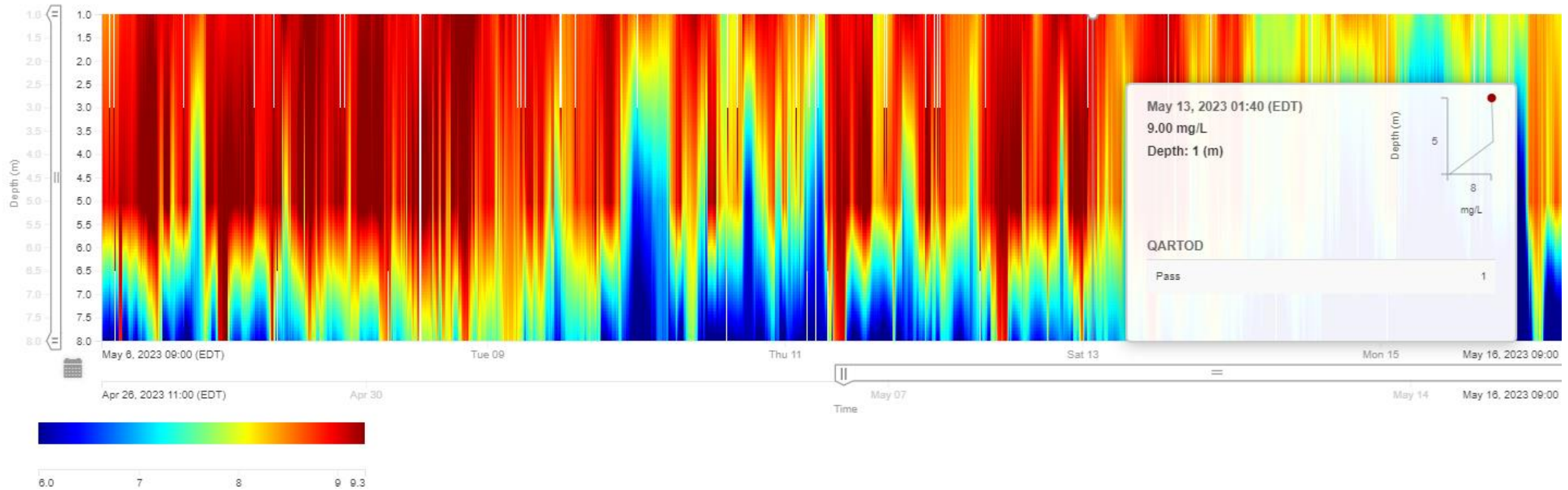
NOAA Chesapeake Bay Interpretive Buoy System
Lower Choptank (2023)

Chart **Curtain plot**

Autoscale color axis

Depth **1 m**

Time bin : all **Auto**



Questions?



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