

Meeting Summary
Oyster Advisory Commission (OAC) Meeting
 Chesapeake Bay Environmental Center
 Grasonville, MD
 (4:00 PM – 7:00 PM)
 November 16, 2011

LIST OF ATTENDEES

Commissioners Present:

William Eichbaum (Chair)	Vice President, World Wildlife Fund
Don Boesch, Ph.D.	President, University of Maryland Center for Environmental Science (UMCES)
Senator Richard Colburn	Maryland Senator, Dorchester County
Don Webster	University of Maryland Extension
Doug Lipton, Ph.D.	University of Maryland (UMD), Sea Grant Coordinator
Douglas Legum	General Partner, Real Estate Development
Delegate Tony O'Donnell	Maryland Delegate, Environmental Matters Committee; Legislative Sportsmen's Caucus 2001
Ken Lewis	Coastal Conservation Association (CCA)
Peyton Robertson	Director, NOAA Chesapeake Bay Office
Don Meritt, Ph.D.	University of Maryland Center for Environmental Science, Horn Point Lab (UMCES HPL)
Eric Schott, Ph.D.	University of Maryland Center for Environmental Science (UMCES)
Mark Bryer	The Nature Conservancy

Commissioners Unable to Attend:

Brian Rothschild, Ph.D.	Montgomery Charter Professor of Marine Science and Technology, School for Marine Science and Technology, University of Massachusetts Dartmouth (UMASSD)
Bill Goldsborough	Chesapeake Bay Foundation (CBF)
Dave Smith	Maryland Saltwater Sportfishermen's Association
Jason Ruth	Harris Seafood Co. LLC
Mark Luckenbach, Ph.D.	Virginia Institute of Marine Science (VIMS), Wachepreague Laboratory
Russell Dize	Vice President, Maryland Watermen's Association
Torrey Brown, M.D.	President, Intralytix; Board of Trustees, Chesapeake Bay Trust; Chairman, Oyster Recovery Partnership (ORP)
Bill Richkus, PhD	Versar, Inc.
Ben Parks	Maryland Watermen's Association, Dorchester County

Other Meeting Attendees Present:

Maryland Department of Natural Resources (MD DNR): Mr. Tom O’Connell, Mr. Mike Naylor, Mr. Steve Schneider, Dr. Eric Weissberger, Ms. Lynn Fegley, Mr. Chris Judy

Oyster Recovery Partnership (ORP): Mr. Stephan Abel, Mr. Steve Allen

Coastal Conservation Association (CCA): Mr. Larry Jennings, Mr. Ken Hastings

National Oceanic and Atmospheric Administration (NOAA): Mr. Peter Bergstrom, Ms. Stephanie Westby

Maryland Department of Agriculture: Ms. Susan Payne, Mr. John Rhoderick

Maryland Geological Survey (MGS): Mr. Jeff Halka

University of Maryland Center for Environmental Science (UMCES): Dr. Jeff Cornwell

Morgan State University Estuarine Research Center: Dr. Kelton Clark

Towson University: Mr. Tom Earp, Mr. Kierran Sutherland

Maryland Environmental Service (MES): Mr. Josh Chapman

Southern Maryland Oyster Cultivation Society (SMOCS): Mr. Len Zuza

Maryland Agricultural and Resource-Based Industry Development Corporation (MARBIDCO): Mr. Steve McHenry

Main Street Economics: Mr. Robert Weiland

Jonny Oyster Seed: Mr. Jon Farrington

Oyster King 1: Mr. Greg Dunn, Mr. George Kortoza

Public: Mr. Howard King, Mr. John Klein

MEETING SUMMARY:

Opening Remarks/Review Objectives/Approve May and September 2011 Meeting Summaries (Bill Eichbaum, Oyster Advisory Commission (OAC) Chairman)

Mr. Eichbaum welcomed the commissioners and asked if there were any changes needing to be made to the May and September meeting summaries. No changes were suggested, and a motion was made to approve the minutes. The motion passed; each summary was finalized.

Public Comments

Mr. Eichbaum opened the floor for comments from the public. There were no public comments.

Fall Survey Update/Oyster Dieoffs (Mike Naylor, MD DNR)

MD DNR is over halfway through the fall survey of the Maryland oyster population. The survey is nearly complete in areas north of the Bay Bridge. It is believed that low salinity in the Bay, caused by a rainy spring followed by an active hurricane season, has resulted in oyster die-offs. MD DNR has observed 100% oyster mortality on the lowest salinity oyster bars; in two low salinity areas normally popular with oyster harvesters, 75% mortality has been observed, with the remaining oysters showing signs of significant stress. Mr. Naylor noted that although the oyster harvest in the upper bay (which comprises 2% of the overall harvest) has been severely impacted, the overall oyster harvest has not been impacted.

Mr. Legum asked if the Harris Creek restoration project was affected by the oyster die-offs. Mr. Naylor stated that the Harris Creek oyster population was not very affected by lower salinity. He noted that the fall survey is expected to show that the trend of low disease mortality seen over the past five years has continued. Mr. Legum asked if MD DNR has estimated the number of oysters that have succumbed to low salinity. Mr. Naylor responded that while an exact number was not known, MD DNR believes that about 2% of the total oyster population in the Bay has been lost.

Mr. Bryer noted that a significant volume of sediment entered the Bay following Tropical Storm Lee, and asked which areas of the Bay had experienced increased sediment deposition as a result. Mr. Halka stated that the majority of sediment entering the Bay following Tropical Storm Lee settled in the mainstem below the Bay Bridge, allowing the sediment to spread out thinly. Although significant sedimentation has occurred, it is not as severe as expected.

Del. O'Donnell noted that there had recently been reports of bleached oyster shells in the Bay, and asked if there had been any correlation between the locations of these incidents with the location of wastewater treatment plants. Mr. Naylor responded that MD DNR has not seen any reports of bleached oyster shells, and at this time, bleached oyster shells have not been observed in the fall survey. Del. O'Donnell noted that Maryland Department of the Environment (MDE) has records of bleaching incidents, and suggested that these incidents be reviewed.

Focus of OAC for 2012 (Tom O'Connell, MD DNR)

Mr. Eichbaum announced that he would be stepping down as chairman of the OAC. He thanked the OAC for their work over the past four years and noted that over this period MD DNR's oyster management program has made a dramatic and apparent shift in approach and that this shift has largely reflected the OAC's recommendations on oyster management.

Mr. O'Connell thanked Mr. Eichbaum and the OAC for their work since 2007. Mr. O'Connell noted that the OAC was originally convened in order to provide MD DNR with advice on the implementation of the 2009 Oyster EIS decisions. MD DNR believes that the OAC's work continues to be valuable to the Department, however, as implementation continues; the OAC may be able to serve in this capacity with fewer meetings each year. Mr. O'Connell suggested that in the future the OAC meet twice a year, once in March to discuss legislation relevant to oyster management, and once in the fall to discuss emerging oyster management issues. Additional issues requiring discussion would be addressed by sub-groups within the OAC. Mr. O'Connell asked if this schedule was acceptable to the OAC.

- Mr. Legum observed that the OAC would have a significant volume of work in 2012, including legislative outreach and work to encourage recognition of oyster restoration projects. He suggested that the OAC meet three times in 2012.
- Mr. Webster asked how the OAC was viewed by MD DNR in comparison to other advisory bodies. Mr. O'Connell responded that the OAC is seen as an ongoing high-level advisory committee, similar to the Aquaculture Coordinating Council (ACC) or Sport and Tidal Fisheries Advisory Commissions (SFAC/TFAC).

- Mr. Webster suggested that an official OAC liaison be appointed to participate on these committees. Mr. Robertson suggested that given the large role aquaculture will likely play in the future of Maryland's oyster industry, the ACC may be too far removed from the OAC.
- Del. O'Donnell pointed out that the ACC's charge differs significantly from that of the OAC. Specifically, the ACC works to identify and break down institutional barriers to aquaculture implementation, whereas the OAC is a stakeholders' advisory group. Del. O'Donnell added that the General Assembly previously rejected a proposal to dissolve one of the two committees. He agreed that increased coordination between the two committees would be beneficial.
- Del. O'Donnell stated that he agrees that the OAC should meet three times in 2012.
- Dr. Boesch suggested that the OAC be given a specific goal or deliverable; he noted that the purpose of the OAC's meetings has been unclear since a year-end report is no longer required.

Mr. O'Connell asked if the current meeting time was acceptable to the OAC for the meetings in 2012. There was no objection to the meeting time. He stated that MD DNR will plan three OAC meetings in 2012 rather than two, and he indicated that he will consider the other recommendation made by the Commission.

Harris Creek Restoration Update (Eric Weissberger, MD DNR)

The USACE has compiled side-scan sonar data provided by Maryland Geological Survey (MGS) and multi-beam sonar data provided by the National Oceanographic and Atmospheric Administration (NOAA) and is using this compiled data to identify specific sites for oyster habitat restoration in Harris Creek.

Due to limited shell availability, USACE plans to use alternative substrate (clam shell and granite covered with a layer of oyster shell) at the restoration sites. A few reefs that were originally planned to be constructed with granite will be constructed using clam shell instead because some watermen were concerned that they would not be able to harvest oysters from granite based reefs using traditional methods.

In addition to the USACE program, the Marylanders Grow Oysters (MGO) program is currently growing approximately 15,000 oysters in Harris Creek, with an additional 10,000 planned to be added this year. Furthermore, Dr. Ken Paynter, University of Maryland (UMD), is working on an oyster population estimate for Harris Creek, using a patent tong survey.

According to NOAA's survey, 604 acres of hard bottom exists in Harris Creek. To meet the Oyster Metrics Team's measures of success, the project must restore 50% of this area, or 302 acres. Much work remains to meet this goal, as the current USACE project will restore only 24.5 acres.

Mr. Weissberger noted that oyster restoration in Harris Creek was limited by a USACE – Baltimore District (CENAB) regulation requiring an 8-foot clearance in the Bay and its tributaries; therefore, oyster reefs in the Creek cannot be built higher than 8 feet below the water’s surface. Del. O’Donnell noted that the draft seemed excessive, as few recreational boats require a draft lower than four feet. Dr. Meritt asked if this regulation would prohibit oyster restoration in the top 8 feet of Bay waters statewide. Mr. Weissberger noted that exceptions can be applied for, with each reviewed on a case-by-case basis.

Mr. Eichbaum asked if USACE restoration was complete. Mr. Weissberger responded that USACE is currently reviewing bids for oyster reef construction; the reefs will be built over the winter and planted in July, when oysters are breeding. The source of the shell is currently unknown; the UMD Center for Environmental Science (UMCES) Horn Point Laboratory (HPL) is being considered as a source.

Mr. Bryer asked if funding for oyster restoration in Harris Creek was comparable to funding for restoration in other tributaries, and if oyster restoration in Harris Creek could have adverse effects on other fisheries in the creek. Mr. Weissberger responded that the project was ongoing; therefore, the cost of the project could not yet be compared to similar projects, and added that monitoring the creek for adverse effects of restoration was an ongoing part of the project. Dr. Boesch asked if the project’s main limitation was its ability to secure funding. Mr. Weissberger responded that funding, in addition to CENAB’s 8-foot depth restriction, were significant limitations on the project.

Dr. Meritt noted that the project would require several thousand bushels of shell to cover the acreage required, adding that accurate placement of shells on restored reefs is sometimes difficult, which may result in shell loss. Mr. Weissberger responded that MD DNR would conduct a bottom survey post-construction to confirm that oyster shell had been placed accurately. Dr. Meritt asked if there was a contingency plan if shell were to be placed in the wrong location. Mr. Weissberger responded that this has not been a problem in past oyster restoration events, and was not expected to be an issue in Harris Creek.

Mr. Lewis asked for an update on the progress of MD DNR shell recovery efforts. Mr. Weissberger noted that MD DNR has received authorization to dredge at depths greater than 1 foot for buried shell. Mr. Eichbaum asked if follow-up monitoring was scheduled following planting. Mr. Weissberger stated that the reefs constructed in Harris Creek would be monitored as part of the 2012 fall survey.

Oysters and Nutrient Trading Credits

Researchers from UMD and Maryland Department of Agriculture (MDA) presented their research on the potential for awarding nutrient trading credits for oyster restoration.

Jeff Cornwell (UMCES HPL)

Dr. Cornwell introduced himself as a scientist with UMCES HPL with a background in bivalves and water quality. He presented research that was conducted by UMCES HPL, UMD, and VIMS for the Oyster Recover Partnership (ORP) on nitrogen cycling in oyster reefs. Dr. Cornwell explained that the nitrogen sequestration properties of oyster reefs are well established, however, Dr. Roger Newell's research indicates that the nutrient removal benefits of oyster reefs are not dependent on the nitrogen content of the oyster tissue alone, but is also affected by microbial processes. This suggests that the nitrogen sequestration properties of an oyster reef may vary by location. His team's research is the first to attempt to quantify the nitrogen removal benefits of an entire reef community.

Dr. Cornwell showed how oysters remove nitrogen from the water through a series of microbial reactions and how organic nitrogen wastes produced by oyster reefs are converted to N₂ gas, which is released to the atmosphere.

The study examined two oyster bars in the Choptank River, one previously restored and one unrestored. Divers collected a sample from each of these reefs at each of four sampling events; samples included whole reefs as well as embedded substrate and a portion of the water column over the reef. This community was left in a tray for two weeks to ensure that short-term disturbance artifacts were minimized. Each reef segment was placed in oxygenated baths with salinity and temperature conditions identical to those at the collection point for incubation within five hours.

The animal community in each of the reefs was analyzed and tissue samples were tested for nutrient content, in addition to nutrient concentration analyses. Sample results were fairly consistent across each sampling set, with reefs showing significantly more metabolic activity than control sediments. Reefs were able to remove about 25% of the community-produced nitrogen in the system via denitrification. Restored oyster reefs appear to remove nitrogen at a much higher rate when compared with other ecosystems previously studied. However, the process does not occur in anoxic zones of the Bay – oyster reefs in shallow areas, such as the mouth of Bay tributaries, remove nitrogen most effectively.

Dr. Cornwell noted several assumptions in the study's findings. The study assumes a density of 100 oysters/m². In addition, the study makes assumptions based on the most current scientific understanding of denitrification seasonality in oysters and wetlands, and assumes that oyster restoration in the Choptank River is typical of Bay oyster restoration. Dr. Cornwell also presented a graph showing the acres of restored oyster reef necessary to remove 1% of the Bay nitrogen budget, compared with the acreage of wetland required to do the same task. Approximately 7,000 acres of wetland are required to remove this level of nitrogen; half this acreage of oyster reefs is required to remove 1% of the Bay nitrogen budget. Dr. Cornwell noted that this figure used the current nitrogen loading in the Bay, rather than the total maximum daily load (TMDL) set for the Chesapeake Bay. Dr. Cornwell noted that this acreage was significant; however, the significant benefits are provided by increasing the acreage of oyster reefs. Dr.

Cornwell added that historically, better water quality has been seen in areas with oyster reefs when compared to waters located away from oyster reefs.

Doug Lipton (UMD)

Dr. Lipton presented his work to estimate the demand for oyster nutrient removal services, noting that if oyster restoration is to be undertaken for nitrogen removal credits, it must be cost-competitive, and must be recognized as an effective best management practice (BMP). Dr. Lipton noted that the market for nutrient credits was limited by Maryland's decision to only allow nutrient trading to offset further development once the TMDL has been met. However, the TMDL regulations also specify that TMDLs can be brought up for review in the case of an observed increase in oyster population.

Dr. Lipton explained that while his presentation would focus on oyster reef restoration, opportunities also exist for aquaculture operations to realize benefits from oyster restoration projects. Previous economic analyses suggest that these benefits would be small compared to aquaculture revenues from the sale of stock, however, income from nitrogen trading credits could lower the risks associated with starting an aquaculture operation. Dr. Lipton's study assumed that as a reef ages, its growth slows, and while denitrification and sequestration continues to increase, it does so at a decreasing rate. Thus, it becomes more cost-effective to harvest the reef back to the size it was at an earlier age to optimize the total benefits from the reef. With the assumed growth function, reef size was optimal if it was kept at the size a reef would attain in 4 to 5 years, but more work is needed to refine this estimate. The harvested oysters would be sold as an additional source of revenue for the reef owner. Dr. Lipton added that economic models show that oysters are more economically valuable when sold for food than when in the water; because of this, reef managers would need to be required to sign a contract limiting their ability to harvest from the reef to ensure that the maximum nutrient removal benefits are realized, with severe monetary penalties for violations. Dr. Lipton noted that the State needs to create a market framework in which such contracts can be entered into.

John Rhoderick and Susan Payne (MDA)

Mr. Rhoderick explained that MDA's investigation of the feasibility of developing nitrogen credits for oyster growth suggests that aquaculture operations may be one of the easiest activities to monitor and verify since the oyster population itself can be easily measured for its sequestration rates. Mr. Rhoderick indicated that although the nutrient marketplace is limited by Maryland statute to "point source to point source" and "agricultural nonpoint source to point source" trading, some nutrient trading is already active. He also mentioned that nutrient credits may be required under Maryland's new "Growth and Offset Policy" for new septic systems. Mr. Rhoderick noted that most trades will require nutrient credits to remain in place for ten years. Because of the variability in nitrogen removal properties across oyster reef populations credits for oyster reef restoration may be difficult to guarantee for that long, making the credits more difficult to market.

Discussion

Dr. Boesch asked why the average volume of nitrogen removed from the Bay per dollar of oyster restoration was not calculated. Dr. Cornwell responded that no reliable method has yet been found to calculate a reasonable figure.

Dr. Boesch questioned if harvesting restoration reefs managed for nitrogen removal was efficient, since no method exists for harvesting a single age cohort, and since lowering the population of oysters on a reef would appear to lower the capacity of the reef to remove nitrogen from the water. Dr. Lipton explained that the growth rate of reefs slow without harvesting; limited harvesting would allow continued rapid growth of the reef. Dr. Cornwell noted that older, undisturbed reefs may also carry nutrient removal benefits due to ecosystem services, as his studies have indicated.

Mr. Bryer asked how much research must be done to obtain an oyster aquaculture credit. Mr. Rhoderick replied that currently monitoring would be required for each individual site to verify credits, and added that a contingency plan may be a necessary requirement for oyster aquaculture credits in the event that nutrient removal benefits are not realized as expected.

Del. O'Donnell asked if research had been done to determine the nutrient removal of water column aquaculture, noting that previous research has indicated that oysters grown in the water column grow faster, have a lower mortality rate, filter a larger volume of water, and improve the surrounding habitat. Dr. Cornwell confirmed that similar research was ongoing for water column aquaculture, and confirmed that research has shown that float aquaculture, at a minimum, does not harm underwater habitat if sufficient water flow through the site exists.

Dr. Schott asked why denitrification rates for oyster reefs in intertidal zones were lower than the rates for reefs examined in the current study. Dr. Cornwell responded that wave action in intertidal zones washes many particulate nutrients away from the area. Dr. Schott also expressed concern that developing an average nitrogen removal rate per dollar of oyster restoration, although useful for encouraging investment in oyster restoration, may divert funding from more traditional nitrogen sequestration systems which have been proven effective. Dr. Boesch noted that oyster reefs may have an advantage over some nitrogen sequestration techniques, adding that oyster reefs are more permanent than cover crops used for nitrogen sequestration.

Mr. Webster noted that Maryland has several programs to encourage aquaculture development that may be useful as potential sources of funding for nutrient credit research and marketing. Dr. Lipton agreed, and noted that the effectiveness and role of public policy in encouraging nutrient trading credits for oyster restoration and aquaculture should be evaluated. Del. O'Donnell suggested that Dr. Cornwell and Dr. Lipton's PowerPoint presentations be distributed to the OAC.

Mr. Bryer asked what the current status of nutrient trading in Maryland was. Mr. Rhoderick responded that agricultural nutrient credits have been certified on two properties but no trades have taken place to date.

Mr. Eichbaum asked if there was an overarching program to investigate issues surrounding credits for nitrogen sequestration by oysters. Dr. Boesch responded that research is currently being completed in piecemeal studies. Mr. Eichbaum noted that an overarching program could be useful to allocate funding where research is needed.

Oyster Habitat Study (Tom Earp and Kierran Sutherland, Towson University)

This study produced a graphical representation of the change in oyster habitat using GIS technology. This graphical representation presents oyster habitat data recorded during the Bay Bottom Survey in comparison to the earlier Yates bar survey data. The maps produced show that all but a few oyster bars had decreased in size over the period between these surveys, some dramatically. This work has been confirmed by more recent side-scan data. Mr. Earp stated that the data used in the survey has been entered into Excel format, and that feedback on the data before release would be appreciated.

Dr. Meritt noted that areas of significant habitat loss may be potential sources of buried shell which could be recovered for oyster restoration. Mr. Webster pointed out that the Bay Bottom survey occurred before significant losses in oyster populations from disease pressure were recorded; the habitat loss from the Yates bar survey to the present is therefore likely to be much larger than shown. Del. O'Donnell asked if any correlation was observed between habitat loss and wastewater treatment plant location. Mr. Earp replied that this had not been part of the scope of the project; however, such an investigation would be one of many useful applications of the data.

Mr. Robertson asked if data gathered for the project was available sorted by region. Mr. Earp confirmed that it was. Mr. Robertson suggested that the data be updated as more recent habitat data becomes available, and added that overlays of other environmental factors, such as salinity, could help identify potential restoration sites.

Mr. Naylor noted that the data presented would be useful to MD DNR; MD DNR would be interested to see the rate of change in the oyster habitat between the Yates and Bay Bottom surveys, and compare this to the rate of change since the Bay Bottom survey as updated data from MGS becomes available.

Open Discussion

Mr. Eichbaum stated that he would draft a letter on behalf of the OAC to CENAB advocating for a blanket exception to the 8-foot depth regulation for oyster restoration projects. Mr. O'Connell stated that he would meet with representatives from CENAB to discuss this issue. Mr. Eichbaum asked that MD DNR send him contact information for the appropriate CENAB personnel to whom the letter may be directed.

Sen. Colburn asked if a similar depth regulation is required by USACE – Norfolk District (CENAO). Mr. O'Connell replied that no such regulation had been set by CENAO. Mr. Bryer pointed out that The Nature Conservancy (TNC) has completed oyster restoration projects in

Virginia that created reefs nearly reaching the water surface. Sen. Colburn suggested that this point be made in the OAC letter to CENAB. Dr. Meritt suggested that the letter also argue that oyster restoration should be based on historic populations, much the same way submerged aquatic vegetation (SAV) restoration is currently done.

Public Comments

Mr. Len Zuza, Southern Maryland Oyster Cultivation Society (SMOCS) noted that community-based oyster restoration groups would be interested in managing oyster reefs for nutrient credits. Mr. Zuza added that community groups, while not at the same scale as a corporations which may need to mitigate nutrient loadings, could provide political capital for the program.

Mr. Bergstrom noted that NOAA studies have confirmed that the ability of oysters to sequester nutrients in deep waters is much less than in shallow waters.

Mr. John Klein, asked MD DNR to monitor poaching on oyster bars restored by community groups, noting that the bars, while small, are still often targeted by poachers, and require protection.

Closing Remarks

Mr. O'Connell presented a Governor's Citation to Bill Eichbaum in appreciation for his work on the OAC over the past four years.

The next OAC meeting will be held at a date TBA in 2012.

Meeting adjourned at 7:00