



Sustainable Fisheries GIT

The [Sustainable Fisheries Goal Implementation Team](#) (SFGIT) draws together a diverse group of managers, scientists, and fishery stakeholders to improve management and recovery of species in the Chesapeake Bay. It focuses on advancing ecosystem-based fisheries management by using science to make informed fishery management decisions that cross state boundaries. Institutions represented on the SFGIT include state management agencies, federal agencies, industry groups, nonprofits, and academic institutions that meet as the full SFGIT twice a year.

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Outcomes

2014 Watershed Agreement

2015 Management Strategies

2-Year Workplans

The Chesapeake Bay Program is working to achieve 31 outcomes outlined in the [2014 Watershed Agreement](#). The SFGIT is responsible for the sustainable fisheries goal associated five outcomes: [Blue Crab Abundance](#), [Blue Crab Management](#), [Oyster Restoration](#), [Forage](#), and [Fish Habitat](#) (jointly led with the Vital Habitats Goal Implementation Team).

In 2015, Management Strategies were finalized, designating approaches and high-level actions to achieve each outcome by the year 2025, including monitoring, assessment, reporting, and adaptive management. The strategies are supported by [workplans](#) summarizing specific commitments in two-year increments. The first workplans outlined actions in 2016-2017. The SFGIT is currently developing 2018-2019 workplans to direct next actions and priorities.



Blue Crab

Plan and implement stock assessment.
Support annual review of blue crab stock status.



Oysters

Select tributaries.
Collect data, set targets.
Develop and implement plans.
Track and monitor restoration.



Forage

Define forage.
Develop indicators.
Determine status.
Increase monitoring.
Inform decisions.
Map important habitats.



Fish Habitat

Identify threats.
Compile data.
Develop tools and thresholds.
Enhance protection.
Communicate fish habitat importance.

The December 2017 SFGIT [meeting agenda](#) focused on oyster restoration progress and research on the first day. The second day included a broader outlook of the SFGIT's outcomes by exploring blue crabs, forage, and fish habitat in the Bay.



Maryland Oyster Restoration



Maryland's three selected tributaries: Harris Creek, Tred Avon, and Little Choptank have received construction and seeding effort.

Harris Creek

In 2015, 350 acres of oyster restoration were completed. Monitoring in 2015 and 2016 of the first and second cohorts (reefs planted in 2012 and 2013) found that 98% of reefs met the threshold density (15 oysters/sq. meter) and 60% of the reefs met the target density (50 oysters/sq. meter). The third cohort is currently being monitored.

Monitoring efforts have shown that reefs constructed using a stone base average more than three times the oyster density found on the shell-base reefs.

Little Choptank

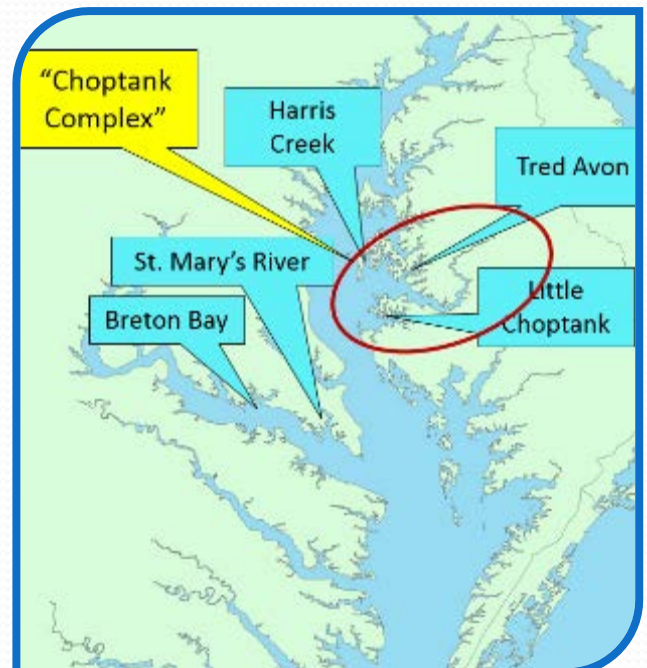
The total acreage target for restored oyster reefs in the Little Choptank is 440 acres. 45 of those acres already met [the conditions for being restored](#). Restoration has been completed on 239 acres as of 2017.

Tred Avon

The Tred Avon River has a total target of 147 acres. As of 2017, 80.8 acres have been constructed, with 380 million spat on shell planted.

Tributary Recommendations

Breton Bay and the upper St. Mary's River have been recommended for large-scale oyster restoration by the Maryland Department of Natural Resources. The department will gather input from citizens and stakeholders on the recommended tributaries.



The three selected tributaries in the "Choptank Complex" and the two recommended tributaries would satisfy the state's commitment to restore native oyster habitat and populations in five tributaries by 2025.

Please see Stephanie Westby and Susan Conner's [presentation](#) for more details.



Virginia Oyster Restoration

Great Wicomico

The SFGIT approved the Great Wicomico as one of Virginia's tributaries for oyster restoration at the December 2017 meeting. An analysis of the Great Wicomico River found that 61 acres of a previously restored oyster reef meet the oyster metrics. The Interagency Team will develop a restoration goal in the coming years as restoration progresses.

Piankatank

Experts are evaluating the restoration target for the Piankatank River. At this time 253 acres are considered restored. Data determined that 203 existing acres met the oyster metrics and 50 acres have been constructed via restoration projects.

Lower York

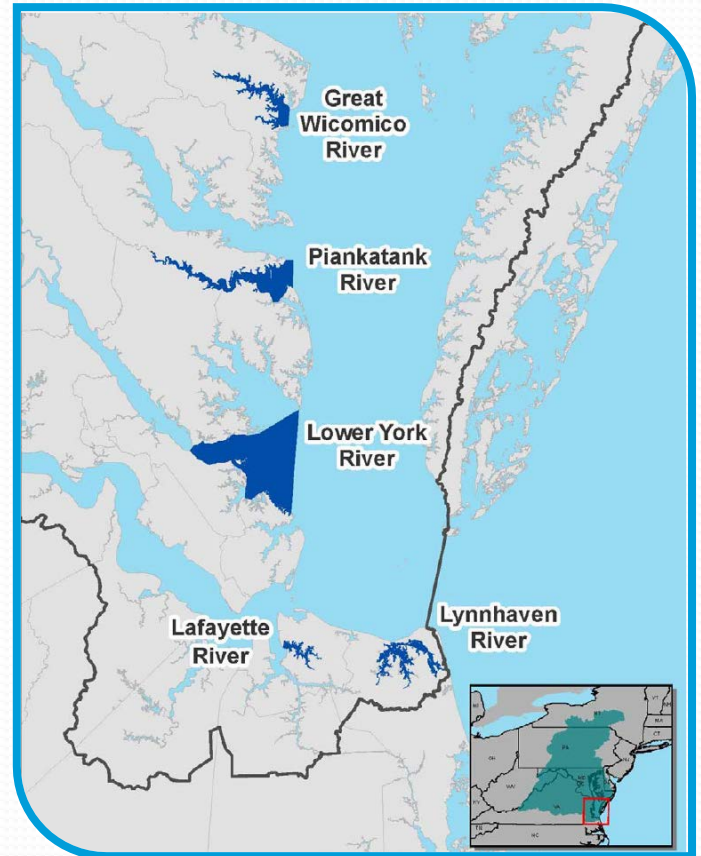
At the December 2017 SFGIT meeting, the Lower York River was approved by the team to be one of Virginia's tributaries selected for oyster restoration. The Western Shore Virginia Workgroup will initiate oyster restoration planning in 2018.

Lafayette

Of the total target restoration goal of 80 acres, 75 acres have been restored. 27 of those acres were actively restored, and 48 acres already met the [oyster density metrics](#) for restored reefs. The Elizabeth River Project and the Chesapeake Bay Foundation received \$400K to construct the remaining five acres with National Fish and Wildlife Foundation funding from the Chesapeake Bay Program.

Lynnhaven

Elizabeth River Now constructed two acres of reef habitat in 2017. The Virginia Interagency Oyster Team is analyzing data to determine the amount of currently restorable oyster habitat and developing a restoration blueprint.



Planning and restoration activities will continue in all five selected Virginia tributaries. With incoming funding, Virginia is scheduled to complete oyster reef construction in the Lafayette River in 2018.

Please see Susan Conner and Stephanie Westby's [presentation](#) for more details.



Virginia Tributary Selection



Oyster experts utilize datasets to select areas which are most likely to ensure a sustainable population of oysters.

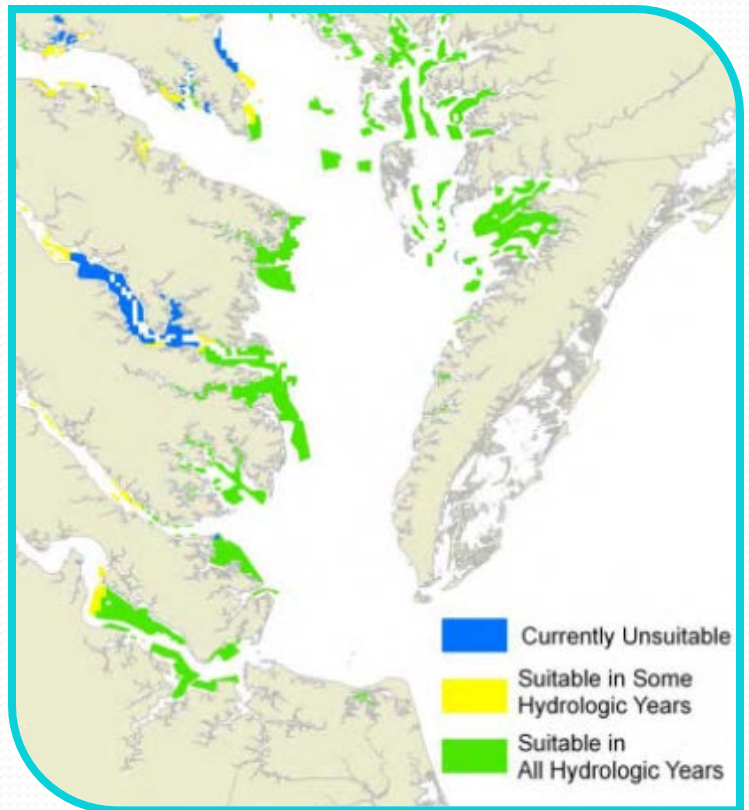
Under the [Chesapeake Bay Watershed Agreement](#), Chesapeake Bay Program (CBP) partners are charged with restoring native oyster habitat and populations to [10 tributaries by the year 2025](#). To accomplish this outcome, Maryland and Virginia are each selecting five tributaries for oyster reef restoration efforts.

Virginia's selection process utilized scientific criteria driving oyster restoration success including favorable dissolved oxygen levels, water depth, salinity, and evidence of historic habitat.

Using this criteria, a suitability analysis was performed to identify areas that would be most likely to support and sustain oyster reproduction and larval reproduction. Potential tributaries were categorized into two tiers based on suitability.

The Great Wicomico and the Lower York both met the criteria as Tier 1 Tributaries. In addition, both tributaries have multiple partner commitments and considerable quantities of restorable bottom. Other factors that were considered included projected restoration targets, proximity to spat-on-shell facilities, and federal interest.

Please see Susan Conner's [presentation](#) to find out more about Virginia's oyster restoration tributary selection process.



The results of the suitability analysis indicates areas more conducive to successful oyster restoration.



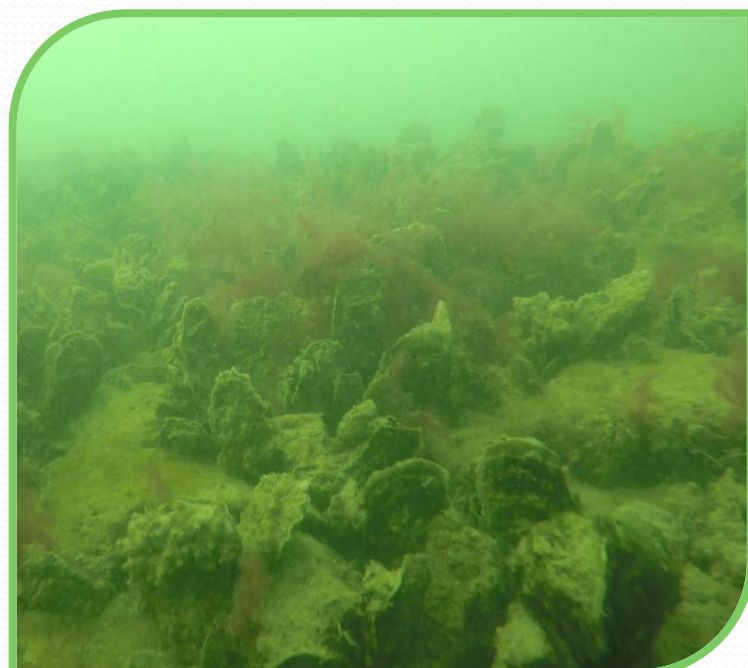
Oyster Restoration Framework Update

A primary principle of the Chesapeake Bay Program is “adaptive management,” a structured, iterative process in which decisions are made given current knowledge, reevaluated regularly, and modified as more information and resources become available. With more than five years of planning, implementation, and monitoring of oyster restoration in the Chesapeake Bay, the NOAA Chesapeake Bay Office (NCBO) Oyster Team evaluated what is working, identified where challenges are arising, and determined how it can adapt current efforts to improve oyster restoration throughout the Bay.

A proposed Oyster Restoration Framework Update resulted from the evaluation. This update, which was approved at the December 2017 SFGIT meeting, will refine the current methodology to establish goals for a broader range of systems, increase consistency in the use of terminology, and eliminate some level of subjectivity and inconsistency through standardization.

Under the update, currently restorable oyster habitat would:

- Determine what the maximum acreage for restoration would be given current conditions (AKA: the 100% target)
- Include historical oyster habitat shallower than the original 4 foot shallow depth limit,
- Quantify all restorable oyster habitat above a tributary specific maximum depth, and
- Exclude sand and muddy sand seabeds, with the exception of areas with substantive shell quantities



A capture from underwater footage obtained while monitoring Chesapeake Bay oyster reef restoration.

These updates will allow the Oyster Interagency Teams more flexibility to conduct and construct restoration in areas that avoid use conflicts.

Find out more about the oyster restoration framework update at Jay Lazar's [presentation](#).



Maryland Oyster Stock Status



The study will propose a target for maximum sustainable oyster harvest and a threshold at which oyster harvest levels become unsustainable.

A collaborative effort between the University of Maryland Center for Environmental Science (UMCES) and Maryland Department of Natural Resources (MD DNR) aims to provide an oyster stock assessment update for the Maryland portion of the Chesapeake Bay. This update was initiated by 2016 Maryland House Bill 937, which establishes that an estimation of oyster abundance and fishing levels should be developed and evaluated to provide biological reference points that can inform management of oysters in the state of Maryland. Results of this study are expected in December 2018.

Stock assessments are designed to support sustainable fisheries by providing fisheries managers with the information necessary to develop sound management actions that maximize fishery harvest while ensuring sustainable fish populations.

To calculate these values, UMCES and MD DNR partners will evaluate an index-based approach and a model-based approach to estimate population size, harvest rates, and recruitment over time.



Scientists have developed Terms of Reference and inventoried data from the fall survey, patent tong surveys and commercial catch per unit effort to estimate the size of the oyster stock. They are currently building and running the assessment, before a peer review of their evaluation and develop of management strategies for future consideration.

To find out more about Maryland's Oyster Stock Status Update, please see Mike Wilberg's [presentation](#).



Oyster Reef Ecosystem Services

While oysters are a critical component to the ecological character of the Bay on their own, these organisms also provide a variety of ecosystem benefits, including nutrient sequestration, invertebrate and finfish habitat utilization, and economic value. NOAA and other Chesapeake Bay Program partners have funded several studies to evaluate the ecosystem and economic services provided by oysters.

Nutrient Flux and Sequestration

Scientists at UMCES are conducting an integrated assessment of oyster reef ecosystem services focusing on denitrification rates and nutrient fluxes, and modeling oyster reef impacts on particle removal and nutrient cycling.



Utilization, Production, and Trophic Pathways

Virginia Institute of Marine Science (VIMS) is quantifying the diet and use of finfish and blue crabs found on restored reefs as well as benthic availability related to the characteristics of the restored reef. A collaboration between VIMS and the University of Maryland is quantifying utilization, productivity, and nutrient sequestration abilities of the macrofaunal communities associated with restored oyster reefs in Harris Creek. VIMS is researching fish and crustacean utilization, secondary production, and trophic linkages through an oyster reef continuum regression design.



Virginia Commonwealth University is assessing fishery responses to oyster reef restoration and trophic pathways that link resources to restored reefs. Dual-frequency imaging sonar and video are being used by the Smithsonian Environmental Research Center to enhance the interpretation of data collected on oyster reefs and provide independent fish and crab abundance surveys in Maryland and Virginia. NCBO is monitoring fish and crab utilization of restoration and reference sites pre and post reef construction in the Little Choptank and Tred Avon Rivers.

Economic Valuation

Morgan State University is using empirical data from the other Oyster Reef Ecosystem Services studies to augment an existing foodweb model to estimate biological production and assess the socioeconomic benefits of oyster restoration.

Please see David Bruce's [presentation](#) to find out how oyster reefs are supporting the Chesapeake Bay ecosystem.



Oyster Best Management Practice Expert Panel

The Oyster Best Management Practice (BMP) Expert Panel is charged to develop a framework or considering oyster practices, including aquaculture and restoration-related activities, as BMPs and provide recommendations on the nutrient and sediment removal effectiveness to help inform the Chesapeake Bay's nutrient and sediment removal goals known as the Total Maximum Daily Load (TMDL).



The Oyster BMP Expert Panel has been working on a strategy to determine the potential nitrogen and phosphorus reduction effectiveness associated with shell from oysters harvested from private aquaculture and is developing a rationale for site-specific estimates to determine the nitrogen reduction effectiveness related to the enhanced denitrification for oyster reef restoration and private oyster aquaculture practices.

The panel reviews various scenarios and has developed incremental recommendations to put forward for the TMDL. Considerations include evaluating nitrogen and phosphorus quantities in oyster tissue and shell, shell dissolution rates, biodeposit influences, and impacts of returned shell to the overall system.

Findings at this stage indicate that more studies are needed to improve estimates of nutrient flux, however, available data is being utilized to develop a second incremental draft report in February/March 2018.

Please view Emily French's [presentation](#) for further information.



Chesapeake Bay Program Biennial Review



The Chesapeake Bay Program (CBP) has implemented adaptive management into their approach for tracking and ensuring success of the outcomes under the Chesapeake Bay Watershed Agreement. This process includes a biennial review called the Strategy Review System (SRS).

The SRS involves outcome teams, such as the Forage Action Team, 1) analyze progress toward outcome including successes and challenges, 2)

develop recommendations to overcome challenges, 3) present performance analysis to CBP leadership, and 5) working with CBP leaders to improve outcome achievement.

The SFGIT had the opportunity to complete the first SRS for its four outcomes in spring-summer 2017. The results of the review are below. The SFGIT workgroups will continue to work on improving their approach through the development of new 2-year workplans.

Outcome	Strategy Review System Results
Blue Crab	<ul style="list-style-type: none">Confirmed completion of the Blue Crab Management OutcomePlan to work with experts to develop a financing strategy for a Baywide stock assessment
Fish Habitat	<ul style="list-style-type: none">Developed strategy and communication materials to encourage the prioritization of water quality projects that offer ecosystem benefits
Forage	<ul style="list-style-type: none">Successfully competed for GIT funding to develop a shoreline threshold for forage
Oyster Restoration	<ul style="list-style-type: none">Plan to work with experts to develop financing strategy for monitoring effortsSuccessfully competed for GIT funding to develop a long-term oyster reef monitoring plan

Please view Bruce Vogt's [presentation](#) for further information on the SRS.



Fish Habitat Workshop

The SFGIT successfully competed for Scientific and Technical Advisory Committee workshop funding to evaluate fish habitat in the Chesapeake Bay Watershed. The workshop steering Committee plans to build off of previous habitat assessments performed at the National and regional scale, to guide the compilation and assessment of Chesapeake Bay watershed fish habitat data.



To accomplish this, steering committee members will work CBP partners to engage with local government planners, state managers, and conservation organizations to determine what information and tools these groups need to improve on-the-ground restoration and conservation efforts. Based on the results of local engagement and a compiled list of available datasets for the Chesapeake Bay Watershed, workshop participants will develop a strategy to provide needed resources to local groups through a potential Chesapeake Bay Watershed fish habitat assessment.



At this time steering committee members are collecting datasets, evaluating scale, and providing localized examples of what could be included in a fish habitat assessment. They are also reaching out to the local audience through a survey to gain input on data and information needs for habitat.



Further information is available at Tom O'Connell's [presentation](#).



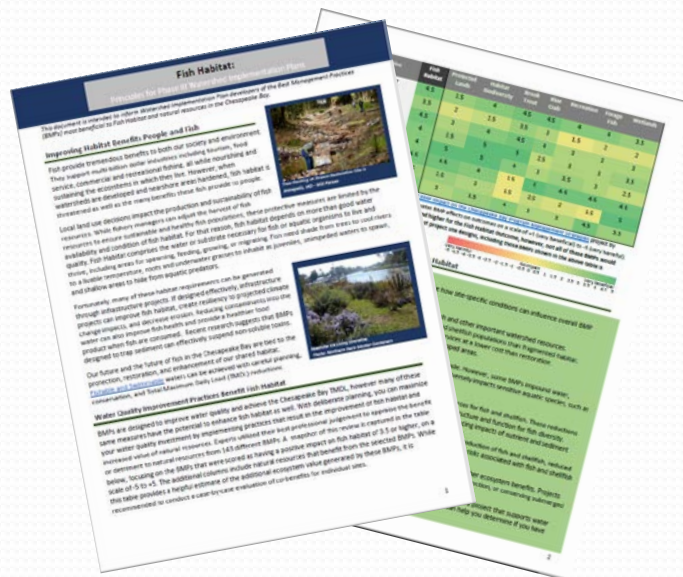
Fish Habitat and Water Quality



The Chesapeake Bay Program is committed to clean the waters of the Chesapeake Bay and has utilized Watershed Implementation Plans (WIPs) to accomplish this large undertaking. WIPs are plans developed by Bay jurisdictions to help determine how the jurisdictions will meet their pollution reduction goals. Each state determines how best management practices can help achieve those nutrient and sediment reduction goals.

The Fish Habitat Action Team recognized the value of this established process and searched for opportunities to integrate fish habitat into the WIP process. To accomplish this, fish habitat subject matter experts developed a fact sheet, designed to connect fish habitat to water quality and serve as an easy and straightforward resource for those who are actively planning and implementing projects in the Chesapeake Bay Watershed.

The Fish Habitat WIP Fact Sheet emphasizes the value of incorporating ecosystem benefits into water quality projects, provides ecosystem benefit scoring of currently approved water quality projects, lists contacts for planners to reach out to regarding their specific jurisdiction, and links to helpful fish habitat tools and resources.



The fact sheet will be included as a resource in Watershed Implementation Plans for Chesapeake Bay Program jurisdictions.

More details on the process of linking fish habitat to water quality can be found at Kara Skipper's [presentation](#).



Chesapeake Bay Stock Assessment Committee Updates

The Chesapeake Bay Stock Assessment Committee (CBSAC) is comprised of fishery managers and scientists who meet each year to review the results of annual Chesapeake Bay blue crab surveys and harvest data and develop management advice for Chesapeake Bay jurisdictions: the state of Maryland, Commonwealth of Virginia, and the Potomac River Fisheries Commission.



CBSAC is working on several projects at this time, including an evaluation of how to present uncertainty around estimates of exploitation, a review and response to a report on “Ecological and Economic Effects of Derelict Fishing Gear in Chesapeake Bay”, and a compilation of recent and ongoing blue crab research to inform managers and stakeholders.

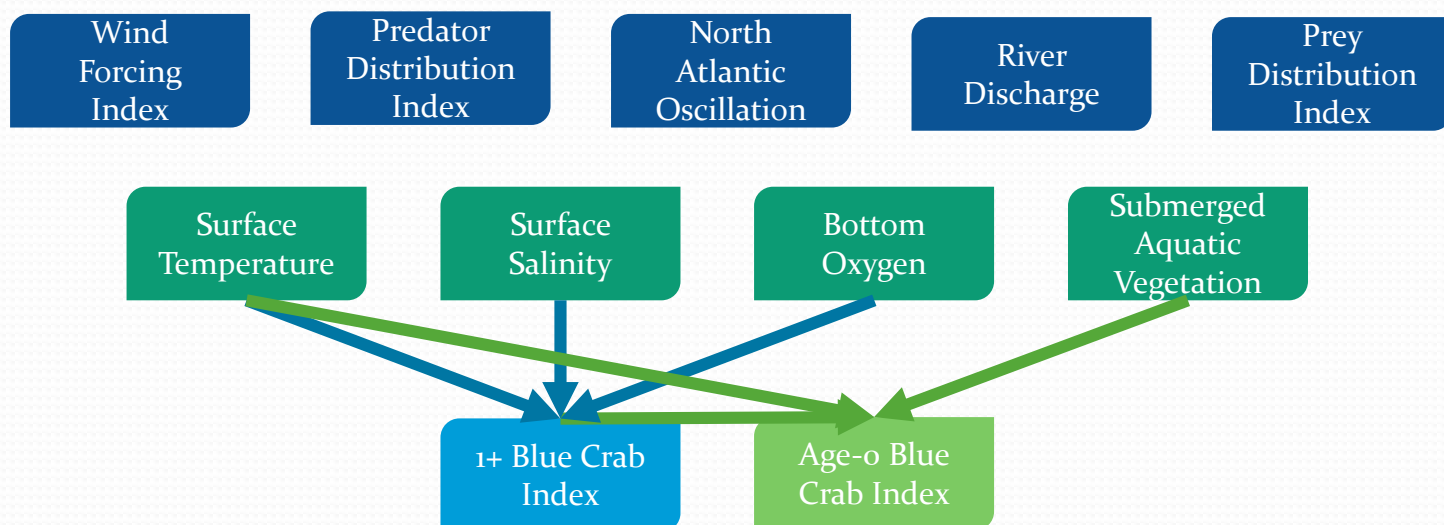
In addition to these new efforts, members of CBSAC are conducting a stock assessment update which will use the Catch Multiple Survey model to address Terms of Reference and questions that have arisen by reviewers. CBSAC’s meeting in January 2018 included discussions of current projects, revisions to the 2018 – 2019 Blue Crab Workplan, and recommendations for the timing of the next benchmark assessment.

Please view Glenn Davis’ [presentation](#) for further information.



Ecosystem Factors Impacting Blue Crab Population Dynamics

The University of Maryland Center for Environmental Science (UMCES) Chesapeake Biological Laboratory is investigating the impact of ecosystem factors on blue crab population dynamics. Scientists are comparing uncertainties of age-o and adult abundance of blue crabs through design-based and model-assisted methods. The design-based estimate is a function of sample size and has not varied much since 1993. Whereas, the model-assisted estimate shows increasing uncertainty as the time series progresses.



Probability network models are being developed to identify rank pathways through which ecosystem factors affect abundance. At this stage, UMCES scientists have accessed all data needed to analyze the proposed causal relationships between factors (displayed above) and are determining the most relevant spatial and temporal scale for the individual factors. The study is anticipated to be completed in 2018.



Please view Dong Liang's [presentation](#) for further information.

Image Credits

Page 2: Intertidal Oysters – Chesapeake Bay Program (Will Parson)

Maryland Oyster Restoration Map – Stephanie Westby

Page 3: Virginia Oyster Restoration Map – Susan Conner

Page 4: Intertidal Oyster Reef – Virginia Institute of Marine Science

Suitability Analysis Map – Susan Conner

Page 5: Oyster Restoration Monitoring – Jay Lazar

Page 6: Oyster Tongs – Dave Harp

Oysters in Bushel Basket – Chesapeake Bay Program

Page 7: Eastern Oyster – Judith Dibello

Harris Creek Restored Oyster Reef – Oyster Recovery Partnership

Page 8: Oyster BMP Expert Panel – Emily French

Page 9: Blue Crab – Jennifer Baxter

Page 10: Marsh – Chesapeake Bay Program (Will Parson)

Herring Spawning – Dave Harp

Wooded Creek – Chesapeake Bay Program (Steve Droter)

Page 11: Tree planting at Restored Stream – Chesapeake Bay Program (Will Parson)

Fish Habitat WIP Fact Sheet – Kara Skipper

Page 12: Juvenile Peeler Crab – Ashley Lane

Blue Crabs on Dock – Chesapeake Bay Program

Page 13: Blue Crab – Chesapeake Bay Program (Will Parson)



Thank You!

Thank you to all of the Sustainable Fisheries Goal Implementation Team facilitators, presenters, and participants for making this meeting successful!



Meeting presentations and materials can be found at the meeting website:

[https://www.chesapeakebay.net/what/event/december 2017 full sustainable fisheries git meeting](https://www.chesapeakebay.net/what/event/december%2017%20full%20sustainable%20fisheries%20git%20meeting)