Scientific and Technical Advisory Committee
September 11-12, 2012 Quarterly Meeting Minutes
O'Callaghan Annapolis Hotel - Annapolis, MD

September 11 Minutes

Attendance:

Members: Charlie Abdalla, Brian Benham, Charlie Bott (T), Russ Brinsfield (T), Randy Chambers (T), Bill Dennison, Michael Ford (T), Carl Friedrichs, Marjy Friedrichs, Jim Glancey (T), Kurt Gottschalk, Kirk Havens, Robert Hirsch, Susan Julius, Mark Lukenbach, Jack Meisinger, Margaret Mullholland, Ray Najjar, Jim Pease, Chris Pyke, Marc Ribaudo, David Sample (T), Dave Secor (T), Lisa Wainger, Denice Wardrop, Claire Welty, Gene Yagow, Weixing Zhu (A)

Guests: Karl Blankenship, Jeffery Brainard (T), Sarah Brzezinski, Pat Buckley (T), Arthur Butt, Adam Davis, Stephen Faulkner, Mike Fritz, Jon Hall, Troy Hartley, Maria Herrmann, Catherine Krikstan (T), Lewis Linker (T), Doug Lipton (T), Jamie Mitchell (T), Chris Moore, Steve Newbold (T), Jerry Raynor, Gary Shenk, David Simpson, Peter Tango, Howard Townsend

Administration: Melissa Fagan, Natalie Gardner, Kevin Sellner

Announcements and Consent Agenda – Chris Pyke (USGBC)

STAC Chair, Chris Pyke, called the meeting to order shortly after 10:00 am. Following member introductions, STAC Coordinator, Natalie Gardner announced the 2013 STAC quarterly meeting dates: March 12-13, June 11-12, September 17-18, and December 3-4.

Pyke requested a motion to approve the consent agenda. Before membership approval, Pyke reviewed the July 30, 2012 STAC Executive Board (EB) meeting minutes. Members briefly discussed the proposed document entitled " Role and Responsibilities for STAC Mayoral and Gubernatorial Members. Pyke requested that members review the document overnight and prepare to discuss it before the meeting tomorrow. Additionally, Pyke requested approval of the STAC Chesapeake Bay Program Committee Nomination Appointment Protocol.

VOTE: Pyke asked members for a motion to approve the nominations protocol. Results: Motion carried - nominations protocol approved.

VOTE: Pyke asked members for a motion to approve the consent agenda. Results: Motion carried - consent agenda approved.

Furthermore, Pyke requested a motion to approve the June, 2012 quarterly meeting minutes.

VOTE: Pyke asked members for a motion to approve the June quarterly meeting minutes. Results: Motion carried - June, 2012 quarterly meeting minutes approved.

Review Request: The Potential for Nutrient Removal by Aquaculture – Kirk Havens (VIMS)

The Commonwealth of Virginia, with support of the Chesapeake Bay Program (CBP) Management Board (MB), will be requesting a STAC technical review of the state-of-the-science regarding filtration and removal of nitrogen by oyster aquaculture and oyster reefs. The request will ask STAC to focus on three main questions: (1) What is the current state-of-the-science regarding nutrient removal efficiencies of nitrogen by oyster aquaculture and oyster reefs? (2) Does current science support using oyster aquaculture or oyster reefs as a best management practice in the Chesapeake Bay model? (3) If so, what would be the most appropriate nitrogen removal efficiency based upon the current science? Anthony Moore (Commonwealth of Virginia) will present the proposed STAC review to the CBP MB for approval. STAC members pointed out that uncertainty within the current science shows that nitrogen removal rates are great in some instances, but poor to non-existent in others. It was suggested that STAC introduce the program as an oyster habitat conservation, and recovery pilot with a secondary focus on the denitrification capabilities of oyster aquaculture.

Action: Mark Luckenbach (VIMS) will form a steering committee for the STAC review request entitled "State-of-the-Science Review on Removal of Nitrogen by Oyster Aquaculture." Members interested in serving on the steering committee should contact Luckenbach at: luck@vims.edu.

James River Chlorophyll Project – Arthur "Rusty" Butt (Virginia Department of Environmental Quality)

The 2010 TMDL for the Chesapeake Bay Watershed set nutrient load caps for all river basins, including the James River (VA). The TMDL cap for chlorophyll standards in the James River basin was much lower than 2005 EPA approved standards, creating an estimated $1-2 billion increase in nutrient reduction costs. A team of scientists revisited the James TMDL allocations and conducted a comprehensive review of existing James River Site-Specific Numeric Chlorophyll a Criteria in preparation for WIP III (2017). The review established a two-track approach: (1) Staged Implementation – achieve TMDL Implementation 60 percent reductions by 2017 with additional reductions after 2017 and (2) Scientific Study with Standards Review – conduct a 3-4 year scientific study to review chlorophyll standards, and make recommendations for standard/TMDL revisions by 2017, as appropriate. Continuous monitoring of James River and weekly/monthly samples will help delineate algal bloom characteristics and establish a clearer relationship between chlorophyll and HABs (harmful algae blooms). STAC members discussed developing a carbon-to-chlorophyll ratio to properly merge available models, since current models use carbon currency primarily.

CRC Presentation: Fostering Chesapeake Stewardship GIT 5 – Sarah Brzezinski (CRC)

Brzezinski described the action teams, and workgroups that make up GIT 5. First, The Chesapeake Conservation Corps Action Team was assembled to meet the Executive Order strategy to expand corps workforces, and so, the Chesapeake Youth Corps Expansion Strategy was developed on behalf of that action team to foster partnership between existing programs, deploy an intern team, develop regional training, and generate collective metrics. Second, the Educational Workgroup (EW) assures that Mid-Atlantic students graduate with environmental literacy, and the ability to make informed choices to protect and restore the Chesapeake Bay. Additionally, the EW is working on an expansion strategy for Bay Backpack. Furthermore, the EW and STAC conducted a workshop on August 27-28, 2012 entitled "Research-Based Best Practices for Environmental Education." The product from this workshop will synthesize the suite of best practices, and refined metrics (specifically, the Meaningful Waterway Educational Experience [MEWEE]) discussed during the workshop. Thirdly, the Public Access Planning Team created a Draft Public Access strategy, in which it identified 1,144 existing public access sites, as well as 316 new public access sites. Finally, the Land Conservation Action Team has been working with NatureServe to develop the Landscope Chesapeake system, which provides a publicly accessible, watershed-wide land conservation priority system (Landscope.org).

CRC Presentation: Sustainable Fisheries GIT 1 – Adam Davis (CRC)

GIT 1 developed the Invasive Catfish Policy Adoption Statement to mitigate spread, and limit abundance of the blue and flathead catfish species. An Invasive Catfish Task Force was created to achieve those goals. The Chesapeake Bay Stock Assessment committee will identify and implement male specific reference points (female reference points already exist). The stock assessment committee met in October, 2011 to generate these reference points. GIT 1 is interested in developing a STAC workshop, and would like to propose STAC have a Land Use workshop next year. The GITs Oyster Metrics Team established quantitative metrics to evaluate tributary and reef level oyster restoration, with specific numbers for biomass and reef classification. Inter-agency oyster workgroups are looking to identifying tributaries where they can apply these metrics to achieve better restoration. Additionally, GIT 1 is developing a new American Shad indicator, since there is now a moratorium on the fishery. The Fisheries GIT will hold their next meeting in Port Isobel, Virginia on Dec. 6-8, 2012.

STAC Workshop Draft Report on Nutrient and Sediment Processing Rates of Natural Landscape Features – Mike Fritz (EPA-CBPO) and Stephen Faulkner (USGS)

STAC sponsored a March 2012 workshop, requested by the CBP Maintain Healthy Watersheds GIT, to examine whether there is a scientific basis for changing the Chesapeake Bay Watershed Model (CBWM) nutrient/sediment processing rates assigned to natural landscape features, and how to more specifically differentiate between forest, wetland, and stream landscapes. The workshop inspected three elements of these landscape features: ecological health/condition,

management status, and landscape position. The workshop report states that a better understanding of landscape type and condition is necessary to develop a loading rate, or metric, based on inherent transport controls, and nitrogen/phosphorous levels. Findings include:

(1) Forests – more forested land equated to healthier habitat, water quality and overall watershed. The conservation of established forests is a preferred practice instead of forest restoration efforts, given the uncertainty of restoring water quality functions as a result of restoring forested lands.
(2) Wetlands – wetland landscapes retain and transform nutrients/sediment through position and biogeochemical processes, but retention capabilities vary. Groundwater flow facilitates nitrogen removal in the Mid-Atlantic coastal plain wetlands, and the amount of nutrients/sediments retained by wetland landscapes increases with greater hydrologic connectivity to local waterways.
(3) Streams – healthier, un-channelized streams were more likely to have higher nutrient retention efficiencies, and deliver lower nutrient loads downstream. Forest- stream landscapes may also have lower nitrate-N loads than the Chesapeake Bay Program Model suggests. Streams with high transient water storage demonstrate increased nutrient retention.

Overall findings and recommendations from the report include: the spatial and hydrologic connectivity of landscape features to waterways influences nutrient/sediment flux from watershed to aquatic ecosystem; and the CBP should upgrade CBWM by providing more accurate estimates of nutrient/sediment loading rates. To achieve this, the report advises that riparian forests, forested floodplains and other wetlands should be identified and reclassified separately, and loading rates should be adjusted based on spatially explicit landscape attributes (directional connectivity, multi-direction flow fields, and flow-path analysis).

Analysis Northeastern US Fishery Management Decision Networks – Troy Hartley (Virginia Sea Grant)

The CBP is in the process of implementing adaptive management through the decision framework method. Hartley explained how CBP and its partners can more effectively measure, and improve connections within their network. Increasingly social scientists (particularly public policy, public administration, and political scientists) are assessing government organizational design and decision-making processes using emerging network analysis methods. Network analysis quantitatively measures links (e.g., communication frequency, resource exchanges, etc.) between actors (e.g., individuals, organizations), constructs network maps representing those connections and actors, and then analyzes the structure and function of the network, including the connectivity among players and the role individuals are playing in the network function. Examples are presented of the application of network analysis in fisheries management from New England and the Chesapeake Bay. By conceptually mapping out the organization leaders most connected to the network, CBP will be able to determine who the most important decision

makers are. This approach will allow CBP to streamline its communications efforts, and learn where organizational connections are most productive in implementing new policy focused on improving the Bay. CBP needs to determine whether or not they are interested in following through with these governance issues, and if the Partnership has the right skill sets, and connections, required to use these tools. Pre- and post-workshop questionnaires could provide additional information about these interactions.

Climate Change Simulations with HSPF Phase 5.3.0 Model of the Chesapeake Bay Watershed – Maria Herrmann (Sigma Space Corporation)

Climate-induced changes in stream flow, and loads of nutrients and sediments have been identified as some of the largest uncertainties in the Chesapeake Bay's response to climate forcing. Herrmann and Sigma Space Corp. conducted six 10-year simulations of the Chesapeake Bay watershed model to examine the impact of projected future climate change, as predicted by General Circulation Models, on stream flow, nutrients (nitrogen and phosphorous) and sediment levels within the watershed. The years (1990-1999) acted as the baseline period for the 10-year hydrological model, and the projected climate-change runs were conducted for the years 2086-2095. The overall results showed a significant decrease in stream flow by the end of the 21st century across all simulations, with warming occurring in all seasons and highly variable season precipitation projections. Sediment response was also highly variable. Winter and Spring sediment TSS fluxes increased, whereas summer and fall flux remained largely unchanged. Nitrogen levels increased in winter seasons, but decreased in other seasons. Phosphorous levels decreased slightly in summer and fall, but stayed the same in winter and spring. Herrmann hopes future studies will be able to better separate temperature and precipitation, and generate a clearer picture of climate change and its impacts on the Bay watershed model. STAC members asked if simulations could be conducted for extreme events and worst case scenarios, as these would likely dominate variability seen in the current projections. These issues need to be addressed sooner than later because present, and future infrastructure will depend on accurate science to ensure long life spans.

Ecological Production Function for Chesapeake Bay Benefits Study – Howard Townsend (NOAA-CBPO)

The purpose of this study was to assess the impacts of eutrophication on major Chesapeake Bay fisheries, and examine the economic benefits to commercially and recreationally important species, resulting from implementation of TMDL-prescribed nutrient loading regulations. Townsend's presentation did not specifically discuss economic modeling, but focused on aspects of ecology, and fisheries management, using an open loop management strategy evaluation. Ecosystem models were used to keep track of trade-offs in resource management decisions, and two complementary models are being used in the study. The Chesapeake Bay Fisheries Ecosystem Model (CBFEM), which uses biomass as currency, was used in the initial study. The Chesapeake Atlantis Model uses nitrogen as currency, and more accurately couples available

biogeochemistry to the fisheries food web and fisheries management, and will be available for use next year. Using the CBFEM, Townsend developed three distinct eutrophication scenario models:

(1) Agricultural model – increased N loads result in proportional increases in primary productivity, and result increases in secondary productivity and fisheries
(2) Agriculture-Microbial Shunt model – increases in N loads above a certain threshold level result in energy and matter being shunted away from primary producers to microbial pathways that do not contribute to fishery production at higher trophic levels;
(3) Microbial Shunt – Scenario 2, without Scenario 1.

The models produced different results under four different TMDL implementation scenarios. Full implementation of TMDL regulations resulted in loads reducing over time, and more rapidly than if tributary strategies were put in place. In the constant baseline scenario, loads are held at their current levels, and with no action, loads will increase steadily over time. The results of this study showed that fish aren't necessarily coming back as water quality improves, and long term data on fish landings have not changed much compared to current numbers, despite increased fertilizer use and subsequent runoff to the Bay over the last 50 years. The economic model will be included in the report to Congress, due out later this year/early-2013.

Stated Preference Analysis for Chesapeake Bay Benefits Study – Chris Moore (EPA)

The EPA is undertaking a benefits analysis of improvements in Chesapeake Bay water quality from reduction of nutrient and sediment loads to the Bay. These improvements will benefit nearby Bay residents, as well as the larger watershed population. Stated preference analysis is required to understand the "non-use values" of these benefits for the upper watershed population group. Stated preference analysis uses carefully constructed surveys to ask people to make choices between hypothetical options in order to tease out how much people are willing to pay for certain amenities. Revealed preference relies on observable behavior and inference regarding peoples' willingness to pay for environmental amenities, based on the decisions they make already. Stated preference also takes into account "existence values," which arise when people care about the condition of a resource, regardless of whether they use it directly. To assess the level of public concern regarding a number of topics, a stated preference survey was conducted via mail in three different geographic regions: bay states, watershed states, and other east coast states. Results showed that people cared most about water clarity, preservation of iconic species such as striped bass, blue crabs, oysters, and algae levels in lakes and local waterways. This method of evaluating public interest will assist the Bay Program and STAC in identifying key topics, and addressing community interest in various aspects of the Chesapeake Bay.

September 12 Minutes

Attendance:

Members: Brian Benham, Randy Chambers (T), Bill Dennison, Carl Friedrichs, Marjy Friedrichs, James Glancey (T), Kurt Gottschalk, Kirk Havens, Robert Hirsch, Susan Julius, Mark Lukenbach, Jack Meisinger, Jim Pease, Chris Pyke, Marc Ribaudo, Lisa Wainger, Denice Wardrop, Claire Welty, Gene Yagow, Weixing Zhu

Guests: Shawn Garvin, Rick Keister, Lewis Linker, Bruce Michael, Linda Miller, Gary Shenk, Peter Tango

Administration: Melissa Fagan, Natalie Gardner, Kevin Sellner

Discussion

STAC members reviewed the Gubernatorial and Mayoral Responsibilities overnight, and came to the consensus that the document's tone should be revised to make it less confrontational. Havens and Sellner will revise the document and accept editorial advice from the membership. Some appointees are more active than others, and Havens volunteered to bring them together more routinely to hopefully increase their participation.

Action: Kirk Havens (VIMS) and Kevin Sellner (CRC) will work with STAC staff to revise the document "STAC Gubernatorial/Mayoral Roles and Responsibilities," STAC staff will send the revised document to the membership for approval.

Action: Havens volunteered to coordinate with STAC mayoral and gubernatorial appointees on a routine basis to encourage communications with staff of the jurisdiction's executive office, and assist with brief annual summaries to inform jurisdiction decisions, legislation, or EC discussions and policy formulation.

Event Response in the Chesapeake Bay – Peter Tango (USGS)

An event response team was developed to help create an action strategy to properly monitor, and document extreme events in the Chesapeake Bay. So far, it has been used to monitor the Bay after the Chalk Point oil spill in 2000, and the Gulf oil spill in 2010, to track harmful algae blooms and dissolved oxygen levels in the Corsica River, and document the large scale effects of Hurricane Irene, and Tropical Storm Lee. Event response could be warranted for incidents involving invasive species, bacterial events, and insect infestations (i.e. mosquitoes bearing West Nile virus, beetles, etc.), although there is currently no specific Chesapeake Bay Program event response policy or published list of objectives. The CBP looked closely at its monitoring capabilities during the Monitoring Realignment, and adjusted both existing and future monitoring plans to match CBP priorities. Despite recommendations to invest in data analysis, and small watershed monitoring and synthesis, no recommendations were made to focused on

event response capacity. Membership raised the question of whether or not FEMA would be interested in funding event response planning for the CBP, but expressed concern about a delay in policy formation. Other options for event response in the Chesapeake Bay include helping coordinate and motivate preparation and response by local jurisdictions, or establishing a stand-by emergency fund for additional ship monitoring. Decision networking tools from previous presentation could be employed to more effectively connect parties involved in event response, allowing for a more coordinated and focused approach to event response. The CBPO addressed requests for supplemental funding to support some event-related monitoring: Irene and Lee 2011 – Supplemental additional water quality cruise funding, MD sediment assessment funding; BP Oil Spill 2010 – Supplemental benthic assessments in VA, coast; HAB-toxin testing in 2004 – NOAA provided $5,000 in support.

Status of the CBP Decision Options for Model Analysis Supporting the 2017 Midpoint Assessment – Lewis Linker (EPA-CBPO)

A system of models developed for the 2017 Midpoint Assessment will be applied to the last and most difficult reductions in the CBP WIP IIIs, which will be implemented from 2017 to 2025. Any CBP model refinements addressing the 2017 Midpoint Assessment will be assessed on a value added basis for CBP decision making. The CBP Partners are beginning the process of 2017 refinement prioritization. Three priorities have been identified by the states and partners for the 2017 assessment that pertain to STAC demands:

(1) Consider use of multiple models in shallows;
(2) Work on problem segments to better obtain/assess SAV clarity;
(3) Develop BMPs in the estuary

There are remaining uncertainties about the cost and resources available to accomplish these priorities by 2017, and the introduction of adaptive management practices could reconfigure priorities after the Midpoint Assessment. The CBP is examining the use of Multiple Management Models (M3) as a valuable tool to improve decision making in shallow Bay waters The CBP is currently soliciting partnership input for the Midpoint Assessment and using a working version of the Guiding Principles to begin scoping and prioritizing components of the midpoint assessment. By winter 2013, the PSC approval of the Guiding Principles priorities will be finalized. Additionally, STAC will hold a workshop on multiple CBP management models to explore opportunities and challenges in applying multiple models into management.

Discussion: The year 2017 will be big year for adaptive management, and could potentially create a whole different set of priorities. Virginia moved money from the management budget to the research budget because they recognized that additional research in the James River watershed will improve the management process. STAC members asked: Is this precedence for the CBP and other partners to do the same? Additionally, assuming the CBP moves forward with shallow water refinements, CBP will need assistance from STAC in determining what

refinements are needed, and what current work is being done to achieve the model refinements. Work will hopefully begin on this when the FY2013 EPA budget is made available, but there are no guarantees the funds will be made available for this project. Furthermore, the effects of climate change might also be necessary to consider in these scenarios – how will it impact effectiveness and future implementation of BMPs?

Action: Denise Wardrop (PSU) volunteered to provide guidance to Lewis Linker (EPA-CBPO), and the CBP Modeling Team while implementing adaptive management into the decision making process.

Goal Line Workshop Report Update – Jack Meisinger (USDA) and Jim Pease (VT)

The Goal Line 2025 workshop report was recently revised by the Water Quality Goal Implementation Team's (GIT4) Agricultural Workgroup, and will be made available to STAC members in the next few weeks. The product of this workshop was intended to inform the WIPs, help determine practices ready to be utilized for 2017, and highlight other practices that need more work before potential implementation by 2025. Additionally, the workshop report was revised to make it useful to local constituents as they refine and prepare future WIP versions. Meisinger and Pease updated STAC on the report findings, and recommendations to CBP. The final report will be released in the following weeks.

Marcellus Workshop Report Findings – Kurt Gottschalk (USDA Forest Service)

STAC held a workshop in State College, Pennsylvania on April 11-12, 2012 entitled "Exploring the Environmental Effects of Shale Gas Development in the Chesapeake Bay Watershed." The workshop steering committee, and workshop participants developed a set of recommendations to CBP, and its associated partners on the future effects of shale gas development in the watershed. In addition to summarizing the state-of-the-science, and identifying research gaps related to Marcellus Shale gas extraction, a list of recommendations was developed for industry, scientific, and policy making communities.

Action: Kurt Gottschalk will develop two sets of recommendations for the STAC Marcellus Shale workshop report. Recommendations should be directed towards Chesapeake Bay Program (CBP) and the Partnership, and another set of recommendations should be developed specifically for industry, and scientific and policy making communities, including EPA Region 3.

Continued Collaboration with STAC – Shawn Garvin (EPA Region 3 Administrator)

Garvin spoke about the importance of TMDL regulations, but stressed that implementation is the key component of Bay restoration moving forward, whereas the watershed model has acted as a distraction. Garvin discussed model criticism, and its use as a planning tool to help make decisions and evaluate progress. Garvin added that implementation is threatened by drawn out academic and scientific processes, and we need to get these practices on the ground quickly.

STAC's proactive role is one of the most beneficial to CBP because STAC is able to identify important issues that the Bay Program management needs to address. CBP struggles with messaging, and public portrayal of CBP actions needs revision. Garvin said CBP should do a better job of reaching out to people beyond the shore and up into the headwaters of the entire watershed. Additionally, STAC should be the body that assists CBP in developing, and operating on the adaptive management principle by highlighting where adaptive management practices are already being used, and where they could be used elsewhere. Efforts within the Bay watershed are viewed as a model of environmental protection and restoration by other estuary groups nationwide, so maintaining a progressive and proactive approach is a must. To remain efficient as a committee, STAC needs to address specific charge questions as a means of streamlining their work. Lastly, Garvin addressed the issue of climate change, and how STAC should remain aware, and prepared for extreme storm events moving forward. Climate change should not act as a deterrent to action, but rather, should be considered in decision making from here on out.

Setting Water Quality Trading Goals and STAC's Role in Program Development – Lisa Wainger (CBL)

Wainger explained that water quality credit trading is often seen as the "magic bullet" when considering the costs of Bay restoration, but trading is really only intended to reduce the costs of compliance within a regulated system. CBP is using this trading scheme in a voluntary environment with economic incentives, and in the existing water quality markets, there have been very few trades, so it is not being effective. State regulators set the market rules, but these may require adaptive management. Market rules determine the environmental, and economic performance of trading, but what is best for water quality is not necessarily best for developing a robust trading program. Wainger cited three adaptive management needs that Carl Hershner (VIMS) identified:

(1) Specify at the outset what program needs/seeks to attain through the operation of the programs (articulate its goals)
(2) Identify the elements of trading programs that must be managed to attain those goals
(3) Develop guidance for state programs that is clear and consistent with that understanding
(4) Specify the metrics and timetable that will be used to assess performance

A trading discussion between STAC economists and CBP (Darrell Brown and Nick DiPasquale) raised other concerns including legal liabilities, equity issues for interstate trading programs, overall program design, and verification issues. Next steps include a review of technical memoranda, management of trading expectations, and promotion of alternative approaches to achieving cost efficiency.

Action: Nick DiPasquale (EPA-CBPO) will discuss how to incorporate STAC into the review process of the CBP Nutrient Trading Technical Memoranda with the CBP Management Team.

Discussion of future quarterly meeting agenda topics, and recommendations for the December 2012 meeting - STAC Members

Following presentations, STAC members and participants discussed future STAC quarterly meeting presentations topics. The membership expressed interest in future presentation to include: nutrient trading, Phosphorus review update, Sediment at the Conowingo Dam, etc. Additionally, members showed interest allowing more time during quarterly meetings for proactive workgroup discussions. STAC Staff took note of the members interests, and plans on drafting the December quarterly meeting agenda based around this discussion.

Action: Natalie Gardner (STAC Coordinator) will contact Gary Shenk (EPA-CBPO) regarding the pending modeling runs for the STAC Phosphorus Review.