

**Task Force to Study the Impact of Ocean Acidification on State Waters
December 15, 2014 Meeting Minutes**

Task Force Members

Present:

Eric Schwaab, National Aquarium in Baltimore
Bruce Michael, MD Dept. Natural Resources
Matt Stover, MD Dept. of the Environment
Doug Myers, Chesapeake Bay Foundation

Staff:

Mark Trice, MD Dept. Natural Resources
Marek Topolski, MD Dept. Natural Resources

Audience

Ryan Ono, Ocean Conservancy
Eric Weissberger, MD Dept. Natural Resources
April Morton, MD Dept. of Legislative Services
Kathy Brohawn, MD Dept. of the Environment
Molly McKee, Office of MD Senator Bill Ferguson
Shaun Luber, Office of MD Delegate Eric Luedke
Rich Norling, MD Dept. Natural Resources
Julie Reichert, Oyster Recovery Partnership – via phone
Ward Slacum, Oyster Recovery Partnership – via phone

Logistics

- Initial revisions to Bruce and Eric December 17, 2014
- Second draft distributed to Task Force December 19, 2014
- Final report due January 1, 2015
- Administrative signatures may be delayed by holidays until January 5, 2015
- Report will be available to State Legislature within the first days of the legislative session
- OA Task Force information is available at <http://mddnr.chesapeakebay.net/mdoatf/index.cfm>

Discussion:

Draft Document Structure

- Document style is for policy audience
- Recommendation section structure
 - Header, two sentence description of the header topic, then bulleted listing of recommendations
- OA 1.0/2.0/3.0 terminology needs to be defined/expanded upon in the document
 - 1.0 adequate for ocean but not for Chesapeake Bay
- End of each section should have a set of conclusions and key findings
 - Recommendations within the individual species sections should be moved to the recommendations section
- Recommendations section will mirror the key findings from previous sections
 - Recommendations presented as a list of specific actions

- Monitoring program improvements
- Additional research priorities
- Key species activities
- Communications / Outreach
- Coordination with other states and federal resource managers
- Industry direct support
- Legislative Action Follow –ups?

Review of Draft Recommendations

- Monitoring program improvements
 - **[Primary Finding]** Existing monitoring programs are inadequate to effectively inform understanding of or response to increasing acidification, particularly to estuarine waters
 - Need to build on existing monitoring networks to better understand and respond to OA events (building on that network looks like A, B, C, ...)
 - Explicit list of ways to build on and leverage existing robust monitoring system to improve understanding of OA and address OA
 - Identify specific parameters that need to be added to address the data gap: $p\text{CO}_2$, aragonite saturation, etc.
 - Reference Whitman’s report (Alliance for Coastal Technologies Workshop Proceedings: Science Assessment of Chesapeake Bay Acidification: Towards a Research and Monitoring Strategy)
 - Install additional instrumentation at current sites
 - Examine existing databases for parameters and patterns that will help target expansion of OA monitoring
 - Identify additional monitoring sites, important to industry, to increase spatial coverage of continuous monitoring (currently two sites) and integrate it with existing monitoring capabilities
 - Public agencies should seek to develop cooperative relationships with affected industries to have them host or help support enhancements in the monitoring network that will specifically benefit our understanding of and response to OA events
 - Public agencies should work with federal partners, via Chesapeake Bay Program, to enhance the monitoring network that will specifically benefit our understanding of and response to OA events
 - **[Finding]** Mechanisms are in place in other regions that allow for easy access to data by industry
- Additional research priorities
 - OA 2.0/3.0 dynamics that occur in estuarine waters needs further study
 - 1.0 adequate for acidification in ocean but not Bay
 - Compounding effects of nutrient enhancement and low DO on acidification (D. Breitburg comment: The multiple stressors paper... suggests that the most important co-occurring stressors are increasing temperatures, hypoxia and altered food webs, with anthropogenic nutrient enrichment being a major driver of the latter 2 stressors...)
 - Ecosystem interactions - - implications for food chain, early life stages, critical habitats, etc. (D. Breitburg comment: The multiple stressors paper... acidification tends to increase energetic costs, so co-occurring stressors that further increase energy demand (temperature) or limit energy utilization or availability (low oxygen and altered food webs, which are both related to nutrients) are of particular concern)

- Determine the energetic cost for various species that results from OA
 - OA effect on mortality rates due to energetic requirements, competitive disadvantages, and reproductive success
- Determine oyster standing stock biomass in the Chesapeake Bay
- Continue efforts of oyster restoration (sanctuary and aquaculture) to improve resiliency to OA
 - Monitor survival of oyster on reefs
 - Support research to determine the calcium mass balance in the Chesapeake Bay watershed: shellfish, limestone geology, etc.
 - Understand the calcium mass balance implications of current shell biomass
 - Determine how much oyster/shellfish and where needed for OA buffering
- Key species activities
 - Oyster
 - Include aragonite saturation (Ω) as one of the criteria used for siting oyster restoration projects
 - Diversification of larval shellfish supply by increasing the number of larval hatchery facilities
 - Establish a robust monitoring and reporting system for the Horn Point shellfish hatchery to notify MDE for water parameter testing when there is a larval kill
 - Blue crab (Draw a parallel between the concern Maryland should have and the concern that exists in Maine for lobster. Coordinate research with Virginia.)
 - Chesapeake Bay Program (BBCAC?) should support research on early life history stages of blue crab under expected acidification scenarios for lower estuary and nearshore ocean waters
 - Given the importance of blue crab and the potential implications this should be something considered by the relevant management committees (in coordination with Virginia)
 - Chesapeake Bay Program's management committees (BBCAC or GITs) should coordinate research to understand OA effect on blue crab larvae in polyhaline waters
 - Striped Bass
 - **[no recommendations identified]**
 - Forage fishes
 - Implement a zooplankton monitoring program designed to improve understanding of how OA effect on phytoplankton will cascade through the food web to forage fish and ultimately dependent fisheries
- Communications / Outreach
 - The Administration should fund, build, and maintain a dynamic website to host this report and future developments in OA
 - Helping targeted policy / science / management / industry groups understand the science, the unique estuarine challenges and the risks
 - Leverage Sea Grant's outreach and education capabilities to raise awareness of OA with particular attention to the shellfish aquaculture industry
- Coordination with other states and federal resource managers

- Continue efforts to reduce eutrophication via implementation of Chesapeake Bay TMDL and WIP goals
- Chesapeake Bay Program should coordinate state, federal, academic, and NGO entities to advance research efforts
- Maryland should join forces with other states that have initiated state level commissions or task forces for the purpose of bringing greater attention nationally and for other states.
- The Administration should develop a coordinated effort to submit applications for NOAA OA funds to allow Maryland to become a focal point for the understanding of and response to estuarine acidification problems
- Industry direct support
 - Support and encourage a voluntary monitoring system with various industries and stakeholders that will be affected by OA
 - Provide opportunities for volunteer participation in locations/support for routine or research monitoring at aquaculture facilities by the current and future aquaculture industry
 - Incorporate relevant mitigation mechanisms identified by the Washington State Blue Ribbon Panel on Ocean Acidification
 - Establish regular academic / industry meetings / symposia / information exchange
- Legislative Action Follow –ups?
 - Maryland DNR should take the lead in establishing an interagency/public commission to implement recommendations, identify additional resources, follow up, and progress reporting of interstate initiatives
 - Secure targeted funding for enhanced monitoring programs, research in some areas identified, and coordination of activities with affected industries
 - Explore Chesapeake Bay Commission presentation and focus on topic of OA