



**RESPONSES TO QUESTIONS FOR THE RECORD BY**  
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**REGARDING THE LEGISLATIVE HEARING ON JANUARY 20, 2022,**  
**BEFORE THE**

**COMMITTEE ON NATURAL RESOURCES**  
**SUBCOMMITTEE ON WATER, OCEANS, AND WILDLIFE**  
**U.S. HOUSE OF REPRESENTATIVES**

**1. Much of the work that the NOAA Chesapeake Bay Office does is focused on conserving and restoring coastal and marine habitat in the Bay. One important example of this work has been the Office’s oyster restoration projects. Can you describe the large-scale oyster restoration projects the NOAA Chesapeake Bay Office has led?**

The NOAA Chesapeake Bay Office (NCBO) recognizes that a key component to being able to restore the Chesapeake Bay is building back its oyster reefs which increase fisheries productivity, enhance nutrient removal, improve water clarity, and facilitate recovery of other important species like underwater grasses. Unfortunately, oyster reefs comprise only a small fraction of the area they once did in Chesapeake Bay. This loss is due to historical overfishing, pollution, and disease which has fundamentally changed the productivity and function of the Chesapeake Bay ecosystem.

Starting in 2010, federal and state agencies, including NCBO, embarked on an ambitious plan to restore native oyster populations in Chesapeake Bay.<sup>1</sup> In 2014, this goal was reaffirmed and codified by the Chesapeake Bay Program partners through the Chesapeake Bay Watershed Agreement, which set a goal to “restore oyster populations in ten tributaries by 2025 and ensure their protection.”<sup>2</sup>

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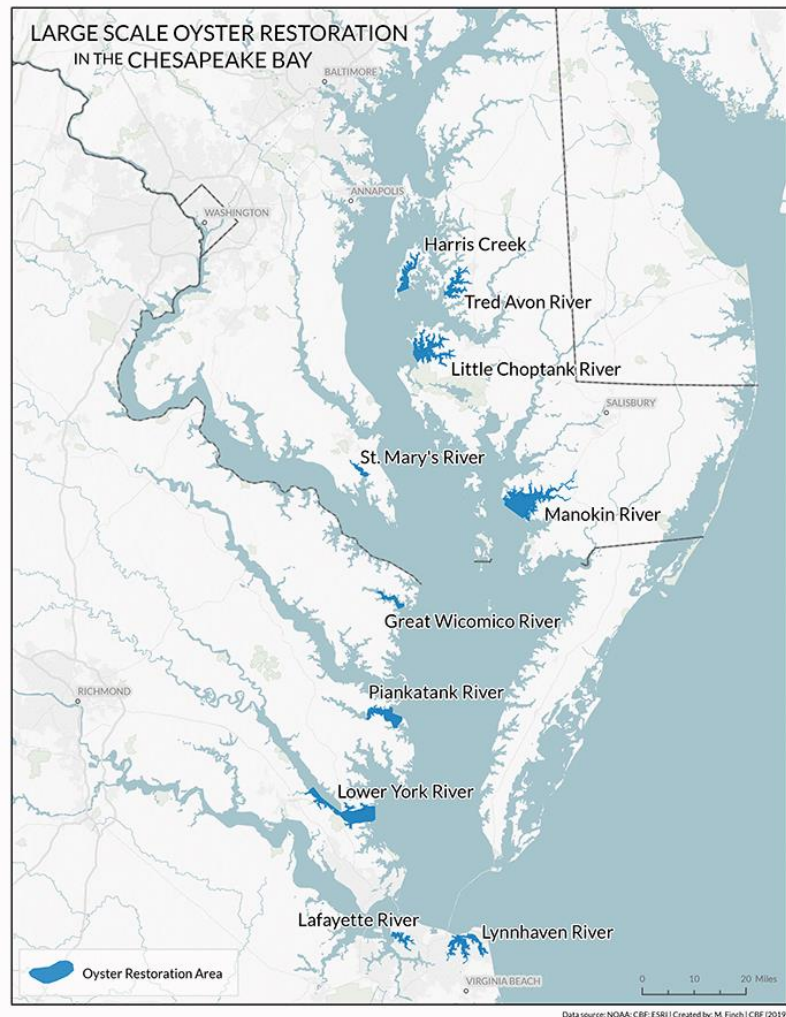
<sup>1</sup> Executive Order 13508 Action Plan: Strategy for Protecting and Restoring the Chesapeake Bay Watershed (Dec. 18, 2012),

[https://federalleadership.chesapeakebay.net/eo\\_13508\\_fy13\\_action\\_plan.pdf](https://federalleadership.chesapeakebay.net/eo_13508_fy13_action_plan.pdf).

<sup>2</sup> Environmental Protection Agency, Chesapeake Bay Program, Chesapeake Bay Watershed Agreement (2014)

[https://www.chesapeakebay.net/what/what\\_guides\\_us/watershed\\_agreement](https://www.chesapeakebay.net/what/what_guides_us/watershed_agreement).

As of December 2021, restoration blueprints for all ten tributaries have been completed.<sup>3</sup> Restoration construction has been completed in six tributaries, three in Maryland and three in Virginia, and in-water restoration work is ongoing in the remaining four tributaries. Out of a total 1,770 acres to be constructed across all ten tributaries, 1,220 acres (70%) have been completed to date and planted with more than 2 billion juvenile oysters. This area is nearly two square miles and would cover 924 football fields<sup>4</sup> and has been recognized as the largest oyster restoration project in the world.



Even more impressive than its size is the level of success this restoration project has achieved. For example, in Maryland, where nearly 300 restored reefs have been monitored following construction, 96% of three-year-old reefs and 99% of six-year-old reefs are meeting the success metric for abundance of oysters per square meter of reef; 100% of reefs have multiple ages of oysters presents and have a stable or increasing

<sup>3</sup> See Chesapeake Progress, Oysters, <https://www.chesapeakeprogress.com/abundant-life/oysters> (the ten tributaries are Harris Creek, the Little Choptank, Tred Avon, upper St. Mary's and Manokin rivers in Maryland, and the Great Wicomico, Lafayette, Lower York, Lynnhaven and Piankatank rivers in Virginia).

<sup>4</sup> Maryland and Virginia Interagency Oyster Restoration Workgroups of the Sustainable Fisheries Goal Implementation Team, Annual Update on Oyster Restoration Progress toward the Chesapeake Watershed Agreement "Ten Tributaries by 2025" Oyster Outcome (Jan. 2022), [https://www.chesapeakebay.net/channel\\_files/44200/a.git\\_oyster\\_update\\_jan\\_2022\\_westby\\_button\\_final.pdf](https://www.chesapeakebay.net/channel_files/44200/a.git_oyster_update_jan_2022_westby_button_final.pdf).

reef habitat footprint. Reefs that meet these criteria six years following construction are considered “fully restored.”<sup>5</sup>

Through every step of the restoration process, NCBO has played a critical leadership role in large-scale oyster restoration. NCBO chairs the Chesapeake Bay Program Sustainable Fisheries Goal Implementation Team and the Oyster Interagency Workgroups in both Maryland and Virginia. These groups are responsible for carrying out the Watershed Agreement oyster goals, including selecting the tributaries for restoration, designing restoration blueprints, and coordinating implementation of restoration plans. Prior to construction, NCBO staff carry out surveys of the Bay bottom to determine the appropriate restoration treatment and confirm areas are suitable for restoration. Post-restoration, NCBO coordinates and carries out monitoring to ensure restored reefs are meeting the pre-determined metrics of success and to document lessons learned for future projects.

Because of its unprecedented scale, restoration in Chesapeake Bay serves as a ‘living lab’ for restoration efforts across the U.S. To understand the value and impact of these projects, NCBO directed an extensive research portfolio documenting the ecological changes attributed to oyster restoration efforts.<sup>6</sup> These insights allow for iterative improvements to restoration approaches as well as advancements in other estuaries where oyster restoration is taking place.

A recent analysis of large-scale ecosystem restoration projects across the U.S. cited federal agency coordination and leadership as a key social factor of oyster restoration success in Chesapeake Bay.<sup>7</sup> Providing NCBO the resources necessary to continue in this role ensures further progress toward restoring oysters and the

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<sup>5</sup> NOAA Fisheries, Maryland Oyster Restoration Interagency Workgroup under the Chesapeake Bay Program’s Sustainable Fisheries Goal Implementation Team. 2020 Oyster Reef Monitoring Report: Analysis of Data from the ‘Ten Tributaries’ Sanctuary Oyster Restoration Initiative in Maryland. 2021, available at

[https://www.chesapeakebay.net/documents/2020\\_Maryland\\_Oyster\\_Monitoring\\_Report\\_%282%29.pdf](https://www.chesapeakebay.net/documents/2020_Maryland_Oyster_Monitoring_Report_%282%29.pdf)

<sup>6</sup> Bruce, D. G., J. C. Cornwell, L. Harris, T. F. Ihde, M. L. Kellogg, S. Knoche, R. N. Lipcius, D. N. McCulloch-Prosser, S. P. McIninch, M. B. Ogburn, R. D. Seitz, J. Testa, S. R. Westby, and B. Vogt. 2021. A Synopsis of Research on the Ecosystem Services Provided by Large-Scale Oyster Restoration in the Chesapeake Bay. NOAA Tech. Memo. NMFS-OHC-8, 52 p., available at <https://spo.nmfs.noaa.gov/sites/default/files/TMOHC8.pdf>.

<sup>7</sup> DeAngelis, B.M.; Sutton-Grier, A.E.; Colden, A.; Arkema, K.K.; Baillie, C.J.; Bennett, R.O.; Benoit, J.; Blicht, S.; Chatwin, A.; Dausman, A.; Gittman, R.K.; Greening, H.S.; Henkel, J.R.; Houge, R.; Howard, R.; Hughes, A.R.; Lowe, J.; Scyphers, S.B.; Sherwood, E.T.; Westby, S.; Grabowski, J.H. Social Factors Key to Landscape-Scale Coastal Restoration: Lessons Learned from Three U.S. Case Studies. *Sustainability* 2020, 12, 869. <https://doi.org/10.3390/su12030869>.

resources to monitor these efforts going forward.<sup>8</sup> These oyster reefs are a critical component of the Chesapeake Bay ecosystem.

**2. These efforts by NOAA Chesapeake Bay Office are instrumental in ensuring healthy and sustainable Bay ecosystems and vibrant commercial and recreational opportunities. What have been the impacts- environmental and economic- of these efforts and what resources are needed to see them continue to succeed?**

The NCBO's work to protect and restore habitats pays significant ecological and economic dividends for the Chesapeake Bay region and beyond. According to NOAA's latest report, in 2018 the commercial seafood industry in Maryland and Virginia brought \$5.8 billion in sales, \$1.4 billion in income, and nearly 40,000 jobs to the region.<sup>9</sup> Recreational fishing in Maryland and Virginia supported over 14,000 jobs and generated approximately \$1.6 billion in sales \$610.3 million in income.<sup>10</sup> Moreover, oyster restoration efforts supported by NCBO are expected to increase productivity of commercial blue crab and finfish fisheries, resulting in an additional \$23 million annually in commercial fisheries revenue and an increase of 300 jobs in the region. Restored oyster reefs also enhance nutrient removal, a service valued at \$6,500 per acre of oyster reef annually.<sup>11</sup> Other economic benefits derived from improved habitat quality include increased protection from coastal storms and flooding<sup>12</sup> and increased property values.<sup>13</sup>

Restoration itself is also an economic driver. For every \$1 million spent on coastal habitat restoration, an average of 17 jobs are created.<sup>14</sup> These jobs are not only

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<sup>8</sup> Monitoring and evaluation of these reefs is critical to understand what progress is being made and if additional steps are needed to help aid in restoring these reefs. Typically, the reefs are monitored and evaluated at three- and six-year intervals. Chesapeake Progress, Oysters, <https://www.chesapeakeprogress.com/abundant-life/oysters>.

<sup>9</sup> National Marine Fisheries Service. 2021. Fisheries Economics of the United States, 2018. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-F/SPO-225, 246 p. 112, available at [https://media.fisheries.noaa.gov/2021-11/FEUS-2018-final-508\\_0.pdf](https://media.fisheries.noaa.gov/2021-11/FEUS-2018-final-508_0.pdf).

<sup>10</sup> *Id.* at 113.

<sup>11</sup> NOAA Fisheries, Infographic: Value of the Chesapeake Bay Oyster Habitat (Jan. 23, 2020), <https://www.fisheries.noaa.gov/infographic/infographic-value-chesapeake-bay-oyster-habitat>.

<sup>12</sup> NOAA Fisheries, Habitat Conservation, Oyster Reef Habitat, (last updated Oct. 26, 2021), <https://www.fisheries.noaa.gov/national/habitat-conservation/oyster-reef-habitat>.

<sup>13</sup> Watsh, P., Griffiths, C. Guignet, D., Klemic, H. Modeling the Property Price Impact of Water Quality in 14 Chesapeake Bay Counties. *Ecological Economics* 135 (2017) 103-113, [https://www.chesapeakebay.net/documents/Walsh\\_et\\_al\\_2017\\_EcolEcon\\_HedonicWQChesapeakeBay.pdf](https://www.chesapeakebay.net/documents/Walsh_et_al_2017_EcolEcon_HedonicWQChesapeakeBay.pdf).

<sup>14</sup> Edwards, P.E.T., Sutton-Grier, A.E., Coyle, G.E., Investing in Nature: Restoring Coastal Habitat Blue Infrastructure and Green Job Creation, *Marine Policy* 38 (March 2013) 65-71, <https://www.sciencedirect.com/science/article/abs/pii/S0308597X12001182>.

related to restoration construction, but also those that are created by enhanced commercial and recreational fishing, tourism, and outdoor recreation – jobs that remain long after restoration construction ends.

However, these benefits continue to be threatened by pollution, habitat loss, and climate change. It is vitally important to understand these impacts so that they can be mitigated through restoration and management. NCBO's role in monitoring environmental conditions, habitat quality, and ecosystem effects is critical to ensuring the Chesapeake Bay continues to deliver the services that drive the ecosystem and our economy. Through monitoring and applied research, NCBO provides important insights for stakeholders, managers, and the seafood industry.

The Chesapeake Bay represents an important zone of biological transition along the East Coast of the United States. It is in the Chesapeake Bay that the tropical ecosystems and species of the southern states meet the temperate ecosystems and species of New England. This mixing of diverse ecosystems is one of the main drivers of the Bay's diversity and productivity, but also places the Chesapeake Bay at the epicenter of understanding the effects of climate change. As water temperatures rise, species are expected to shift northward, and Chesapeake Bay will be on the front lines of those shifts. NCBO's network of environmental monitoring buoys and sensors, along with sensors that track fish movement, will be critical to understanding how changes in climate affect the abundance and distribution of fish, with important implications for the fisheries and communities that depend on them.

NCBO's technical expertise and monitoring capabilities will be key to helping Chesapeake Bay communities address these climate change threats head on. By fully funding and continuing to improve and build out NCBO's monitoring network and research portfolio, managers can better understand and help mitigate changes to species abundance and distribution.

The Chesapeake Bay is also a critical nursery habitat for a number of commercial and recreational fish species along the Atlantic Coast, including the iconic striped bass. Protection and restoration of nursery habitats within Chesapeake Bay benefits all Atlantic states by increasing the survival and growth of fish that eventually migrate out of the Bay to join fisheries along the coast. Thus, NCBO's work to protect and restore habitat within the Bay improves fisheries productivity in areas far afield of Chesapeake Bay.

Given the breadth of work that the NCBO undertakes, a funding increase is necessary to support these efforts. The NCBO's funding has been relatively flat for at least the past five years despite calls from partners for an increase for funding for the office. We are at a critical point in restoring the Bay and NCBO needs the reassurances that it will have the funding needed to fulfill its duties.

**3. Based on your experience working in the watershed, how important is it for the Chesapeake Bay Office to operate as the central office for all Bay-related projects at NOAA?**

It is critical that NCBO continue to operate as the central office for all Bay-related projects at NOAA and more broadly continue its leadership role in the implementation of the Chesapeake Bay Watershed Agreement.<sup>15</sup> Coordination and communication with stakeholders across the watershed is necessary to ensure the conservation and restoration efforts to save the Bay are done in a meaningful way. NCBO plays that role both internally within NOAA and externally with partners.

The Chesapeake Bay watershed covers six states - Delaware, Maryland, New York, Pennsylvania, Virginia, and West Virginia - and the District of Columbia. On the federal level, partners include the NOAA, U.S. Environmental Protection Agency, U.S. Department of Agriculture, U.S. Department of Defense, U.S. Department of Homeland Security, U.S. Department of Interior, and U.S. Department of Transportation.<sup>16</sup> Within NOAA, there are several offices that are engaged in the restoration efforts related to the Bay, as is evidenced by the number of accounts involved in funding these efforts.<sup>17</sup> Thus, it is critical to have one point office which is effectively managing the efforts around the Bay and making sure that coordination across offices is occurring.

Additionally, with regards to the Chesapeake Bay Watershed Agreement, there are six implementation teams tasked with meeting the (1) sustainable fisheries goals, (2) habitat restoration goals, (3) water quality goals, (4) maintaining healthy watersheds goal, (5) fostering Chesapeake stewardship, and (6) enhance partnering, leadership and management.<sup>18</sup> NCBO is chair for the Sustainable Fisheries Goal

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<sup>15</sup> Chesapeake Bay Watershed Agreement, *supra* n. 2.

<sup>16</sup> *Id.*

<sup>17</sup> See, e.g., White House Office of Management and Budget, Report to Congress: Chesapeake Bay Restoration Spending Crosscut (Dec. 2021), <https://www.whitehouse.gov/wp-content/uploads/2021/12/2021-Chesapeake-Bay-Crosscut-.pdf>.

<sup>18</sup> Environmental Protection Agency, Chesapeake Bay Program, How We're Organized, [https://www.chesapeakebay.net/who/how\\_we\\_are\\_organized](https://www.chesapeakebay.net/who/how_we_are_organized).

Implementation Team<sup>19</sup> tasked with “coordinat[ing] and facilitat[ing] improved management of blue crab and recovery of oysters, while promoting considerations of fish habitat and forage for key managed species like menhaden, striped bass and alosines.” This team consists of fishery managers across the watershed on the federal and state levels, watermen, fishers, and non-profit organizations.<sup>20</sup> Additionally, NCBO also sits on three other implementation teams: Habitat Goal Implementation Team<sup>21</sup>, Maintain Healthy Watersheds Goal Implementation Team<sup>22</sup>, and Fostering Chesapeake Stewardship Goal Implementation Team<sup>23</sup>.

NCBO staff know the stakeholders, understand the framework created for partners to work together to conserve and restore the watershed, and what is needed to achieve those goals thanks to their in-depth technical knowledge about the natural systems making up the watershed.

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<sup>19</sup> Environmental Protection Agency, Chesapeake Bay Program, Sustainable Fisheries Goal Implementation Team (GIT 1), [https://www.chesapeakebay.net/who/group/sustainable\\_fisheries](https://www.chesapeakebay.net/who/group/sustainable_fisheries).

<sup>20</sup> Id.

<sup>21</sup> Environmental Protection Agency, Chesapeake Bay Program, Habitat Goal Implementation Team (GIT 2), [https://www.chesapeakebay.net/who/group/habitat\\_goal\\_implementation\\_team](https://www.chesapeakebay.net/who/group/habitat_goal_implementation_team).

<sup>22</sup> Environmental Protection Agency, Chesapeake Bay Program, Maintain Healthy Watersheds Goal Implementation Team (GIT 4), [https://www.chesapeakebay.net/who/group/maintaining\\_healthy\\_watersheds\\_goal\\_implementation\\_team](https://www.chesapeakebay.net/who/group/maintaining_healthy_watersheds_goal_implementation_team).

<sup>23</sup> Environmental Protection Agency, Chesapeake Bay Program, Fostering Chesapeake Stewardship Goal Implementation Team (GIT 5), [https://www.chesapeakebay.net/who/group/fostering\\_stewardship\\_goal\\_implementation\\_team](https://www.chesapeakebay.net/who/group/fostering_stewardship_goal_implementation_team)