Summary of comments and Panel responses on Oyster BMP decision framework - For Oyster BMP Expert Panel update to WQGIT during April 25, 2016 meeting.

Comment Focus	Comments Summarized	Oyster BMP Expert Panel Response to Comments
Define "suitable from a scientific perspective"	SELC et al. - suitable from a scientific perspective should be clarified and must be based on identified, quantifiable, and scientifically defensible metrics.	The Panel discussed this decision point concerning "suitable from a scientific perspective" and decided to change this to "suitable for reduction effectiveness consideration." The Panel agreed that this step of the decision framework is based on whether a protocol can occur with a particular category (i.e., the biological process can occur under the practice conditions). The Panel defines suitable for consideration as, "In the Panel's best professional judgement, the reduction process could occur in association with a particular oyster practice category." It is important to note that this step aims to identify which potential crediting protocols should be evaluated for a particular oyster practice category and does not involve the decision whether there is sufficient science to determine the reduction effectiveness, which is built into the second step of the framework. Overall, the first step of the framework allows the Panel to rule out any combinations where conditions of the practice would never support the occurrence of the biological process, resulting in a recommendation that the combination shouldn't be pursued for reduction effectiveness crediting purposes.
Define "Sufficient Data"	CAC, CBF, CBC, SELC et al. - What would constitute as "sufficient data;" how will that bar be met in the future when more info becomes available?	The Panel discussed what constitutes as sufficient science/data and reached the consensus on the following definition: "In the Panel's best professional judgement, data of sufficient quality and scope exist and can be used to generate a reasonably constrained estimate of the reduction associated with a particular oyster practice category." Reasonably constrained involves an estimate where variance in the data is such that the likelihood of meeting water goals would be more certain. In regards to policy-related issues, the Panel has suggested to the Chesapeake Bay Program Office that they organize a policy group to evaluate policy-related concerns involving in-water biological BMPs as this is outside the purview of the Panel's charge.

Unintended Consequences	CAC - Concerned with unintended consequences of using shellfish as in-water BMP: 1) disease potential caused by high-density culturing operations that could threaten restoration, 2) shell not being returned to the Bay exacerbating shell shortage, 3) reduce efforts toward on-land stormwater controls, 4) basing WQ on organisms that could die. SELC et al. - How is the Panel addressing accumulation of nutrient heavy biodeposits in systems with heavy aquaculture operations?	The Panel will be identifying and considering relevant unintended consequences when developing their recommendations and will share their recommendations at a later time as they are still being developed. Panelists share similar concerns as expressed by the commenters concerning shell and will continue to evaluate these concerns as they develop their recommendations as full consensus has not been reached yet. Heavy biodeposits have been identified by panelists as an unintended consequence and is currently being discussed by the Panel. In regards to policy-related issues, the Panel has suggested that the Chesapeake Bay Program organizes a policy group to evaluate any policy-related concerns involving in-water biological BMPs as this is outside the purview of the Panel's charge. The Panel's charge is to develop a decision framework for determining the reduction effectiveness of potential oyster BMPs and to apply the decision framework to review existing science to provide recommendations on what the reduction effectiveness should be, and if it cannot be determined at this time, then provide recommendations on what could be done to fill in the science gaps.

Verification	CAC - Would like specific details on verification guidelines, given that most of the questions asked of STAC by DiPasquale remained largely unanswered. SELC et al. - Have verification reps review and comment on approaches; verification protocols should seek to establish confidence that modeled water quality improvements are actually being observed on-the ground; panel should identify if they are taking a generalized or specific approach to verification guidelines. CBF - Any denitrification crediting should be accompanied with verification guidelines given that much variability exists among sites.	The Panel will add a decision point in the framework on whether the reduction effectiveness associated with the protocol/practice category combination is verifiable. Verifiable is defined by the Panel as "In the Panel's best professional judgement, a practical method exists, or could be created, to track reduction effectiveness if the BMP is implemented." Per the CBP BMP Review protocol, the Panel will take a generalized approach when determining the verification guidelines and will focus on providing recommendations on the variables that should be measured. Rich Batiuk is an advisor to the Panel on BMP verification and will guide the Panel accordingly concerning any reviews needed on the verification guidelines. The Panel has and continues to discuss topics that are also captured in the questions raised by DiPasquale to STAC, which ultimately will be covered in the Panel's recommendations.

Data Concerns	CAC, SELC et al. - STAC identified spatial and temporal limitations of the data. CBF - There isn't enough data to support crediting enhanced burial (not opposed to as an option, but not at this time) SELC et al. - 2013 STAC Report couldn't address all 12 questions raised by CBP, DiPasquale; therefore, if data doesn't exist 3 years later to answer questions then the Panel shouldn't derive estimates until adequate data becomes available; there wasn't many studies for STAC to review (N assimilation-5 studies; denitirification-2 studies; burial-no published rates)	The Panel's recommended framework includes the separation of the various oyster-associated biological processes into separate crediting protocols that can be individually evaluated for each oyster practice category. This approach will allow the Panel to determine and put forward recommendations on the reduction effectiveness of protocols for practices where there is sufficient science for approval and implementation. Where there isn't sufficient science, the crediting protocol for that practice category will not be recommended for use at this time until the science gaps are filled. If this is the case, then the recommendations will focus on how the science gaps could be addressed. In regards to the STAC findings, while STAC did identify limitations, they also put forward recommendations to the Chesapeake Bay Program (CBP) for the approval of default nitrogen and phosphorus removal estimates in tissue and shell of harvested oysters from caged aquaculture based on their scientific evaluation. These recommendations were presented during the July 9 and August 7, 2014 Watershed Technical Workgroup (WTWG) meetings and can be found at http://www.chesapeakebay.net/channel_files/21399/intensive_oyster_aquaculture_bmp_technical_appendix_07092014.pdf. The management board responded to STAC stating that the WTWG didn't raise "any concerns over the technical merit," but it was decided that the BMP couldn't be implemented in the CBP modeling suite at that time because established BMP approval procedures through the Water Quality Goal Implementation Team had not been completed and that crediting oyster aquaculture as a BMP should be addressed through the expert panel process (letter can be found at http://www.chesapeake.org/stac/presentations/225_MB%20Response%20to%20STAC%20Oyster%20Aquaculture%20Review%20Report%20FINAL.pdf) The Oyster BMP Expert Panel has been convened to evaluate the reduction effectiveness of various oyster practices following the BMP approval procedures mentioned by the management board (i.e., the BMP Expert Panel Review Protocol). However, it is important to note that the Oyster BMP Expert Panel has their own charge that aligns with the CBP Partnership's BMP Expert Panel Review protocol and is not the same charge given to STAC. So while the Panel is building on the evaluation that was done by STAC, they are also conducting their own review of the literature/data using a recommended decision framework they have developed to determine the reduction effectiveness of oyster practices; therefore, their recommendations may be similar or different from what STAC recommended in 2014.

Omit Shell Assimilation Protocols	CAC, CBC, CBF - Omit oyster shell crediting because of unintended consequence of reducing critically needed sources of oyster shell. SELC et al. - Crediting should be developed in such a way that does not provide disincentives for shell recycling programs.	The Panel is still deliberating on the protocols concerning the crediting of N and P assimilation in oyster shell, which include the identification of unintended consequences. Panelists share similar concerns as expressed by the commenters and will continue to evaluate these concerns as they develop their recommendations.
Recommended Methodology to Determine Estimates	CBF - Not supportive of jurisdictions determining estimate using recommended methodology from Panel (in reference to Step 2.f.); any new proposed number should go through Expert Panel review (not doing so would be short-cutting the process). SELC et al. - Panel should consider recommending a specific protocol with metrics to guide these decisions.	The Panel will modify this step to include expert review of site-specific estimates generated from recommended methods by the Panel. The Panel does not feel that it would be necessary to convene a new Panel for well established methods, but agree to have experts review the numbers to ensure the calculations were done correctly before being submitted for approval to the Water Quality Goal Implementation Team.

Baseline	CBF - Jurisdictions should not be seeking credit for oysters that are already being grown/raised, but rather should only receive credit for new or expanding projects; current wild and aquaculture populations should be determined; recommend temporal baseline of January 1, 2011 or after (reflects period after the completion of the Bay TMDL). SELC et al. - The Panel should consider burial and denitrification that would occur in the absence of oysters.	The Panel will be evaluating baseline considerations for recommended protocols/oyster practice category combinations and will be seeking guidance from the CBP modeling workgroup. Baseline data is currently being collected to assist with this evaluation.
Permit Compliance	CBC - Should estimates match level of certainty for both permit compliance and Chesapeake Bay modeling framework?	The Panel recommends that this question be addressed by the policy sub-group that is being organized by the Chesapeake Bay Program Office as it is outside the purview of the Panel.
Oyster Practices	CBC - Raft culture and cage culture may not have similar implementation considerations; should not be grouped together. SELC et al. - Ensure that best available science supports the groupings; concerned with how groupings will align with verification; recommend eliminating or clarifying language in Category D (Oyster Restoration) to ensure that only active oyster growth is considered.	"Similar implementation considerations" was viewed in the context of how it will affect the biological processes the crediting protocols are based on. The Panel's thought is that raft and cage culture will be similar in regards to the reduction effectiveness because they are both above the sediment surface. The intent of the descriptions for the oyster practice categories is to include language that capture the individual practices that would fall under that category. In regards to oyster restoration, it would be the crediting guidelines for the protocols that would address active oyster growth.

Suspended Sediment	SELC et al. - There is a relatively small volume of available science on sediment sequestration; additional discussion on how the Panel plans to evaluate would be helpful; not clear how sediment deposition would be monitored or verified because efficiencies would be very site-specific.	The Panel is still deliberating on this protocol and will provide additional details at a later date. The Panel shares similar concerns as the commenter concerning available science. For site-specific considerations, the Panel is building into the decision framework that established methodologies where there is sufficient science could be used to determine site-specific estimates by jurisdictions that would go through expert review and approval steps before implementation. In regards to sequestration, the Panel has asked the CBP to provide additional guidance on whether removal from the water column is acceptable for an in-water BMP. This has been put forward as a topic for a Chesapeake Bay Program policy sub-group to consider.
Crediting Protocols	CBC - For clarification, expand on what is meant by additive; Panel must take into account the impact of disease, water quality, poaching pressure, predation and storm events. SELC et al. - Protocols need to take into account other variables; most studies were conducted in warm months; therefore Panel should consider if there are differences in other months concerning growth.	The Oyster BMP reduction effectiveness framework is based on incremental approval and implementation of reduction effectiveness crediting protocols. In other words, if there is sufficient science, as determined by the expert Panel, for one protocol to be applied toward an oyster practice category, but not the others, then that protocol can be put forward for approval and implemented once approved. Once science is available for pending protocols, then those will be re-evaluated and recommendations put forward for approval. Once approved the reduction effectiveness of that protocol can be added onto the reduction effectiveness of any other existing protocol(s) that are already being implemented that are for the same pollutant. Environmental conditions are being considered by the Panel and will share their recommendations at a later time as they are still being developed.

Nutrient Trading	CBC - How will restoration and protection of local water quality be met when oyster BMPs offset the discharge of pollution?; how should credits be limited to a defined hydrologic unit and/or where oyster practices take place?; should standard trading ratios apply?; should they provide more than a temporal reduction credit?; baseline safeguards to ensure that credits are established beyond what would have occurred in absence of trade; are existing oyster aquaculture reporting requirements sufficient for verification?	Nutrient trading evaluation is outside the purview of this Panel. For nutrient trading concerns, the Panel recommends that a separate group be established to evaluate these issues.
Support for Considering Denitrification and Burial Crediting Protocols	Lynnhaven River Now - Important to LRNow that the panel continue to consider and determine crediting protocols regarding sanctuary oyster reef nutrient and sediment removal.	The Panel will continue to evaluate oyster reef restoration as an oyster practice category for nutrient and suspended sediment reduction effectiveness consideration using the decision framework proposed by the Panel.
Crediting Guidelines	CBF - Suggest credits only be given to harvested oysters. SELC et al. - Consider separate estimates for triploid versus diploid oysters (many aquaculture growers rely on faster growth rates of triploid stock).	The Panel is still deliberating on whether reduction effectiveness can only be credited to harvested oysters or whether there are scientifically defensible methods that would allow the reduction effectiveness to be determined from oysters that aren't harvested. This will be more relevant to the determination of crediting protocols for the oyster reef restoration practice category since this involves practices where harvest isn't allowed. The Panel will evaluate literature concerning growth rates of triploid stock to determine whether there is a need to separate the estimates.

BMP Review Process	SELC et al. - Panel should not hesitate to invite other experts as guests (BMP Review Protocol allows this).	The Panel will continue to invite guests when needed.

Acronyms

CAC - Citizen Advisory Committee
CBC - Chesapeake Bay Commission
CBF - Chesapeake Bay Foundation
LRNow - Lynnhaven River Now
SELC - Southern Environmental Law Center