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NOAA Chesapeake Bay Office
Biennial Report to Congress
Fiscal Years 2019 and 2020

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The National Oceanic and Atmospheric Administration (NOAA) Chesapeake Bay Office (NCBO) uses its capabilities in science, restoration, and community engagement to improve the understanding, management, and stewardship of the Chesapeake Bay. NCBO focused on sustainable fisheries science, oyster restoration, oceanographic and meteorological observations, environmental literacy, and community partnerships.

NOAA has been a partner in the Chesapeake Bay Program since 1984. In 2014, NOAA and its Federal and state partners signed the [Chesapeake Bay Watershed Agreement](#), which included goals supporting the restoration and protection of the Bay watershed and guiding the work of the Chesapeake Bay Program. During the biennium, NCBO worked with partners to implement the goals of the Agreement and other shared priorities.

This report describes highlights of NCBO's activities for Fiscal Years (FY) 2019–2020 under the NOAA Authorization Act, 15 U.S.C. 1511d. This Act established the NCBO, which is a division of the Office of Habitat Conservation within the NOAA National Marine Fisheries Service (NMFS).



The Chesapeake Bay includes habitat that supports commercially and recreationally important species, including striped bass. Photo: Dave Harp.

Implementing Large-Scale Oyster Reef Restoration in the Chesapeake Bay

- Completed Little Choptank River oyster restoration, comprising just over 350 acres of reef habitat. This is the third Bay tributary completed toward the Chesapeake Bay Watershed Agreement goal of restoring oysters in 10 tributaries by 2025.
- Developed tributary-scale oyster restoration blueprints for the Lynnhaven, Piankatank, Lower York, and Great Wicomico Rivers in Virginia and the St. Mary's and Manokin Rivers in Maryland. Restoration blueprints are now complete for all of the 10 tributaries in the Chesapeake Bay that have been selected for large-scale restoration.
- Conducted oyster habitat assessment surveys in the Lafayette, York, Piankatank, Great Wicomico, and St. Mary's Rivers.

Continuing Activities: Over the next 2 years, NCBO will work with partners to restore oysters in the Tred Avon, St. Mary's, and Manokin Rivers in Maryland and in the Piankatank, Lower York, Great Wicomico, and Lynnhaven Rivers in Virginia. NCBO will coordinate stakeholder efforts, provide funding for reef construction, map habitat, monitor progress, and produce GIS products in support of Chesapeake Bay oyster restoration efforts.



Restored oyster reefs, like this one in Maryland's Little Choptank River, provide habitat for a wide range of Chesapeake Bay species and help filter the water. Photo: Oyster Recovery Partnership.

Monitoring Chesapeake Bay Conditions

- Maintained the Chesapeake Bay Interpretive Buoy System (CBIBS), a network of buoys that continuously tracks water quality and weather information at key Bay locations, and delivered the data to public users such as boaters and recreational anglers, as well as NOAA partners for use in marine and ecological forecasts.
- Transitioned from the first-generation CBIBS buoys to a smaller buoy platform that provides the same data suite while making buoys easier to deploy and recover, saving valuable time and resources.
- Integrated CBIBS buoy data into the NMFS 2020 State of the Ecosystem Report for the Mid-Atlantic for the first time, demonstrating the effects of low salinity levels in the Bay on habitat conditions and biological responses for oysters, blue crab, striped bass, and invasive blue catfish.

Continuing Activities: Over the next 2 years, NCBO will complete the transition to the smaller and more efficient buoy platforms while continuing to deliver near real-time information on the Bay's changing weather and water conditions to a wide variety of users. NCBO will also work with state and academic partners to deploy and maintain acoustic telemetry receiver arrays to better understand fish movement and habitat uses. Lastly, NCBO will support the development of a mainstem water column monitoring program by piloting a hypoxia monitoring platform in partnership with the Chesapeake Bay Program.



Deployed in early March 2020, the Annapolis CBIBS buoy is one of the new, smaller buoys, making on-the-water operations easier in an often challenging environment. Photo: NOAA Chesapeake Bay Office.

Sustainable Fisheries and Habitat Science

- Led the Chesapeake Bay Program’s Sustainable Fisheries Goal Implementation Team (Fisheries GIT) to implement Chesapeake Bay Watershed Agreement oyster, blue crabs, forage, and fish habitat goals. For example, NCBO led the team to synthesize the effects of shoreline hardening on fish habitat, allowing land use managers to make more informed shoreline development decisions.
- Supported fish and habitat science with a focus on state fisheries management needs for striped bass, summer flounder, black sea bass, and invasive blue catfish. For example, NCBO provided analyses of Chesapeake Bay habitat that were used to update the Mid-Atlantic Fishery Management Council’s Ecosystem Approaches to Fishery Management Risk Assessment. This document guides their science and management decisions.
- Developed a Technical Memorandum summarizing nine projects that quantified the ecological and economic benefits of restored oyster reefs. One model from Morgan State University estimated that the economic return derived from mature, restored oyster reefs would be \$20 million a year to Talbot and Dorchester counties in Maryland, after all economic multipliers were factored in.

Continuing Activities: Over the next 2 years, NCBO will continue to lead the Fisheries GIT to coordinate Bay fisheries management and science for key species and communicate results of habitat suitability assessments for striped bass, bay anchovy, summer flounder, and black sea bass to inform Bay and regional fishery management decisions. NCBO will initiate Bay-specific population estimates for striped bass and menhaden as a first step to conducting studies for estimating the effects of environmental drivers on population dynamics. NCBO will also provide training in quantitative fisheries approaches for NCBO and state agency staff.



Crab pickers in Cambridge, Maryland, are part of the dynamic economic web made possible by the Chesapeake Bay crab fishery. Photo: Dave Harp.

Educating the Next Generation of Bay Stewards

- Partnered with the Commonwealth of Virginia to convene state, Federal, and nongovernmental executives for an Environmental Literacy Leadership Summit focused on “Ensuring Equity in Environmental Education” in support of the Chesapeake Bay Program’s Environmental Literacy Goal.
- Provided \$5.2 million in grant funding through the NOAA Chesapeake Bay Watershed Education and Training (B-WET) Program to support 50 projects in the region to support Bay environmental literacy. During FY 2019 and FY 2020, these projects delivered meaningful watershed educational experiences to 53,000 students and professional development training to 1,700 teachers.
- Hosted the Chesapeake Bay Program’s Environmental Literacy Forum, which brought together approximately 200 educators and state education officials to focus on best practices in implementation of Meaningful Watershed Educational Experiences (MWEE), a key method for delivering effective environmental education to the region’s K-12 students and teachers.
- Transformed a full portfolio of NOAA Environmental Science Training Center summer educator professional development offerings to a virtual format, including a climate education conference attended by more than 200 participants, and created resources to support MWEE implementation in the time of COVID for NOAA B-WET and other partners.

Continuing Activities: Over the next 2 years, NCBO will focus on increasing the number of local school districts that have strategic, equitable, and sustainable environmental literacy portfolios, and building a regional network to better support and connect these local efforts to facilitate shared learning.



Chesapeake B-WET funds programs that support teacher professional development, like this session from 2019 at Virginia Commonwealth University’s Rice Rivers Center. Photo: Virginia Commonwealth University.

Engaging in Community-Based Partnerships

- Supported the design of three nearshore habitat restoration projects in the York River and Mobjack Bay in Virginia; two of the projects leveraged more than \$1 million in funding from the Department of Defense for implementation.
- Completed an extensive stakeholder outreach effort in the Middle Peninsula of Virginia to assess regional nearshore habitat and coastal resilience needs. This assessment drew support from other NOAA offices for regional nearshore habitat restoration priorities and resulted in the creation of the NOAA-led Habitat Restoration Steering Committee as part of the York River and Small Coastal Basin Roundtable.
- Created conditions for long-term sustainability and success of Envision the Choptank, a partnership born out of NOAA's Choptank Complex Habitat Focus Area that is collaborating to increase the health and productivity of restored oyster reefs, including:
 - Used the partnership's Choptank Common Agenda to obtain a \$1 million grant from the National Fish and Wildlife Foundation to install green infrastructure and support partnership coordination capacity.
 - Established common metrics to measure progress toward the Choptank Common Agenda as a partnership.
 - Added financial capacity for the partnership through a fiscal sponsor partnership.
 - Established workgroups that are building capacity of local governments and disenfranchised communities.

Continuing Activities: Over the next 2 years, NCBO will continue to work with regional partners to support the design and implementation of nearshore habitat restoration and coastal resiliency projects in the Middle Peninsula. NCBO will also assist the Envision the Choptank partnership in engaging a diverse range of stakeholders in habitat restoration, including natural resource-based industries that support the blue economy, and provide technical assistance to local governments to increase resiliency.



A living shoreline project in York County, Virginia, helps support healthy habitat in the Middle Peninsula area. Photo: Chesapeake Bay Program.

Enhancing Climate Resilience

- Hired a new resiliency coordinator to lead the Climate Resiliency Workgroup for the Chesapeake Bay Program; received funding from the Chesapeake Bay Program to research effects of climate change on stormwater and green infrastructure best management practices.
- Established climate resilience priorities for the Chesapeake Bay Program involving the identification of uses for climate change indicators to track impacts to living resources and habitat and supporting projects to assess the resiliency of tidal water best management practices.
- Co-led initial research efforts on the potential impact of ocean acidification on oyster aquaculture and restoration in partnership with NOAA Ocean Acidification Program, the Virginia Institute of Marine Science, and Virginia Sea Grant.

Continuing Activities: Over the next 2 years, NCBO will support the climate resiliency work in the Chesapeake Bay by leading and collaborating on research involving data synthesis products to inform adaptation strategies and decision-making related to sea level rise projections and wetland habitat, prioritize the development of a Bay water temperature climate change indicator in connection with fisheries management decisions, and provide technical assistance for new adaptation projects.



Nuisance flooding, as seen here in downtown Annapolis, Maryland, is expected to increase in coastal communities around the Chesapeake region. Photo: National Weather Service.

Organizational Excellence

- In 2019 and 2020, hosted 10 summer interns, including five through the Chesapeake Student Research, Early Advisement, and Mentoring (C-StREAM) internship program, which focuses on recruiting, advising, and mentoring students from underrepresented groups, to prepare them for careers in environmental protection and restoration. Summer 2020 internships were hosted virtually and featured significant online interaction with interns' designated mentors.
- Sponsored a NOAA Experiential, Research, and Training Opportunity Ph.D. candidate intern who developed a successful proposal to develop a striped bass nursery habitat assessment leading to funding from the Chesapeake Bay Program. The intern is now a Knauss Fellow assigned to the NOAA Climate Program Office.
- Transitioned NCBO web content to the NOAA Fisheries website, enabling a broader, national audience to learn about the Chesapeake Bay and how NOAA science, service, and stewardship help to protect and restore this treasured ecosystem.

Continuing Activities: NCBO is committed to creating a more equitable workforce. Over the next 2 years, the office will work with the Chesapeake Bay Program, Chesapeake Research Consortium, and others to develop intentional career pipelines among existing youth programs — from NOAA B-WET and internship programs to conservation corps and early career development programs.

Recommended Research, Monitoring, and Data Collection Activities for NOAA to Support the Chesapeake Bay Watershed Agreement

According to 15 U.S.C. 1511d (b)(7)(A) the biennial report “... shall include an action plan consisting of ... a list of recommended research, monitoring, and data collection activities necessary to continue implementation of the [NOAA Chesapeake Bay restoration] strategy.”

NCBO is a leader in applied science for the Chesapeake Bay, advancing ecosystem science through collaborations with academic institutions, other Federal agencies, and states. NCBO's 2020–2025 strategic plan calls for improved science and synthesis quantifying the linkages between changing Bay conditions and impacts on living resources. This will be achieved through extramural funding, in-house capacity, and partnerships established within the Chesapeake Bay Program. Training opportunities will be provided to improve staff skill and capacity in data science, geospatial analysis, current ecological statistical approaches, and coding environments. NCBO will seek to incorporate diversity, equity, inclusion, and justice across research and monitoring activities.

Research Considerations

- Assess fish productivity associated with nearshore habitats (submerged aquatic vegetation, marshes, oyster reefs, living shorelines).
- Quantify impacts of climate change, water quality, and habitat condition on fish abundance and distribution that can be used to develop indicators to track annual variation in Bay conditions and living resource response.
- Evaluate factors influencing large-scale oyster restoration (larval transport, shell budget, metapopulations) to enhance sustainability and ecosystem services of future restoration projects.
- Improve social science by exploring human dimensions of fisheries and habitat (human behavior, ecosystem service valuation).

Monitoring and Data Collection Considerations

- Establish strategically placed mainstem acoustic telemetry arrays to track fish movements that can be analyzed in the context of Bay conditions.
- Support improved vertical water column measurement of temperature, salinity, and dissolved oxygen.
- Explore use of remote-sensing technologies (satellites, video, acoustics) and machine-learning approaches to collect and analyze physical and biological data.

Conclusion

During FY 2019–2020, NCBO, consistent with its mission as established by the NOAA Authorization Act, 15 U.S.C. 1511d, has:

- Advanced Chesapeake Bay oyster restoration.
- Facilitated sustainable Bay fisheries.
- Monitored the Bay’s changing weather and water-quality conditions.
- Supported Bay watershed education for thousands of students and related professional development for teachers.
- Enhanced a community conservation partnership in the Choptank River region in Maryland and built a similar partnership in the Middle Peninsula of Virginia.
- Increased climate resiliency planning efforts in the watershed.
- Made progress toward organizational excellence and a more diverse future workforce.

Moving forward, NCBO will continue to focus on improving the understanding, management, and stewardship of the Chesapeake Bay. This will include work toward achieving the 2014 Chesapeake Bay Watershed Agreement goals relating to sustainable fisheries, vital habitats, environmental literacy, and climate resiliency as well as supporting monitoring efforts to track progress toward these goals.