Sustainable Fisheries Goal Implementation Team (Fisheries GIT) Meeting
June 4-5th, 2014
Virginia Institute of Marine Science – Gloucester Point, VA

Meeting Materials: http://www.chesapeakebay.net/S=0/calendar/event/21643/
Fisheries GIT Website: http://www.chesapeakebay.net/groups/group/sustainable_fisheries

Meeting Summary

Background

On June 4-5th, 2014 the Sustainable Fisheries Goal Implementation Team (Fisheries GIT) of the Chesapeake Bay Program met at the Virginia Institute of Marine Science for its 9th biannual meeting. This report provides the meeting takeaways/next steps and short summaries of the presentations and discussions.

The Fisheries GIT draws together a diverse group of jurisdictional managers, scientists, and other stakeholders to improve management and recovery of oysters, blue crab, menhaden, striped bass, and alosines in the Chesapeake Bay. It focuses on advancing ecosystem-based fisheries management by using science to make informed fishery management decisions that cross state boundaries. Through this approach, the Fisheries GIT is focused on managing sustainable Chesapeake Bay fish populations that support viable recreational and commercial fisheries and provides for natural ecosystem function.

The objectives of this June 2014 meeting were to discuss:

- **Striped Bass:** research updates on the interactive effects of disease and environmental stressors; development of nutritional reference points; status of ASMFC's Draft Addendum IV that will propose new fishing mortality reference points and management measures.
- **Forage Workshop:** an overview and status of the STAC Forage Workshop planned for the fall.
- **Climate Change:** observed and projected changes in species distribution and habitats due to climate change on the Atlantic Coast and in the Chesapeake Bay.
- **Blue Crabs:** 2013-14 winter dredge survey results and the current status of the blue crab population; CBSAC's proposed management recommendations; additional data to understand blue crab population; natural mortality, specifically habitat loss and predation.
- **GIT Member Updates:** recent fisheries-related projects and initiatives of GIT members and their organizations.

Meeting Takeaways and Next Steps

Striped Bass

- Integrate environmental stressors (i.e. hypoxia) and disease and their interactive effects in population estimates/models used by managers.
- Support the inclusion of nutritional reference points and associated data into ASMFC models and stock assessments;
- Support further research on fish behavioral response to hypoxia, temperature and other environmental stressors.

- Reconsider a revised draft of ASMFC Addendum IV for public review at the ASMFC meeting in August.

Forage Workshop

- Workshop Steering Committee will complete a preliminary analysis of selected predator/prey interactions from the ChesMMap data and share results with full GIT.
- Provide information from pre- and post- STAC Forage workshop into ecosystem models.
- Use forage workshop outcomes to ensure that public messaging on forage is consistent and accurate across the Bay.
- Support the need for a Baywide zooplankton survey that would contribute to analysis of forage availability through the Scientific, Technical Assessment and Reporting team during the phase III BASIN process.

Climate Change

- Explore the development of a climate vulnerability assessment tool for key Chesapeake Bay fish and shellfish species based on the current NOAA Fish Stock Climate Vulnerability Tool.
- Ensure fisheries and habitat are considered under the climate resiliency goal and outcomes of the new Chesapeake Bay Watershed Agreement.
- Consider multiple driving mechanisms between climate change and fisheries such as temperature, multispecies interaction, availability of forage and habitat.

Blue Crabs

- Continue discussions to adopt a new July-June management year for all jurisdictions.
- Support continued research to quantify predator-prey relationships between blue crabs and their predators as part of the upcoming Benchmark Stock Assessment process.
- Consider funding options for shallow-water dredge survey to better understand status of juvenile blue crabs in the Bay through the Scientific, Technical Assessment and Reporting team during the phase III BASIN process or other mechanisms.
- Explore long-term management options to more effectively address natural mortality and life history of blue crabs (Ex: closures in the spring to protect spawning females).
- Follow up with lead industry representatives from all three jurisdictions to discuss the following:
    - Impacts of the peeler industry
    - Latent effort
    - Electronic reporting
    - Seasonal closures of fishery to protect spawning females
    - Bay-wide allocation

Oysters (from GIT member updates)

- Promote the production of an underwater video featuring restored oyster reefs and associated fish and invertebrates to support public messaging efforts about oyster restoration.
- Discuss legislative needs with CBC and jurisdictions to protect oyster restoration investments.
- Explore the potential of reef balls as a poaching deterrent.

Invasive Catfish (from Wide Net Presentation)

- Follow up on consumption advisories, both federal (commercial) and statewide (recreational).
- Evaluate the status of the blue catfish commercial fishery and market opportunities throughout the Bay.

Presentation and Discussion Summaries

Striped Bass

Effects of Hypoxia, Temperature and Mycobacteriosis

Mary Fabrizio (VIMS) presented the results of a recent study looking at the interactive effects of mycobacteriosis, hypoxia, and temperature on the metabolic health of striped bass. Hypoxia affects both the abundance and distribution of fish. In conjunction with elevated temperatures, hypoxia can be even more stressful to fish as more oxygen is required to maintain normal function at higher temperatures. In addition to environmental stressors, mycobacteriosis is prevalent throughout the Chesapeake Bay striped bass population (>75% in some areas) and is associated with increased natural mortality and lower growth rates.

Results reveal that there is a significant interactive effect of hypoxia, high temperature, and the severity of mycobacteriosis on the metabolic function of striped bass. In cases where heavily diseased fish are exposed to high temperature and low DO, there was an average 54% decrease in the metabolic scope, which means activity is greatly compromised and fish can fatigue rapidly, have lower growth rates, and exhibit reduced immune function and reproductive performance. More information can be found in the associated final report for this study.

In response to questions from Fisheries GIT members, Mary and Wolf Vogelbein (VIMS), another PI on the project, emphasized that taking into account the interactive effects of multiple environmental stressors is key to estimating the abundance of fish populations. For example, fish may be unable to invest sufficient energy in their reproductive capacity as the Bay waters they rely on for spawning are stressing their energy stores due to hypoxia and elevated temperature.

Managers discussed the habitat squeeze concept that was presented and asked what can be managed in the interlinked loops of hypoxia and decreased forage/habitat availability. Mary and others pointed out that experimental management approaches are important since lab experiments cannot mimic what happens in situ. Behavioral studies, perhaps tagging studies, are needed to investigate fish behavior in relation to hypoxic zones and to determine if water quality/temperature data can be used to predict where fish will aggregate.

ASMFC Striped Bass Draft Addendum IV

Bob Beal presented the status of draft Addendum IV to Amendment 6 of the Interstate FMP for Atlantic Striped Bass. This addendum will propose new fishing mortality reference points recommended by the recent 2013 benchmark stock assessment as well as proposed management measures to achieve these reference points. Under the proposed reference points, fishing mortality (F) is currently above the new target and spawning stock biomass (SSB) is approaching the new overfished threshold. The Striped Bass Management Board is required to take action when F is above the target and SSB is below the target, hence the development of Draft Addendum IV.

Currently, the coastwide stock is not overfished and overfishing is not occurring. This new addendum would address the period of poor recruitment from 2005-2010 and attempt to protect the strong 2011 year class as they mature, especially the females. The addendum is currently being updated by the ASMFC Striped Bass Technical Committee and will be considered for approval for public comments by the Management Board this August. Addendum management measures are scheduled to be implemented in January 2015.

Regarding the Chesapeake Bay specifically, there has been some debate over whether the Bay jurisdictions should take as much of a harvest reduction as other states along the Atlantic coast since a large portion of Bay jurisdictions' harvest is males. Board members are also debating whether or not these measures should be implemented all at once or gradually over a three-year timeframe.

Fisheries GIT members discussed the importance of keeping Chesapeake Bay constituents informed as management measures are developed to reduce juvenile mortality and to protect females. GIT members discussed other factors to consider including the impact of bycatch mortality and natural mortality in the summertime due to hypoxia /temperature. Managers emphasized that the current SSB levels are similar to the levels considered "recovered" in 1995, so while the levels are less than the levels in the late 1990s and early 2000s, the current SSB is considered still healthy. The coastal states are seeing strong recruitment when environmental conditions are favorable, which was not the case before the stock was recovered in the early 1990s. Socioeconomic impacts and tradeoffs need to be considered when making decisions to implement harvest reductions.

Nutritional Reference Points

Jim Uphoff (MD DNR) presented his work on developing nutritional reference points for striped bass using fall diets and ecological indicators from the Maryland portion of the Chesapeake Bay. This work builds off previous work by Jacobs et al. (2013) that established targets and thresholds for lipid concentration to determine the nutritional status of individual striped bass. Jim presented some ecological indices that have been developed based on striped bass health and diet data from the Chesapeake Ecological Foundation (CBEF) and Maryland DNR's Fish and Wildlife Health Program.

The data indicate that diet of legal-sized fish is dominated by Atlantic menhaden. The condition of sub-legal striped bass is tied to their diet during the Oct-Nov timeframe, while the condition of legal fish does not correspond to a specific timeframe. Ecological indices presented included forage indices to determine the availability of prey; relative survival estimates from ASMFC over time that indicate periods of low survival; the proportion of fish with no body fat which may indicate times when adequate prey is not available.

Fisheries GIT members discussed the value of knowing the menhaden carrying capacity of the Bay, as higher striped bass populations due to reduced F would require more forage availability. Members also discussed the lack of diversity in the sampled fish diets, and potentially attribute it to the high demand for specific forage items as management regulations affect what size striped bass are present in the Bay. Looking at forage availability from a bottom-up view was also discussed, and GIT members brought up the past Baywide zooplankton survey that could help identify bottom-up forcing. Members expressed interest in finding possible funding sources ($200,000-$500,000) to reinstate this survey.

Striped Bass Next Steps

- Integrate environmental stressors (i.e. hypoxia) and disease and their interactive effects in population estimates/models used by managers.
- Support the inclusion of nutritional reference points and associated data into ASMFC models and stock assessments;
- Support further research on fish behavioral response to hypoxia, temperature and other environmental stressors.
- Reconsider a revised draft of ASMFC Addendum IV for public review at the ASMFC meeting in August.

Forage Workshop

STAC Forage Base Workshop

Bruce Vogt (NOAA) presented progress on developing the Scientific and Technical Advisory Committee (STAC) workshop titled *Assessing the Chesapeake Bay Forage Base: Existing Data and Research Priorities*. The workshop Steering Committee (SC) is a diverse group of scientists and managers from multiple perspectives to ensure the workshop is addressing the appropriate scientific questions and that the outcomes will be useful for management purposes. The workshop proposal and outcomes will address the new Chesapeake Bay Program Watershed Agreement forage outcome and the Fisheries GIT forage discussion at the December 2013 full GIT meeting.

Currently, the SC is working to define the composition of "forage" for the Chesapeake Bay as part of the pre-workshop objectives. The SC is exploring the ChesMMAP data in order to identify important forage species/groups before the workshop convenes. The exploration process consists of 1) selecting important managed predators of interest, 2) determining the prey species and diet composition of those predators, 3) assembling the prey species into taxonomic groups, and 4) identifying key habitats for the forage groups. SC members are testing this process for a few managed species to determine if this process identifies a representative list of Bay forage species.

Fisheries GIT members agreed with the SC process to determine the forage species that are key to supporting valuable managed predators. The SC's analysis may reveal a higher importance of certain prey items and habitats across multiple predators. It was recommended that this work should also focus on how to take predation pressure off commercially important species, like blue crab, which can be subject to more predation when other forage availability is low. When asked about the outcomes of the workshop, the workshop chairs indicated that this workshop would focus on understanding the available data and how it can help managers make decisions in the Bay; the workshop is not directly focused on informing stock assessments at a larger scale.

Forage Workshop Next Steps

- Workshop Steering Committee will complete a preliminary analysis of selected predator/prey interactions from the ChesMMap data and share results with full GIT.
- Provide information from pre- and post- STAC Forage workshop into ecosystem models.
- Use forage workshop outcomes to ensure that public messaging on forage is consistent and accurate across the Bay.
- Support the need for a Baywide zooplankton survey that would contribute to analysis of forage availability through the Scientific, Technical Assessment and Reporting team during the phase III BASIN process.

Climate Change

Panel Presentations

Carl Hershner (VIMS) facilitated a panel of experts presenting climate change impacts on fisheries in the Bay and along the Atlantic Coast. Vince Saba (NOAA) began the panel with temperature observations and projections from the Northeast Shelf off the Atlantic coast and referenced the coastal surveys that can monitor climate change impacts. He emphasized the importance of tracking other

driving mechanisms in addition to temperature, such as fishing pressure, habitat, multi-species interactions, to monitor the impacts of climate change on living resources.

Jim Gartland (VIMS) discussed the use of Virginia's three main fishery-independent monitoring surveys (Juvenile Survey, ChesMMAP, NEAMAP) to track climate change impacts on fishery resources. All three trawl surveys track biological, hydrographic, and atmospheric data over a long period of time and can document environmental change and associated species response. The presentation then featured ASMFC's efforts to develop management options to address changing species distributions, specifically for summer flounder, that incorporate both historical harvest information and the current distribution of the species.

Donna Bilkovic (VIMS) focused the panel on the projected loss of important Bay habitats due to climate change. Rising temperature, stronger storms, and sea level rise, among other effects, are projected to severely impact the growth and survival of coastal wetlands and SAV. Sea level rise is predicted to be especially problematic in low-lying areas of Virginia while increasing human development and shoreline hardening accentuate wetland loss. The importance of understanding the larger picture of habitat connectivity and species distribution is essential to further research and climate adaption.

Wendy Morrison (NOAA) presented a Fish Stock Climate Vulnerability Tool that NOAA is developing for the Northeast region. The tool assesses the relative vulnerability of various fish stocks to climate changed based on exposure to climate change impacts and sensitivity (based on life history) to these impacts. This tool is still in the development stage and is currently only programmed for fisheries in the Northeast region. The tool can help managers identify those stocks that would be most vulnerable to climate change and potential management actions that may increase stock resilience.

Full GIT Climate Change Discussion and Reflection

As the facilitator, Carl posed questions to the full GIT following the panel presentations. The first point of discussion was how climate change could affect the Fisheries GIT and the Chesapeake Bay Program's ability to achieve the fisheries outcomes set forth in the new Chesapeake Bay Watershed Agreement. The point was made that most of the climate information available is at a much broader scale than the Chesapeake Bay, so we need more information on specific Chesapeake Bay climate drivers and impacts. The climate resiliency goal and outcomes of the new agreement were identified as a possible mechanism to garner the means and support for additional research on Chesapeake Bay fisheries responses to climate change.

Fisheries GIT members discussed the benefit of applying a similar framework of the NOAA Climate Vulnerability Tool to important Chesapeake Bay fish and shellfish species to determine their sensitivity to climate change impacts. From a management perspective, climate change is occurring in a dynamic system at the same time as continued human development and ecosystem changes. Managers need to identify different management tools for different stressors.

Phytoplankton are recognized as an essential part in the Chesapeake Bay food web and also sensitive to climate change impacts. Although the plankton community is not directly managed, they are key to the health of fishery resources. This broader-scale, ecosystem view of the issue is crucial when trying to identify climate impacts and drivers.

Climate Change Next Steps

- Explore the development of a climate vulnerability assessment tool for key Chesapeake Bay fish and shellfish species based on the current NOAA Fish Stock Climate Vulnerability Tool.
- Ensure fisheries and habitat are considered under the climate resiliency goal and outcomes of the new Chesapeake Bay Watershed Agreement.

- Consider multiple driving mechanisms between climate change and fisheries such as temperature, multispecies interaction, availability of forage and habitat.

Blue Crabs

CBSAC Blue Crab Advisory Report

The Chesapeake Bay Stock Assessment Committee (CBSAC) has analyzed the 2013-14 winter dredge survey results and is developing the 2014 Blue Crab Advisory Report. Joe Grist, CBSAC Chair, presented the 2014 data and the draft CBSAC management recommendations. The 2014 female (age 1+) crab abundance is 68.5 million, just under the threshold of 70 million. The 2013 exploitation fraction was 23%, which is below the target of 25.5%. The stock is depleted but overfishing is not occurring. The term "depleted" indicates that low stock abundance is due to other factors, not just exploitation. Juvenile abundance increased slightly from 2013, while the number of male blue crabs slightly decreased from 2013. The 2014 Advisory Report will be completed and released to the public in late June or early July 2014.

CBSAC's short-term management advice includes maintaining a risk-averse management approach to protect the 2014 recruits; improving harvest accountability and increasing effort to determine the biological characteristics of the catch. Long-term management advice includes evaluating a Bay-wide quota system; establishing year-round sanctuaries for mature females; increasing monitoring efforts to estimate the total, spatial, and temporal patterns of the crab pot fishery; estimating latent effort. The report will also address CBSAC's critical data and analysis needs including evaluating gear efficiency estimates, estimating over wintering mortality; providing hypotheses of what happened to the 2011-2012 recruits; and investigating the potential for sperm limitation.

Fisheries GIT members discussed the use of the term "depleted" which indicates a potential lack of understanding/science to explain why the population is low. Although the exploitation fraction has been low the past few years and is not likely the main cause of the depleted population status, the jurisdictions are considering short-term management measures to address the low abundance levels. The jurisdictions are also considering a new July-June management framework in order to be more responsive in the long-term to the WDS results and have more time to develop management measures to protect juveniles.

Jurisdictions use different reporting systems that focus on different aspects of the fishery. Managers expressed the need to evaluate the reporting systems and determine if the reports are providing adequate accountability. Fisheries GIT members and managers also expressed concern over the unknown impacts and magnitude of the peeler industry and the need to have more information on that part of the fishery.

Blue Crab Data Sources

Chris Bonzek (VIMS) explained the Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP) that collects important biological and ecological information, including abundance indices, size information, and diet composition, for several important recreational and commercial species throughout the year. ChesMMAP provides important data for stock assessments and ecosystem-based analyses for predator-prey relationships. Chris and other VIMS faculty are currently analyzing the ChesMMAP data for blue crabs to determine if ChesMMAP and the winter dredge survey (WDS) are showing the same trends. ChesMMAP can provide data on blue crab relative abundance during the summer months when the winter dredge survey does not operate. Rom Lipcius (VIMS) presented additional analysis to validate the winter dredge survey by comparing the dredge survey data to the VIMS trawl survey data. Preliminary results show similar trends in both datasets.

Discussion focused on how to improve data collection to ensure blue crab abundance estimates are as accurate as possible. Rom indicated that a shallow water dredge survey would be an effective and useful tool that would provide more accurate estimates of juvenile abundance in the Bay. Discussion also centered on the variable sizes of juveniles and how natural mortality may affect smaller vs. larger juveniles.

Natural Mortality of Blue Crabs

Rom Lipcius (VIMS) focused the blue crab discussion on causes of natural mortality, specifically predation and habitat loss. He reviewed the blue crab life cycle and the importance of seagrass as critical habitat. A recent VIMS modeling study showed that more seagrass made the blue crab population more resilient as fishing mortality increased compared to areas with low seagrass. Rom also described current efforts to quantify the predator-prey relationships between blue crabs and its many predators on both adult and juvenile crabs.

Matt Ogburn (SERC) continued the predation discussion with an overview of SERC's long-term study on juvenile crab predation in the Rhode River in Maryland. The study indicates that adult blue crabs are the main predators of the juvenile blue crabs in the Rhode River and that juvenile mortality is correlated with the density of crabs in the Bay for a given year (higher blue crab density→higher mortality rate in the study). The study also compared sites in the Middle River and Upper Tangier Sound and found that relative juvenile mortality decreases as juveniles move up the Bay.

Fisheries GIT members agreed that predation (i.e. top-down forces) has a significant impact on blue crabs, but the availability of habitat and forage (bottom-up forces) should also be considered. Fisheries GIT members strongly supported continued research to quantify the predator-prey relationships for both adult and juvenile blue crabs to better understand the effects of natural mortality on the blue crab population in the Bay. Members also discussed the need to quantify the role of habitat on blue crab fishery production and such analysis should be considered for the next stock assessment.

Public Comment Period

The public comment period on Day 2 of the meeting was focused on blue crabs. Ken Smith, a member of the Fisheries GIT, and William (Bill) Mullis spoke on behalf of the Virginia Blue Crab Industry Panel. Ken brought up multiple points including the need for a quota system and a suggestion to implement spring season closures instead of fall season closures in order to protect the sponge crabs. He emphasized that a quota system would allow watermen to expend effort more efficiently as they see fit until their quota is filled. He also pointed out that water quality and SAV issues cannot be fixed immediately, but that the management framework can adjust to focus more on the conservation of juveniles and females.

Bill Mullis, the Chair of the VA Blue Crab Industry Panel, shared his thoughts on the positive interactions between industry and managers that have been occurring over the past few years. Bill discussed the need to eliminate small peeler pots and get a handle on the peeler pot industry's impact on the fishery. Similar to Ken's point, Bill also discussed a potential spring season closure to protect the spawning females. He then advocated for mandatory, electronic reporting and his effort to reach out to watermen to garner their support and participation in this reporting. Finally, he address the latent effort that exists in the fishery and the need to better quantify and identify these permits.

Blue Crab Next Steps

- Continue discussions to adopt a new July-June management year for all jurisdictions.
- Support continued research to quantify predator-prey relationships between blue crabs and their predators as part of the upcoming Benchmark Stock Assessment process.

- Consider funding options for shallow-water dredge survey to better understand status of juvenile blue crabs in the Bay through the Scientific, Technical Assessment and Reporting team during the phase III BASIN process or other mechanisms.
- Explore long-term management options to more effectively address natural mortality and life history of blue crabs (Ex: closures in the spring to protect spawning females).
- Follow up with lead industry representatives from all three jurisdictions to discuss the following:
    - Impacts of the peeler industry
    - Latent effort
    - Electronic reporting
    - Seasonal closures of fishery to protect spawning females
    - Bay-wide allocation

GIT Member Updates
(All updates are posted on the meeting page)

Oysters
- USACE Restoration Activity
- Maryland Implementation Update
- TNC in Piankatank
- CBF Reef Ball Evaluation

Additional Organization Updates
- DNR Habitat Thresholds for Fish Species
- VMRC Species Updates
- PRFC Species Updates
- MAFMC Select Updates
- Habitat GIT Updates

Topics of Interest
- Invasive Catfish Task Force Updates
- Virginia Sea Grant Ecosystem Post doc and Land Use Interns
- ACFHP/TNC River Herring Workshop
- Telemetry Projects Summary

Oyster Updates Next Steps
- Promote the production of an underwater video featuring restored oyster reefs and associated fish and invertebrates to support public messaging efforts about oyster restoration.
- Discuss legislative needs with CBC and jurisdictions to protect oyster restoration investments.
- Explore the potential of reef balls as a poaching deterrent.

Invasive Catfish

The Wide Net Project is a non-profit organization working in the Chesapeake Bay to promote the removal of invasive catfish as a healthy protein source for consumers, including for low-income individuals through reduced prices hunger-relief organizations. Wendy Stuart, co-founder of Wide Net, was present at the Fisheries GIT meeting and provided an overview of the project and its current status.

This initiative spurred discussion on the current status of blue catfish harvest in the Bay and what market opportunities are available. Market opportunities are regulated somewhat by consumption advisories and size limits due to contaminants levels in larger fish.

Invasive Catfish Next Steps

- Follow up on consumption advisories, both federal (commercial) and statewide (recreational).
- Evaluate the status of the blue catfish commercial fishery and market opportunities throughout the Bay.

Meeting Attendance

Fisheries GIT Members:

Peyton Robertson *(Chair)*	NOAA
Tom O'Connell *(Vice-Chair)*	MD DNR
Bob Beal *(Ex Comm)*	ASMFC
Marty Gary *(Ex Comm)*	PRFC
Rob O'Reilly *(Ex Comm)*	VMRC
Bruce Vogt *(Coordinator)*	NOAA
Nancy Butowski	MD DNR
Jessica Coakley	MAFMC
Susan Conner	USACE
Lynn Fegley	MD DNR
Jack Frye	CBC
Greg Garman	VCU
Bill Goldsborough	CBF
Bob Greenlee	VDGIF
Joe Grist *(CBSAC Chair)*	VMRC
Tom Ihde	Versar/NOAA
Andy Lacatell	TNC
Laura McKay	VA DEQ
Matt Mullin *(teleconference)*	EDF
Tom Powers	VA Blue Crab Advisory Committee
Jim Price *(teleconference)*	CBEF
Mike Slattery	USFWS
Ken Smith	Virginia Waterman's Association
Ann Swanson	CBC
Emilie Franke *(Staff)*	Chesapeake Research Consortium
Sara Molinsky *(Staff)*	NOAA
Andrew Turner *(Staff)*	Versar/NOAA

Presenters and Additional Attendees:

Donna Bilkovic	VIMS
Karl Blankenship	Bay Journal
Chris Bonzek	VIMS
John Bull	VMRC
Pam Dangelo	Indep. Journalist/Public Radio
Brenda Davis	MD DNR
Jillian Daniel	VMRC
Ande Ehlen	VMRC
Mary Fabrizio	VIMS
Jim Gartland	VIMS
Troy Hartley	VA Sea Grant
Carl Hershner	VIMS
Ed Houde *(teleconference)*	CBL

Mike Hutt	VA Seafood Council
Paula Jasinski	Chesapeake Environmental Communications
Rom Lipcius	VIMS
Mark Lukenbach	VIMS
Wendy Morrison *(teleconference)*	NOAA
Bill Mullis	VA Blue Crab Industry Panel
Matt Ogburn	SERC
Sally Roman	VMRC
Kelsey Rooks	VMRC
Vince Saba *(teleconference)*	NOAA
Nancy Smith	VMRC
Wendy Stuart	Wide Net Project
Jim Uphoff	MD DNR
Wolf Vogelbein	VIMS
Carter Watterson	Dept. of Navy
John Wells	VIMS
Laurie Williams	VMRC