

Supplemental Material - Oyster BMP Expert Panel responses to comments from the Chesapeake Bay Partnership and interested parties on the Panel's first incremental report

Summary of comments on the Oyster BMP Expert Panel's first incremental report from 30-day review period (September 22 to October 22, 2016) and the Panel's responses. Substantial comments and corresponding Panel responses are presented below in three tables (minor typos were corrected, but are not presented). The first table involves comments directly related to recommendations in the Panel's first incremental report. The Panel discussed these comments and made edits to the report if necessary. The second table lists policy and implementation-related comments that are outside the purview of the Panel's charge and will be handled through the CBP Partnership Management Board. The third table lists comments related to topics that will be covered in a future report (responses will be provided at that time). The CBP Partnership BMP Expert Review Protocol referenced in the responses is available at http://www.chesapeakebay.net/publications/title/bmp_review_protocol.

Table 1. Summary of comments directly related to the Panel's recommendations on the Panel's first incremental report and the Panel's responses.

#	Comment Focus	Comment Summarized	Oyster BMP Expert Panel Response to Comments	Edit Made in Report
1	Re-evaluation Process	<p>SELC et al. (in reference to bottom of pg. 15 after Table 2a) - Request additional details on following statement, "For protocols where there isn't sufficient science, the Panel recommends that, once sufficient science is available, it is evaluated by an Expert Panel to determine the reduction effectiveness and put forward for approval" and 5-year re-evaluation:</p> <p>-Does the Panel intend that the existing Oyster BMP Expert Panel might be reconvened as needed to review and approve new science, or would a new group of scientists be convened ad hoc? And if the latter, would a new group be formed every 5 years?</p> <p>-Given that the Oyster BMP Expert Panel was not intended as a standing Panel, who would be responsible for making the determination when sufficient science is available in the future? (For example, would a jurisdiction make a request to the WQGIT? Or would it be the responsibility of one of the GITs to identify new science?)</p> <p>-Would there be a public review period for any new science and possible protocols considered? We think such review would be critical.</p>	<p>"Evaluated by an Expert Panel" refers to a newly convened Panel following the procedures described in the CBP Partnership BMP Review Protocol, which may include members from this Panel or new members. In regards to this Panel, according to the BMP Review Protocol, once the Panel charge is met, the comment period ended, and reports finalized by the WQGIT, the Panel members are released from duty.</p> <p>The 5 year timeframe for re-evaluation is a recommendation from the Panel, but would be dependent on whether new science is available. The CBP Partnership BMP Expert Review Protocol already has established procedures to review existing methods, stating, "The WQGIT will periodically re-evaluate existing loading and effectiveness estimates if new science or information becomes available, to determine if a review is warranted. Such reviews can be prompted by the availability of new information, such as a new treatment process or new information on efficiencies...If approved by the WQGIT Chair, the review of existing estimates and, when applicable, the definition of a BMP can be conducted within a source Workgroup in consultation with the WTWG. This approach should reduce the amount of time necessary to conduct the review because the definition(s) have already been developed, a background of available data already exists, and issues of how the practices or land use is incorporated into the CBWM have been addressed. Reviews of existing estimates should follow the guidelines listed in IIA [Review Process for New Estimates] above except that a separate Panel is not convened and the information generated is added to the existing support documentation for the estimate." The Panel added text in the report to indicate that procedures found in the CBP Partnership BMP Expert Review Protocol should be followed when re-evaluating estimates.</p>	Yes
2	Approval Process	<p>SELC et al. - It is our understanding that the Panel will revise this report based on the public review process and then present it to the Water Quality Goal Implementation Team, and possibly the Sustainable Fisheries Goal Implementation Team, and/or the CBP Management Board for approval.</p>	<p>For the most part, the commenter is correct, except it will be a joint meeting with the Water Quality Goal Implementation Team and the Sustainable Fisheries and Habitat Goal Implementation Teams. If consensus is not reached, then it will be elevated to the CBP Management Board for an approval decision.</p>	No
3	Incremental Approach	<p>CBF - Appreciates the incremental approach that the expert panel is using to release their recommendations; allowed the conservation community and other interested parties to spend the necessary time and resources to adequately review the recommendations and offer comments.</p> <p>SELC et al. - We appreciate the Panel's process of issuing its recommendations in incremental reports, allowing for a thorough review of each as the larger process moves forward. This has worked well, and we appreciate the Panel's attention to public comments and its work to address them. We encourage the CBP and Panel to continue providing such "early and often" opportunities for public involvement.</p>	<p>The Panel thanks the commenters for their feedback and agrees that it is beneficial using an incremental strategy to assess oyster practice-related BMPs and offer opportunities for public involvement throughout the process.</p>	No
4	Definition	<p>CBC (comment #1) - Should the report indicate that the practice of on-bottom-private-oyster aquaculture using substrate addition involves only diploid oysters? We suggest that this could be clarified in the report.</p>	<p>The Panel intended that the on-bottom private oyster aquaculture using substrate addition would only involve the diploid estimates because it is assumed that the wild oysters are diploid. The Panel added clarification text throughout the report.</p>	Yes

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5	Definition	OCVA - In the definitions, it should be noted that a diploid oyster can be a wild oyster.	The Panel added diploid in the definition of wild oysters.	Yes
6	Definition	SELC et al. - Under the "Key Definitions" listed on page 6, I would suggest adding the terms identified on p. 23 of the report including Suitable for Consideration, Sufficient Science, Verifiable, and Unintended Consequence.	The Panel added these terms to the definition list.	Yes
7	Endorsed Oyster Practices	CBF - Agrees with the panel's decision not to recommend use of private aquaculture, with no additional inputs (refers to "private oyster aquaculture with no activity" category in report), as a creditable practice under the TMDL; it does not represent "additional" oysters and nutrient reductions beyond the "status quo." For any practice to be considered a viable BMP by the Chesapeake Bay Program, additional inputs by way of substrate or oysters need to be included.	The Panel thanks the commenter for their feedback. The Panel felt it was important to only endorse practices that include an enhancement activity that could result in the overall production of new oysters.	No
8	Endorsed Oyster Practices	CBF - Would like to express its support for the expert panel's decision not to recommend the practices covered by the movement of wild oysters on private leases as a BMP practice. Although this practice is common in parts of Virginia in order to enhance leased bottom, much like harvesting oysters from private leases with no additional inputs, this activity does not represent activities beyond the "status quo" and therefore should not be creditable as a BMP for the Chesapeake Bay TMDL.	The Panel thanks the commenter for their feedback and agrees that the movement of wild oysters on private leases shouldn't be considered a BMP. The Panel's rationale is that this practice does not include an enhancement activity that could result in the overall production of new oysters. It simply transfers existing oysters to a new location.	No
11	Endorsed Oyster Practices	SELC et al. - Ensure clarity among readers by defining growing practices. I would like to see the report be more specific about what is meant by off-bottom aquaculture, floating oyster farms, and on-bottom culture. What constitutes "high density"?	The Panel feels that they have provided adequate definitions of the oyster practices in Section 5.0. What constitutes "high density" is dependent on the environmental and bottom conditions of the site; therefore, there isn't one value that would fit all circumstances. The Panel is assuming the commenter is concerned about potential unintended consequences from over-enrichment of the sediments. The Panel has provided information concerning this unintended consequence in Section 10 of the report.	No
14	Decision Framework	<p>CBF - The expert panel has done a good job describing the various decision points, both for the current efforts and the possible evaluation of new practices in the future. CBF does recommend that addition consideration be given to the step identified as 2.g in Figure 4c. Although CBF agrees that it is unlikely that the expert panel would be reconvened simply to look at a single practice, we also believe that any new practices should be subject to the same reviews as the current process and also open to public review and comment. At this time, it is unclear if the steps proposed in figure 4c and the additional figures would include such review and comment opportunities.</p> <p>SELC et al. - On page 27, within the Panel's recommended "Step 2" decision points, the report adds an asterisk that provides: "If the recommended method is used to determine what the estimate would be within the 5 year timeframe, then the Panel suggests that the estimate is reviewed by at least 2 experts selected by the State and CBP before making an approval decision." Rather than just offering this as a suggestion, we recommend rewording to recommend that at least 2 experts be required. Relatedly, and as we requested in our May 13, 2016 letter, we believe that the report should specify the type of credentials that would qualify a person an "expert." In addition, given the power potentially delegated to these individuals who will be chosen by the jurisdiction that developed the estimate, we believe that the report should indicate that proof is required that no actual or potential conflicts of interest exist. We also believe that a step should be added to Step 2 to specifically require CBP review, and approval or rejection, of any new estimates developed and submitted by jurisdictions in the absence of a reconvened Expert Panel. Otherwise a new methodology with potentially far-reaching ramifications could be certified by two outside experts without oversight.</p>	The Panel re-evaluated this language and decided that it would be more appropriate for these procedures to be sorted out by the Chesapeake Bay Partnership. The Panel found the re-evaluation procedures of existing estimates described in the CBP Partnership BMP Expert Review Protocol as a potential good model for the CBP Partnership to consider in establishing procedures related to the review of estimates derived using the Panel's recommended methodology. The Panel also encourages the CBP Partnership to incorporate opportunities for stakeholder involvement and input during these procedure-related determinations. The Panel added text in the report indicating the above.	Yes

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15	Default Reduction Effectiveness Estimate	CBC (comment #5) - Given that maintenance and harvest methods for off-bottom private oyster aquaculture differ significantly from on-bottom private oyster aquaculture, the report should include an explanation of the Expert Panel's consideration of those differences to provide the reader with a better understanding of how a common reduction effectiveness value is appropriate.	The Panel did consider different culture methods when developing the oyster shell height to tissue dry weight regression equations and selecting the 0.5 quantile regression equation used to determine the default reduction effectiveness estimates. This evaluation is discussed in Section 7.1.1 and additional details are presented in Appendix D. Also, see Table 7d. The Panel added clarification language in the report to highlight that the diploid regression equation captures any variability from these different methods because it was derived from both off and on-bottom data representing various culture methods. Concerning the triploid dataset, the Panel is not concerned that it only included one culture method (i.e., near bottom in cages) given that triploid oysters are typically grown in gear of some sort. The Panel would also like to point out that the default reduction effectiveness estimates are based on oyster biology and are applied once the oysters are removed (harvested); therefore, maintenance wouldn't affect the calculations.	Yes
16	Default Reduction Effectiveness Estimate	OCVA (in reference to Table 7.i and 7.j) - Too many oyster size classes and values for program; suggest having 3 sizes: cocktail, regular, and jumbo with associated values.	The data available allowed the Panel to recommend estimates for these five size class categories; however, it was not the Panel's intent that a practice must report in all five. Instead they would only report in the size classes that is relevant to their practice. The Panel included text in the report to indicate this. Also, the Panel avoided using terms, such as cocktail, regular, and jumbo in their recommendations because they found these terms are not consistent and could be attributed to different sizes.	Yes
17	Site-Specific Reduction Effectiveness Estimate	CBC (comment #7) - The Expert Panel should provide guidance on the appropriate expertise necessary to provide adequate review of site-specific estimates of nitrogen and phosphorus reduction effectiveness as recommended on page 60.	The Panel re-evaluated this language and decided that it would be more appropriate for these procedures to be sorted out by the Chesapeake Bay Partnership. The Panel found the re-evaluation procedures of existing estimates described in the CBP Partnership BMP Expert Review Protocol as a potential good model for the CBP Partnership to consider in establishing procedures related to the review and approval of site-specific estimates. The Panel also encourages the CBP Partnership to incorporate opportunities for stakeholder involvement and input during these procedure-related determinations. The Panel added text in the report indicating the above.	Yes
18	Practice - Substrate Addition	<p>CBC (comment #6) - The Expert Panel should provide clarification on how much substrate is sufficient to establish an "on-bottom private oyster aquaculture using substrate addition" practice and so that the practice will enhance the production of new oysters.</p> <p>CBF - Supportive of Panel's recommendation to consider on-bottom aquaculture using substrate addition as a BMP, but strongly recommends that the expert panel further define on-bottom private oyster aquaculture using substrate addition by developing guidelines for the amount of shell placement that would be required to constitute a BMP. Without such guidelines, potentially thousands of acres of leased bottom with minimal substrate additions could be considered as a creditable BMP. Developing such shell planting guidelines would be similar to guidelines the Chesapeake Bay Program, federal, and state conservation programs use for BMPs such as buffer plantings and reforestation projects (e.g., number of trees planted or existing per acre).</p>	<p>The Panel agreed that a baseline guideline on the amount of substrate would not be appropriate because substrate requirements would vary greatly based on the site characteristics (e.g., type and existing condition of the bottom), type of substrate used (e.g., shell, granite, cement, etc.), and requirements to maintain the site. The Panel is of the opinion that this issue is more related to implementation and should be sorted out when the jurisdiction, in coordination with the CBP Partnership, develops implementation and verification procedures for this practice. However, the Panel agreed that requirements related to substrate addition is integral to this practice operating as a BMP and should be determined before allowing application of the reduction effectiveness credit. It is of the Panel's understanding, that some jurisdictions may already have substrate addition-related requirements associated with this practice (e.g., Maryland's oyster aquaculture regulations includes requirements related to substrate). To assist with developing substrate requirements, the following guidance may be of use, in addition to reviewing existing regulations:</p> <ul style="list-style-type: none"> • USDA Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP) guidance on oyster bed restoration and management (USDA NRCS Factsheet). • Sea Grant, "Stabilizing Oyster Ground" (http://www.mdsg.umd.edu/topics/oysters/oyster-aquaculture-and-restoration) <p>The above should not be viewed as a comprehensive list, but as a starting point to assist with developing substrate addition requirements. The Panel also agreed that requirements will likely need to be evaluated on a case-by-case basis because of the factors described above. The Panel added this text in the report in Section 9.0, Recommended Application and Verification Guidelines.</p>	Yes

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19	Movement of Oysters	<p>OCVA (in reference to Section 9.1) - The whole purpose of the N/P program is to provide real nutrient reductions in each watershed and accelerate oysters over the baseline supply. The Program should be modeled so as to encourage watermen and aquaculture farmers to invest in each watershed area and areas within each watershed.</p> <p>-Relay of oysters for taste is NOT a part of the protocol</p> <p>-Oysters (not initial oyster seeds) that are removed from their primary watershed to another watershed forfeit their credit, unless harvested and have a special permit for relay / taste (ex. sale to another watermen who has a client that needs more salinity) and those oysters shall only be counted for primary watershed credit and not be counted again for credit in another watershed.</p>	<p>The Panel felt it was important to include recommended guidelines on how to apply the reduction effectiveness in situations where the oysters are moved from one location to another in a scientifically defensible manner because this does occur. Since the Panel's charge is to determine the reduction effectiveness of oyster practices, the Panel felt it was appropriate to provide these guidelines to ensure the reduction effectiveness is applied correctly in this situation. In regards to the decision on whether the movement of oysters will be allowed for crediting purposes, this decision would ultimately be made by the Chesapeake Bay Partnership as they develop implementation and policy procedures and shouldn't affect the approval of this report.</p> <p>While discussing this comment, the Panel did re-evaluate their recommendation and decided that partitioning the credit would never be necessary because oysters are either moved when they are less than 2 inches and therefore the entire credit would be applied to the final grow-out location or they are moved for only a short period of time to the final grow-out location and therefore, the entire credit would go to the initial grow-out location. The Panel included explanations for this in Section 9.1.</p>	Yes
20	Application and Verification Guidelines	<p>OCVA - If you are going to give some type of credit for accelerating diploid oysters from the hatcheries, but discourage giving credit from "wild" oysters that should be encouraged to stay in the waters, then you need to create the mechanism that will be transparent, validated and enforceable.</p>	<p>The Panel's charge was to identify and define oyster practices, including aquaculture and restoration activities, in Chesapeake Bay for BMP consideration and to evaluate and reach consensus on the nutrient/sediment reduction effectiveness estimates of these practices based on existing science using the Panel's recommended nutrient and sediment reduction effectiveness determination decision framework and following the CBP Partnership's BMP review protocol. Given that oyster practices in Chesapeake Bay use diploid oysters (wild and hatchery-produced) the Panel felt it was appropriate to review the science and provide recommendations on the reduction effectiveness of both culture types. The diploid default estimates were derived from a compiled dataset that included both wild and hatchery-produced oysters and therefore can be used for both culture types (i.e., the shell height to tissue dry weight equations capture biomass variability associated with both these culture types). The Panel realized that this was not included in the report and therefore added text that explains this in Section 7.1.1.2 and Appendix D.</p> <p>In regards to which culture type should be encouraged or discouraged, this would ultimately be a decision by the Chesapeake Bay Partnership as they develop implementation and policy procedures and shouldn't affect the approval of this report because it does not affect the Panel's recommendations concerning the reduction effectiveness. However, the Panel encourages the decision-makers involved in developing these procedures to incorporate opportunities for stakeholder involvement and input.</p>	Yes

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21	Verification and Reporting Guidelines	<p>OCVA (in reference to Section 9.0 and 9.2) - Policy and procedures should NOT use boxes and bushels or general acreage as the conversion/ counting mechanism for harvesting reports. Oysters should be counted and not estimated (ex. using bushels or general acreage) for credit.</p> <p>OCVA's ISNRP system with cage oysters uses numbered cages with oyster counter equipment (soon to use Oyster grader sorter equipment for documentation for each watershed) for validating aggregate oyster counts for credit and opportunity for other study/data.</p> <p>Each farm harvesting oysters to be certified for credits records the number of actual oysters by size daily with the appropriate empirical values associated with the oyster and transfers to an approved "dashboard" reporting system (like the one developed by OCVA's ISNRP). OCVA dashboard technology developed for ISNRP provides transparent data and validation for credits by numbered cages and harvested oysters by daily size in aggregate for each watermen/ watershed / each yearly cycle and merges with Trace Registry for traceability and Farm to Table marketing.</p>	<p>The Panel acknowledges that individuals would be the preferred reporting unit and added language in the report indicating this. However, the Panel also recognizes that harvest reporting in boxes and bushels is occurring now with these practices. Therefore, the application and verification guidelines were aimed to account for these different reporting unit scenarios to offer flexibility to the reporting jurisdictions (i.e., States) in verifying the reduction effectiveness in a scientifically-defensible manner. The Panel felt these guidelines are appropriate since the purpose of these Expert Panels is to increase the understanding of the nutrient and sediment reductions associated with the practices.</p> <p>These Expert Panels are meant to focus on the evaluation of the reduction effectiveness. Ultimately, it will be the reporting jurisdictions and the CBP Partnership that will decide on which reporting unit to implement and which technologies to support during the development of implementation and verification procedures (such decisions are outside the purview of this Panel). These decisions do not affect the Panel's recommendations concerning the reduction effectiveness and shouldn't affect the approval of this report. However, the Panel encourages the decision-makers to incorporate opportunities for stakeholder involvement and input when making these decisions.</p>	Yes
22	Reporting	<p>CBC (comment #4) - The Expert Panel should discourage crediting practices based on incomplete reporting. In several instances, the report provides guidance for when information on shell length, location, etc. is not provided in reporting on a particular practice (Section 9 and Appendix F). Thorough and complete practice reporting should be emphasized.</p>	<p>The Panel included additional recommendations in this section, including which reporting factors should be required. The Panel still supports the recommended method presented in the report to deal with missing ploidy or verification measurements because the BMP implementer would only be allowed to receive the minimum reduction effectiveness. The remaining reporting components presented in Section 9.2 would need to be required to calculate and apply the reduction effectiveness. Ultimately, it will be the reporting jurisdiction and the CBP Partnership's decision on whether to allow missing ploidy and verification measurements. Allowing this will not affect the minimum reduction effectiveness that would be applied. The Panel added text in the report to explain this more clearly in Section 9.2.</p>	Yes
23	Reporting	<p>CBC (comment #2) - Please clarify in the report that reduction credits for the three aquaculture practices are applicable for only the year during which the live oysters are harvested. This recommendation is found in Appendix F but not stated in the body of the report.</p>	<p>The Panel agrees that the reduction effectiveness is based on the annual reporting timeframe during which the live oysters are harvested and added clarification text in the report.</p>	Yes
24	Reporting	<p>OCVA (in reference to Section 9.0 and 9.2) - The harvesting reports should "mirror" the certification reports turned into the State agency certifying the N/P credits; use harvesting reporting system that has the necessary data and can be seamlessly used by State agencies to validate the harvests and certify nutrient credits for EPA.</p>	<p>The Panel's recommended reporting components are based on what is needed to calculate and validate the recommended reduction effectiveness for the nitrogen and phosphorus assimilation in oyster tissue protocols. Some of these components may be missing from existing reporting structures. The Panel agrees that these components should be are built into existing reports where possible. This is also why the Panel provided recommended application and verification guidelines for different reporting unit scenarios. The Panel added clarification language in the report.</p>	Yes

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25	Reporting	<p>SELC et al. - Recommend adding a reporting field to the list on p. 18 to document where the larval/seed/young oysters came from (e.g., hatchery name, wild recruitment, etc.). This would serve to verify that the oysters began under the size limit stated (<2.0") in the recommendations; and it would create a checks and balance process, provide a way for states to assess hatchery bottlenecks, and track performance of varying oyster stocks, etc.</p>	<p>The Panel did not feel that the report form needed to include a field indicating where the oysters came from since it is not needed to calculate the reduction effectiveness. However, they did feel it would be appropriate to include in the recommended reporting guidelines (Section 9.2) suggestions on how the initial oyster planting size could be verified. The Panel added the following suggestions:</p> <ul style="list-style-type: none"> - For hatchery-produced oysters from off-bottom and on-bottom oyster practices, receipts could be used to demonstrate that larvae or spat were purchased by the practice (these life stages are < 2.0 inches). - For wild oysters harvested under the substrate addition category, initial site assessments of current oyster populations during the bottom leasing process could be used to establish if there were oysters greater than two inches present. These oysters could then be estimated and subtracted from the total harvested oyster count of the first BMP reporting year. <p>Ultimately, reporting requirements will be sorted out when the jurisdictions and the CBP Partnership develop implementation and verification procedures for these practices.</p>	Yes
26	Unintended Consequences	<p>CBC (comment #8) - The report does not provide sufficient detail on how to manage unintended consequences of over-enrichment of sediments from off-bottom private oyster aquaculture (Sections 10.0 and 12.0). Guidance regarding how to monitor sediment conditions, how often to monitor and whether monitoring should be conducted by a state or the bmp implementer should be included.</p> <p>SELC et al. (in reference to pg. 72 of report) - Growers are unlikely to be taking cores or identifying "control areas" as a normal course of their business unless required to do so in a mandatory protocol recommended by the Panel and implemented or required by the jurisdictions; recommend that the Panel include specific protocols for monitoring for and managing these potential consequences, including requirements for control areas to measure against. A clear list of potential management measures to mitigate the identified unintended consequences would also be instructive.</p>	<p>The Panel's intent was to provide options that could be evaluated by the jurisdiction/CBP Partnership. It is the Panel's understanding that detailed procedures are addressed by the jurisdiction/CBP Partnership. The Panel revised this text in the Decision Framework (Section 4.5) and the unintended consequences section (Section 10.0) so that it is clear that these are options that could be evaluated by the jurisdiction/CBP Partnership. The Panel also included some other options that could be evaluated by the jurisdiction/CBP Partnership. The decision concerning whether the monitoring is conducted by the State or the BMP implementer is outside the purview of this Panel, and would likely be made by the jurisdiction/CBP Partnership during the development of implementation procedures.</p> <p>It is important to note that the CBP Partnership BMP Review Protocol only requires the Panel to identify any significant ancillary benefits or unintended consequences beyond impacts on nitrogen, phosphorus and sediment loads during their review and not to develop detailed protocols. The Panel also built into their Decision Framework an additional step to identify options that they are aware of that could be used to prevent the occurrence/reduce effects from potential negative unintended consequences. The Panel's intent was that these options would be considered by the CBP Partnership. Details concerning unintended consequences are typically pursued as an appendix to the report by the GIT as a concurrent effort with the Panel or after the Panel report is final. The Panel's expectation would be that the CBP Partnership would consider options identified by the Panel as they develop implementation and verification procedures. The CBP Partnership BMP Expert Review Protocol clearly states that, "...any appendix on ancillary benefits or unintended consequences does not change the definitions and loading or effectiveness estimates for nutrient and sediment reducing technologies and practices in the final Panel report." It also states that, "State and local governments may then consider both the definitions and effectiveness estimates from the main panel report, as well as ancillary benefits or unintended consequences from the appendix, when deciding upon which technologies and practices they intend to select, fund, and implement within their respective jurisdictions."</p>	Yes

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27	Unintended Consequences	SELCO et al. - To the extent possible, we encourage the panel to characterize and quantify the unintended consequences of aquaculture on hydrodynamics within this current report. Floating and bottom cages have the potential to reduce wave energy, possibly causing sediment accretion beneath and shoreward of cages. Additionally, large arrays of cages could potentially impact flow enough to reduce tidal flushing of creeks and embayments. The efficiency numbers provided are so small that they may either act as disincentives for growers and jurisdictions to pursue nutrient removal credit or they may encourage very large-scale operations with the potential to actually adversely impact water and sediment flow within systems.	<p>The Panel acknowledged that changes in hydrodynamics could be detrimental and added this as an unintended consequence in Section 10.0. Detailed procedures to address potential unintended consequences would be handled through the CBP Partnership (see response to #26 above).</p> <p>While the commenter did not provide any studies for the Panel to evaluate, the Panel did discuss this topic and added their thoughts in the report under Section 10.0. The Panel also knew of research where positive consequences were observed related to hydrodynamics and shoreline erosion prevention. Overall, the Panel felt that potential negative consequences associated with hydrodynamics could be controlled and identified options for consideration by the jurisdictions/CBP Partnership.</p>	Yes
28	Future Research	SELCO et al. - One of the areas of suggested future research is additional study of N & P content of triploid oyster tissue. In addition, the Panel should consider as part of this research a seasonal analysis of the difference in N & P between triploid and diploid oysters. Given the drastic physiological changes that diploid oysters undergo during spawning season, it would be informative to know if this impacts N & P content. The question being asked – is the BMP value of a diploid oyster variable depending on time of year?	The current literature review in this report captured the spring, summer, and fall seasons for diploid % N and % P contents in tissue. These values were well constrained (low variability in comparison to converting shell length to biomass) suggesting a likely low seasonal effect, if any. It is not expected that % N and % P contents of triploid oysters will be affected by the season given that triploid oysters do not spawn. Since there is currently no data on this, a study may be useful; however, for BMP reduction effectiveness evaluation, the Panel feels that oyster age/size and site-specific differences should be considered first. The Panel added text to this section of the report to reflect this priority setting.	Yes
29	Future Research	SELCO et al. (in reference to pg. 75 of report) - Measuring and reporting the amount of bio-fouling on gear is impractical for most aquaculture operators, and would seem to be an unreasonable expectation for verification practices. This is in addition to the fact that many operators currently clean their gear in-situ and it would be nearly impossible to remove it from the gear in such a way that it does not go back into the Bay. While findings on the sequestration impact bio-fouling organisms have on N&P would be interesting, it is less clear how those findings could be translated into policy.	The Panel feels that this should remain in the future research section because it's related to potential N and P removal. It is difficult to discern whether this is a viable option without future research on this topic.	No

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30	Model Application	CBC (comment #3) - Please clarify in the report that reduction credits for the three aquaculture practices are to be applied to the shoreline segment nearest to the practice location. This recommendation is found in Appendix F and briefly mentioned on page 18. We believe that a fuller explanation of this recommendation should be provided in the main body of the report. We also recommend that the partnership would benefit from the Expert Panel's guidance on the extent of local water quality influenced by an oyster aquaculture practice.	The technical appendix is written by the CBP Modeling Team, in coordination with the Watershed Technical Workgroup and therefore, a section in the Panel's main report is not typical since this information is not from the Panel. The Panel shared this comment with the Panel's Watershed Technical Workgroup representative and they added additional clarification text in Appendix F. The extent of local water quality influenced by an aquaculture practice is ultimately determined from model runs that CBP uses to inform whether the TMDL goals are being met after approval of the reduction effectiveness estimates.	Yes

Table 2. Summary of policy and implementation-related comments on the Panel's first incremental report and Panel's responses. While these comments are outside the purview of the Panel's charge, the Panel still felt it was important to include them as a record for the CBP Partnership to discuss as they move forward in developing implementation and verification procedures for oyster practices, upon approval of the Panel's recommended reduction effectiveness estimates.

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31	Endorsed Oyster Practices	OCVA (in reference to Table 1A, page 11, on-bottom private oyster aquaculture using hatchery-produced oysters) - Consider stating "Triploids only" model so as to promote purchase and use of the hatchery triploid larvae (for spat on shell) & cultch seed" for commodity use while preserving, allocating and directing the hatchery "diploid" larvae and cultch seed for restoration use. This allows for smart allocation of finite hatchery supply for maximum benefit of keeping diploid oysters in the waters for seasonal reproduction (for every year they can stay in the waters they can produce more natural larvae) Eliminates any cross-counting of wild oysters with hatchery diploids as the diploid hatchery oysters have to stay in the waters longer to achieve harvest size, therefore subject to natural strike on their shell which has an unintended consequence of removing wild oysters that could have reproduction opportunities Eliminates any conflict of mixed use within private lease grounds for various methods, some of which could conflict with intended Category approvals. OCVA (in reference to Table 5B, page 32, on bottom oyster aquaculture practice using substrate addition and definition). This does not promote the acceleration of diploid hatchery use for restoration/ sanctuary. It does not promote the use of Triploid for the intended use of commodity consumption. Wild oysters at this time should not receive credit for being taken out of the water. We are still less than 1% of the wild oyster supply left in the Bay. The substrate addition should not promote giving a credit to remove diploid or wild oysters from the waters. The model should encourage leaving wild oysters in the water. And if they die to disease, at least they had more time to reproduce. And their shells remain in the waters for recruitment and other benefits.	The Panel's charge was to identify and define oyster practices, including aquaculture and restoration activities, in Chesapeake Bay for BMP consideration and to evaluate and reach consensus on the nutrient/sediment reduction effectiveness estimates of these practices based on existing science using the Panel's recommended nutrient and sediment reduction effectiveness determination decision framework and following the CBP Partnership's BMP Review Protocol. The Panel's recommendation on whether an oyster practice should undergo BMP consideration was based on it including an enhancement activity that could result in the overall production of new oysters that could contribute to an overall reduction in nitrogen and phosphorus. Following this criteria, the Panel felt that on bottom private oyster aquaculture using substrate addition qualified because the addition of substrate provides wild oysters a better chance of survival. Given that oyster practices in Chesapeake Bay use diploid oysters (wild and hatchery-produced) the Panel felt it was appropriate to review the science and provide recommendations on the reduction effectiveness of these oysters. The points raised in this comment is more suited for a policy discussion and does not affect the Panel's recommendations on the reduction effectiveness of this practice. How the recommendations are implemented is ultimately decided by the jurisdictions and CPB Partnership. However, the Panel encourages the decision-makers involved in this process to incorporate opportunities for stakeholder involvement and input.	Not Applicable

#	Comment Focus	Comment Summarized	Oyster BMP Expert Panel Response to Comments	Edit Made in Report
32	General Policy	Dr. Land - It is a waste of time and money to pursue "sop up" strategies like credits for N & P for seafood, which will result in no measurable improvement in water quality; such a strategy merely delays necessary action to agriculture to fertilize crops more efficiently and to force society to choose between the cheapest possible food and improvement in water quality.	The points raised in these comments are more suited for a policy discussion and does not affect the Panel's recommendations on the reduction effectiveness. As written in the CBP Partnership BMP Expert Review Protocol, "...the purpose of the Panels is not to incentivize or promote the use of any BMP; it is to increase the understanding of the nutrient and sediment reductions associated with these practices." Which BMPs to implement is ultimately decided by the jurisdiction/CBP Partnership. However, the Panel encourages the decision-makers involved in this process to incorporate opportunities for stakeholder involvement and input.	Not Applicable
33	General Policy	SELC et al. - Growing oysters is not a panacea for localities hoping for an easy and cost effective means for reducing pollution through their WIPs. While any removal is preferable to no removal, what is not accounted for in these reduction effectiveness numbers is the cost necessary to implement, staff, report, and verify harvests and practices to ensure accurate and timely monitoring. The staffing and reporting requirements (within already staff- and budget-constrained agencies) that would be necessary to adequately support a functional program may greatly outweigh the nutrient removal value. Fisheries management staff in both Maryland and Virginia already handle extreme workloads, and it seems unlikely that the jurisdictions will be able to quickly provide the staff and budgets that would be required for the monitoring, reporting, and verification aspects. Moreover, these investments do not seem warranted given the exceedingly small, potential nutrient removal benefits that oysters may provide. Given these challenges, now is not the time for jurisdictions to move away from on-land mitigation measures and become sidetracked by less effective in-water approaches.		
34	General Policy	SELC et al. - Oyster restoration and aquaculture efforts confront significant challenges of keeping these vulnerable animals alive in the face of predation, disease, poor water quality, harmful algal blooms, fertilizer and other pollutant-contaminated runoff, and poaching. If an on-land BMP faced as many challenges to its very existence, managers would be disinclined to consider it.		
35	Policy - Trading	OCVA - There is a fundamental observation where the current model is considering counting oysters grown for commodity consumption purposes be given "credits" after harvesting and placed on a registry for "sale" or "secondary trading platform". Even though this draft agreed not to address policy for the TMDL, its framework will have unintended consequences. OCVA's DEQ authorized pilot program in 2015, called ISNRP (In Situ Nutrient Remediation Program), developed a strategic model that is built on "additionality to baseline" where N/P credits are directly contracted with entities first and foremost to provide additional triploid oyster larvae and cultch seed purchases from hatcheries to meet its contract obligations. This creates a real "annual" accelerated supply of oysters, more sustainable jobs, more real nutrient remediation, more shell for commodity and restoration use, more revenue for the Commonwealth and Maryland, more tax benefit opportunities to fund environmental programs without relying on the taxpayer to continually take on the additional debt. Secondary to the contract are opportunities to provide the meat for a known demand to increase high valued lean protein for world markets.	The charge of the Panel was to evaluate the science and recommend the reduction effectiveness of oyster practices. The Panel's Decision Framework was developed with this as its goal. How the recommendations are implemented in the TMDL and trading policies is ultimately decided by the jurisdictions, in coordination with the CBP Partnership. However, the Panel encourages the decision-makers involved in this process to incorporate opportunities for stakeholder involvement and input.	Not Applicable

#	Comment Focus	Comment Summarized	Oyster BMP Expert Panel Response to Comments	Edit Made in Report
36	General Implementation	SELC et al. - This report confirms that the use of aquaculture reared oysters to remove nitrogen (N) and phosphorus (P) would be only minimally effective. Using the Panel's numbers for diploid oyster N removal rates, Virginia's 2015 aquaculture harvest numbers, and 2015 N loads for Virginia, all 40 million oysters harvested in Virginia last year sequestered about 7,000 lbs. of N, or approximately 0.012% of the total loads.	The Panel would like to point out that this is an incremental report and that they are still in the process of quantifying the nitrogen and phosphorus reduction effectiveness of additional protocols associated with these oyster practices. However, with that said, the Panel was informed by CBP representatives on the Panel that decisions pertaining to which BMPs to select, fund, and implement is the responsibility of the jurisdictions and the CBP Partnership as they develop watershed implementation plans, which includes public comment and CBP/EPA oversight opportunities.	Not Applicable
37	Implementation - Process	SELC et al. - We further understand that following approval, the aquaculture specific reduction effectiveness numbers could be applied toward jurisdictional Watershed Implement Plans (WIPs). We believe that significant work and preparation is still needed at the state level, working with the CBP, before this can occur in order to adequately identify, staff, and fund the mandatory reporting requirements and verification steps necessary to ensure accurate monitoring.	This is also the understanding of the Panel. It is also the Panel's understanding that the jurisdictions, in coordination with the CBP Partnership, will develop implementation and verification procedures for any approved recommended estimates from the Panel.	Not Applicable
38	Implementation - Reporting	OCVA (in reference to Section 9.2) - Use calendar year for annual cycle of credit generation. Remember, N/P credits are annual and not yet perpetual credits (which may become approved with reefs/natural or artificial).	This is ultimately an implementation decision that would be made by the reporting jurisdiction and the CBP Partnership.	Not Applicable
39	Policy/Implementation - Verification and Reporting Guidelines	SELC et al. - Appreciate the great deal of thought that has been put into both the reporting and verification guidelines associated with this particular BMP. On page 17 and in Section 9.2, recommended reporting and verification practices are listed; however, the recommendations did not include who should be responsible for verification procedures. Each overseeing jurisdiction would have to designate and train staff to conduct these measures. The detail of "who" should verify the reporting requirements should be referred to the Policy group to provide criteria for independent, non-conflicted trained professionals.	It is the Panel's understanding that implementation and verification procedures are developed by the jurisdictions and CBP Partnership after approval of the Panel's recommended reduction effectiveness estimates. The Panel encourages the CBP Partnership to incorporate opportunities for stakeholder involvement and input during these procedure-related determinations.	Not Applicable
40	Policy/Implementation - Verification Guidelines	CBC (comment #9) - In developing the verification guidelines, did the Expert Panel discuss the applicability of third-party, independent verifiers? Once oysters are harvested and sold, what mechanisms are in place to confirm practice reporting figures?		
41	Policy/Implementation - Verification Guidelines	CBF - Current verification guidelines should be supplemented to include harvest reporting to the state and or local credit verification agency at the same time harvest reports are made to the respective fisheries management agencies; reasons, 1) state fisheries management agencies cannot verify nutrient credits as these do not fall within their regulatory authority, 2) lag time between when harvests are reported the fisheries management agency and when those data are actually available to the public which could delay the reporting of credits, and 3) harvest reports could contain a mix of oysters for nutrient credit generation and those simply harvested for regular sales (separating would be a burden on fisheries management agencies).		

#	Comment Focus	Comment Summarized	Oyster BMP Expert Panel Response to Comments	Edit Made in Report
42	Consideration of Economic Impacts	OCVA - The Bay Act is an extension of the public trust doctrine and, like many other environmental protection programs, allows the Commonwealth to manage certain aspects of the environment for the benefit of all Virginians. The first sentence of the Bay Act serves as a theme for the entire statute: "Healthy state and local economies and a healthy Chesapeake Bay are integrally related; balanced economic development and water quality protection are not mutually exclusive." Therefore, while developing the framework and models using an "adaptive management process", it is essential for this panel, CBP and the CBP Partnership to recognize; understand and incorporate the timely economic impacts that can foster resources from sustainable public-private "partnership" programs and projects to meet its desired goals. This results in lowering the financial burdens on Federal and State budgets as part of reducing our national debt, rebuilding a balanced sustainable fisheries and protecting our natural resources for future generations.	The evaluation of economic impacts is outside the purview of the Panel's charge. The Panel shared this comment with the CBP to consider.	Not Applicable

Table 3. Summary of comments that will be addressed in a future report as they pertain to oyster practice-reduction effectiveness protocol combinations that are not presented in the Panel's first incremental report.

#	Comment Focus	Comment Summarized	Oyster BMP Expert Panel Response to Comments	Edit Made in Report
43	Restoration Oyster Practice	OCVA - Once sequestration and other values are modeled and "reefs" can be shown to have a mean quantitative value that can be monitored, then they can receive a credit value, without having to harvest. There is a difference in annual and perpetual credits that needs to be considered when developing these models.	The Panel will address these comments in a future report.	Not Applicable to first incremental report
44	Shell Protocols	SELC et al. - For the second incremental report, when shell N & P assimilation is addressed, please consider that the shells of cage-grown triploid oysters (not tumbled) tend to be thinner. This may be due to less stress and quicker growth. Growing and handling practices greatly influence shell thickness and should be taken into account.		

Acronyms

CBF - Chesapeake Bay Foundation SELC et al. - Southern Environmental Law Center and others Dr. Land - Dr. Lynton S. Land
CBC - Chesapeake Bay Commission OCVA - Oyster Company of Virginia CBP - Chesapeake Bay Program