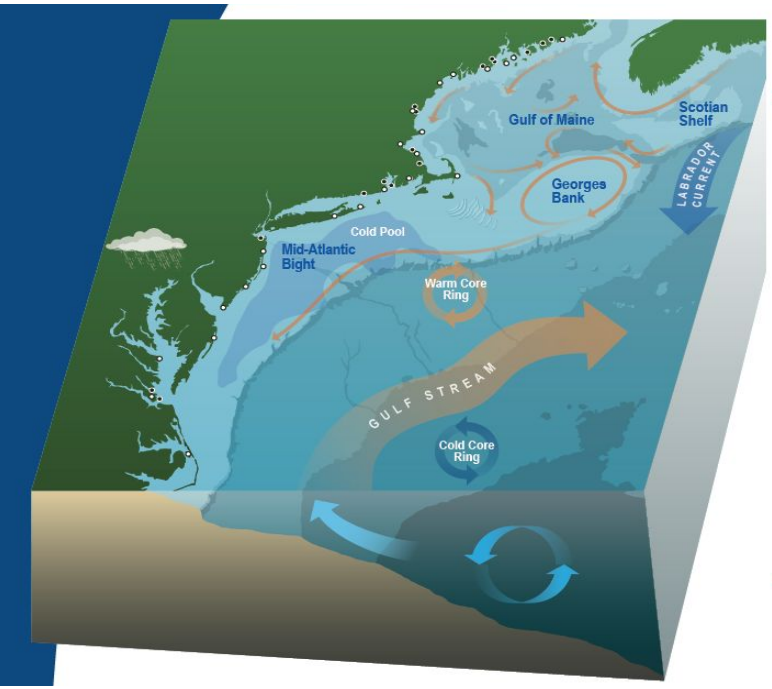
NOAA FISHERIES

2023 State of the Ecosystem: Chesapeake Bay

Mandy Bromilow
Contributors: Ron Vogel, Bruce Vogt, Kim Couranz, CJ Pellerin
NOAA Chesapeake Bay Office
Winter 2023 Sustainable Fisheries GIT Meeting

Overview

- Managers interested in estuaries as critical habitats

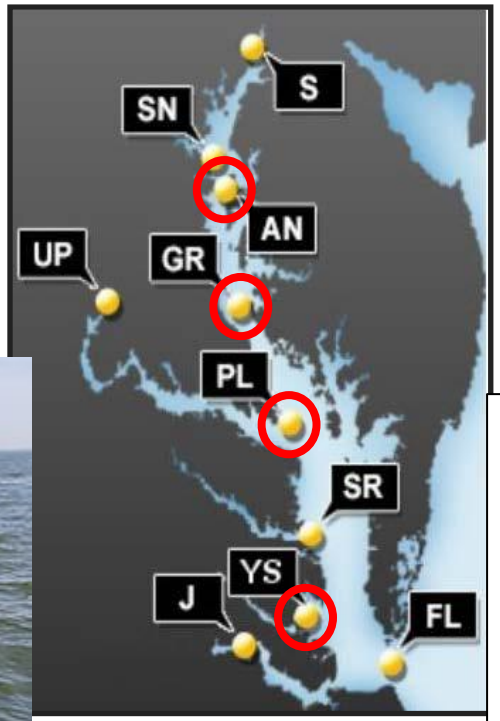


The Northeast US Shelf is one of the most productive marine ecosystems in the world. Changes in climate, nearshore, and oceanographic processes as well as human uses affect productivity at all trophic levels and impact fishing communities and regional economies.

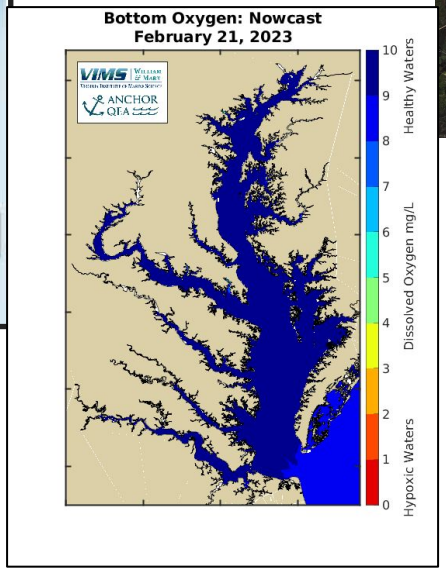
- Examining conditions relative to long-term averages and assessing potential impacts on key resources
- Intended to guide habitat and fishery management decisions in the face of changing environmental conditions

NOAA FISHERIES

Data Sources



CBIBS buoy locations



USGS stream gauges

Impacts on Natural Resources

Winter

- Blue crab overwintering mortality (temperature)
- Striped bass recruitment (temperature, flow)
- Bay anchovy (salinity)

Spring

- Striped bass recruitment (temperature, flow)
- Oyster production (salinity)

Summer

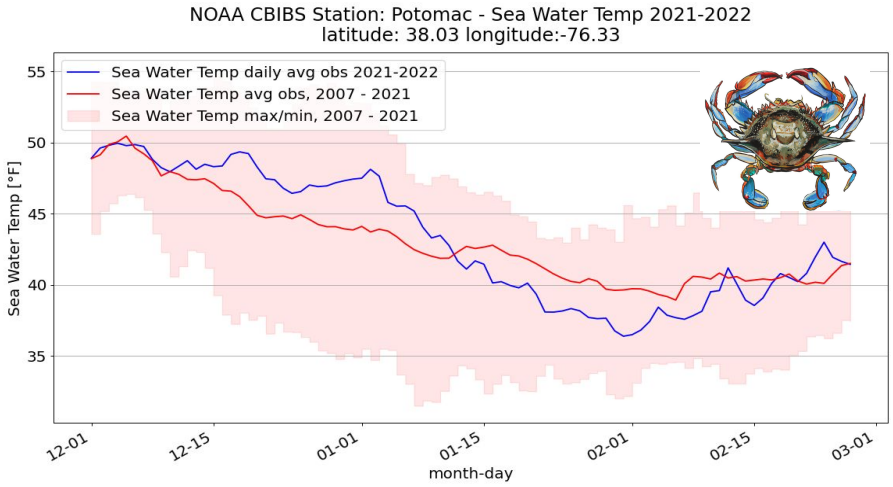
- General mortality (DO, temperature)
- Oyster production (salinity)
- SAV health (temperature)
- Juvenile spot (DO)

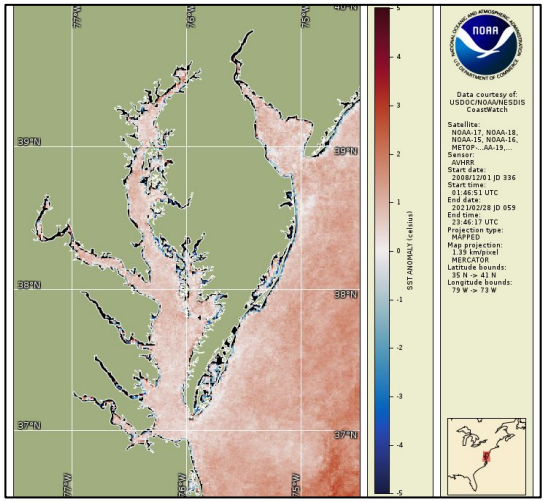
Fall

- General growth, mortality (temperature, DO)
- Fish migration (temperature)
- Oyster production (salinity)

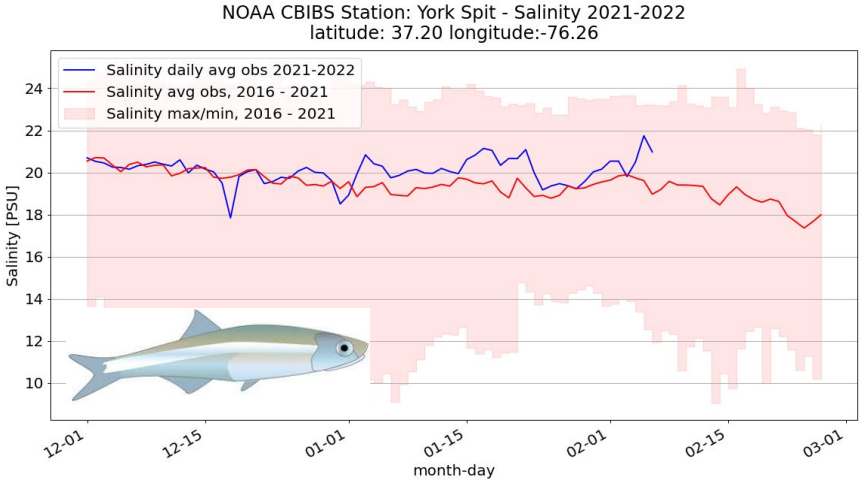
NOAA FISHERIES

Winter 2021-22 Headlines



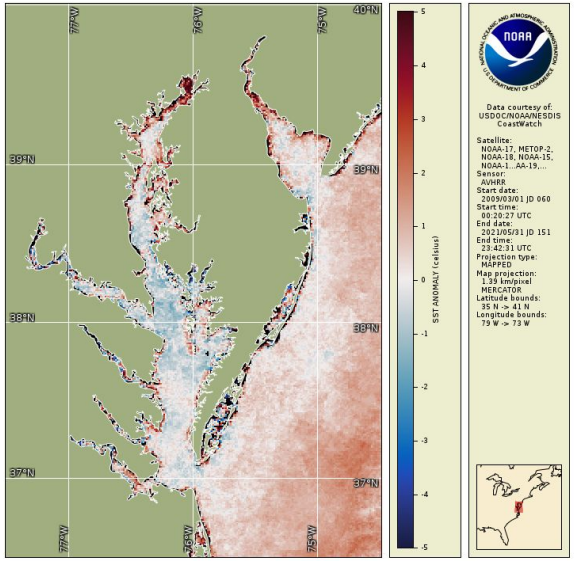


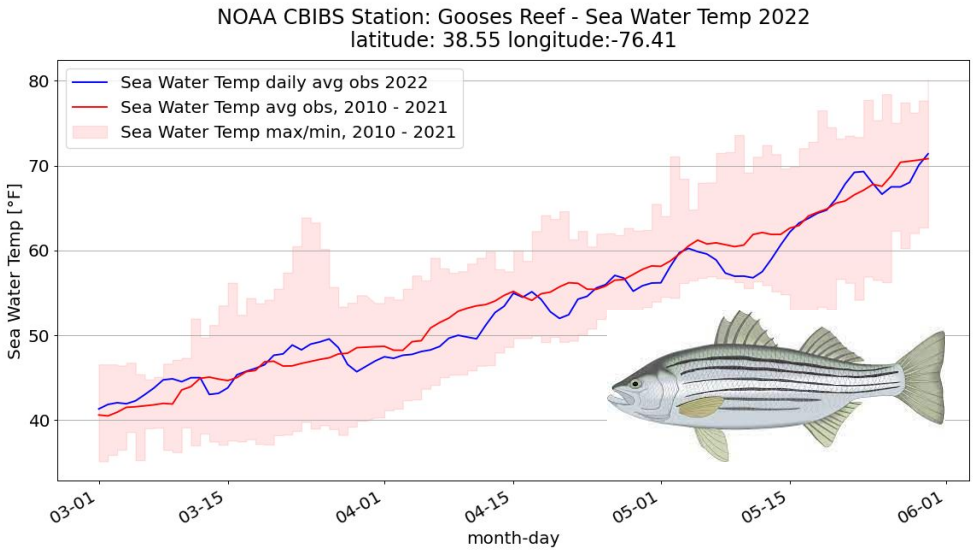
- Below-average water temperatures in late winter may increase blue crab overwintering mortality in the lower Bay
- Above-average lower Bay salinities in mid-late winter may indicate more suitable habitat available for bay anchovy



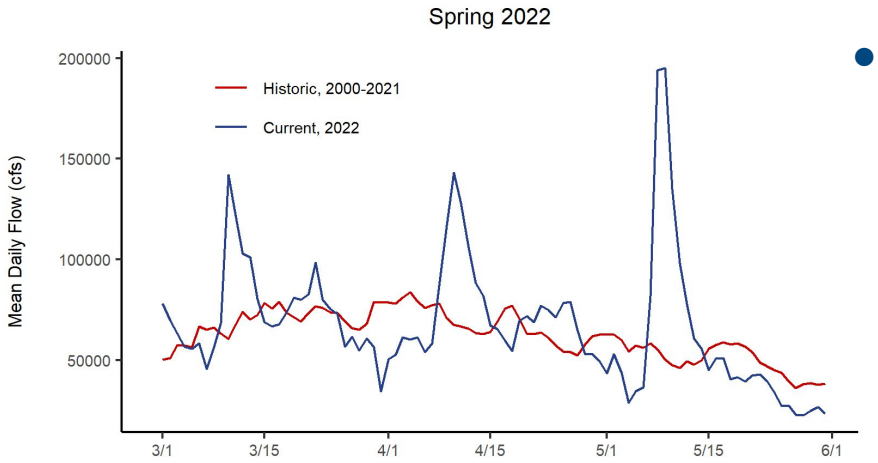
NOAA FISHERIES

Spring 2022 Headlines



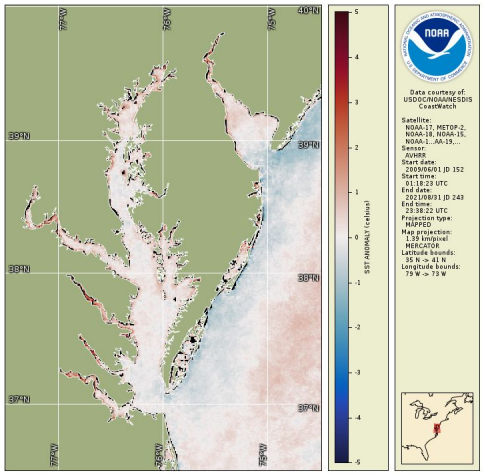


USGS Flow Data: Susquehanna River 01578310



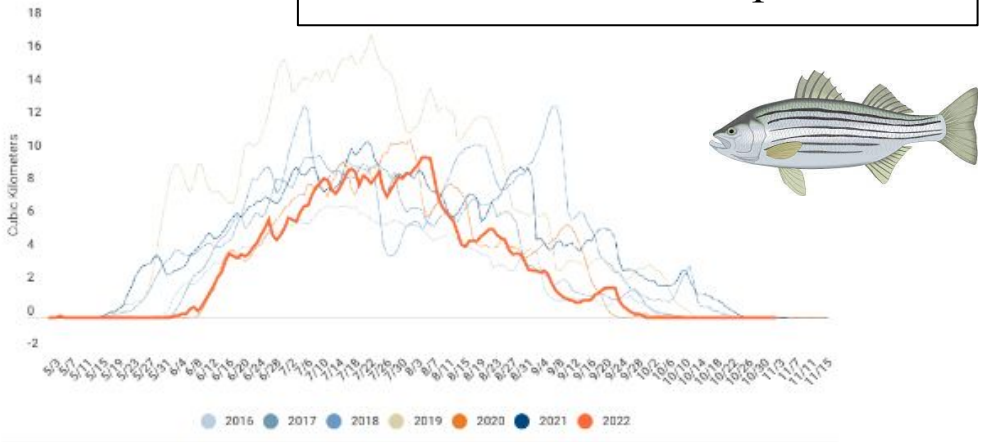
- Average to below-average water temperatures and occasional peaks in freshwater flow throughout the spring suggest favorable conditions for striped bass spawning and recruitment in 2022

Summer 2022 Headlines

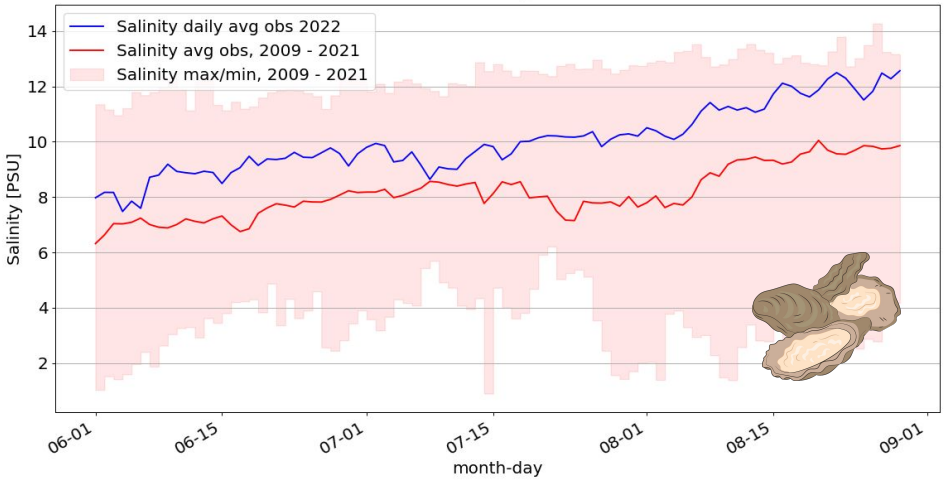


Time Series Estimates

VIMS Dead-Zone Report Card

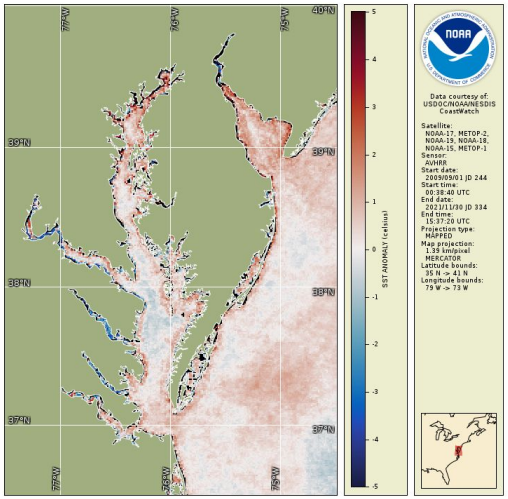


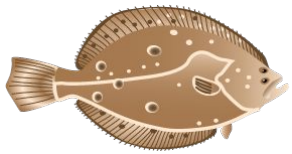
NOAA CBIBS Station: Annapolis - Salinity 2022
latitude: 38.96 longitude:-76.44

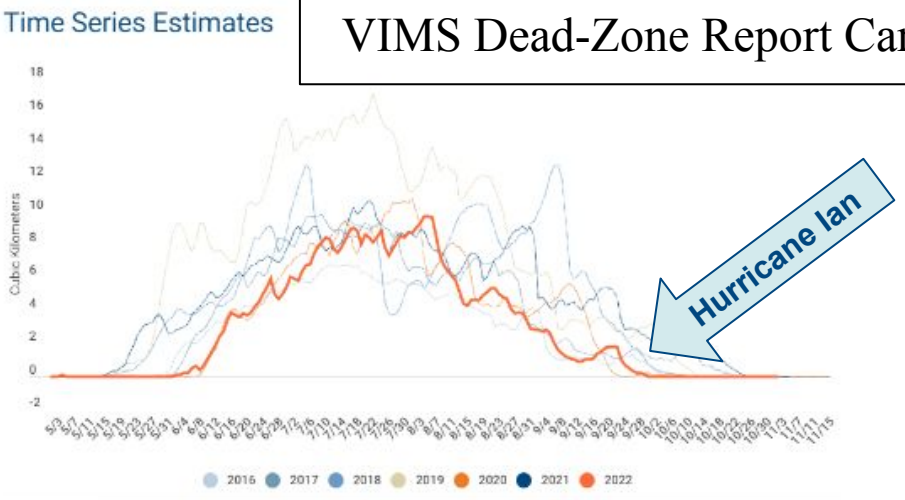


- Average water temperatures and below-average hypoxic volume throughout the summer suggest favorable conditions for key species and habitats
- Above-average salinities throughout the oyster spawning season support larval growth and recruitment

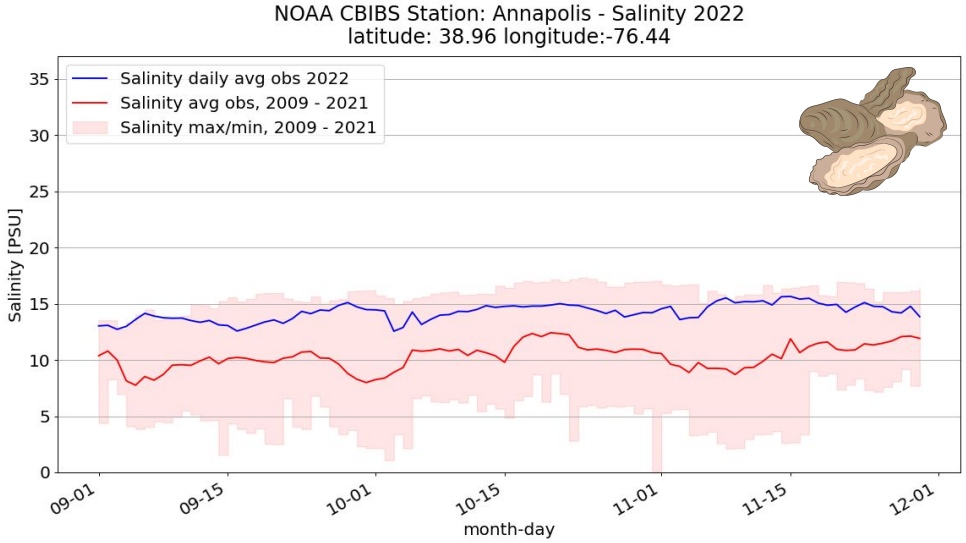
Fall 2022 Headlines







VIMS Dead-Zone Report Card



- Above-average water temperatures may extend residence time of juvenile summer flounder in the Bay
- Strong winds from the remnants of Hurricane Ian shorten hypoxia duration
- Above-average salinities support oyster recruitment and survival

NOAA FISHERIES

2023 State of the Ecosystem Headlines

- Summary of 2022 headlines by species
- Highlighted key research outcomes from projects funded by NCBO's Chesapeake Bay Fisheries Research Program
  - Relative habitat use of Chesapeake Bay by several finfish species (e.g., Atlantic croaker, spot, summer flounder, weakfish, clearnose skate, horseshoe crab) is declining (Schonfeld et al. 2022)
  - Suitable habitat for juvenile summer flounder has declined between 47% and 64% since 1996 (Fabrizio et al. 2022)

Looking Ahead

- Continue to improve the seasonal summaries by:
  - Incorporating new research results and developing indicators
  - Incorporating statistical analysis
  - Obtaining feedback from managers, scientific experts, and other stakeholders

Thank You!

NOAA FISHERIES