2026 Chesapeake Bay Blue Crab Stock Assessment Review

April 13 - 16, 2026

Visit the meeting webpage for meeting materials and additional information.

Purpose: This meeting convened modeling experts, state jurisdictions, and independent reviewers to evaluate the draft 2026 Chesapeake Bay Blue Crab Stock Assessment.

Minutes

Day 1: April 13, 2026

I. Welcome & Introductions

Lead: Bruce Vogt (NOAA)

Bruce Vogt (NOAA) welcomes everyone to the meeting and gives a brief background on the Chesapeake Bay Program and the Chesapeake Bay Stock Assessment Committee (CBSAC). Bruce provides context for the Chesapeake Bay Blue Crab Stock Assessment Review Meeting and an overview of the meeting's goals and objectives - specifically noting that no management decisions will be made at this meeting. Finally, Bruce introduces the members of the Review Panel and the CBSAC.

Decisions:

1. N/A

Actions:

1. N/A

II. Presentation of the 2025 Blue Crab Stock Assessment

Lead: Michael Wilberg (UMCES)
Review of Terms of Reference (TORs) 4, 5, 7 and 8

Decisions:

1. N/A

Actions:

1. N/A

Discussion Notes:

TOR 4: Sub-Annual and Spatially Explicit Stock Assessment Models

- The team successfully implemented a blue crab stock assessment model with monthly time steps, allowing for finer resolution of population dynamics and seasonal patterns.
- Spatial resolution below the Bay-wide scale was considered, but data limitations and initial work at the beginning of the assessment led to continued use of a Bay-wide model.
- The model captures recruitment, and seasonal growth and fishing mortality, improving on previous annual time-step models.
- Challenges remain in integrating spatial heterogeneity due to limited movement data, limited survey coverage, and inconsistent data across jurisdictions.
- Future work may include development of spatial models.

TOR 5: Characterize Uncertainty in Assessment Estimates

- Uncertainty in mortality and abundance estimates was characterized using asymptotic standard errors, sensitivity analyses, and retrospective analyses.
- The model is highly sensitive to growth parameters, with changes in growth assumptions causing large shifts in abundance and fishing mortality estimates.
- Survey catchability, reporting accuracy, and natural mortality rates are also important sources of uncertainty, with efforts to quantify their uncertainty through sensitivity analyses.
- Retrospective bias was evaluated and found to be moderate, with recommendations to further refine uncertainty characterization.
- The team emphasized the need for ongoing data collection and methodological improvements to address persistent uncertainties.

TOR 7: Biological Reference Points for Management

- The assessment team recommended aggregate Bay-wide reference points based on spawning potential ratio (SPR), with thresholds set at 40% SPR and a target at 75% of the threshold.
- Sex-specific reference points were developed, reflecting differences in vulnerability and maturation between males and females.
- A lower threshold recruitment reference point was proposed using the 25th percentile of estimated recruitment during 1994-2023 and status would be calculated by comparing a three-year running average of estimated recruitment to the reference point, providing an indicator of low productivity periods.

- The utility of these reference points was discussed, with aggregate and sex-specific metrics deemed appropriate for current management needs.
- The team noted that recruitment reference points are less common in fisheries but may be valuable as a leading indicator for stock size and fishery catches.

TOR 8: Stock Status Relative to Reference Points

- Stock status was evaluated using the recommended reference points, with most years showing fishing mortality below the threshold and abundance above the threshold for females.
- Males exhibited more variable status, often below the target abundance and fluctuating around the fishing mortality target and threshold reference points.
- Recent years have seen declines in recruitment and abundance, with the three-year running average of recruitment falling below the threshold reference point, indicating potential concern.
- The assessment found no evidence of overfishing in recent years, but highlighted ongoing declines in recruitment and abundance. No mechanism was identified to fully explain the decline in recruitment.
- Management agencies were advised to monitor recruitment and abundance trends closely and consider adaptive measures if low productivity persists.

III. General / Open Question Period

Lead: Dan Hennen (NOAA)
Questions and discussion from review panel

Decisions:
1. N/A

Actions:
1. N/A

IV. Public Comment

Lead: Dan Hennen (NOAA)
Opportunity to hear questions or comments from the public

Decisions:
1. N/A

Actions:
1. N/A

V. Adjourn

Day 2: April 14, 2026

I. CIE Term of Reference Review and Discussion

Lead: Dan Hennen (NOAA)

Review of TORs 2 & 3

Decisions:

1. N/A

Actions:

1. N/A

Discussion Notes:

TOR 2: Fishery-Independent Surveys and Indices of Abundance

- Multiple fishery-independent surveys were evaluated for their utility in informing stock assessment, with spatial-temporal standardization (VAST) and generalized additive models applied to standardize abundance indices.
- Survey selectivity, gear changes, and environmental effects (e.g., temperature, hypoxia) were considered, with uncertainty characterized through model-based and design-based comparisons.
- Size composition data were reviewed, revealing challenges in reconciling differences between the treatment of survey data for indices versus size and sex compositions.
- The team identified gaps in spatial coverage and recommended integrating additional surveys, recording the same metrics across surveys, and refining index calculation methods.
- Uncertainty in indices was acknowledged, especially regarding catchability and environmental variability, with ongoing efforts to address these issues.

TOR 3: Catch, Effort, CPUE, Bycatch, and Uncertainty

- Catch and effort data were compiled for each jurisdiction, with commercial CPUE indices deemed unreliable relative to survey indices due to reporting inconsistencies and effort estimation challenges.
- Trends in catch and effort were described, noting declines in commercial trips and increases in recreational license sales, but overall uncertainty remains high.

- Bycatch and discard mortality estimates were based on limited observer data, with incidental mortality likely underestimated although the inclusion of incidental mortality represents an improvement in this stock assessment.
- Recreational harvest was estimated in a relatively small number of years with more estimates from Maryland than Virginia. Uncertainty in the trend and scale of recreational harvest remain high.
- The team recommended improved data collection and reporting to reduce uncertainty and better inform future assessments.

II. Lunch

III. CIE Term of Reference Review and Discussion (continued)

Lead: Dan Hennen (NOAA)
Review of TORs 1, 6, 9

Decisions:

1. N/A

Actions:

1. N/A

Discussion Notes:

TOR 1: Life History Parameters and Vital Rates

- The assessment reviewed blue crab growth, maturation, and mortality rates, noting the potential for interannual and spatial variation in these parameters across the Chesapeake Bay.
- Sex-specific growth and maturation were incorporated, with new data improving estimates but highlighting persistent uncertainty in natural mortality and recruitment timing.
- The team discussed the effect of environmental factors and survey design on observed life history variation, emphasizing the need for more robust, spatially explicit data.
- Historical assumptions were updated, but gaps remain in understanding how climate and habitat changes affect vital rates.
- Recommendations included expanding biological sampling and refining growth models to better capture annual and regional differences.

TOR 6: Update Sex-Specific Catch Survey Models

- The 2026 assessment model incorporated new sex-specific growth, maturation, and survey data, updating key assumptions from the 2011 benchmark.
- Major changes included refined growth parameters, improved index standardization, finer temporal and fleet resolution for fisheries, and updated selectivity estimates.
- The model now accounts for more detailed sex and size structure, but challenges remain in integrating disparate survey data and reconciling differences in abundance estimates.
- Uncertainty in model outputs was discussed, with recommendations for further refinement and validation.
- The team emphasized the importance of ongoing updates as new data become available.

TOR 9: Ecosystem and Climate Influences

- The assessment considered effects of blue catfish, temperature effects on growth and overwinter mortality, and effects of hypoxia as key influences on blue crab population dynamics.
- Environmental factors such as temperature, hypoxia, and substrate type were discussed as potentially affecting survey catchability and crab distribution.
- The team noted the lack of comprehensive ecosystem data and suggested integrating climate variables into future assessments.
- Predation and cannibalism were recognized as important but difficult to quantify, with ongoing research needed.
- Collaborative efforts to improve ecosystem data sharing and analysis were encouraged to support more holistic management.

IV. Public Comment

Lead: Dan Hennen (NOAA)
Opportunity to hear questions or comments from the public

Decisions:

1. N/A

Actions:

1. N/A

V. Adjourn

<u>Day 3: April 15, 2026</u>

I. CIE Term of Reference Review & Discussion

Lead: Dan Hennen (NOAA)

Review of TORs 10 & 11

Decisions:

1. N/A

Actions:

1. N/A

Discussion Notes:

TOR 10: Data Sources, Gaps, and Uncertainty

- The assessment identified key data sources including fishery-independent surveys, commercial and recreational catch reports, tagging studies, and environmental monitoring.
- Major data gaps include limited spatial coverage in surveys, poor characterization of recreational harvest and composition information for the commercial harvest, and uncertainty in natural mortality and growth rates.
- For fishery-dependent data, uncertainty is highest in recreational catch estimates and discard mortality. Winter Dredge Survey catchability was also uncertain.
- The team recommended targeted studies to address gaps, such as expanded biological sampling, improved survey design, and enhanced reporting systems.
- Collaborative data sharing and integration across agencies were highlighted as priorities for reducing uncertainty and improving assessment accuracy.

TOR 11: Status and Prioritization of Research Recommendations

- Progress since the last benchmark assessment includes improved sex-specific growth and maturation modeling, expanded survey standardization, and better characterization of catch and effort.
- Key research recommendations for future work include refining growth models, developing spatially explicit surveys, improving recreational harvest estimation, and integrating environmental drivers into assessments.
- The team emphasized the need for ongoing updates to survey design, biological data collection, and model structure to address persistent uncertainties.
- The team also emphasized the need for improved data on recreational and commercial harvest, including incidental commercial mortality and the sex and length composition of the harvest.
- Prioritization criteria discussed included impact on assessment accuracy, feasibility, cost, and timeline, with growth estimation and winter dredge survey refinement ranked highest.

- Collaborative efforts and enhanced data sharing were encouraged to efficiently address research needs and support adaptive management.

II. Review Session [closed-door]

Lead: Dan Hennen (NOAA)

Opportunity for the review panel to discuss assessment methodologies and develop individual opinions. The review panel will initiate development of the panel summary report.

Decisions:

1. N/A

Actions:

1. N/A

III. Lunch

IV. Review Session (continued) [closed-door]

Lead: Dan Hennen (NOAA)

Opportunity for the review panel to discuss assessment methodologies and develop individual opinions. The review panel will initiate development of the panel summary report.

Decisions:

1. N/A

Actions:

1. N/A

V. Plenary Session

Lead: Dan Hennen (NOAA)

Review panel discloses decision on TORs.

Decisions:

1. The Review Panel accepted the 2026 Chesapeake Bay Blue Crab Stock Assessment as the best available tool to inform management of the blue crab fishery in the Chesapeake Bay.

Actions:

1. The panel agreed to provide a summary peer review report to follow 2 weeks after the review.
2. The panel confirmed that most TORs were addressed, with some partially met due to broad wording of many of the TORs that made them very difficult to fully meet, data limitations, or ongoing research needs.

Discussion Notes:

TORs Met

- TOR 3 (Catch): Met, with catch and uncertainty well described.
- TOR 6 (Bridge to last assessment): Met, the last assessment was successfully updated.
- TOR 8 (Stock status): Met, with stock status evaluated against reference points and management implications discussed.
- TOR 10 (Data sources/gaps): Met, with major data sources and gaps identified and uncertainty characterized.
- TOR 11 (Research recommendations): Met, with progress reported and future priorities outlined.

TORs Partially Met

- TOR 1 (life history parameters): Partially met, as not all life history rates were evaluated for potential interannual variation (e.g., growth and maturity).
- TOR 2 (Surveys): Partially met, as size composition data were not standardized in the same way abundance indices were, and environmental covariates were not included in index standardization.
- TOR 4 (Assessment model): Partially met, with spatial resolution less than the whole bay not implemented.
- TOR 5 (Uncertainty): Partially met, with process error not explicitly considered, and environmental drivers not modeled.
- TOR 7 (Reference points): Partially met, with no Management Strategy Evaluation (MSE) or other formal tool to evaluate appropriateness.
- TOR 9 (Environmental drivers): Partially met, as drivers of low recruitment remain unexplained, and cannibalism was not explicitly considered.

Next Steps

- Panelists will finalize their review and submit a detailed report in the coming weeks, incorporating additional analysis and feedback.

- The assessment team will revise the assessment report, update the assessment model using the most recent data, and continue research to address data gaps.
- Management agencies are advised to monitor recruitment and abundance trends and consider management changes if low productivity persists.
- Collaborative data sharing and improved survey design will be pursued to enhance future assessments.

VI. Public Comment

Lead: Dan Hennen (NOAA)
Opportunity to hear questions or comments from the public

Decisions:

1. N/A

Actions:

1. N/A

Discussion Notes:
There were no additional public comments

V. Adjourn

Review Panel:

- Dan Hennen (NOAA)
- Yong Chen (Stony Brook University/CFE)
- Nick Caputi (Western Australian Fisheries and Marine Research Laboratories, DPIRD)
- Simon Delestang (Department of Primary Industries and Regional Development (DPIRD), Australia)

Assessment Team:

- Michael Wilberg (UMCES CBL)
- Maya Drzewicki (UMCES CBL)
- Madison Sholes (UMCES CBL)
- Dong Liang (UMCES CBL)
- Gina Ralph (VIMS)
- Gabrielle Salula (VIMS)
- Rom Lipcius (VIMS)
- Ingrid Braun-Ricks (PRFC)
- Alexei Sharov (MDNR)
- Trey Mace (MDNR)
- Mandy Bromilow (MDNR)
- Amanda Bevans (MSU PEARL)
- Tom Ihde (MSU PEARL)
- Rob Latour (VIMS)
- Alexa Galvan (VMRC)
- Brooke Lowman (VMRC)

- Glenn Davis (MDNR)
- Matt Ogburn (SERC)
- Rob Aguilar (SERC)
- Tom Miller (UMCES)
- Troy Tuckey (VIMS)

Attendees:

- **Day 1:** Dan Hennen (NOAA), Michael Wilberg (UMCES CBL), Bruce Vogt (NOAA), Christina Garvey (CRC), Nick Staten (CRC), Madison Sholes (UMCES CBL), Dong Liang (UMCES CBL), Gina Ralph (VIMS), Gabrielle Salula (VIMS), Rom Lipcius (VIMS), Carrie Kennedy (MDNR), Maya Drzewicki (UMCES CBL), Yong Chen (Stony Brook University/CFE), Ingrid Braun-Ricks (PRFC), Alexei Sharov (MDNR), Trey Mace (MDNR), Mandy Bromilow (MDNR), Amanda Bevans (MSU PEARL), Tom Ihde (MSU PEARL), Rob Latour (VIMS), Alexa Galvan (VMRC), Brooke Lowman (VMRC), Matt Ogburn (SERC), Rob Aguilar (SERC), Tom Miller (UMCES), Troy Tuckey (VIMS), Nick Caputi (DPIRD), Simon Delestang (DPIRD), William Stoker (MDNR), Amy Schueller (NOAA), Sharon McBreen (PCT), Danielle Kozkinski (MBA), Matthew Zink (NCDEQ), Holly Funkhouser (SC DNR), CJ Schick (SC DNR), Jeff Brunson (SC DNR), Graham Wagner (SC DNR), Ron Owens (PRFC)

- **Day 2:** Dan Hennen (NOAA), Michael Wilberg (UMCES CBL), Bruce Vogt (NOAA), Christina Garvey (CRC), Nick Staten (CRC), Madison Sholes (UMCES CBL), Dong Liang (UMCES CBL), Gina Ralph (VIMS), Gabrielle Salula (VIMS), Rom Lipcius (VIMS), Carrie Kennedy (MDNR), Maya Drzewicki (UMCES CBL), Yong Chen (Stony Brook University/CFE), Ingrid Braun-Ricks (PRFC), Alexei Sharov (MDNR), Trey Mace (MDNR), Mandy Bromilow (MDNR), Amanda Bevans (MSU PEARL), Tom Ihde (MSU PEARL), Rob Latour (VIMS), Alexa Galvan (VMRC), Brooke Lowman (VMRC), Matt Ogburn (SERC), Troy Tuckey (VIMS), Nick Caputi (DPIRD), Simon Delestang (DPIRD), William Stoker (MDNR), Matthew Zink (NCDEQ), CJ Schick (SC DNR), Ron Owens (PRFC), Adriana Celtruda (UMD), Matthew Damiano (NC DMF)

- **Day 3:** Dan Hennen (NOAA), Michael Wilberg (UMCES CBL), Bruce Vogt (NOAA), Christina Garvey (CRC), Nick Staten (CRC), Madison Sholes (UMCES CBL), Dong Liang (UMCES CBL), Gina Ralph (VIMS), Gabrielle Salula (VIMS), Rom Lipcius (VIMS), Carrie Kennedy (MDNR), Maya Drzewicki (UMCES CBL), Yong Chen (Stony Brook University/CFE), Ingrid Braun-Ricks (PRFC), Trey Mace (MDNR), Mandy Bromilow (MDNR), Amanda Bevans (MSU PEARL), Tom Ihde (MSU PEARL), Rob Latour (VIMS), Alexa Galvan (VMRC), Brooke Lowman (VMRC), Matt Ogburn (SERC), Troy Tuckey (VIMS), Nick Caputi (DPIRD), Simon Delestang (DPIRD), Heather Hayden (MDNR), William Stoker (MDNR), Tom Miller (UMCES)