Scientific and Technical Advisory Committee (STAC)
December 6-7, 2016 Quarterly Meeting Minutes
Crowne Plaza Hotel - Annapolis, MD

Tuesday, December 6 Minutes

Attendance: (W: Webinar)

Members: Joshua Behr, Brian Benham, Donna Bilkovic, John Karl (JK) Bohlke, Kathleen Boomer, Charles Bott, Christopher Brosch, Amy Collick, Alix Dowling Fink (W), Zachary Easton, Lara Fowler (W), Marjy Friedrichs, Kirk Havens, Carl Hershner, Thomas Ihde, Susan Julius (W), Peter Kleinman, Martin Lowenfish, Mark Luckenbach, Andrew Miller, Mark Monaco, Steve Newbold (W), Marc Ribaudo, David Sample, Adel Shirmohammadi, Kurt Stephenson, Denice Wardrop, Gene Yagow (W), Weixing Zhu (W)

Guests: Karl Blankenship, Donald Boesch, Jeffrey Brainard (W), Ruth Izraeli (W), Zoe Johnson, Nicole Lehmer, Lew Linker (W), Daniel Pendick (W), Scott Phillips (W), John Schneider (W), Gary Shenk, Brian Sturgis (W), Peter Tango, Jeremy Testa, Bryan Watts, Kristen Wolf (W)

Administration: Bill Ball, Rachel Dixon, Melissa Fagan, Elaine Hinrichs, Renee Kelly

Call to Order – *Brian Benham (STAC Vice-Chair - VT)*

Benham called the meeting to order shortly after 10:00 am. Benham led the meeting in STAC Chair, Lisa Wainger's (UMCES) absence. Benham requested a motion to approve the September 2016 quarterly meeting minutes and October 2016 Executive Board (EB) meeting minutes. STAC members approved both documents.

DECISION: **Benham** requested a motion to approve the September 2016 quarterly meeting minutes and October 2016 EB meeting minutes. Result: Motion carried.

Status Update: *Ad hoc* Group Factsheet – Phosphorus (P) in the Bay Watershed – *Peter Kleinman (USDA-ARS)*

Kleinman highlighted important takeaways from the September 2016 quarterly meeting and updated STAC on progress made by an *ad hoc* workgroup formed to review the state of the science and management on major P concerns in the Chesapeake Bay watershed. The group is drafting a summary factsheet and plans to expand the factsheet into a white paper, which would likely be a Journal of Environmental Quality "Environmental Issues" paper. Kleinman noted the factsheet will provide an overview of degrading P loading trends in areas of the watershed, legacy P and artificial drainage, zero acre farms, animal heavy use areas, dissolved P as an unintended consequence of conservation programs, and the Conowingo Dam. The white paper would address these topics in greater depth and also consider others, such as conservation programs. The group will continue to develop the factsheet and white paper.

ACTION: **Kleinman, Christopher Brosch (DDA), Bob Hirsch (USGS), Martin Lowenfish (USDA-NRCS), Adel Shirmohammadi (UMD), and Wainger** will continue to review the state of the science on major P concerns of the Chesapeake Bay watershed through the development of a STAC factsheet and a white paper.

Altered phenology and long-term trends in the coupled biogeochemical cycles of Chesapeake Bay – *Jeremy Testa (UMCES)*

Testa highlighted spatially-specific changes in the transformation and concentration of chlorophyll-*a*, dissolved oxygen (DO), and nutrients in the mainstem of Chesapeake Bay over the past three decades. While long-term and annual trends in these water quality variables are evident, Testa's recent work has focused on changes in the timing of the seasonal cycles of these variables that have implications for our understanding of how the Bay will function in a period of altered climate and nutrient loading patterns. Understanding phenology (cyclic and seasonal variability) in coastal ecosystems is particularly challenging because 1) estuaries are highly dynamic systems where freshwater input can be the dominant driver, 2) phenological changes occurring in watersheds are transferred to the estuary, 3) the time scales of turnover for small organisms (e.g., phytoplankton) may be too short to accumulate long periods of climatological change, and 4) there are spatial variability and gradients in seasonal timing.

Testa's investigation of phenological changes in Bay water quality variables began with an examination of the seasonal cycle of hypoxic volume within the mainstem. Comparing the average hypoxic volume for 1985-1999 to the average for 2000-2013 indicates that the regular mid-summer peak has shifted forward by approximately two weeks. Testa set out to determine the driver behind this shift in hypoxic volume timing and the corresponding effects of this shift, focusing analyses on the upper, middle, and lower regions of the Bay. Throughout the Bay, hypoxia does not seem to be appearing earlier, but it does seem to be disappearing faster. Testa explained that connecting evidence of a modest decline in nitrogen (N) loads from the Susquehanna River to changes in hypoxia requires an investigation into chlorophyll-*a* in the Bay. In the past 15 years, winter/spring phytoplankton blooms have increased drastically in the upper Bay while decreasing slightly in the lower Bay. The late summer increase in DO, decrease in ammonium, and increase in nitrate (NO_3^-) over the past three decades in the lower Bay suggests that oxygenation is causing more ammonium to be oxidized and produce NO_3^-. Testa concluded with a conceptual diagram that summarized changes in coupled biogeochemical cycles in the upper, mid, and lower Bay between 1985-1999 and 2000-2013. After a question and answer (Q&A) session with STAC members, Testa agreed to keep STAC informed of papers he is planning to publish related to this presentation.

ACTION: **Testa** will keep STAC informed of papers he is planning to publish related to his presentation.

Extirpation of the Black Rail from the Chesapeake Bay – *Bryan Watts (William & Mary)*

Watts began with some positive news: the bald eagle, osprey, and great blue heron, all of which nest in trees and primarily eat fish, are doing well in the Chesapeake Bay watershed. However, a number of bird species that nest on the ground are struggling, including the black rail. The black rail, one of the least understood species in North America, is a tiny, secretive marsh bird with five subspecies. The eastern black rail is listed as endangered in six eastern states and is a candidate for federal listing. This subspecies has specific habitat requirements, and has been found primarily in the high marsh of saltmarshes, but also in impoundments, freshwater wetlands, prairie, and grassy fields. A recent status assessment in support of the upcoming federal listing package suggests that the eastern black rail has experienced a catastrophic decline, including a contraction of the northern range limit from Massachusetts to New Jersey and a more than 90% decline in the Chesapeake Bay region. The total eastern black rail population is now estimated at below 1,500 pairs. The eastern black rail occurred historically in all counties around the tidal Chesapeake Bay, but Bay-wide surveys found about 100 individuals in 2007 and 2008 and only about 10 individuals in 2014. Watts explained that marsh reclamation, salt hay harvesting, and altering of marsh hydrology are all thought to have contributed to the historic decline of the eastern black rail, but recent declines are primarily due to sea-level rise, and increasing inundation frequency. Sea-level rise is causing shifts in marsh composition, so the eastern black rail is forced upslope with the high marsh until there is no local higher ground. Watts explained that the eastern black rail is the first in a chain of species that will likely be lost due to sea-level rise in the Northeast, but it may be possible to retrofit impoundments or tidal marshes to manage for eastern black rail habitat.

Chesapeake Research Consortium (CRC) Staffer Presentation – *Nicole Lehmer (CRC) – Management Board, Principals' Staff Committee, and Executive Council Staffer*

The CRC Environmental Management Career Development Program provides early career professionals with a stepping stone to a future career in the fields of environmental science, policy and management, outreach and education. Staffers provide technical and administrative support to the various Chesapeake Bay Program (CBP) partnership committees, teams, and workgroups and not only gain a solid professional foundation from which to build their careers but also individualized development and career exploration opportunities. Lehmer provided an update on current Management Board, Principals' Staff Committee, and Executive Council activities as well as her own background, work, and future plans.

A Strategic Approach to Chesapeake Bay Research – *Donald Boesch (UMCES)*

Boesch shared insights gained while serving on advisory committees in the Baltic region of Europe over the past 16 years for potential ways that Chesapeake Bay restoration plans can use strategic research to realign for future success. The Baltic Sea has similar ecological problems as the Chesapeake Bay, and the Baltic Marine Environment Protection Commission (HELCOM) operates within multiple layers of laws similar to the CBP. However, the Baltic Sea is larger and deeper than the Chesapeake Bay, and the Baltic region contains multiple nations and a larger population with different languages and cultures. The Baltic also has the Union in a Joint Baltic Sea Research and Development Programme (BONUS). Boesch described BONUS' history,

structure, and vision. BONUS' strategic plan and objectives were developed with close coordination from the management (HELCOM) and the scientific community. Boesch overviewed BONUS' objectives and the research themes within each objective, and detailed a few examples of BONUS projects. Boesch also highlighted BONUS' young scientist training and networking activities, which promote lasting interactions across national boundaries and lay the foundation for the next generation of restoration.

Based on the success of BONUS in the Baltic, Boesch suggested a similar strategic research approach in the Chesapeake Bay region. The world-class research capacity in the Chesapeake region currently cobbles together funding from regional and national sources; there is no strategic research enterprise to address CBP goals (except for limited agency programs), intra-regional collaboration is underdeveloped and not sustained, and much remains to be done in order to achieve restoration goals and tackle issues of sustainability and climate change. Boesch outlined steps forward for creating Strategic Research for the Chesapeake (SRCH) program: 1) assess the state of Bay-related research funding; 2) build support in the scientific community; 3) determine how SRCH can add long-term value without competing with existing programs and needs; 4) explore opportunities for federal funding; and 5) develop a strategic plan. Boesch believes SRCH must have a common strategic focus, be based on calls for proposals that address strategic needs while allowing for innovation, inspire and facilitate interdisciplinary research and regional collaboration, produce peer-reviewed publications, achieve effective 'push and pull' between science and management, and create a system that builds the capacity, competitiveness, and responsiveness of the regional scientific and technical community.

Discussion

STAC members engaged in a discussion with Boesch on a strategic Chesapeake Bay research initiative. STAC members expressed general support for a strategic research initiative, but raised concerns about the process of gathering and sustaining investment in the initiative, political resistance to funding and regulations (which tend to stem from research conclusions), and how to justify that such a strategic effort would make a clear difference. STAC members discussed the possibility of a research-needs STAC or CRC workshop with heavy involvement by leaders and coordinators of the CBP Goal Implementation Teams (GITs), and potentially higher-level managers, to encourage managers to support a research initiative that would be serving them. Denice Wardrop (PSU), Kirk Havens (VIMS), and Carl Hershner (VIMS) gave background on a previous STAC workshop on management that involved jurisdictions' deputy secretaries of the environment as critical participants who could make a budgetary decision. STAC Executive Secretary, Bill Ball (CRC) suggested a workshop with residents, poets, and artists to develop a vision for a restored Chesapeake and serve as a base from which to build a strategic initiative. Lara Fowler (PSU) suggested a workshop connected to the Center for Nutrient Solutions about innovative tools and research to help guide meaningful watershed management decisions and implementations. Hershner suggested trying to identify other programs, centers of excellence, or multi-institutional partnerships that have produced useful outputs that could serve as models or analogs for a strategic Chesapeake research approach. Boesch recommended that

STAC members review an old STAC report entitled 'Chesapeake Futures' - which outlines the likely consequences of choices made at the beginning of the 21st century and corresponding implications for the future of the Chesapeake Bay and the surrounding region. Boesch also requested that STAC keep him updated on any actions related to this strategic research initiative, and agreed to be involved ex officio. Benham asked interested STAC members to follow up with each other to discuss a plan for communicating with managers about a strategic Chesapeake research initiative and potential workshop ideas.

ACTION: **Fowler, Wardrop, Hershner, Ball, and Marjy Friedrichs (VIMS)** will continue discussion of potential STAC/CRC workshop ideas, and involve Boesch on any actions related to a strategic Chesapeake Bay research initiative.

ACTION: **STAC Staff** will bring copies of Chesapeake Futures, a 2003 STAC publication, to the March 2017 quarterly meeting.

Fiscal Year 2017 (FY17) Workshop Themes and Request for Workshop Proposals (RFP) Overview

STAC members discussed research priorities to guide workshop topics for the upcoming fiscal year and reviewed the Workshop Protocols, RFP, and Process documents. STAC Staff, Renee Kelly (CRC) began the discussion by overviewing the workshop process timeline. STAC Coordinator, Rachel Dixon (CRC) explained how the timeline had changed slightly from previous years to include time for STAC members to voluntarily pre-screen workshop proposals, in addition to STAC Staff's review, and send feedback to proposers. Kelly and Dixon reminded STAC that aligning with the recommended workshop themes is not a prerequisite for funding, and shared some theme suggestions from GITs that came out of Dixon's presentation on the STAC workshop process at a recent CBP Coordinators/Staffers meeting. STAC members then discussed the utility of recommending workshop themes and whether the themes should be more specific or removed completely. Friedrichs requested a motion to remove the "Recommended Themes" section from the draft FY17 RFP and revise the evaluation criteria language in the draft Workshop Proposal Scoring Rubric to emphasize linkages to CBP goals, outcomes, and Decision Framework. STAC members approved the motion and decided to replace the "Recommended Themes" section in the draft FY17 RFP with the revised evaluation criteria, and suggested revisions to the rubric wording while Kelly made edits in real time.

DECISION: **Friedrichs** requested a motion to remove the "Recommended Themes" section from the draft FY17 RFP and revise the evaluation criteria language in the draft Workshop Proposal Scoring Rubric to emphasize linkages to CBP goals, outcomes, and Decision Framework. Result: Motion carried.

ACTION: **STAC Staff** will revise the draft Workshop Proposal Scoring Rubric and FY17 RFP according to STAC's decisions and suggestions.

ACTION: STAC Staff will send the revised workshop documents to STAC's EB for approval before releasing the RFP on 12/14/16. **UPDATE:** Kelly sent the revised draft RFP and Rubric documents to the EB pending approval on 12/12/16. The EB approved the documents and Kelly distributed the final RFP to the CBP and STAC on 12/14/16.

Midpoint Review Reports – Guidance Document

STAC discussed the development of a guidance document for the creation of Review Reports, and the importance of effective "key point" headlines to encourage the communication of recommendations. Dixon explained that the idea of a guidance document or template came out of conversations with Wainger and Ball about how to improve report effectiveness. The idea was discussed on the last EB call, and Dixon and Ball created a general outline of an exemplary report executive summary. Dixon requested general feedback on the document. Zachary Easton (VT), who had just submitted a report using the draft guidance document, thought it was helpful to have guidance on major takeaway points, and mentioned that the detailed description of when the review panel met might not be needed in the executive summary. Ball shared that Wainger had suggested having a sentence about main findings and relevance to the CBP in the beginning of the executive summary, which could be used as a "teaser" when emailing the review report to the CBP. Gary Shenk (USGS) mentioned that CBP technical staff do read the details of a review report, but suggested giving presentations on reports in order to communicate review findings to less technical audiences. STAC members supported continued development of the STAC Executive Summary Guidance and Examples document.

ACTION: Dixon and Ball will continue finalizing the STAC Executive Summary Guidance and Examples document. STAC members should send any input to Dixon at dixonr@chesapeake.org and Ball at ballw@chesapeake.org .

Wednesday, December 7 Minutes

Attendance: (W: Webinar)

Members: Joshua Behr, Brian Benham, Donna Bilkovic, John Karl (JK) Bohlke, Kathleen Boomer, Charles Bott, Christopher Brosch, Amy Collick, Bill Dennison, Alix Dowling Fink (W), Zachary Easton, Lara Fowler (W), Marjy Friedrichs (W), Kirk Havens, Carl Hershner, Thomas Ihde, Hamid Karimi, Martin Lowenfish, Mark Luckenbach, Mark Monaco, Steve Newbold (W), Marc Ribaudo (W), David Sample, Adel Shirmohammadi, Kurt Stephenson, Denice Wardrop, Weixing Zhu (W)

Guests: Greg Allen, Thomas Barron (W), Jeffrey Brainard (W), Carl Cerco (W), Dinorah Dalmsy (W), James Davis-Martin (W), Gaby Gilbeau (W), Andrew Heyes, Zoe Johnson (W), Lew Linker, Daniel Pendick (W), Scott Phillips, Leonard Schugam (W), Gary Shenk, Ted Tesler (W), Guido Yactayo (W)

Administration: Bill Ball, Rachel Dixon, Melissa Fagan, Elaine Hinrichs, Renee Kelly

Toxics Contaminants Workgroup (TCW) Discussion – *Greg Allen (EPA) and Scott Phillips (USGS)*

Allen and Phillips, co-chairs of the CBP TCW, discussed work strategies for the toxic contaminants outcomes in the 2014 Chesapeake Bay Watershed Agreement, science needs, and potential areas for STAC support. A 2012 report by the U.S. Environmental Protection Agency (EPA), U.S. Geological Survey (USGS), and U.S. Fish and Wildlife Service (FWS) classified the extent and severity of traditionally monitored contaminant groups and groups of emerging concern in the Bay watershed, and summarized effects on fish, wildlife, and humans. The goal outlined in the 2014 Agreement is to "ensure that the Bay and its rivers are free of effects of toxic contaminants on living resources and fish", with the two corresponding outcomes focusing on 1) policy and prevention and 2) research.

The policy and prevention outcome directs the CBP to continually improve practices and controls that reduce and prevent the effects of toxic contaminants below harmful levels for aquatic systems and humans. The outcome focuses on reducing the amount and effects of polychlorinated biphenyls (PCBs) by building on existing programs and using research findings to evaluate the implementation of additional policies, programs, and practices for other contaminants. Allen explained that this prioritization is because PCBs are the main cause of widespread contamination of fish and extensive fish consumption advisories. The research outcome directs the CBP to continually increase our understanding of the impacts and mitigation options for mercury, PCBs, and other contaminants of emerging and widespread concern. Phillips described current efforts and research gaps for each of the research outcome management strategy work themes, including information needs addressing the influence of contaminants on the health of wildlife, habitat degradation, and safety of fish and shellfish for consumption, and options for mitigating risk and informing policy and prevention strategies. To conclude, Phillips shared some ideas for engagement between STAC and the TCW, presented a list of potential STAC workshop topics and STAC reviews, and asked STAC to help the TCW identify potential researcher partners.

ACTION: STAC will help the TCW identify potential researcher partners.

Stormwater Control Practices and Toxic Sediments – *David Sample (VT)*

Sample presented on stormwater control measures (SCMs) and best management practices (BMPs) that collect toxic sediments. Sample began by overviewing categories of stormwater treatment technologies, noting that most categories use sedimentation as the primary removal mechanism. Sources of stormwater sediments include vehicular traffic, industrial sites, vegetation, construction and demolition, corrosion, and spills. Sample then shared a list of urban runoff pollutants with sampled concentration ranges, and pointed out two classes of emerging concern: perfluoroalkyl acids (PFASs), and Polycyclic Aromatic Hydrocarbons (PAHs), the latter of which stem largely from the use of coal-tar pavement sealants. Sample then shared a number of case studies.

Sample concluded by explaining that there is potential to better optimize sediment removal, as opposed to delaying maintenance, which leads to expensive dredging decades later. Sample suggested a market for devices that trap sediment upstream and a need for more research on the maintenance needs of stormwater ponds. During the Q&A after Sample's presentation, Allen noted that there are local bans on coal-tar pavement sealants and an alternative asphalt-based product. Also, Hamid Karimi (DOEE) explained that when a BMP is built within the District of Columbia, it becomes part of the property and maintenance of the BMP goes as a covenant on one's deed. The District inspects the BMP every two years, and if it not maintained, the owner of the property is liable for the cost of District maintenance.

Fate and Transport of Multiple Toxics – *Andrew Heyes (UMCES)*

Heyes presented emerging concerns about two contaminants affecting the Chesapeake Bay: 1) mercury and 2) brominated compounds. Since most mercury concentrations in Chesapeake Bay fish during the early 2000s were below the EPA consumption threshold, the Bay was not considered impaired for mercury like it was for PCBs. However, Heyes explained that those levels of mercury are known to have negative impacts on fish reproductive success. Heyes explained how the bioavailability of mercury depends on the types of bacteria and chemicals present in an aquatic environment, noting the sequence of reduction–oxidation processes. In the Chesapeake Bay, total mercury concentration in the sediment decreases down the Bay (since there is more industry at the north end) while methylmercury concentration in the sediment stays relatively constant. Heyes described how land use and mitigation of other contaminants may impact mercury bioavailability. Since inorganic mercury and methylmercury loading in the Susquehanna River have remained low from 1999 to 2015, but mercury loading to the Bay is increasing, Heyes suggested that we may be canceling out some of the impacts of reduced mercury deposition by stimulating methymercury production in the watersheds as we decrease N loads to the Bay.

Heyes then discussed the new and evolving threat of brominated disinfection byproducts - formed when bromine in saltwater replaces chlorine on organic compounds upon the mixing of chlorine and saltwater. Heyes explained how these brominated compounds are either dumped into or formed in the Bay following disinfection of ships' ballast water with chlorine to stop the invasion of unwanted species. Chlorination is a common ballast water treatment method because it is fast and can be done electrochemically, but other methods, such as increasing the pH or using ultraviolet light or heat, exist. Heyes and colleagues compared intake and discharge water for chlorine disinfection systems and determined that many brominated compounds in the discharge are unknown. Such byproducts are an important emerging contaminant as a result of potential changes in wastewater treatment and increases in shipping in the Bay, defouling of power plant cooling equipment, and desalinization around the world.

Panel Discussion

Following their presentations, Allen, Phillips, Sample, and Heyes led a panel discussion on what should be done to advance the science on important toxic contaminant issues. STAC and the

panelists discussed needs, potential STAC workshops or actions, and areas where STAC lacks expertise. Ball offered that the CRC could try to facilitate more funding to advance research on toxic contaminants, and agreed that the CRC could also coordinate networking among institutions to increase social capital. Panelists discussed potential management decisions STAC and researchers should be aware of regarding toxic contaminants, highlighting alternatives products as well as decisions that come from PCB Total Maximum Daily Loads (TMDLs). Allen suggested that a workshop on atmospheric loads of PCBs might be a good fit for STAC. Based on the theme of unintended toxic contaminant consequences, Bill Dennison (UMCES) suggested a STAC workshop focused on envisioning the future state of toxics in the Bay and watershed given the TMDL, and determining interventions to prevent resurgence or emergence of toxic contaminants. STAC members recalled the process by which the Chesapeake Bay Commission (CBC) requested the STAC review of microplastics, which was a different situation because policymakers felt the problem was characterized and significant enough to take action, plus there was a specific industry source. Charles Bott (HRSD) brought up concerns about chlorinated and brominated compounds entering the environment from chlorine disinfection at waste water and drinking water treatment plants in the US, and increased chlorine disinfection required under new virus criteria. Allen suggested STAC separate toxic contaminant issues where enough is understood to move forward with management actions from issues that require more research. Gary Shenk (USGS) and Hershner mentioned the opportunity for STAC, perhaps through a workshop, to suggest a reprioritization of the CBP in order to address toxic contaminants before future impairment. Benham recommended that the next STAC EB call include further discussion of possible actions and next steps STAC could take regarding toxic contaminants.

ACTION: **STAC Staff** will ensure the agenda for the next EB call includes a discussion on possible actions and next steps STAC could take concerning emerging toxic contaminants in the Chesapeake Bay watershed.

Water Quality and Sediment Transport Model (WQSTM) Request for Peer Review – *Carl Cerco (U.S. CoE ERDC)*

The CBP, through the Modeling Workgroup, has requested a STAC review of the WQSTM with particular emphasis on the new model aspects of the estuarine simulation. To inform this review request, Cerco presented an overview of the current WQSTM and how it fits with the other CBP modeling tools. The new model aspects include: 1) increased consideration of nutrient loads from Conowingo scour, wetlands loss, and shoreline erosion; 2) improved representation of the bioavailability of particulate organics; 3) a wetlands module to handle wetlands function and projection of future wetland areas; and 4) distinguishing natural reefs, aquaculture, and sanctuaries for oysters.

Cerco began by detailing the model's improved ability to simulate Conowingo reservoir infill and distinguish the typical suspended load from the exceptional scoured load using the reactivity of particulate organic material. Another refinement to the shallow water simulation is the representation of shoreline loads of nutrients, which are now being included in the model

because credits may be given for reductions in shoreline erosion. Cerco described the expert panels and models being used to inform modeling of shoreline erosion and wetlands loss. Two processes occur with wetlands loss: 1) the function of the wetland (burial, denitrification, etc.) is lost; and 2) suspended solids, organic carbon, and nutrients enter the Bay through wetland erosion. Cerco explained that the Modeling Workgroup does not want to develop a complete wetlands biogeochemical model, but instead wants to develop a simplified module that includes major impacts on the system, such as particle burial (organic and inorganic), respiration, denitrification, primary production, and others. Wetland areas are assigned to model cells based on proximity and local watershed boundaries, and scenarios from the Sea Level Affecting Marshes Model (SLAMM) are used to project effects of rising sea levels on tidal wetland area. Cerco concluded by detailing the explicit representation of oyster aquaculture, sanctuaries, and wild populations. Cerco overviewed the current representation of oysters in the WQSTM, and explained the plan for locating and assessing currently missing information on the location, methods, and biomass (where applicable) on present beds, aquaculture, and sanctuaries.

The meeting concluded with a Q&A session about the WQSTM and the upcoming review. STAC members recommended resources for filling in the missing information on oysters. Ball requested that STAC members inform him if they are interested in serving on the panel for this review, and if they have any recommendations for a panel leader. STAC discussed the compressed timeline for this review, and Ball reminded STAC and Cerco of the need for both the questions and review documentation before STAC can approval the review.