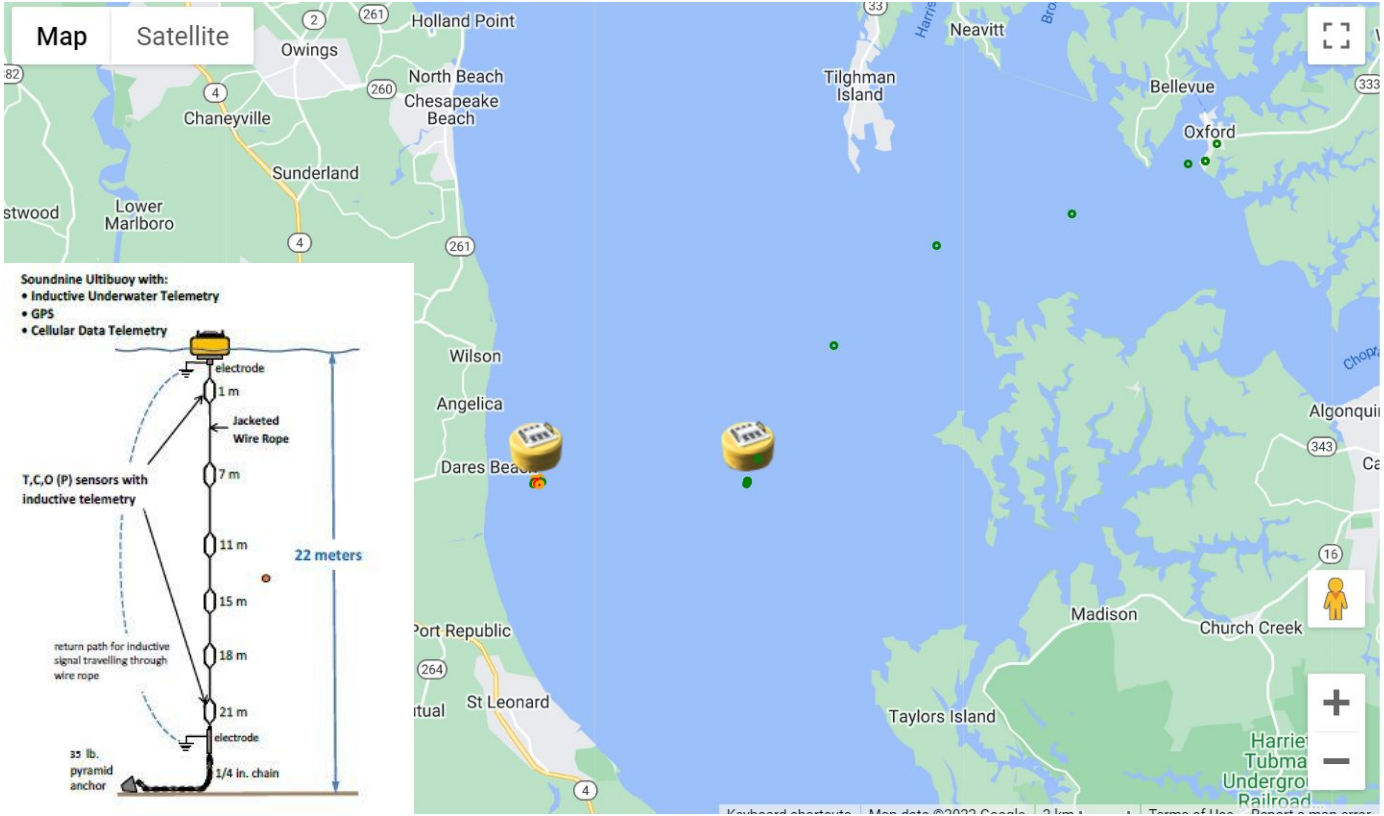
2022 Hypoxia 2-Array Deployment

An Update to the Chesapeake Bay Program Fisheries Goal Implementation Team

July 21, 2022

NOAA Chesapeake Bay Office

Initial Spring Deployment
May 16, 2022



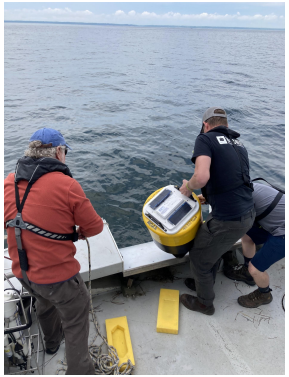
Buoy Locations

Hypoxia West

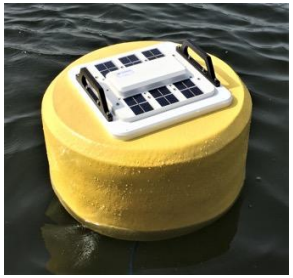
2022-07-15T14:30:00+0000 (GMT)
38.55618, -76.49283
Center on map | Center/zoom

Hypoxia East

2022-07-15T15:20:00+0000 (GMT)
38.55648, -76.39205
Center on map | Center/zoom



Data Servers and Visualizations



Buoy

S9

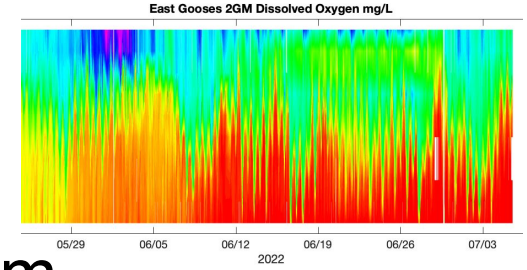
Rawdata

NCBO

Rawdata &
Display Data

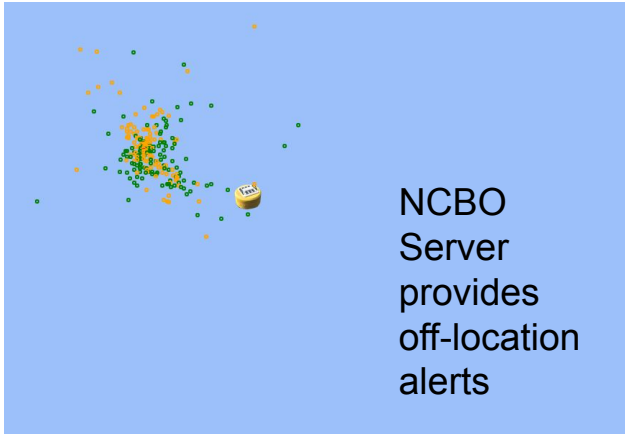
Axiom

Deliver Raw & Display;
Visualize Display



Axiom
Visual QC
&
Download
Tool

Data Server Alerts



NCBO Server provides off-location alerts

dante@s9server.com
to darius, me, doug

SData:ReportLog:Calculations:GPS Distance:Distance = 187142.2 is above specified maximum value of 100;

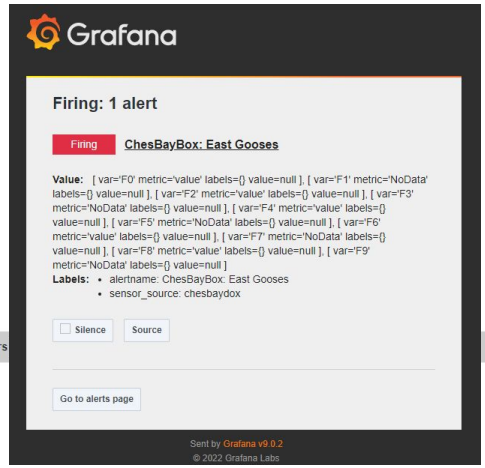
dante@s9server.com
to darius, me, doug

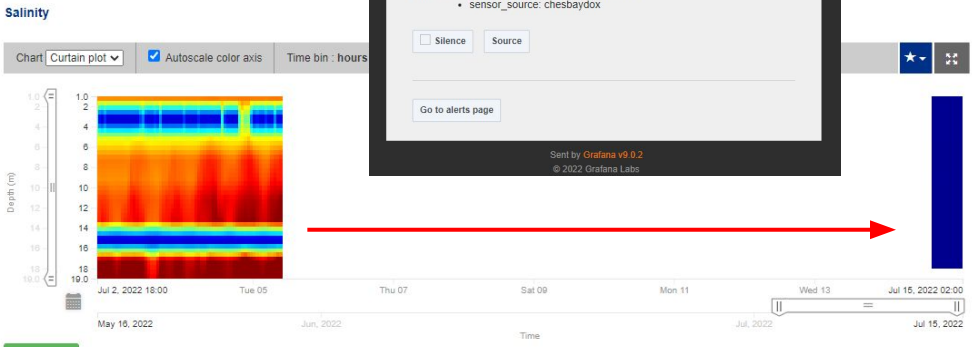
SData:ReportLog:Calculations:GPS Distance:Distance = 186852.8 is above specified maximum value of 100;

dante@s9server.com
to darius, me, doug

SData:ReportLog:Calculations:GPS Distance:Distance = 186882.7 is above specified maximum value of 100;

Axiom Server provides “no data” alerts



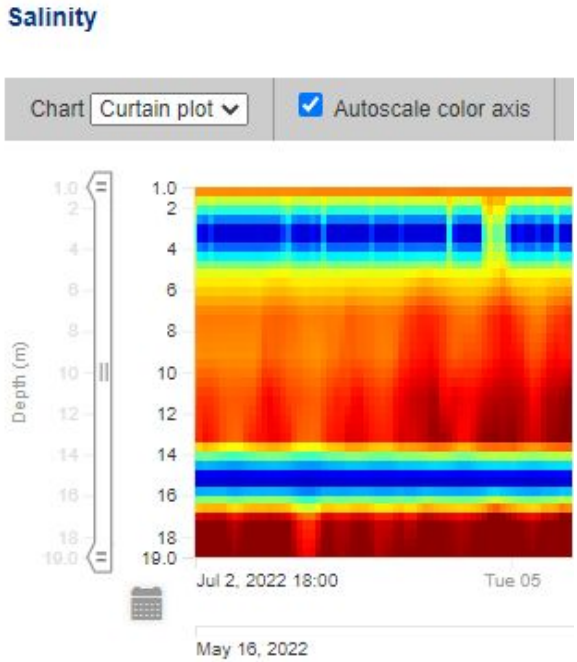


Maintenance Visits & Issues

Anti-Fouling

- Copper wire mesh covering and copper tape initially
- Barnacle season requires more frequent visits; vinegar baths
- Short period gaps for recovering an array to dissolve the barnacles is OK
- Additional copper mesh nested around sensors to add anti-fouling measures

Maintenance Visits & Issues
Bad Sensor Readings



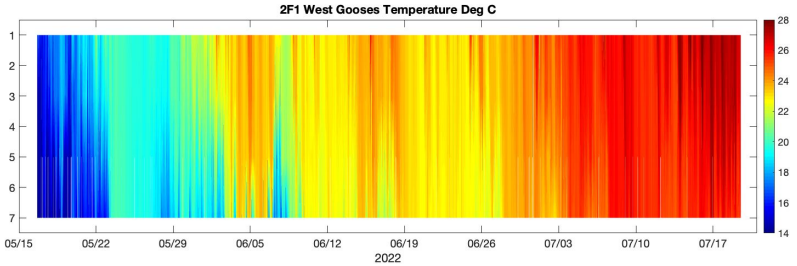
- Bad conductivity cells at 3m & 15m on East array
  - 15m conductivity cell became a problem on May 22, less than a week after deployment
  - 3m conductivity cell became a problem on July 1 likely due to barnacle fouling
  - Eventual course of action will be to replace the sensors and either remove biofouling or return for maintenance
  - NCBO display server will interpolate through the bad data at 3m & 15m (see ‘clean’ visualizations)
  - Raw and Display data will be retrievable through Axiom
  - New sensors will be swapped into these positions

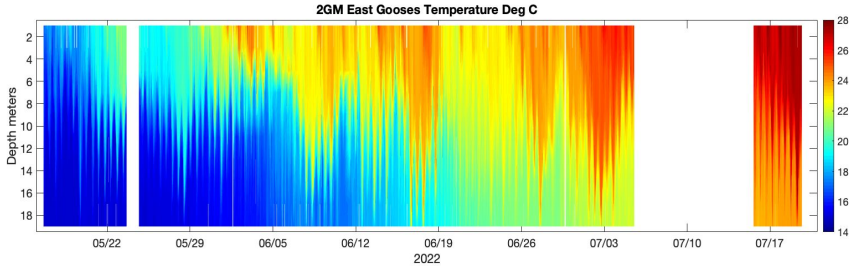
“Clean” Visualizations

West

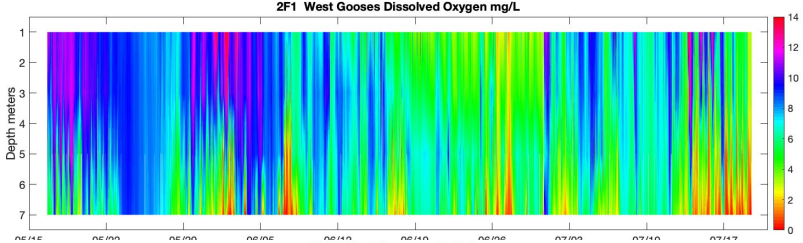
East

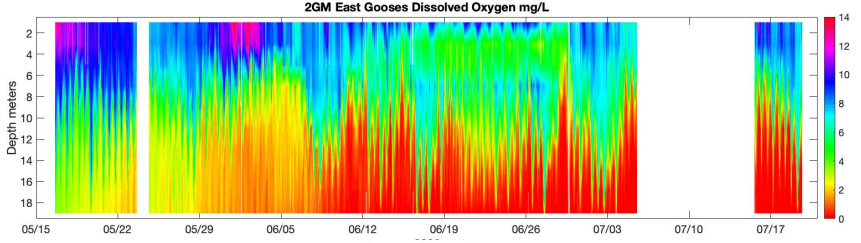
T (C)



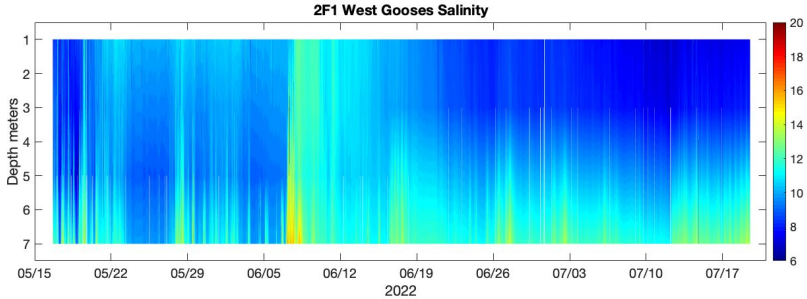


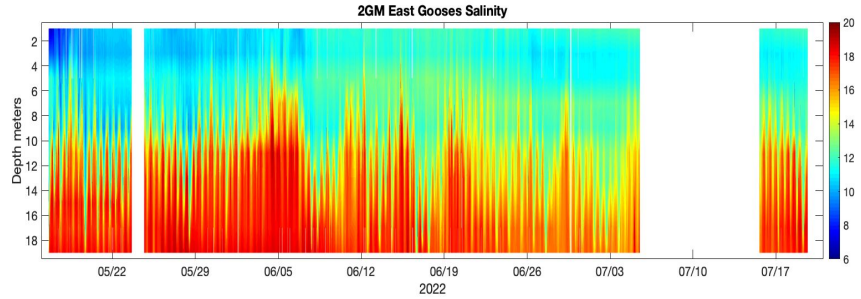
DO (mg/L)





S (psu)



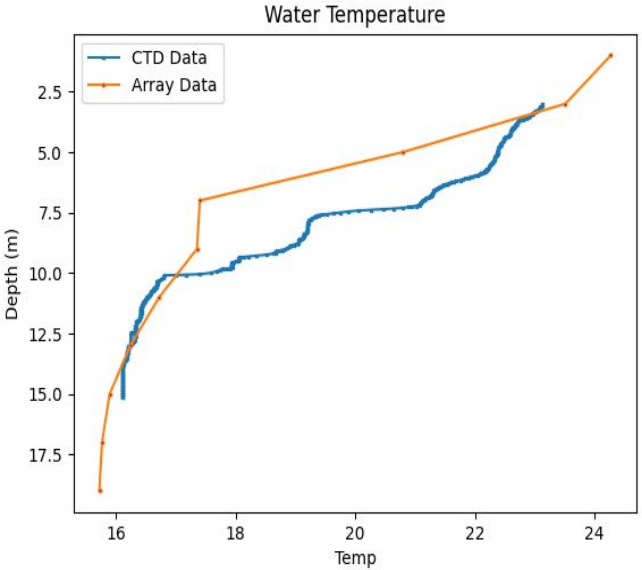


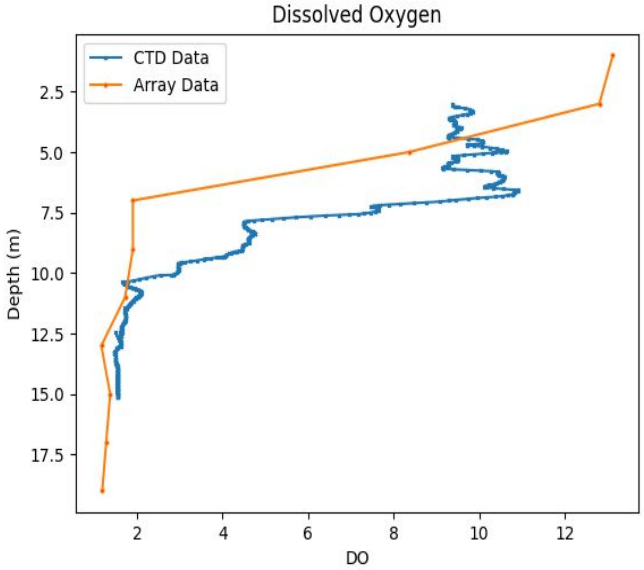
QA/QC Measures

Current Tests Evaluated- Sensor Variable Thresholds Under Review

- Location Test
- Spike Test
- Gross Range Test
- No Data Test
- Flat Line Test
- Rate of Change Test

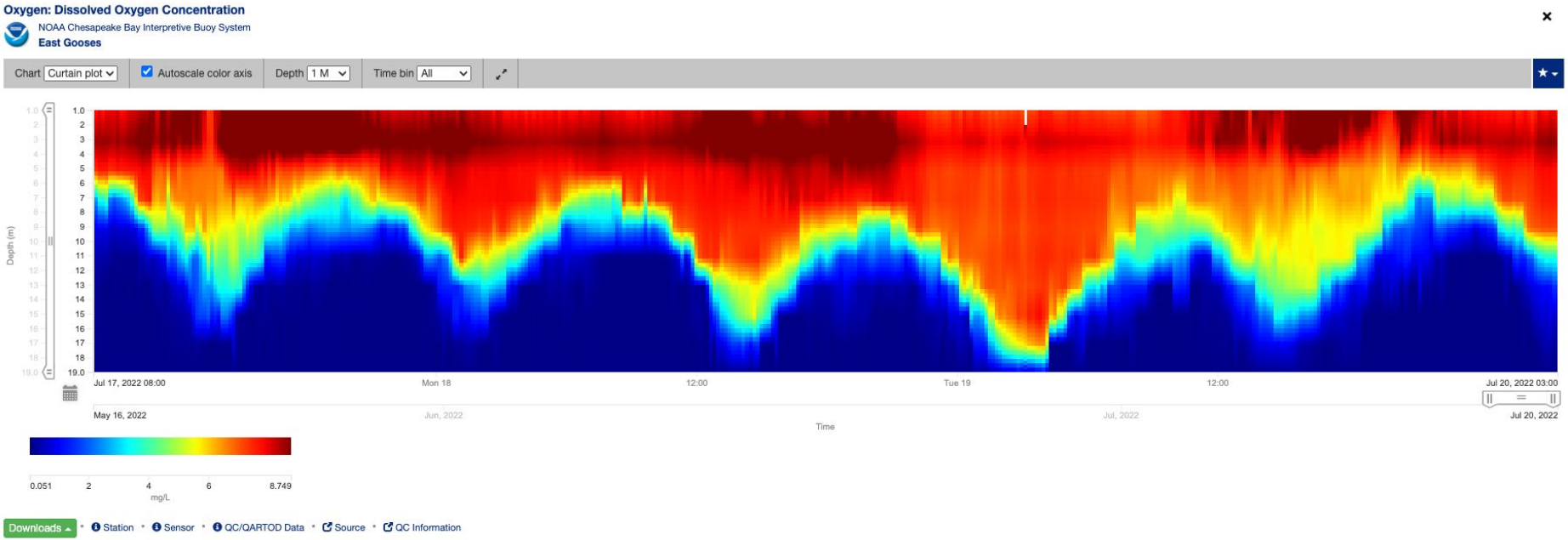
Validation CTD Casts





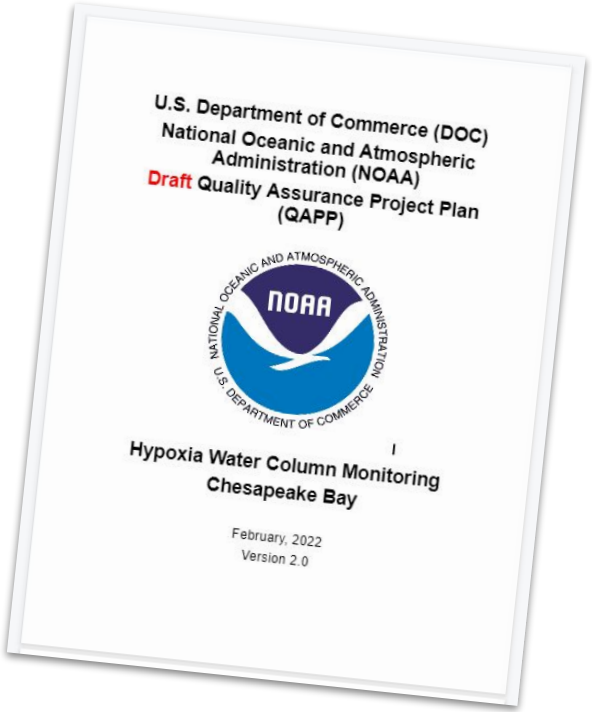
- Seabird SBE19 CTD (Blue) vs East Gooses Array Data (Orange)
- Partially automated routine under development by NCBO
- Variation considerations include water column variability, distance to array & 10 minute averaging of array measurements
- Casts collected during every O&M visit to arrays
- Can compare to CBP profiles as well

High Temporal Resolution provides Insights into Extreme Variability and Vertical Gradients- 3 Days



Next Steps for the Array Network

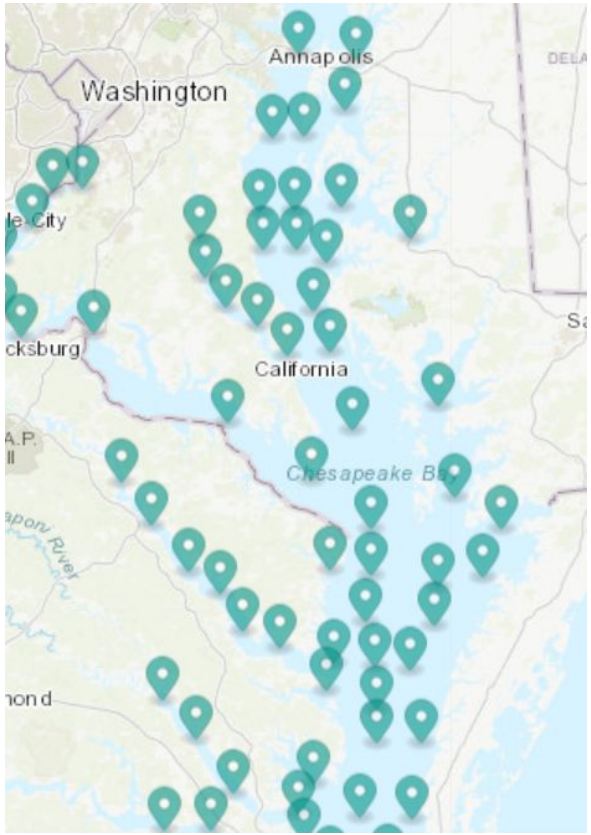
- QAPP development continues
- Maintenance schedule and operational planning evolves
- A third array (read: replacement sensors) is being delivered
- Funding source secured for the wider network
- COL Calibration facility planning underway
- Project Coordinator hire planned for January 2023


U.S. Department of Commerce (DOC)
National Oceanic and Atmospheric Administration (NOAA)
Draft Quality Assurance Project Plan (QAPP)

Hypoxia Water Column Monitoring
Chesapeake Bay

February, 2022
Version 2.0

Planning & Budgeting for a Wider Array Network



- EPA confirms 2 years of funding
- NCBO provides overall project oversight and management
- NCBO acquires equipment and supplies for a 10-array system
- Engage the Hypoxia Collaborative Workgroup to develop network options
- Operate and maintain a maximum of 7 arrays in the 2023 sampling season (March-Dec)

Observations & Living Resources

- Acoustic telemetry receivers are a component of all CBIBS (small buoys and hypoxia arrays) platforms
- Data is archived within the Mid-Atlantic Acoustic Telemetry Observation System (MATOS)
- Opportunities exist to tie species presence data with continuous water column habitat (DO, Temp, Salinity) data

Consulting Acknowledgement

Doug Wilson - Caribbean Wind

Thank you for your interest.
Questions?

Contact Jay.Lazar@NOAA.gov for additional information