Oyster Futures

Stakeholder Workgroup

MEETING VIII SUMMARY REPORT

Sunday, February 4, 2018
Horn Point Laboratory, University of Maryland
Cambridge Maryland

Summarized by:

FCRC CONSENSUS CENTER

"Facilitating Consensus Solutions, Supporting Collaborative Action."

THE FLORIDA STATE UNIVERSITY

OYSTER FUTURES STAKEHOLDER WORKGROUP
MEETING VIII SUMMARY REPORT

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OYSTER FUTURES WORKGROUP MEETING VIII
EXECUTIVE SUMMARY
FEBRUARY 4, 2018

On behalf of the Oyster Futures Research Team, Elizabeth North welcomed the Workgroup Members to the eighth meeting of the Oyster Futures Workgroup and introduced the facilitation team of Jeff Blair and Bob Jones with the FCRC Consensus Center at Florida State University. The facilitators reviewed the agenda and the Workgroup approved the agenda and accepted the January 2018 Work Group meeting summary without changes. The facilitator reminded the members of the workgroup guidelines that were adopted at the organizational meeting in February 2016 which call for the development of a package of Workgroup consensus recommendations to DNR informed by the model which has been collaboratively developed by the Workgroup and the Oyster Futures project research team. As in past meetings, members also completed a short Social Science Study survey at the outset and on Sunday afternoon after the review and rating of the modeling options.

Rasika Gawde presented the Water Quality model measures and results and outlined the components of the model including, temperature, salinity, oyster habitats, water flow and oyster filtration. The water quality model estimates how algae grows in the presence of nutrients, how algal growth, death, and decomposition affects oxygen, and how oyster abundance affects how deep light can reach (water clarity). The model links nutrients on land with what the oysters do in the water. It shows that the number of oysters in the water affects water clarity.

Mike Wilberg noted there were no changes in the basic model from the January review. He made general comments about the model: improvements from management or restoration options will take 5-15 years to materialize; the options with completing restoration maximize abundance; adding shell every year maximizes habitat; keeping a portion of sanctuaries open to harvest maximizes harvest. The model suggests that spat on shell is better than shell planting. In general, the model results appear to overestimate oysters and habitat in Tred Avon and underestimate oysters and habitat in Broad Creek.

Dr. Wilberg reviewed each option highlighting its impact on oyster abundance, habitat and harvest. These included options on enforcement, rotational harvest, habitat modification/restoration, stocking, and combinations of these options. Following a general overview, review and discussion of the modeling results, the Workgroup rated each option based on its acceptability and support, discussed concerns and offered suggestions to the modelers for new or combined options. Each of the modeled options was reviewed in terms of its performance on abundance, habitat and harvest and rated for acceptability by the Workgroup. The results of the ratings are featured below.

Workgroup Average Support Ratings Color Key
0-59% Rating
60-74% Rating
75-100%, Rating

STATUS QUO AS AN OPTION

- **Option 1: Status quo (SQ) [5% non-compliance with size limit, 1% Sanctuary harvest, and bushel price of $47.22].**

Support Rating: 0% (4-0s, 3-0s, 2-11s,1-4s)

ENFORCEMENT OPTIONS

- **Option 2: Status quo with complete compliance with size, 1% Sanctuary harvest.** *(17th Abundance, 23rd Habitat, 22nd Harvest)*

Support Rating: 100% (4-7s, 3-8s, 2-0s,1-0s)

- **Option #3: Full compliance (no trips with more than 5%) with the current law ~~size limit~~ and sanctuary regulations.** *(9th Abundance, 21sd Habitat, 23rd Harvest)*

Support Rating: 100% (4-6s, 3-9s, 2-0s,1-0s)

ROTATIONAL HARVEST OPTIONS

- **Option 9a: 2-yr rotation in smaller areas (low catch bars, with annual cost of spat on shell ~$600K/year) – spat on shell. [Previous Option 11]** *(18th Abundance, 19th Habitat, 21st Harvest)*

Support Rating: 40% (4-0s, 3-5s, 2-9s,1-1)

- **Option 9b: 2-yr rotation in smaller areas (low catch bars, with annual cost of spat on shell ~$2M/year) – spat on shell. [Previous Option 9]**

(12th Abundance, Habitat 9th, Harvest 16th)

Support Rating: 7% (4-0s, 3-1s, 2-13s,1-1s)

Comments before/after Rating

- **Option 13a: 2-yr hang tong rotation in Middle Chop sanctuary (cost ~$600K/year) – spat on shell.** *(11th Abundance, 15th Habitat,11th d Harvest)*

Support Rating: 73% (4-2s, 3-9s, 2-4s,1-0s)

- **Option 13b: 2-yr hand tong rotation in Middle Chop sanctuary (cost ~$2M/year) 100 acres per year –spat on shell. [New]** *(6th Abundance, 7th Habitat,4th Harvest)*

Support Rating: 70% (4-2s, 3-8s, 2-5s,1-0s)

- **Option 15a: 3-yr hand tong rotation in Little Choptank tributaries – spat on shell (cost ~$600K/year). [New]** *(21st Abundance, 18th Habitat,15th Harvest)*

Support Rating: 60% (4-1s, 3-8s, 2-6s,1-0s)

- **Option 15b: 3-yr hand tong rotation in Little Choptank tributaries – spat on shell (cost ~$2M/year). [Updated: previous Option 15a]** *(19th Abundance, 11th Habitat,14th Harvest)*

Support Rating: 53% (4-0s, 3-8s, 2-7s,1-0s)

- **Option 16a: 2-yr hand tong rotation in Little Choptank tributaries – spat on shell (cost ~$600K/year).** *New Option for review at the March meeting.*
- **Option 16b: 2-yr hand tong rotation in Little Choptank tributaries – spat on shell (cost ~$2M/year). [Updated: previous Option 15a]** *New Option for review at the March meeting.*

ROTATIONAL OPTION COMBINATIONS

- **Option 9a+13a: 2-yr rotation in smaller areas; 2-yr hand tong rotation in Middle Choptank sanctuary; (cost ~$1.2M/year) – spat on shell. [New]**

Support Rating: 60% (4-0s, 3-9s, 2-6s,1-0s)

- **Option 9b+13b: 2-yr rotation in smaller areas; 2-yr hand tong rotation with Middle Choptank sanctuary; (cost ~$4M/year) – spat on shell. [New]**

Support Rating: 40% (4-0s, 3-6s, 2-9s,1-0)

HABITAT MODIFICATION/RESTORATION OPTIONS

- **Option 17a: Add shell to each bar every year in Broad Creek, hand tong (cost ~$600K/year). [Previous 17a2]** *(20th Abundance,3rd Habitat,19th Harvest)*

Support Rating: 80% (4-1s, 3-11s, 2-3s,1-0s)

- **Option 17b: Add shell to each bar every year in Broad Creek, hand tong (cost ~$2M/year). [Previous 17a]** *(14th Abundance, 1st Habitat,18th Harvest)*

Support Rating: 67% (4-1s, 3-9s, 2-5s,1-0s)

- **Option 18: Open tributaries in the Little Choptank River to hand tonging, and provide added shell (every 3 years) (cost ~$460K/year).** *(23rd Abundance, 16th Habitat,17th Harvest)*

Support Rating: 64% (4-0s, 3-9s, 2-5s,1-0s)

- **Option 18a: Open tributaries in the Little Choptank River to hand tonging, and provide added spat on shell (every 3 years) (cost ~$600K/year). [New]** *(22nd Abundance, 20th Habitat,12th Harvest)*

Support Rating: 71% (4-5s, 3-5s, 2-4s,1-0s)

- **Option 18b: Open tributaries in the Little Choptank River to hand tonging, and provide added spat on shell (every 3 years) (cost ~ $2M/year). [New]** *(15th Abundance, 10th Habitat, 7th Harvest)*

Support Rating: 64% (4-6s, 3-3s, 2-5s,1-0s)

- **Option 19: Complete Little Choptank and Tred Avon restoration (6" and 12" substrate per restoration plan.) [Updated: Previous 19 and 20 combined]** *(2nd Abundance, 6th Habitat,6th Harvest)*

Support Rating: 79% (4-6s, 3-5s, 2-3s,1-0s)

- **Option 20: Complete Little Choptank restoration. [New]** *(8th Abundance, 14th Habitat,13th Harvest)*

Support Rating: 0% (4-0s, 3-0s, 2-10s,1-4s)

- **Option 21: Complete Tred Avon restoration. [New]** *(10th Abundance, 13th Habitat,10th Harvest)*

Support Rating: 21% (4-3s, 3-0s, 2-10s,1-1s)

- **Option 23: Place reefballs (placed near/around the bridge, channel markers, etc.) in the Middle Choptank region (reef balls, 1 foot apart, 1 time, cost ~$2M private funding) not in conflict with fishing activities. Work with watermen for placement options.** [Note: this option was favored over the 3' spacing option] *(16th Abundance, 22nd Habitat,20th Harvest)*

Support Rating: 100% (4-3s, 3-11s, 2-0s,1-0s)

STOCKING

- **Option 26a: Add spat every year in the Middle Choptank, hand tong (cost ~$600K/year). [Previous 17b] (13, 17, 8)**

(13th Abundance, 17th Habitat,8th Harvest)

Support Rating: 93% (4-2s, 3-11s, 2-1s,1-0s)

- **Option 26b: Add spat every year in the Middle Choptank, hand tong (cost ~$2M/year). [Previous 26a] (7, 8, 1)** *(7th Abundance, 8th Habitat, 1st Harvest)*

Support Rating: 93% (4-1s, 3-12s, 2-1s,1-0s)

COMBINATION OPTIONS

- **Option 15b+19:** 3-yr rotation in Little Choptank tributaries with spat on shell ~$2M; Complete Little Choptank and Tred Avon restoration. *(3rh Abundance, 5th Habitat, 3rd Harvest)*

Support Rating: 64% (4-0s, 3-9s, 2-5s,1-0s)

- **Option 15b+19+3:** 3-yr rotation in Little Choptank tributaries with spat on shell ~$2M; Complete Little Choptank and Tred Avon restoration; full compliance with size and sanctuary regulations.*(1st Abundance, 2nd Habitat, 5th Harvest)*

Support Rating: 64% (4-0s, 3-9s, 2-5s,1-0s)

POLICY STATEMENTS

The Workgroup reviewed a set of policy statements as part of the vision of success themes that had been developed and received high consensus ratings of between 3.5 and 4.0 on a four-point consensus scale during the first two Workgroup meetings. These statements were not subject to modeling. The Workgroup agreed that draft recommendations should be developed by the Team for review and rating by the Workgroup at its final meeting in Mach on the following areas:

A. Address and provide funding for enforcement presence on the water (both in increasing numbers and quality through training) to address poaching and support strategies such as focusing on the buyer level. [Theme A—Average Rating: 4.0]
Unaninmous support for developing a recommendation.

B. Consider modifying regulations so a single bar is not divided between gear types or open and closed. [Theme A—Average Rating: 3.9]
Unaninmous support for developing a recommendation.

C. Conduct a stock assessment of the oyster resource/fishery with involvement of the stakeholders. [Theme A—Average Rating: 4.0]
Unaninmous support for developing a recommendation.

D. Review and revise DNR regulations and management goals in consultation with oyster resource stakeholders to ensure they are clear and enforceable and include a working feedback loop with the regulated public to refine the program and enhance compliance. [Theme A—Average Rating: 4.0]
Unaninmous support for developing a recommendation.

E. Establish and support a long-term shared vision of success for oyster resources among stakeholders that can be sustained, implemented and strengthened into the future. [Theme A—Average Rating: 4.0]
Unaninmous support for developing a recommendation.

F. Improve DNR's website making it more user friendly. [Theme A—Average Rating: 4.0]
Unaninmous support for developing a recommendation.

G. Prioritize Workgroup Recommendations to invest more funding in the management of oyster resources. [Theme A—Average Rating: 4.0]
Unaninmous support for developing a recommendation.

H. Address, correct and update DNR oyster resource mapping issues to inform watermen on the water and all stakeholders such as bottom mapping to better define oyster bars. [Theme A—Average Rating: 4.0]
Unaninmous support for developing a recommendation.

I. Perform an analysis to investigate. Consider limiting entry to oyster fishery to watermen making the majority of their living from commercial fishing. [Theme A—Average Rating: 3.9] Create a limited entry oyster fishery. [Theme A—Average Rating: 3.75]
Majority support for developing a draft recommendation for consideration in March.

J. Evaluate and consider changes/increases of oyster fishery related fees and taxes. [Theme A—Average Rating: 3.9]
Unaninmous support for developing a recommendation.

K. Conduct more and better research to inform regulations and better understand the efficiency of gear types and their impacts on the oyster resource [Theme B—Average Rating: 3.9]
Majority support for developing a recommendation.

L. Consider modifying regulations so a single bar is not divided between gear types or open and closed. [Theme A—Average Rating: 3.9]
Unaninmous support for developing a recommendation.

M. Focus on strategies for increasing the funding, use and reclamation of local shells from the Chesapeake Bay and from local watermen to supplement bars and increase the viability of the oyster resource. [Theme C—Average Rating: 4.0]
Unaninmous support for developing a recommendation.

N. Develop shell recycling recommendation with incentives through taxation. Provide incentives for the private sector to participate in shell recycling efforts.
Unaninmous support for developing a recommendation.

O. Continue to address and find solutions for oyster diseases. [Theme D—Average Rating: 4.0]
Unaninmous support for developing a recommendation.

P. Develop recommendation for oyster marketing strategies based on the following statements
Unaninmous support for developing recommendations.

- Develop better business plans for the industry that reflects trends for consumer interest in local products. [Theme C—Average Rating: 4.0]
- Review best practices and outcomes and adapt successful techniques from other places/regions. [Theme C—Average Rating: 4.0]
- Test strategies for marketing oysters by location and a shucked product. [Theme C—Average Rating: 3.8]
- More public funds into marketing strategies, celebrating heritage. These bring tax dollars into the state and they should be returning funds to support local oyster. E.g. Organize a tour on both sides of the bay. VA Oyster trail. Not just oysters but the fishery industry more generally. [Theme E—Average Rating: 4.0]
- Look for ways to use a strategy like True Blue the one used for crab use in restaurants, in the oyster fishery. [Theme E—Average Rating: 4.0]
- Providing incentives for businesses for shucking houses/capacity to address shell replenishment. [Theme E—Average Rating: 4.0]
- Consider the Working Waterfronts Program as good resource to reach out to. [Theme E—Average Rating: 4.0]

Q. Develop a recommendation(s) for education that incorporates the following statements:
Unaninmous support for developing a recommendation.

- Support education in fisheries science and management. [Education—Average Rating: 4.0]
- The Workgroup itself represents an educational initiative and a forum for communication among stakeholders. [Education—Average Rating: 4.0]

- Identify education programs that would be beneficial to the industry, especially young entrants. [Education—Average Rating: 4.0]
- Look at lessons learned from other areas and fisheries in terms of how they addressed and solve issues around oyster resource management and education, such as Puget Sound, Virginia, Delaware, scallops etc. [Education—Average Rating: 4.0]
- Support the role of oyster resources and ecology for aquaculture and commercial fishing, education programs for primary & secondary school students along with help from community college. [Education—Average Rating: 4.0]

R. Option 27- Use shells from the Bay. *(New Policy option to consider for March. No modeling)*

The Workgroup reviewed the final report outline and an executive summary format that would help to communicate the Workgroup's approach and recommendations and would be accompanied by a full report to DNR. It was suggested that the Team prioritize electronic communications and consult with DNR on communication and distribution. The Workgroup discussed the meeting schedule and agreed that the March 23-24 meeting should start at 1 p.m.- 6:00 p.m. and dinner and go from 8:30-5 on the second day. The Workgroup will review any additional options and focus on building consensus on recommendations to DNR that will be send well in advance of the meeting.

The meeting adjourned at 4:00 p.m.

OYSTER FUTURES
WORKGROUP MEETING VIII SUMMARY
FEBRUARY 4, 2018

I. WELCOME, WORKGROUP INTRODUCTIONS, REVIEW OF AGENDA AND WORKGROUP SUMMARY

On behalf of the Oyster Futures Research Team, Elizabeth North welcomed the Workgroup Members to the eighth meeting of the Oyster Futures Workgroup and introduced the facilitation team of Jeff Blair and Bob Jones with the FCRC Consensus Center at Florida State University. Following a workgroup member roll call *(See Appendix #2 for the Workgroup members list and meeting participants)*, the facilitators reviewed the agenda and the Workgroup approved the agenda and accepted the January 2018 Work Group meeting summary without changes. The facilitator reminded the members of the workgroup guidelines that were adopted at the organizational meeting in February 2016 which call for the development of a package of Workgroup consensus recommendations to DNR informed by the model which has been collaboratively developed by the Workgroup and the OysterFutures project research team. As in past meetings, members also completed a short Social Science Study survey at the outset and on Sunday afternoon after the review and rating of the modeling options.

II. REVIEW, DISCUSSION AND CONSENSUS RATING OF MODELED OPTIONS

A. REVIEW OF MODELING RESULTS

1. Water Quality Model

Rasika Gawde presented the Water Quality model measures and results and outlined the components of the model including, temperature, salinity, oyster habitats, water flow and oyster filtration. The water quality model estimates how algae grows in the presence of nutrients, how algal growth, death, and decomposition affects oxygen, and how oyster abundance affects how deep light can reach (water clarity). The model links nutrients on land with what the oysters do in the water. It shows that the number of oysters in the water affects water clarity.

Workgroup Comments/Questions

- Does the model consider SAV growth? *A: Not yet in the current model grid.*
- Does the model account for hurricanes or droughts? A: The model incorporates data on meteorological conditions and takes into account wind and air and water temperatures. However this has been run for one year due to computational time

needed. The hope is to run this for 10 years which will better reflect hurricanes and drought.

- Where is the data coming from for the model? *A: It is data from observation cruises- 20 cruises in 2010-12 that were measured through Horn Point lab.*

2. Review of Modeling Options

Mike Wilberg noted there were no changes in the basic model from the January review. He noted that in general: improvements will take 5-15 years to materialize; complete restorations options maximize abundance; adding shell every year maximizes habitat; and keeping a portion of sanctuaries open to harvest maximizes harvest. The model suggests that spat on shell provides better results than just shell planting. In general, the model results appear to overestimate oysters and habitat in Tred Avon and underestimate oysters and habitat in Broad Creek.

He then reviewed the "status quo" option (with complete compliance with size, 1% Sanctuary harvest, $47.22 per bushel). The Enforcement options call for more NRP officers- checking more thoroughly than they currently do. In terms of reviewing the Rotation options the results depend on the size of the area chosen.

- 15a. 3-yr rotation in Little Choptank tributaries (cost ~$600K/yr) – spat on shell – new
- 15b. 3-yr rotation in Little Choptank tributaries (cost ~$2M/yr) – spat on shell [15a]
  Workgroup Comments/Questions
  - Can we model a 2 year vs. 3 year rotation? Concerned about derby effects. . *A: Would be able to show consequence of 2- year rotation for consideration at the March meeting.*
- 9a+13a. 2-yr rotation in smaller areas, with Middle Chop sanctuary (cost ~$1.2M/yr)– spat on shell – new
- 9b+13b. 2-yr rotation in smaller areas, with Middle Chop sanctuary (cost ~$4M/yr)– spat on shell – new
- Does Option 17b produce 3 times more habitat? *A: Yes by adding shell every year in Broad Creek.*
- Are there diminishing returns on plantings in Broad creek?
- Is there exchange between Harris creek and Broad Creek within sanctuary? *A: There is larval transport between the two regions. Lots of oyster larvae going in every direction.*

B. RATING OF MODELED OPTIONS

Following a general overview and review and discussion of the modeling results, the Workgroup rated each option based on its acceptability and support, discussed concerns and offered suggestions to the modelers for new or combined options. Each of the modeled options was reviewed in terms of its performance on abundance, habitat and harvest and rated for acceptability by the Workgroup.

Workgroup Average Support Ratings Color Key
0-59% Rating
60-74% Rating
75-100%, Rating

STATUS QUO AS AN OPTION

Option 1: Status quo (SQ) [5% non-compliance with size limit, 1% Sanctuary harvest, and bushel price of $47.22].

Support Rating: 0% (4-0s, 3-0s, 2-11s,1-4s)

Workgroup Comments on Rating:

- Are we rating the status quo as the basis of the modeling or as an option we would consider recommending? *A: Rating this as an option for recommending to DNR.*
- This is encouraging in that we should be reviewing the modeled and other options to try to do better than the status quo.
- More confidence in model. Model now reflects logically what would happen in this case scenario. *A: Research Team feels confident that the model is high quality and the results make sense.*
- The harvest fraction of % taken out seems stable.
- How does the model handle inflation? Consider including a footnote. *A: The model increases the price with inflation with an assumption built into numbers. Will make a note of this in the final report. The Research team ran the higher price scenarios to look at the potential for prices increasing at a rate higher than inflation. The results generally stay the same.*
- The model appears useful and we can see the relationship of one option to another.

Workgroup Comments after Rating

- Minor reservations: Want to look at these results with some caution, hard to get 100% on all options.

ENFORCEMENT OPTIONS

Option 2: Status quo with complete compliance with size, 1% Sanctuary harvest. *(17th Abundance, 23rd Habitat, 22nd Harvest)*

Support Rating: 100% (4-7s, 3-8s, 2-0s,1-0s)

Comments before/after Rating

- None

Option #3: Full compliance (no trips with more than 5%) with the current law ~~size limit~~ and sanctuary regulations.*(9th Abundance, 21sd Habitat, 23rd Harvest)*

Support Rating: 100% (4-6s, 3-9s, 2-0s,1-0s)

Comments before/after Rating

- Does this change the 5%? *A: No.*
- Where do we address or capture the cost of increased DNR enforcement?

- Impact of compliance- Option 3 has biggest impact for enforcement. Because of the sanctuary and the enforcement costs.
- If we keep option 3- on table, size limit is the problem.
- There is harvest of undersized oysters under 5%. On average, across the fishery for those trying to be compliant. What % of bushel are undersized? *A: About 1% of bushel undersized.*
- Gets to the question of how strictly will the regulation enforced.
- Complete compliance with current size limit will never be achieved. We should reword. Should we increase 5% to 7% knowing that full compliance is not possible?
- Get everyone to follow the laws on the books now. We know that poaching is going on. Difficult for this group to change the existing standards. This option helps us look at what full compliance does in terms of impact on abundance, habitat and harvest.
- Emphasizing the value of enforcement. Show that it benefits all which might lead to greater investment.
- We can add enforcement options on any of the recommendations that we conclude with.
- One is lower cost but also has a big impact on adult abundance (from 20th to 9th).
- General comments about enforcement- not just status quo with compliance.
- Cap on licenses. Will there be a recommendation on this? *A: We will review some Limited entry options that the Workgroup framed early on and rated them with greater than 75% support.*
- #3. Full compliance? Is this impossible? *A: close to very few small oysters. Model describes oysters by their size.*

ROTATIONAL HARVEST OPTIONS

Option 9a: 2-yr rotation in smaller areas (low catch bars, with annual cost of spat on shell ~$600K/year) – spat on shell. [Previous Option 11] *(18th Abundance, 19th Habitat, 21st Harvest)*

Support Rating: 40% (4-0s, 3-5s, 2-9s,1-1)

Comments before/after Rating

- None

Option 9b: 2-yr rotation in smaller areas (low catch bars, with annual cost of spat on shell ~$2M/year) – spat on shell. [Previous Option 9]

(12th Abundance, Habitat 9th, Harvest 16th)

Support Rating: 7% (4-0s, 3-1s, 2-13s,1-1s)

Comments before/after Rating

- Will site selection impact the results? *A: Results depend on size of the area chosen. Site selection shouldn't affect the results. Shell committees would assist with shell locations.*

Option 13a: 2-yr hang tong rotation in Middle Chop sanctuary (cost ~$600K/year) – spat on shell. *(11th Abundance, 15th Habitat,11th d Harvest)*

Support Rating: 73% (4-2s, 3-9s, 2-4s,1-0s)

Comments before/after Rating

- None

Option 13b: 2-yr hand tong rotation in Middle Chop sanctuary (cost ~$2M/year) 100 acres per year –spat on shell. [New] *(6th Abundance, 7th Habitat,4th Harvest)*
Support Rating: 70% (4-2s, 3-8s, 2-5s,1-0s)

Comments after Rating

- One place on upper Choptank is currently being leased.

Option 15a: 3-yr hand tong rotation in Little Choptank tributaries – spat on shell (cost ~$600K/year). [New] *(21st Abundance, 18th Habitat,15th Harvest)*
Support Rating: 60% (4-1s, 3-8s, 2-6s,1-0s)

Comments before Rating

- Do spat on shell costs go down and increase in financial efficiency? A*: In general, but haven't seen studies of this. Model suggests spat on shell better vs. shell planting.*\
- Can we test this option with a 2 year vs. 3-year rotation for Workgroup consideration? Concerns about a derby effect, wiping out the harvest quick. Does this option indicate we would be pushing wild harvest towards meeting demand for smaller oysters? Don't want watermen to be pushed out of a market because they can only harvest larger. A: not too late for recommendations. *A: Yes we can test a 2 year rotation on these options and review at the March meeting.*
- Rotation is not a good option in terms of gear types.

Option 15b: 3-yr hand tong rotation in Little Choptank tributaries – spat on shell (cost ~$2M/year). [Updated: previous Option 15a] *(19th Abundance, 11th Habitat,14th Harvest)*
Support Rating: 53% (4-0s, 3-8s, 2-7s,1-0s)

Comments before/after Rating

- Money is the concern. 15a. and 15b.
- Rated this lower because a better option coming up.
- We shouldn't base our ratings on cost alone as we don't know what the budget will be. We shouldn't remove an option from the table just based on costs.

Option 16a: 2-yr hand tong rotation in Little Choptank tributaries – spat on shell (cost ~$600K/year). *New Option for review at the March meeting.*

Option 16b: 2-yr hand tong rotation in Little Choptank tributaries – spat on shell (cost ~$2M/year). [Updated: previous Option 15a] *New Option for review at the March meeting.*

ROTATIONAL OPTION COMBINATIONS

Options 9a+13a. 2-yr rotation in smaller areas, with Middle Chop sanctuary (cost ~$1.2M/yr) – spat on shell *(10th Abundance, 13th Habitat,10th Harvest)*

Support Rating: 60% (4-0s, 3-9s, 2-6s,1-0s)

Options 9b+13b. 2-yr rotation in smaller areas, with Middle Chop sanctuary (cost ~$4M/yr) – spat on shell *(5th Abundance, 4th Habitat, 2nd Harvest)*
Support Rating: 40% (4-0s, 3-6s, 2-9s,1-0)

Comments before/after Rating

- Are we rating combined option? *A: Yes.*
- Why does option 17b contain 3 times more habitat? *A: That is because it adds shell every year in Broad Creek.*
- It is a surprise there is not an increase in harvest in Broad creek which is the best spat set area in the Choptank. If this is something that is not captured in the model it lowers stakeholder faith in the model. *A: options for Broad Creek disagree most with our perceptions which justifies having some skepticism. In general, the model suggests that planting shells is less efficient than putting spat on shells. There is not good monitoring data on harvest and how many oysters are there. The research team will try to engage Dr. Matt Grey- a bivalve ecologist at the Lab to review the results. Addendum – we ended up doing additional analyses and runs to attempt to address this concern.*
- Would it be possible to only plant shell when you see larvae in water? *A: The problem then is to get them planted in that window.*
- Are there diminishing returns for the shell plantings in Broad Creek? *A: We can look at how often the habitat is saturated with spat.*
- Do larvae go from Harris Creek into Broad Creek? *A: Yes, however, we have not checked how many larvae make it to the areas with shell plantings.*
- As you get into details of the model, it appears to generally overestimate Tred Avon and generally underestimate Broad Creek.
- We should recommend adding a disclaimer to this option. *Addendum – We can reconsider this recommendation at the March meeting.*

HABITAT MODIFICATION/RESTORATION OPTIONS

Option 17a: Add shell to each bar every year in Broad Creek, hand tong (cost ~$600K/year). [Previous 17a2] *(20th Abundance,3rd Habitat,19th Harvest)*
Support Rating: 80% (4-1s, 3-11s, 2-3s,1-0s)

Comments before/after Rating

- Reservation with the model results for Broad Creek based on local knowledge.
- #s of spat on shell in Broad Creek? 60 years and no data that is usable? *A: Incomplete data in terms of being able to compare data from sites from year to year.*
- Recommend conducting a study to gather this important data.
- If Broad Creek is not shell limited this may be a carrying capacity issue, we may be getting as much as we can from it. *A. The Research Team will look at this and report back in March on plausible explanations and solutions.*
- DNR research- on shell and not seeing a recognizable signal in harvest?
- DNR does not have detailed study about plantings and results 5 years out, but DNR does have have acreage and spat count per bushel. Model could take spat estimate from planting/acreage.

- Shell planting might get as much as a 10 to 30-fold increase in spat. Surveys show good bang for the buck. The benefits are functioning well in the early years. *A: This will depend on your comparison area. We don't currently have an estimate that is usable in the model. However the model in a general way captures this idea. More shell = more settlement. How much shell is already there is another important data point.*
- Brand new shell planting produce higher spat levels.
- Sounds like the State has records but we are not using them in the model. This is incomplete and we may have a hard time getting to consensus. *A: The research team will look into the data that MD DNR has on the effect of clean shell on spat set and will modify the model if there is enough data to support it.*
- Can we make a recommendation to study spat on existing shell? *A: what happens to oyster habitat when you do different things: clean shell out; how oyster survive, grow and how habitat changes. Most important is the connection between science and local information. Models won't hit the nail on the head in any fishery.*
- Watermen working bars give DNR info? Provide missing piece of spatial info to harvest? Recommendation for a pilot study in the report? Pilot study that can establish the relationship between plantings and harvest.
- Cost per bushel- quantify this as amount of material instead of costs. Can keep cost in parentheses. *A: All $$ values assume inflation into the future (based on last year's costs). The model assumes that the amount of shell that goes in is the same each year.*
- Local knowledge on Broad Creek- model's performance and one based on local knowledge on the tributary. Do we need to bring scientific knowledge up to a higher level?
- Do we have enough information to improve upon the status quo?

Option 17b: Add shell to each bar every year in Broad Creek, hand tong (cost ~$2M/year). [Previous 17a] *(14th Abundance, 1st Habitat,18th Harvest)*

Support Rating: 67% (4-1s, 3-9s, 2-5s,1-0s)

Comments before/after Rating

- We should be considering these options by judging whether they are good ideas to implement in the real world.

Option 18: Open tributaries in the Little Choptank River to hand tonging, and provide added shell (every 3 years) (cost ~$460K/year). *(23rd Abundance, 16th Habitat,17th Harvest)*

Support Rating: 64% (4-0s, 3-9s, 2-5s,1-0s)

Comments before/after Rating

- Long term negative for abundance and water quality.
- Enforcement concerns regarding boundaries.

Option 18a: Open tributaries in the Little Choptank River to hand tonging, and provide added spat on shell (every 3 years) (cost ~$600K/year). [New] *(22nd Abundance, 20th Habitat,12th Harvest)*

Support Rating: 71% (4-5s, 3-5s, 2-4s,1-0s)

Comments before/after Rating

- Long term negative for abundance and water quality.
- Enforcement concerns regarding boundaries.

Option 18b: Open tributaries in the Little Choptank River to hand tonging, and provide added spat on shell (every 3 years) (cost ~ $2M/year). [New] *(15th Abundance, 10th Habitat, 7th Harvest)*

Support Rating: 64% (4-6s, 3-3s, 2-5s,1-0s)

Comments before/after Rating

- Long term negative for abundance and water quality.
- Enforcement concerns regarding boundaries.

Option 19: Complete Little Choptank and Tred Avon restoration (6" and 12" substrate per restoration plan.) [Updated: Previous 19 and 20 combined] *(2nd Abundance, 6th Habitat,6th Harvest)*

Support Rating: 79% (4-6s, 3-5s, 2-3s,1-0s)

Comments before/after Rating

- What type of substrate? Is it granite? *A: Complete as planned. Model treats shell and granite as the same.*
- How much more restoration to do? % completed? *A: From 2016- Tred just started. ¼-1/3 done. From today: 44 acres left in Tred Avon. Little Choptank*
- All three tributaries Harris, Tred and LC- $51 million. Little Chop today- $18.5 M spent covering 240 acres of 440 acres. About ½ needs substrate. Tred- 67 acres to go.
- Where will the substrate come from?
- How many acres in Little Choptank? *A: 240 acres. 113 was seed only, the rest substrate and seed.*
- Concern about cost effectiveness.
- How many more acres of substrate is planned to go down for the Little Chop and Tred Avon? *A: Around 100 acres.*

Option 20: Complete Little Choptank restoration. [New] *(8th Abundance, 14th Habitat,13th Harvest)*

Support Rating: 0% (4-0s, 3-0s, 2-10s,1-4s)

Comments before/after Rating

- None

Option 21: Complete Tred Avon restoration. [New] *(10th Abundance, 13th Habitat,10th Harvest)*

Support Rating: 21% (4-3s, 3-0s, 2-10s,1-1s)

Comments before/after Rating

- None

Option 23: Place reefballs (placed near/around the bridge, channel markers, etc.) in the Middle Choptank region (reef balls, 1 foot apart, 1 time, cost ~$2M private funding) not in conflict with fishing activities. Work with watermen for placement options. [Note: this option was favored over the 3' spacing option]*(16th Abundance, 22nd Habitat,20th Harvest)*

Support Rating: 100% (4-3s, 3-11s, 2-0s,1-0s)

Comments before/after Rating

- Would like to be clearer on the source of funding.
- Cost will be privately funded, not public funds.

STOCKING OPTIONS

Option 26a: Add spat every year in the Middle Choptank, hand tong (cost ~$600K/year). [Previous 17b] (13, 17, 8)
(13th Abundance, 17th Habitat,8th Harvest)

Support Rating: 93% (4-2s, 3-11s, 2-1s,1-0s)

Comments before/after Rating

- Concern about fishing effort in one spot. Does this reflect only one bar investment? *A: No.*

Comments before/after Rating

- Acceptable to increase- left up to shell committee for placement? *A: Yes. It says at the top of the Options document that "The exact locations for adding shell and siting reef balls will be done in consultation with the respective shell committees, waterman and other key stakeholders as relevant for the option."*
- Is this above and beyond what is currently being invested? *A: Would be total expenditure.*
- Would should clarify this is not in the Sanctuary.
- Do what we are doing before and add more here. Could some of it could come from restoration to go in here?
- Do we mean this is additional money or no matter the source?
- The dollar ranges relate to: $600K is about what we get in oyster surcharge revenue and tax $$. $2M is what MDOT provides for support of oyster management. $400-600K for restoration.
- Funding available now. Do we need to find other funds? General funds? Increase MDOT funding? Other sources to increase revenue? *A: Oyster and shell fish fund receive no general funds. That's the current challenge.*
- This gives us targets, ideas, and some results based on these model numbers.

Option 26b: Add spat every year in the Middle Choptank, hand tong (cost ~$2M/year). [Previous 26a] (7, 8, 1) *(7th Abundance, 8th Habitat, 1st Harvest)*

Support Rating: 93% (4-1s, 3-12s, 2-1s,1-0s)

Comments before/after Rating

- What is the estimated acreage? *A: 100 acres.*

- Acceptable to increase- left up to shell committee for placement? *A: Yes.*

Option 27- Use shells from the Bay. (New Policy option to consider.) *New Option for March.*

Comments before/after Rating

- Group could recommend where we can get all the shells. Address that and figure out how to get them. We have to have them to put them out.
- Where is the shell coming from? What is the source?
- Do we need a recommendation on where the shell is coming from?

COMBINATION OPTIONS

Options 15b+19: 3-yr rotation in Little Choptank tributaries with spat on shell ~$2M; Complete Little Choptank and Tred Avon restoration. *(3rd Abundance, 5th Habitat, 3rd Harvest)*
Support Rating: 64% (4-0s, 3-9s, 2-5s,1-0s)

Options 15b+19+3: 3-yr rotation in Little Choptank tributaries with spat on shell ~$2M; Complete Little Choptank and Tred Avon restoration; full compliance with size and sanctuary regulations.*(1st Abundance, 2nd Habitat, 5th Harvest)*
Support Rating: 64% (4-0s, 3-9s, 2-5s,1-0s)

III. REVIEW OF POTENTIAL POLICY RECOMMENDATIONS

The Workgroup reviewed a set of policy statements as part of the vision of success themes that had been developed and received high consensus ratings of between 3.5 and 4.0 on a four-point consensus scale in the first two Workgroup meetings. These statements were not subject to modeling. The Workgroup agreed that draft recommendations should be developed by the Team for review and rating by the Workgroup at its final meeting in Mach on the following areas:

A. Address and provide funding for enforcement presence on the water (both in increasing numbers and quality through training) to address poaching and support strategies such as focusing on the buyer level. [Theme A—Average Rating: 4.0]
Unaninmous support for developing a recommendation.

B. Consider modifying regulations so a single bar is not divided between gear types or open and closed. [Theme A—Average Rating: 3.9]
Unaninmous support for developing a recommendation.

C. Conduct a stock assessment of the oyster resource/fishery with involvement of the stakeholders. [Theme A—Average Rating: 4.0]
Unaninmous support for developing a recommendation.

D. Review and revise DNR regulations and management goals in consultation with oyster resource stakeholders to ensure they are clear and enforceable and include a working feedback loop with the regulated public to refine the program and enhance compliance. [Theme A—Average Rating: 4.0]
Unaninmous support for developing a recommendation.

E. Establish and support a long-term shared vision of success for oyster resources among stakeholders that can be sustained, implemented and strengthened into the future. [Theme A— Average Rating: 4.0]
Unaninmous support for developing a recommendation.

F. Improve DNR's website making it more user friendly. [Theme A—Average Rating: 4.0]
Unaninmous support for developing a recommendation.

G. Prioritize Workgroup Recommendations to invest more funding in the management of oyster resources. [Theme A—Average Rating: 4.0]
Unaninmous support for developing a recommendation.

H. Address, correct and update DNR oyster resource mapping issues to inform watermen on the water and all stakeholders such as bottom mapping to better define oyster bars. [Theme A—Average Rating: 4.0]
Unaninmous support for developing a recommendation.

I. Perform an analysis to investigate. Consider limiting entry to oyster fishery to watermen making the majority of their living from commercial fishing. [Theme A—Average Rating: 3.9]
Create a limited entry oyster fishery. [Theme A—Average Rating: 3.75]
Majority support for developing a draft recommendation for consideration in March.
Comments

- Investigate? vs. consider? Create?
- Address out of state license holders?
- "Consider" or "implement."
- Can't support. Concern about future generations. Need some language regarding succession and apprenticeships.
- Discussion- investigate and evaluate working with stakeholders to address concerns to determine if it will be workable within fishery- because this is a complex issue.

J. Evaluate and consider changes/increases of oyster fishery related fees and taxes. [Theme A—Average Rating: 3.9]
Unaninmous support for developing a recommendation.

K. Conduct more and better research to inform regulations and better understand the efficiency of gear types and their impacts on the oyster resource [Theme B—Average Rating: 3.9]
Majority support for developing a recommendation.
Comments

- Impacts of gear on habitat. Didn't see if elsewhere. Study of different gears?
- Utilizing available info or gathering more?

L. Consider modifying regulations so a single bar is not divided between gear types or open and closed. [Theme A—Average Rating: 3.9]
Unaninmous support for developing a recommendation.

M. Focus on strategies for increasing the funding, use and reclamation of local shells from the Chesapeake Bay and from local watermen to supplement bars and increase the viability of the oyster resource. [Theme C—Average Rating: 4.0]
Unaninmous support for developing a recommendation.

N. Develop shell recycling recommendation with incentives through taxation. Provide incentives for the private sector to participate in shell recycling efforts.

Unaninmous support for developing a recommendation.

O. Continue to address and find solutions for oyster diseases. [Theme D—Average Rating: 4.0]

Unaninmous support for developing a recommendation.

P. Develop recommendation for oyster marketing strategies based on the following statements

Unaninmous support for developing recommendations.

- Develop better business plans for the industry that reflects trends for consumer interest in local products. [Theme C—Average Rating: 4.0]
  Comments
  - This could involve the Department of Agriculture's Office of Seafood Marketing
- Review best practices and outcomes and adapt successful techniques from other places/regions. [Theme C—Average Rating: 4.0]
- Test strategies for marketing oysters by location and a shucked product. [Theme C—Average Rating: 3.8]
- More public funds into marketing strategies, celebrating heritage. These bring tax dollars into the state and they should be returning funds to support local oyster. E.g. Organize a tour on both sides of the bay. VA Oyster trail. Not just oysters but the fishery industry more generally. [Theme E—Average Rating: 4.0]
- Look for ways to use a strategy like True Blue the one used for crab use and restaurants, in the oyster fishery. [Theme E—Average Rating: 4.0]
- Providing incentives for businesses for shucking houses/capacity to address shell replenishment. [Theme E—Average Rating: 4.0]
- Consider the Working Waterfronts Program as good resource to reach out to. [Theme E—Average Rating: 4.0]

Q. Develop a recommendation(s) for education that incorporates the following statements:

Unaninmous support for developing a recommendation.

S. Support education in fisheries science and management. [Education—Average Rating: 4.0]

T. The Workgroup itself represents an educational initiative and a forum for communication among stakeholders. [Education—Average Rating: 4.0]

U. Identify education programs that would be beneficial to the industry, especially young entrants. [Education—Average Rating: 4.0]

V. Look at lessons learned from other areas and fisheries in terms of how they addressed and solve issues around oyster resource management and education, such as Puget Sound, Virginia, Delaware, scallops etc. [Education—Average Rating: 4.0]

W. Support the role of oyster resources and ecology for aquaculture and commercial fishing, education programs for primary & secondary school students along with help from community college. [Education—Average Rating: 4.0]

III. NEXT STEPS

The Workgroup reviewed the final report outline and suggested asking each stakeholder to provide short quotes on the OysterFutures process. The Workgroup reviewed an executive summary format that would help to communicate the Workgroup's approach and recommendations and would be accompanied by a full

report to DNR. It was suggested that the Team prioritize electronic communications and consult with DNR on communication and distribution.

The Workgroup discussed the meeting schedule and agreed that the March 23-24 meeting should start at 1 p.m.- 6:00 p.m. and dinner and go from 8:30-5 on the second day. The Workgroup will review any additional options and focus on building consensus on recommendations to DNR that will be send well in advance of the meeting.

Stephanie Westby, (NOAA) promised to circulate a data summary of issues she discussed and a final document regarding the amount of substrate to be planted.

Workgroup members were asked to comment on the meeting by completing meeting evaluations *(see Appendix #3).* The meeting adjourned at 4:00 p.m. on Sunday afternoon.

Appendix #1 Workgroup Meeting VI Agenda, February 4, 2018

OYSTERFUTURES WORKGROUP
MEETING VIII—SUNDAY, FEBRUARY 4, 2018
Horn Point Laboratory—AREL Conference Room
2020 Horns Point Road—Cambridge, Maryland

WORKGROUP MEETING OBJECTIVES
✓ To Approve Agenda and Meeting VII Summary Report
✓ To Receive Results of New and Revised Options Evaluated by OysterFutures Model
✓ To Rate the Results of Options Modeled Relative to Project Goals and Performance Measures
✓ To Discuss and Evaluate Preliminary Recommendations
✓ To Discuss Draft of Workgroup's Report and Recommendations
✓ To Discuss Communication and Distribution Strategy for Workgroup's Report
✓ To Identify Needed Next Steps, Information Needs, and Agenda Items for Next Meeting

MEETING AGENDA—SUNDAY, FEBRUARY 4, 2018		
All Agenda Times—Including Adjournment—Are Approximate and Subject to Change		
8:30 AM		***BREAKFAST AND SOCIAL SCIENCE STUDY SURVEY (ON CAMPUS)***
1.)	**9:00 AM**	**WELCOME AND INTRODUCTIONS**
2.)	**9:05 AM**	**AGENDA REVIEW AND APPROVAL**
3.)	**9:10 AM**	**APPROVAL OF FACILITATOR'S SUMMARY REPORT (January 6, 2018)**
4.)	**9:15 AM**	**REVIEW OF OYSTERFUTURES CONSENSUS-BUILDING PROCESS—CONSENSUS OPTIONS TO RECOMMENDATIONS**
5.)	**9:30 AM**	**OVERVIEW AND DISCUSSION OF THE RESULTS OF OPTIONS MODELED**
~10:30 AM		***BREAK***
6.)	**10:45 PM**	**EVALUATION AND ACCEPTABILITY RATING OF MODELED OPTIONS RELATIVE TO PERFORMANCE MEASURES AND PROJECT GOALS**
~12:30 PM		***LUNCH (ON CAMPUS)***
7.)	**1:00 PM**	**DISCUSSION AND EVALUATION OF WORKGROUP'S PRELIMINARY RECOMMENDATIONS**
~3:00 PM		***BREAK***
7.)	**3:15 PM**	**EVALUATION OF WORKGROUP'S RECOMMENDATIONS—CONTINUED**
8.)	**4:00 PM**	**REVIEW OF WORKGROUP REPORT AND RECOMMENDATIONS DRAFT**
9.)	**4:15 PM**	**DISCUSSION OF COMMUNICATION AND DISTRIBUTION STRATEGY**
10.)	**4:45 PM**	**NEXT STEPS: AGENDA ITEMS AND INFORMATION FOR THE NEXT MEETING**
~5:00 PM		***ADJOURN***

Appendix #2 Workgroup & Research Team Membership & Participation

WORKGROUP MEMBERSHIP PARTICIPATION- SUNDAY, FEBRUARY 4, 2018

MEMBER (***Bold***= Present, *Italics*= *Absent*)	AFFILIATION
WATERMAN	
J.D. Buchanan	Preston, MD, Caroline County, Talbot County Waterman
Robbie Casho	St. Michaels, MD, Dorchester County Waterman
Jeff Harrison	Tilghman, MD, Talbot County, President Talbot Waterman's Association
Gregory Kemp	McDaniel, MD, Talbot County, Vice President Talbot Waterman's Association
Cody Paul	Church Creek, MD, Dorchester County Commercial Oyster Committee Chair
Bobby Whaples	Vienna, MD, Dorchester County, President Dorchester Seafood Heritage Ass.
AQUACULTURE	
Bobby Leonard	Tred Avon Treats, Ruff-N-Ready, LLC.
Johnny Shockley	Hoopers Island Oyster Aquaculture Co.
SEAFOOD BUYERS	
Aubrey Vincent	Lindy's Seafood
ENVIRONMENTAL CITIZEN GROUPS	
Kelly Cox	Phillips Wharf Environmental Center
Allison Colden	Chesapeake Bay Foundation
Joe Fehrer	The Nature Conservancy
RECREATIONAL FISHING GROUP	
David Sikorski	Coastal Conservation Association (CCA)
MARYLAND DEPARTMENT OF NATURAL RESOURCES	
Dave Blazer	Maryland Department of Natural Resources
OYSTER RECOVERY PARTNERSHIP	
Ward Slacum	Oyster Recovery Partnership
FEDERAL AGENCY	
Stephanie Westby	National Oceanic and Atmospheric Administration (NOAA)

PROJECT SCIENTISTS AND FACILITATORS	
NAME	**AFFILIATION**
UNIVERSITY OF MARYLAND CENTER FOR ENVIRONMENTAL SCIENCE	
Elizabeth North	Fisheries Scientist
Jeffery Cornwell	Estuarine Biogeochemist
Raleigh Hood	Biological Oceanographer
Lisa Wainger/**Chris Hayes**	Environmental Economist (Social Scientist)
Michael Wilberg	Fisheries Scientist
VIRGINIA INSTITUTE OF MARINE SCIENCE	
Troy Hartley	Environmental and Natural Resource Policy (Social Scientist)
FCRC CONSENSUS CENTER, FLORIDA STATE UNIVERSITY	
Jeff Blair	Workgroup Facilitator
Robert Jones	Workgroup Facilitator

Appendix #3 Workgroup Meeting Evaluation Summary

OYSTERFUTURES WORKGROUP
FEBRUARY 4, 2018—CAMBRIDGE, MARYLAND
MEETING EVALUATION SUMMARY

Members used a 0 to 10 Rating Scale where a 0 meant Totally Disagree and a 10 meant Totally Agree. 13 members in attendance submitted evaluation forms. The average ratings and comments are featured below.

1. Please assess the overall meeting.

9.2 The background information was very useful.
9.2 The agenda packet was very useful.
9.3 The objectives for the meeting were stated at the outset.
8.9 Overall, the objectives of the meeting were fully achieved.

2. Do you agree that each of the following meeting objectives was achieved?

9.2 Discussion of Results of New and Revised Options Evaluated by the OysterFutures Model.
9.2 Acceptability Rating of Options Modeled Relative to Project Goals and Performance Measures.
9.2 Discussion and Evaluation of Preliminary Recommendations.
9.3 Discussion of Workgroup's Draft Report and Recommendations.
9.2 Discussion of Communication and Distribution Strategy for Workgroup's Report.
9.4 Review of Next Steps and Agenda Items for the Next Meeting.

3. Please tell us how well the Facilitator helped the participants engage in the meeting.

9.5 The members followed the direction of the Facilitator.
9.8 The Facilitator made sure the concerns of all members were heard.
9.8 The Facilitator helped us arrange our time well.
9.5 Participant input was documented accurately in Facilitator's Summary Report (last meeting).

4. Please tell us your level of satisfaction with the meeting?

9.5 Overall, I am very satisfied with the meeting.
- I was surprised the model assumed doubling the increase in spat set for new shells vs. the rest of the bar when data exists to illuminate this aspect.

9.7 I was very satisfied with the services provided by the Facilitator.
9.4 I am satisfied with the outcome of the meeting.

5. Please tell us how well the next steps were communicated?

9.5 I know what the next steps following this meeting will be.
9.5 I know who is responsible for the next steps.

6. **What did you like best about the meeting?**
    - Thoughtful and respectful discussion.
    - Great commentary
    - Cooperation among stakeholders
    - Organization!
    - All good.
    - Content and conducted very well.
    - Discussion on recommendations was productive
    - In depth discussion of each option.
    - Everything was discussed in a timely manner.
    - Getting close to final product!

7. **How could the meeting have been improved?**
    - Shorter and not on Sunday.
    - Not on Sunday
    - I don't know of any improvements
    - ½ hour for lunch was ample, no need for more time.
    - Well behaved except for some sidebar chats…

Appendix #4 Oyster Futures Workgroup Purpose, Goal and Project Summary

STATEMENT OF PURPOSE. The goal of Oyster Futures is to develop recommendations for oyster policies and management that meet the needs of industry, citizen, and government stakeholders in the Choptank and Little Choptank Rivers.

With funding from the National Science Foundation, we will hold a series of workgroup meetings with a representative group of stakeholders. Through these meetings, the stakeholders will produce a collective vision for the future of oysters in this region and build consensus on policy and regulatory options which will be informed by stakeholder and scientific knowledge and by the joint development and use of a modeling tool. The Maryland Department of Natural Resources has agreed to evaluate the consensus recommendations that result.

The stakeholders participating on the workgroup will be representatives from the key interest groups that affect and are affected by the oyster fishery. Researchers from the University of Maryland Center for Environmental Science and the Virginia Institute of Marine Science will serve as consultants to the stakeholders. Professional independent facilitators with experience in fisheries issues will convene the stakeholder meetings. The facilitators will ensure that a consensus-based approach which includes the input of diverse stakeholders is used to develop the collective vision and recommended actions for a sustainable and profitable future for the oyster industry in the Choptank and Little Choptank Rivers.

WORKGROUP'S ADOPTED GOAL STATEMENT: *(Adopted Unanimously February 26, 2016)* The goal of the Oyster Futures Workgroup is to develop a package of consensus recommendations informed by a model collaboratively developed by the Workgroup and the Oyster Futures project research team. The model will be designed so that it can be used to evaluate oyster fishery practice and management options and restoration policies in the Choptank and Little Choptank Rivers. The Workgroup's recommendations will be directed to Secretary Mark Belton of the Maryland Department of Natural Resources. The project's ultimate goal is to ensure that the regulation and management of the oyster fishery, and oyster restoration polices are informed by the best available science and shared stakeholder stewardship values, resulting in an economically viable, healthy and sustainable Choptank and Little Choptank Rivers oyster fishery and ecosystem.

PROJECT SUMMARY. Achieving effective natural resource management is challenging because of the multiple and often competing objectives of different stakeholder groups, a limited set of policy options, and uncertainty in the performance of those options. Yet, managers need policies that allow continued use of natural resources while ensuring access for future generations and maintenance of ecosystem services. Formal approaches are needed that will assist managers and stakeholders in choosing policy options that have a high likelihood of achieving social, ecological, and economic goals. The goal of this project, Oyster Futures, is to address this need by improving the use of predictive models to support sustainable natural resource policy and management. A stakeholder-centered process will be used to build an integrated model that combines estuarine physics, oyster life history, and the ecosystem services that oysters provide (e.g., harvest, water quality) to forecast outcomes under alternative management strategies. Through a series of facilitated meetings, stakeholders will participate in a science-based collaborative process which will allow them to project how well policies are expected to meet their objectives using the integrated model. This iterative process will ensure that the model will incorporate the complex human uses of the ecosystem as well as focus on the outcomes most important to the stakeholders. In addition, a study of the socioeconomic drivers of stakeholder involvement, information flow, use and influence, and policy formation will be undertaken to improve the process, enhance implementation success of recommended policies, and provide new ideas for integrating natural and social sciences, and scientists, in sustainable resource management. In this presentation, the strategy for integrating natural system models, stakeholder views, and sociological studies as well as methods for selecting stakeholders and facilitating stakeholder meetings will be described and discussed.

Appendix #5 Oyster Futures Project Schedule

OYSTER FUTURES WORKGROUP MEETING SCHEDULE		
PHASE I MEETING SCHEDULE—2016 AND 2018		
I.	February 26 - 27, 2016	Horn Point Laboratory
II.	April 30 – May 1, 2016	Horn Point Laboratory
--	October 23, 2016 (*Oyster Symposium*)	St. Michael's Maritime Museum
III.	November 5 - 6, 2016	Horn Point Laboratory
IV.	March 24 – 25, 2017	Horn Point Laboratory
V.	July 22 – 23, 2017 (Management Options)	Horn Point Laboratory
VI.	November 10 -11, 2017 (Management Options)	Horn Point Laboratory
VII.	January 5-6, 2018	Horn Point Laboratory
VIII.	February 4, 2018	Horn Point Laboratory
IX.	March 23-24, 2018	Horn Point Laboratory

PROJECT WEBPAGE (URL): https://Oyster Futures.wordpress.com/
PROCESS DESIGN AND PROJECT FACILITATION: Process design and meeting facilitation by Jeff Blair and Bob Jones from the FCRC Consensus Center at Florida State University. Information at: http://consensus.fsu.edu/

Appendix #6- Draft Outline of Final Report and Recommendations-February 2018

(Underline reflect additional Workgroup Suggestions)

Executive Summary Outline

- OysterFutures Goal, Membership and Vision of Success Themes
- The OysterFutures Workgroup Consensus Building Process and Collaboration Model and Social Science Findings
- Reflections on the Process
- Recommendations
- Next Steps

OysterFutures Report Outline

I. BACKGROUND

A. Statement of Purpose and Research Project Description
B. OysterFutures Goal and Vision Themes
C. The OysterFutures Workgroup Consensus Building Process
D. Collaboration Model and Social Science Findings
E. Collaborative Modeling: Description and Assumptions
F. Reflections on the Process

II. CONSENSUS RECOMMENDATIONS *(For example)*

A. Stakeholder Collaboration
B. Enforcement
C. Rotational Harvest
D. Oyster Habitat Enhancement
E. Stocking
F. Limited Entry
G. Business Practices and Marketing
H. Education

III. CONCLUSIONS AND NEXT STEPS

A. Workgroup reflections, perspectives and testimonials on the consensus process.
B. Recommendations to DNR and Strategy for Implementation

APPENDICES

A. Workgroup and Research Team Members
B. Meeting Schedule and Summary and Overview of Meetings
C. Overview of Model Components
D. Archive of Options Evaluated