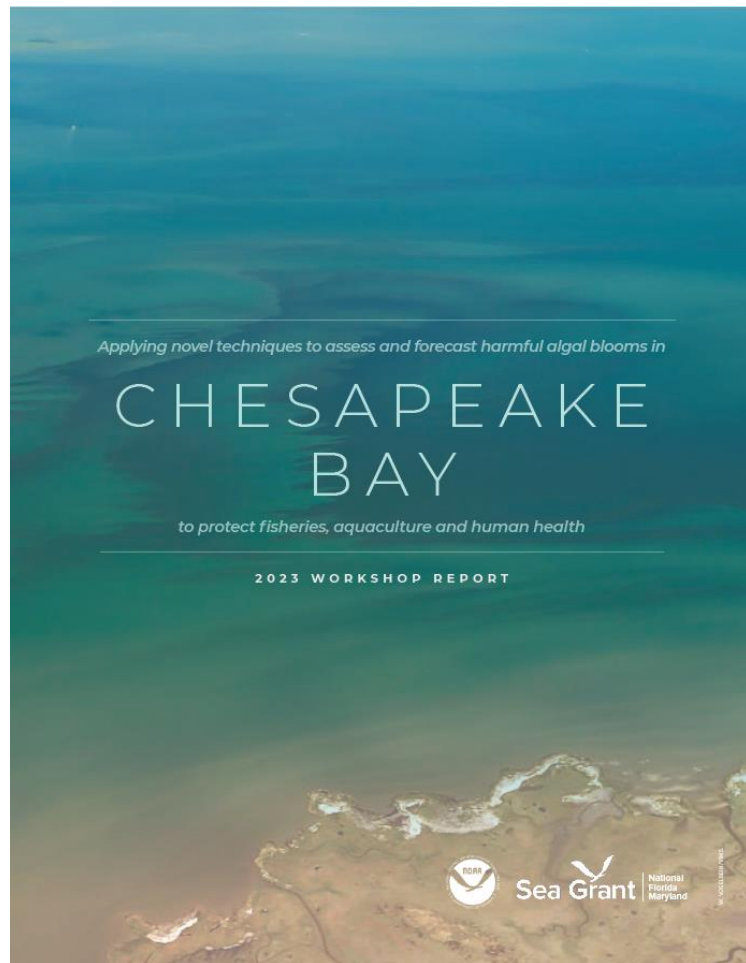


HAB Liaison Engagement in Chesapeake Bay

Key Project Partners: NCCOS HAB-Forecasting Branch, Maryland Sea Grant, MARACOOS

Key Community Partners: Chesapeake Bay Program, Virginia Institute of Marine Science, Maryland Dept. of Natural Resources, Virginia Dept. of Health

The Chesapeake Bay estuary is a crucial natural resource, supporting vital fisheries and tourism. However, it faces eutrophication challenges with over 1400 identified phytoplankton and cyanobacteria species, some potentially harmful. Harmful algal and cyanobacterial blooms pose risks to humans, pets, and wildlife, impacting recreation, tourism, and causing economic losses. Additionally, these blooms can harm fisheries and aquaculture, affecting seafood quality. Managing and mitigating these challenges is essential for sustaining the economic and ecological health of Chesapeake Bay.



The National Centers for Coastal Ocean Science (NCCOS) has been delivering satellite imagery to resource managers in MD and VA since 2016. Several algorithms applied to the Sentinel-3 Ocean and Land Colour Imager (OLCI) have improved bloom detection at 300 m spatial resolution, however, species-level information is reliant on state phytoplankton monitoring programs. Budget constraints and limited temporal/spatial resolution have constrained sampling, and the data are often insufficient for real-time validation of satellite and modeling efforts.

In the interest of improving HAB monitoring with satellite data products and forecasting tools in the Chesapeake Bay, and to assist NCCOS in obtaining broad stakeholder input regarding needs and potential applications, a workshop was organized and held at Virginia Institute of Marine Science (VIMS) in January 2023. The workshop assessed HAB forecasting opportunities & limitations at scales needed for resource management & industry business practices, and brought together agency, industry, and academic experts to discuss this topic.

The goals were to better understand how HABs affect agency and industry operations, explore how satellite imagery is currently being used, and what needs could be met via satellite and forecasting information. Forty-one participants from state agencies, nonprofit organizations, academic institutions, extension, aquaculture, charter boat operators, and the recreational fishing community attended the workshop, allowing for a diverse and comprehensive assessment of forecasting needs and opportunities.

Testimonial: *Excellent workshop! Loved the participation from industry - really added to the purpose of developing the products (Chesapeake Bay Workshop Participant)*

The workshop resulted in several identified next steps for NCCOS, including exploring citizen science monitoring opportunities, site visits with industry partners, improving spatial resolution of satellite products for narrow coastal regions, and following up with MARACOOS regarding coordination on forecast output. A [summary report](#) was also produced.

As a result of the workshop, NCCOS has increased efforts to collect additional phytoplankton samples through the expansion of NOAA's Phytoplankton Monitoring Network to Chesapeake Bay. Collaboration with Maryland DNR and the Bay's aquaculture community has extended sampling in important coastal regions affected by HABs. Efforts are underway to improve satellite observing capabilities by evaluating the use of higher spatial and spectral resolution satellites, such as Sentinel-2, which will provide more information on blooms in narrow coastal regions where aquaculture activities are located. NCCOS is also exploring

the use of higher spectral resolution to separate phytoplankton groups, to improve information about potential toxicity of blooms in anticipation of new hyperspectral satellite products. Finally, NCCOS is working on an experimental forecast for the York River based on targeted stakeholder input.

Communication and coordination in this region are vital. Discussion is underway with MARACOOS regarding hosting NCCOS forecast products. MARACOOS is funded to host VIMS Chesapeake Bay Environmental Forecast System (CBEFS) so adding NCCOS outputs would streamline access for users. NCCOS progress in the region is regularly shared via Chesapeake Bay forums, including presentations at Maryland and Virginia task force meetings.

Phytoplankton Monitoring Network and Remote Sensing training



NATIONAL CENTERS FOR
COASTAL OCEAN SCIENCE



NCCOS Harmful Algal Bloom branches:
Shelly Tomlinson- Remote Sensing of HABS

Jen Maucher Fuquay & Nia René- Citizen/participatory science HAB monitoring MD DNR:

Cathy Wazniak – end users



June 29, 2023: Assateague Island National Seashore

Target Audience :

Coastal/State managers in the Coastal Bays
General Chesapeake Bay volunteers
Aquaculture/farmers

Initial participants at training :

Worcester County Environmental Health -bacteria monitoring program
Assateague Coastal Trust
Maryland Coastal Bays National Estuary Program (volunteer monitors).

October 17, 2023: Aquaculture Farmers and Programs

Participants : 20 attendees

True Chesapeake
Ferry Cove
Hollywood Oyster Company
38 degrees North Oyster
Hoopers Island Oyster Company
Pirates Cove
Piney Point
Morgan State University's PEARL hatchery
Shell and Barrel

Graphic source: NOAA NCCOS