NCBO Seasonal Summaries

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Background

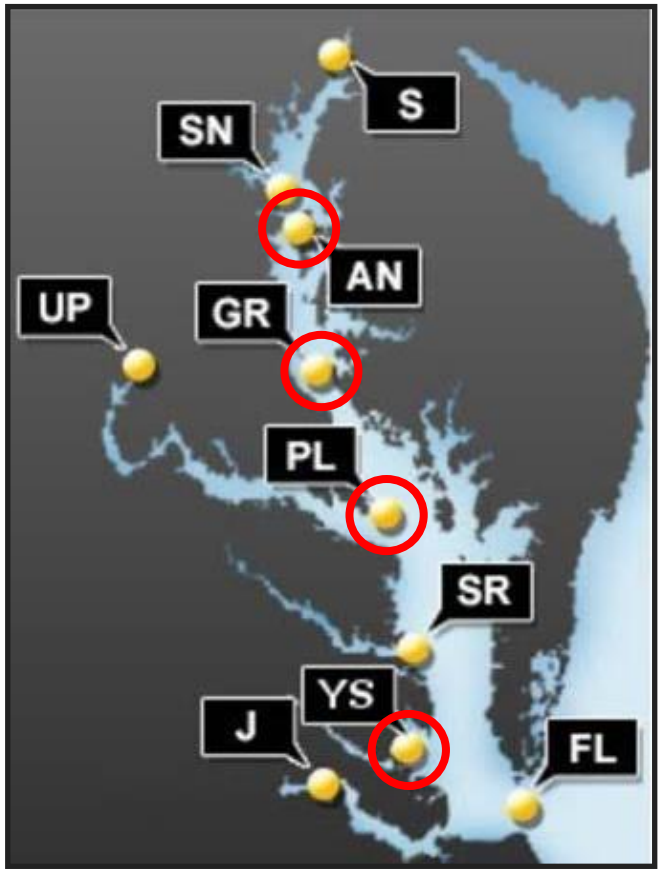
- NEFSC interested in incorporating estuarine habitats into the annual Mid-Atlantic SOE Report
  - Critical nursery, spawning, foraging habitat
- Contributed information about impacts of heavy precipitation in the 2020 SOE Report
  - Spread of invasive catfish, increased oyster mortality, and hypoxic conditions
- Interest in regular contributions led to the development of seasonal summaries

Overview

- What: Summary of seasonal environmental conditions relative to long-term averages and the potential impacts on key fishery resources
- Target Audience: State and coast-wide fishery resource managers
- Purpose: To guide habitat and fishery management decisions in an ecosystem context in the face of changing environmental conditions

Data Sources

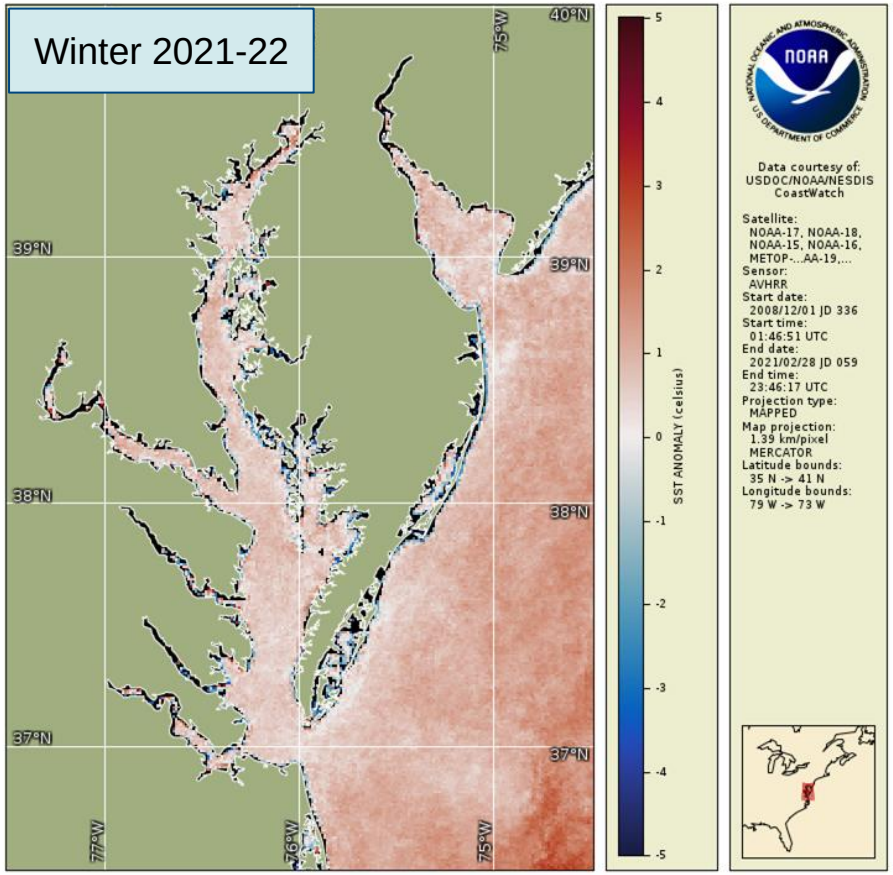
- NOAA Chesapeake Bay Interpretive Buoy System (CBIBS)
- NOAA CoastWatch Program
- USGS National Water Information System
- NOAA National Weather Service
- Fisheries surveys
- Oyster surveys
- Hypoxia reports



CBIBS buoy locations

Water Temperature

- SST anomaly from NOAA CoastWatch satellite imagery
- Average over the whole season
- Warmer-than-average temperatures in winter 2021-22
- May favor blue crabs by maintaining low overwintering mortality

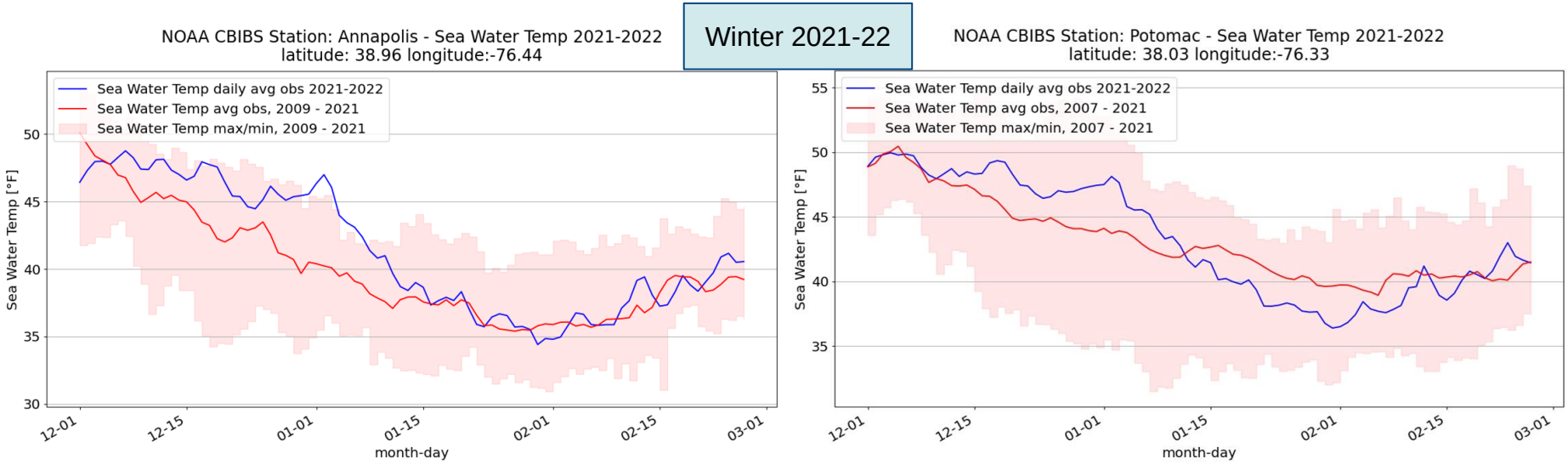


Water Temperature

Annapolis

Potomac

Winter 2021-22



- CBIBS data show temporal variation throughout the season and across the Bay
- Cold snap in January may actually increase overwintering mortality in the lower Bay

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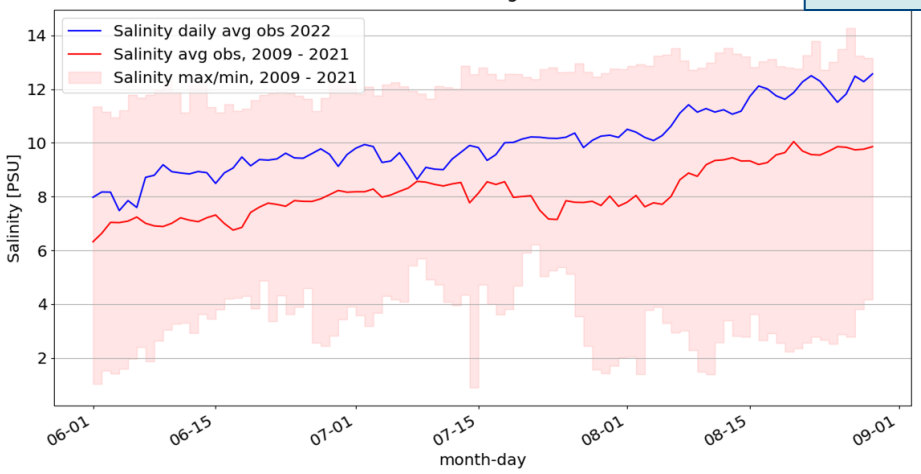
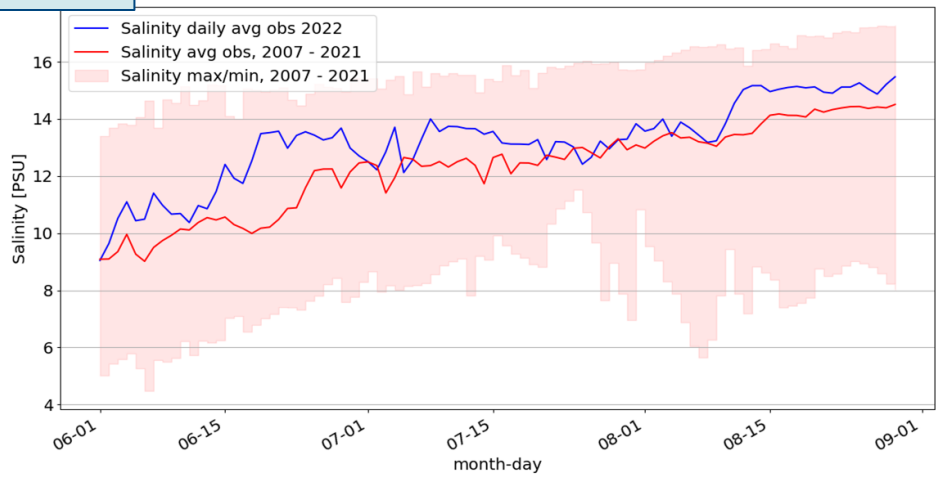
Salinity

Annapolis

Potomac

Summer 2022

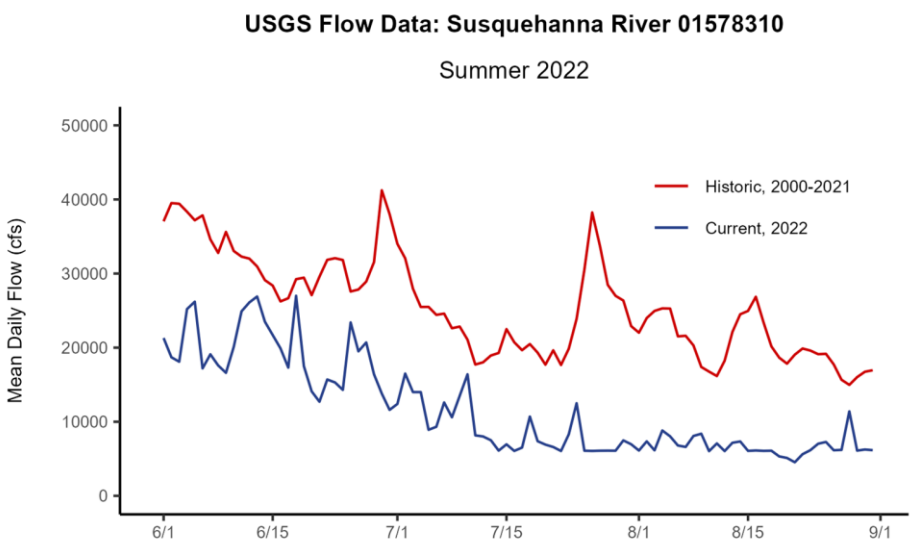




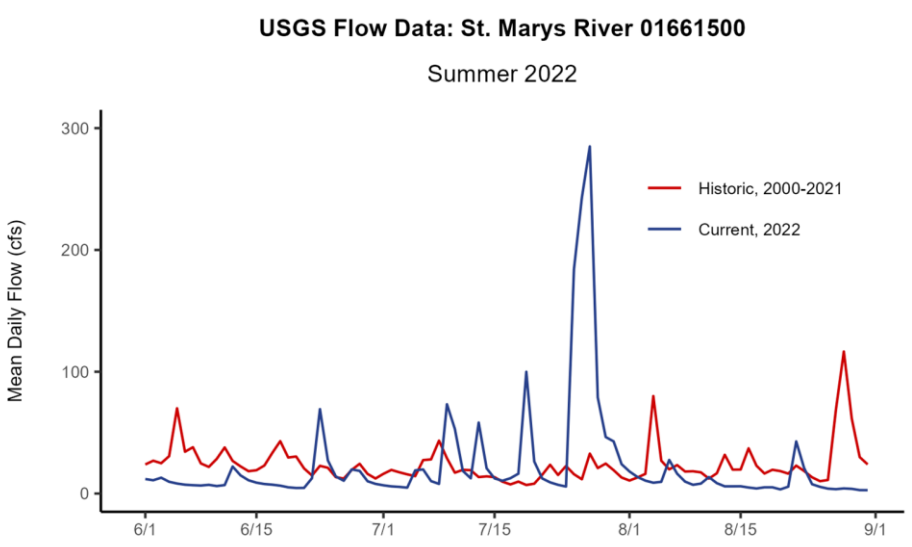
- Above-average salinity in summer 2022, particularly in the upper Bay
- Favorable conditions for oyster larvae recruitment and growth

Freshwater Flow

Near Annapolis



Near Potomac



- Below-average freshwater flow in the upper Bay
- More variable in the lower Bay, similar to salinity

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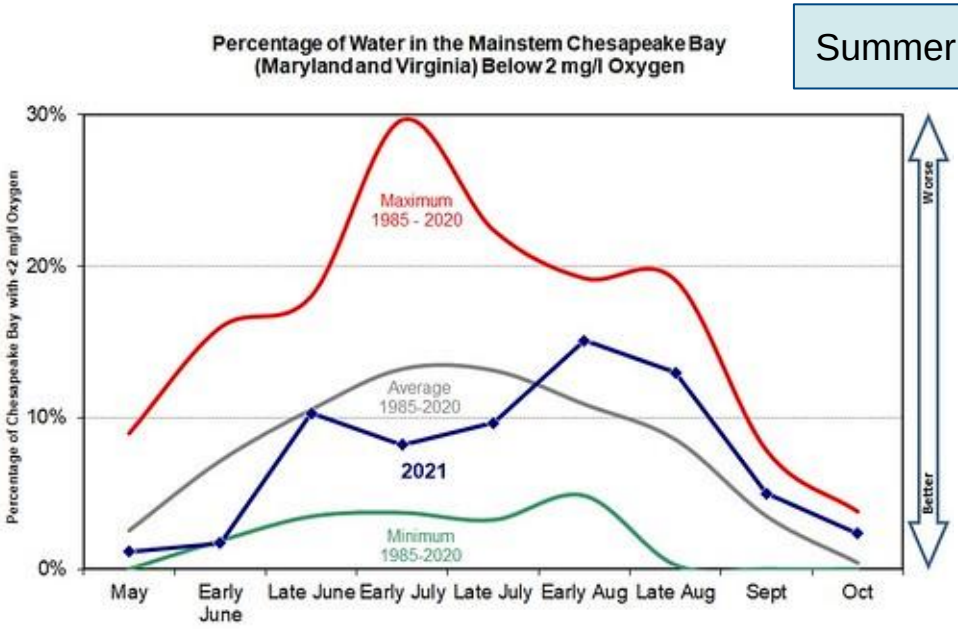
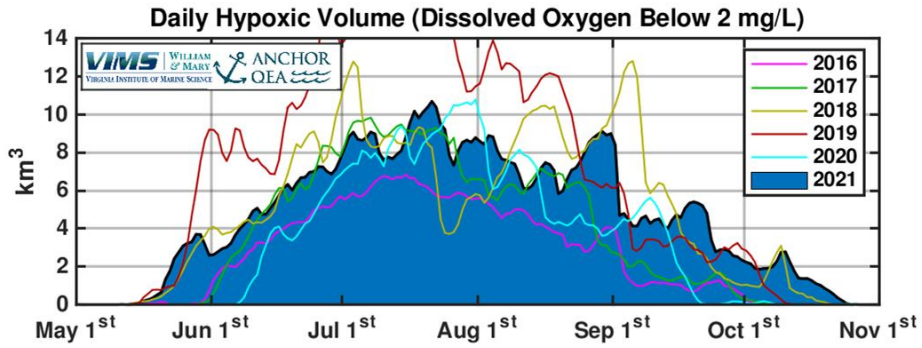
Dissolved Oxygen





- Below-average hypoxic volume in early summer
- Above-average volume in late summer and fall
- Decrease in hypoxic volume with Hurricane Ida
- Relatively long duration of hypoxia
  - Warm fall temperatures
  - High-precipitation events

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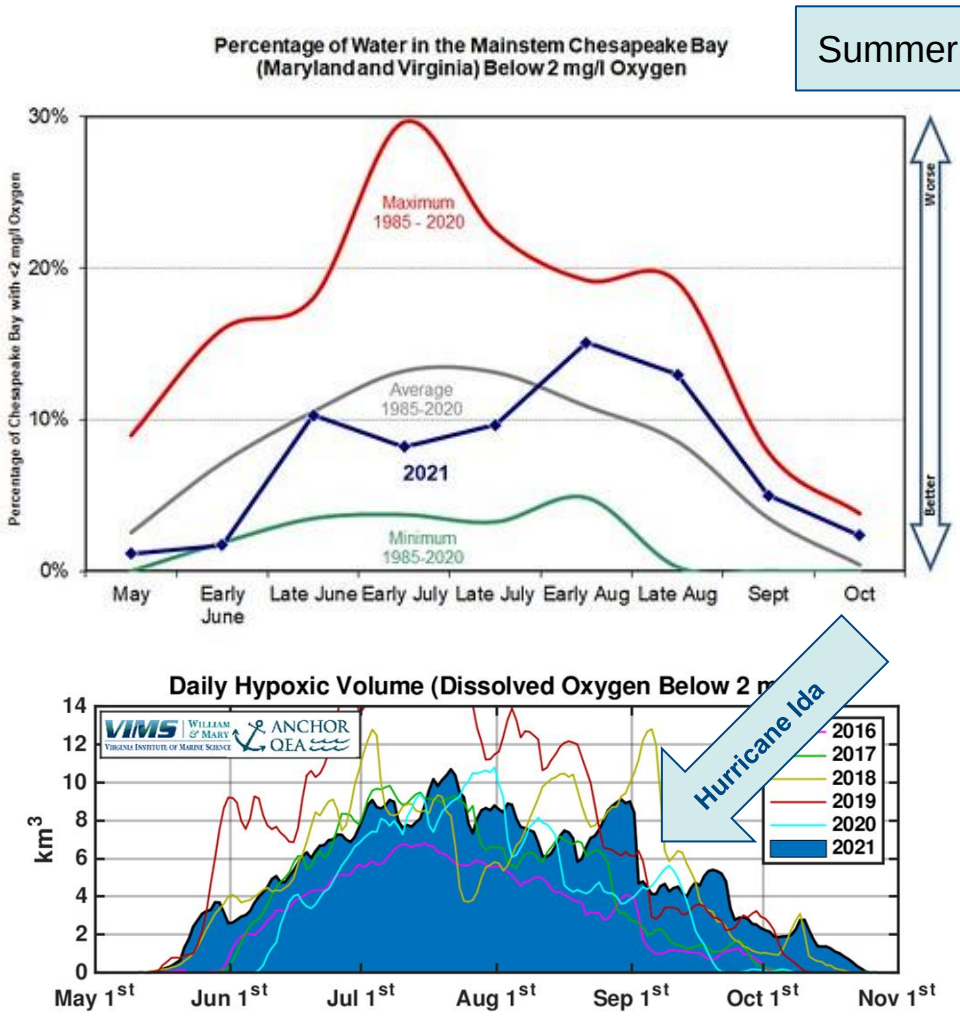
Dissolved Oxygen



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Impacts on Natural Resources

<u>Winter</u> • Blue crab overwintering mortality (temperature) • Striped bass recruitment (temperature, flow) • Bay anchovy (salinity)	<u>Spring</u> • Striped bass recruitment (temperature, flow) • Oyster production (salinity)
<u>Summer</u> • General mortality (DO, temperature) • Oyster production (salinity) • SAV health (temperature) • Juvenile spot (DO)	<u>Fall</u> • General growth, mortality (temperature, DO) • Fish migration (temperature) • Oyster production (salinity)

Looking Forward

- Continue developing seasonal summaries and distribute them broadly to the Bay community
- Incorporate results from NCBO-funded research
  - Forage, habitat suitability models, nursery habitat assessment
- Incorporate more analysis as able
- Provide annual summaries for the Mid-Atlantic State of the Ecosystem Report
- Feedback is welcome!

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