Scientific and Technical Advisory Committee
March 27-28, 2012 Quarterly Meeting Minutes
Herrington on the Bay - Rose Haven, MD

March 27 Minutes
Attendance:
Members: Brian Benham, Donna Bilkovic, Russ Brinsfield (T), Randy Chambers, Bill Dennison, Michael Ford, Carl Friedrichs, Marjy Friedrichs, James Glancy (T), Kirk Havens, Carl Hershner, Robert Hirsch, Susan Julius, Mark Lukenbach, Jack Meisinger, Margaret Mulholland, Ray Najjar, Michael Paolisso, Vikram Pattarkine, Jim Pease, Marc Ribaudo, David Sample, Lisa Wainger, Denice Wardrop, Don Weller, Claire Welty, Gene Yagow, Weixing Zhu (A)

Guests: Jamie Baxter, Karl Blankenship, Walter Boyton, Jeffery Brainard, Sarah Brzezinski, Peter Claggett, Nick DiPasquale, John Gannon, Megan Hession, Edward Houde, Lee Karrh, Christine Keiner, Rick Keister, Sarah Lane, Doug Lipton, Bruce Michael, Jamie Mitchell, Kevin Schabow, Gary Shenk, Tonya Spano (T)

Administration: Melissa Fagan, Natalie Gardner, Matthew Johnston, Kevin Sellner

Announcements and Consent Agenda - Kirk Havens (VIMS)

STAC Vice-Chair, Kirk Havens, called the meeting to order shortly after 10:00 am. Following member introductions, STAC Coordinator, Matt Johnston, announced that four workshop proposals will be presented during this meeting, and due to limited workshop funds, STAC staff would like members to rank the proposed workshops. The top four ranked workshop proposals will be funded. Depending on available funds, the fifth workshop proposal may, or may not get funded.

Havens requested a motion to approve the consent agenda. Before membership approval, Johnston discussed how, and why the STAC Executive Board agreed to appropriate $5,000 for a review activity to discover how the Chesapeake Bay models simulates Phosphorus.

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

Additionally, Havens requested a motion to approve the December, 2011 quarterly meeting minutes, with the correction of Claire Welty being in attendance.

> **VOTE: Havens asked members for a motion to approve the amended December quarterly meeting minutes. Results: Motion carried – December, 2011 quarterly meeting minutes approved.**

Response to the Hydrodynamic Modeling Recommendations - Gary Shenk (EPA-CBPO)

On June 9-10, 2011, STAC partnered with the Chesapeake Community Modeling Program (CCMP) to host a workshop investigating potential future uses of hydrodynamic models by the Chesapeake Bay Program (CBP). As a result of STAC's hydrodynamic workshop, STAC wrote two letters of recommendation to the Chesapeake Bay Program (CBP). Shenk described similarities in both letters, especially STAC's recommendation encouraging the Partnership to adopt a multiple modeling strategy. The CBP Director, Nick DiPasquale, responded with an additional letter of general agreement with STAC's recommendations, but cautionary regarding the difficulty of implementing those recommendations.

STAC recommended the CBP use multiple models, to increase confidence in the model output, and provide uncertainty estimates. CBP agreed in principle to testing multiple models within the estuary, and plans to develop an RFP to conduct a multiple hydrodynamic modeling pilot project in a data-rich area of the estuary such as Gunston Cove. STAC's second recommendation was to use open source community models. CBP agreed, but clarified that currently all models are publically available. However, Shenk does see room for improvement. STAC's third recommendation was to allow the scientific community to evaluate the skill of current models. CBP agreed, but cautioned that model skill is not the only criteria for CBP's decision makers to consider. For example, the CBP's model must accurately account for nutrient reduction and living resources benefits gained by implementing best management practices (BMPs). The fourth recommendation from STAC was to implement multiple models in a modular function. Again, this is something CBP is already doing but there is area for improvement. The final recommendation is for CBP to have a virtual modeling lab. CBP is not sure if it agrees with this recommendation yet or not. A Modeling Laboratory Action Team is forming to determine what a "modeling lab" will look like, and how CBP might pay for it. In addition to Shenk's response to the hydrodynamic modeling recommendations, he also proposed a workshop to discuss how multiple models might be used in a regulatory environment.

Discussion: DiPasquale's expressed concern about how multiple models would be used in a regulatory context, and how multiple models could affect implementation, currently the CBP's main focus. However, DiPasquale does agree that a pilot project, such as Gunston Cove, would benefit the Bay Program. Carl Hershner (VIMS) mentioned that STAC has been pushing CBP to implement multiple models for years, and he also expressed fears that this opportunity to explore multiple models may slip away if the CBP and STAC do not act upon it quickly

Response to the SAV Review Report - Lee Karrh (MD-DNR)

In 2011, STAC convened an independent, external review committee to investigate the CBP's submerged aquatic vegetation (SAV) restoration activities. The review report included recommendations to CBP that could impact future SAV restoration strategies. The review committee broke the recommendations into three categories; operational success, functional success, and programmatic success. The review committee concurred that direct SAV restoration was operationally successful. However, it was functionally unsuccessful because the number of planted areas did not persist over time. Additionally, programmatic success can be seen as an area of improvement. Karrh and the SAV workgroup agree with those

recommendations. According to Karrh, the most positive finding from the SAV review report was that it highlighted knowledge gaps, and research needs. As a result of this review, the SAV workgroup created a research agenda. The agenda includes habitat requirements, factors that influence those requirements (extreme events), and multiple, or chronic stressors. Two key research questions of the SAV workgroup are: "How do we deal with extreme events and the progress of SAV restoration?" and "What is the timeline between an extreme event, and the biological response?"

Discussion: Mark Luckenbach (VIMS) clarified that the review committee did not view this review as a review of the SAV workgroup, but rather a review of CBP's direct SAV restoration. In particular, the concerns about long-term programmatic success and the need for more adaptive management were not directed toward the workgroup. Bob Hirsch (USGS) wanted to know if improvements have been made to SAV restoration strategies, but Karrh indicated that unfortunately, it is too early to tell.

FY 2012 Workshop Proposals

Habitat GIT Workshop Proposal - Lee Karrh (MD-DNR)

There are several reasons to protect and restore vital habitats within the Chesapeake Bay. The Habitat Goal Implementation Team (GIT) is interested in hosting a workshop to explore ways to improve vital habitats. For instance, coastal ecosystems provide habitats for water fowl, a nurturing area for fish and shellfish, and help improve water quality. Additionally, restoring habitats will assist in achieving Total Maximum Daily Load (TMDL) targets, as well as help reach the Executive Order (EO) black duck and wetland restoration targets. Climate change and sea level rise affect habitat availability for conducting restoration activities, and the need for restoration. For all of the above reasons, the Habitat GIT needs an effective and integrated targeting of coastal wetlands, living shoreline, and SAV restoration that will extend the Bay Program's limited resources. The objective of this workshop will be to convene subject matter experts, assess internal strengths and weaknesses in a series of targeting approaches, and share the state-of-the-science regarding targeting of these restoration types. The workshop also plans to address strategies for collaborative targeting and reporting, build consensus among the partners, and report findings on best available targeting approaches. The outcomes of this workshop will be to determine the best targeting approaches for restoring vital habitats, establish how partners can most effectively work together to restore and protect habitats, and evaluate results from other black duck-specific workshops.

Foster Chesapeake Stewardship - Education Workgroup - Jamie Baxter (CB Trust) and Kevin Schabow (NOAA)

The Education workgroup is proposing a workshop and long-term collaboration between STAC and the workgroup to identify research-best practices in environmental education, craft metrics behind those practices, and then develop instruments and protocols to extend those metrics. Since STAC has not been heavily involved in the Education Workgroup, Schabow gave some background information to help members better understand past and current environmental literacy programs within the CBP.

The goal of the workshop will not be to measure actual stewardship in students. Instead, the steering committee is looking for best practices that the group can help implement. For example, the Education Workgroup is working with National Environmental Literacy Assessment (NELA) to evaluate environmental literacy in over 200 schools within the watershed. Once NELA and the Education Workgroup determine the schools that tested high for environmental literacy, researchers will then determine what those schools did in their environmental literacy programs. Baxter is proposing a workshop to bring together the research community that has already been evaluating environmental education practices and methodologies. To date, these institutions have not convened to discuss what they know about best environmental literacy practices or to identify best practices to increase stewardship levels in students. The information from this workshop will be used to feed a working session within the Education Workgroup that will develop a best practices document that will promote a high quality environmental education standard, and indicators to track the progress in improving environmental literacy.

Discussion: Ray Najjar (PSU) expressed concern that Pennsylvania is not well represented on the workshop's current steering committee. Baxter and Schabow agreed with Najjar, and explained that a recent retirement caused this underrepresentation. However, the steering committee will fill the Pennsylvania spot shortly.

STAC Proactive Workshop on Lag Times and Their Effect on Chesapeake Bay Restoration - Robert Hirsch (USGS)

The time elapsed between good (and bad) actions, and their environmental effects, can be extremely long in actions aimed at the delivery of nitrogen, phosphorus, and sediment loads to the Chesapeake Bay. The mechanisms in which delivery is delayed by lag times include groundwater transport, soil processes, stream bed sinks, reservoirs, floodplains, and vegetation. For example, floodplains are a major storage area that can hold nutrients for decades and centuries in length. Currently the Chesapeake Bay Watershed Model does not incorporate lag times due to the difficulty of modeling them. The science questions this workshop will address include: What new conceptual models are out there?; What new measurement methods need to be developed?; Are there mathematical models that should be used?; and, Are they ready for "prime time?"

In addition to describing lag times Hirsch reviewed several policy questions that the steering committee finds important. For example, Hirsch worries the general public does not understand that even though they do the right things in their watershed, that we may not see the benefits for a decade. This concept is difficult for the general public to understand, and could possibly cause them stop restoration activities. The workshop will be organized into four topics: lags associated with cycle of erosion and deposition of sediment; lags associated with cycling and transport through vegetation, soil and groundwater; social, economic, legal, and perceptual issues; and new paradigms for modeling. Several potential speakers have already been identified. The product of this workshop will be a white paper, and a 5-page executive summary to be released within 90-days of the workshop.

Workshop Proposal from the Septics Workgroup - Tanya Spano (MWCOG)

Municipal facilities have received millions of dollars to upgrade septic systems, while responsible homeowners are left to manage the systems in use on their property, often spending thousands of dollars on upkeep and repair. Others fail to provide the needed maintenance, leading to significant health and environmental concerns. Therefore, onsite treatment systems, and the benefits associated with advancing technologies, are very important. The objectives of this workshop will be: to provide local government managers, consultants, and state regulators with information on cutting-edge technologies in onsite/decentralized wastewater treatment that have been successful in real world applications; identifya suite of options and alternatives that regulators should also evaluate as they contemplate how to meet TMDL and other program objectives; and provide a forum for sharing experiences amongst the participants and presenters. The workshop audience is intended to be local government managers, engineers, and consultants supporting them, as well as state regulatory staff that would manage the onsite system BMP implementation for achieving the TMDL goals. The workshop will produce a formal report to CBP's Wastewater Workgroup, and subsequently the Water Quality GIT by the fall of 2012.

Discussion: Vikram Pattarkine (PEACE USA) clarified that the workshop is going to be more information gathering, and the deliverable from this workshop will be the information we put out to the general audience. Spano agreed, and re-emphasized the purpose of this workshop.

Introduction to the STAC Retreat - Carl Hershner (VIMS)

Hershner led STAC members in a discussion of the future of CBP, and how current, and future activities might be bounded. There is an academic, or theoretical, interest in moving CBP to a more effective ecosystem based management program. The motivation came from multiple reviews of the program conducted by outside groups in the last 5 years, and a need for CBP to become more publically accountable for its activities, and its expenditures. There is an internal ability for the program to organize itself in a certain manner. The decision framework is nothing more than programmatic logic that asks groups in the Bay Program to articulate goals in a clear and explicit way that will build a rational for the activities being pursued. The decision framework also monitors the progress towards goals, and the assessment process that adaptively manages the success, or failure of those goals.

Hershner explained that the Executive Order is a portrayal of what is happening within the federal government, as opposed to a product of the partnership represented by the states. Currently, there is an effort within the Bay Program to align activities in CBP so the partnership can craft a new agreement. One way to begin this alignment process is to start implementing an adaptive management practice within every level of the program. GITs are currently re-examining their goals, and incorporating them into the decision framework. All of the GITs are making progress, and the exercise is helping the GITs assess whether their strategies are rational, and how the GITs plan to monitor those goals. Part of the challenge is to be in front of problems that arise for the Bay Program (e.g. lag times), and understanding where the certainties and uncertainties exist. Hershner proposed that STAC begin to think about the future of the Bay, and help guide the GITs while each develops and assesses their goals. He explained that the purpose of the retreat was to create a process which will continue to re-assess the future opportunities for

Bay management, and feed that into the adaptive management process that CBP can adopt. The primary goal will be to educate the Management Board (MB) on what adaptive management is and what it requires, and help the MB get information they can use. The first step in that process is to have people on the ground be able to explain what they are doing, and how they hope to accomplish their goals.

Envisioning the Ecosystem Present and Future: What are the Ecosystem Drivers of Water and Habitat Quality within the Chesapeake Bay, and What is the Possible Future Given What We Know? - Walter Boynton (UMCES-CBL)

Over the last 35 years, Walter Boynton has been trying to understand degradation, and how the system is reacting to current conditions. Luckily, Boynton told the STAC members, the Bay has an opportunity to improve. However, it will never be restored to what its 1832 condition, and Boynton told STAC he does not believe it would be good policy to try to achieve that level of restoration On the other hand, there is also a possibility the Bay could get worse, and encounter more degradation.

A main concern in the Bay watershed is population growth, and the effect that growth will have on impervious surfaces. Conversion of land for development since 1970 has grown; doubling the rate of housing as the population growth rate has tripled. Climate change is also a concern for the Chesapeake Bay Watershed, which can change, among other things, the circulation of transport properties, and can speed up erosion. Tidal marshes are of most concern when the possibility of erosion is on the horizon. tidal and non tidal marshes play a big role in nutrient reduction and water quality within the Bay. Tidal marshes, which represent under 2% of the landscape within the basin, remove 50% of the nitrogen that seeps into tidal waters. Tidal marshes are incredible nutrient sediment sinks, and when they start eroding, they start to add to the problem, instead of helping the problems.

Boynton said that our job as the scientific community is to try and understand the complicated issues within the Bay system, and make recommendations to management on how to improve the conditions. In closing, Boynton said that there is substantial evidence that the Bay's water quality can either get better or worse, depending on the direction the CBP and the scientific community take.

Working to Insure Sustainable Fisheries in the Chesapeake Bay - Edward Houde (UMCES-CBL)

Shortly after the seventeenth century is when population growth, and dam installation started to affect the Chesapeake Bay. At the beginning of the nineteenth century, the Civil War caused a mass number of trees to be deforested within the watershed, which had a detrimental effect on water quality. Scientists who study the Bay say that some fisheries within the Bay are dead, but Edward Houde does not agree with those statements.

Houde's presentation focused on sustainable fisheries management issues and improvements within the Chesapeake Bay watershed that could affect these fisheries. Currently there are 250,000 net pounds of fish being removed from the Bay every year, which is an incredible

number of fish. If you compare those numbers with other marine or freshwater bodies, it is hard to find an ecosystem that produces the same number of fish. Yet some fisheries are still threatened by changes and managers need to understand these threats.

Among other scientific needs, Houde said that it is necessary to: understand the effects of climate change; utilize ecosystem-based management approaches, identify appropriate indicators reference points. For example, the goal of restoring oysters in the Bay is extremely important. However, the probability of restoring the oyster population is not so great. Alternatively, in the 1990's, the blue crab population began to decline. Luckily, the blue crab population is beginning to improve. Furthermore, the outlook for sustainable striped bass and menhaden fisheries is favorable. However, under present conditions, there is not likely to be sustainable shad or river herring fisheries.

Houde reminded STAC members that management decisions have an immense affect on the fate of fisheries in the Chesapeake Bay. Over the years, managers have been able to shift their perspective of Bay restoration from single species management, to multiple species management, which have proven to be more affective.

Experience with Forward-looking Goal Setting and Targets in the Great Lakes: Perspectives Pertinent to the Chesapeake - Dr. John Gannon (International Join Commission's Great Lakes Office) (Retired)

John Gannon's experience in the Great Lakes region is similar to what the Chesapeake Bay region has dealt with. The Great Lakes are also dealing with multiple jurisdictions seeking different management strategies, similar to the Chesapeake Bay Program. The Great Lakes are the largest concentration of fresh water in the world. The Great Lakes watershed consists of a population of 35 million people. The depths and elevations of the Great Lakes watershed have some similarities to those of the Chesapeake Bay watershed. Lake Erie is the shallowest, and most productive of all of the lakes (e.g. 80% of the entire Great Lakes fishery comes from Lake Erie. Niagara Falls is a large relief point for the Great Lakes. Lake Superior has a water retention time of almost 200 years. In contrast, Lake Erie has a water retention time of less than 3 years.

  The 1800s were the start of the degradation of the Great Lakes, which has continued into the present day. Present days challenges to the Great Lakes system include eutrophication, toxic chemicals, unplanned urban sprawl, habitat destruction, nuisance invasive species, long range transport, and climate change. Improvements in the Great Lakes began when a water quality agreement between the United States and Canada improved sewage treatment plants within the watershed.

Historically, there have been positive and negative changes occurring in the Great Lakes, which makes it difficult to communicate improvements to the public. Similarly, the Chesapeake Bay region is dealing with the exact same issues with communication to the public. In the 1960s, the Great Lakes began implementing a conceptual model of the relationship between indicators, measures, targets, objectives, goals, and visions, which in 1985 morphed into remedial action plans (RAPs). Following RAPs, 14 beneficial use impairments (BUIs) were developed, agreed

upon, and incorporated into the current water quality agreement. Currently, there are 43 areas of concern within the Great Lakes Basin. Part of the problem with the Great Lakes restoration effort is the lack of funding, similar to CBPs restoration issues.

Gannon concluded that regardless of any outcomes that have occurred, many lessons have been learned throughout this restoration process (e.g. linking land and water; concentrating on the near shore and coastal zones). Overall, Gannon gave STAC a useful insight into what the Great Lakes have gone through, and how CBP can take the lessons learned from the Great Lakes, and adaptively manage its program according to those recommendations.

Today's Vision for Tomorrow's Reality: What are the population and land use change issues that define what future restoration is possible - Peter Claggett (USGS-CBPO)

Patterns of development in the Chesapeake Bay watershed between the years of 1950-2000 has dramatically increased in the Washington, DC and Baltimore metropolitan areas. However, building permit trends over the last 20 years in the Bay watershed hit a peak in 2005, and have continued to decrease over the years. At the same time, population trends in the Bay watershed have increased, and are projected to continue over time.

Part of the increase in population has more to do with migration due to the federal government jobs available in and around Washington, DC. According to an EPA estimate, the Bay population is projected to increase dramatically over the next 30 years. One question Claggett is asking is, "Is Urban Sprawl Dead?" Claggett gave members numerous examples that could support the theory that urban sprawl could be dead. For example, several patterns currently exist that demonstrate the region's planners have moved to more sustainable practices. Additionally, there is a growing acceptance, and awareness of the cost of sprawls by local governments, even though there is a short-term tax revenue benefit from sprawl. Furthermore, Claggett asked, when the economy bounces back, will urban sprawl start to pick up again?

Claggett also discussed his development of alternative future land use scenarios. The hope is to run these future alternative land use scenarios, simulate the loads caused by these changes, and then quantify land use planning as a Best Management Practice (BMP). Looking at urban sprawl from the Chesapeake Bay model perspective, the trends shown in the Chesapeake Bay Land Change Model (CBLCM) are different from the previous scenarios because satellite imagery does not recognize agricultural land use correctly. Furthermore, USDA forest inventory, and assessment data shows that the watershed has lost 750,000 acres of forest over the past 20 years. This data is difficult to fit into the scenarios because satellite data confuses definitional differences. To compensate, CBLCM is moving to a new patch-based land change model.

Another main point Claggett made is that after 2025, jurisdictions will have to consider offsets for new development. The models shown in Claggett's presentation can help jurisdictions estimate offset demands, how the landscape is changing, and what pressures will be put on us to offset the impacts of growth. In terms of two-year milestones, is there accountability for the land use changes that will occur? In conclusion, will the Chesapeake Bay Watershed be able to handle an additional 6 million people in the watershed, and another 100 million chickens by the year 2050? Claggett seems to think that perhaps we can, with the proper use of technology.

Science, Values, and the Clash of Cultures in Chesapeake Environmental Policymaking: Potential Insights for Bay Restoration from the History of Maryland Conservation - Christine Keiner (STS - Public Policy Department)

STS's scholars study the interactions between science and technology in society, how they function at different levels, and their various cultural and environmental contexts. Keiner's research deals with the long standing debate over bringing aquaculture to the Chesapeake Bay. There is still much research that needs to be done on this topic to answer the important scientific issues. Keiner began with a 1910 quote which states, "An American from any other part of the country knows that without being told, that the Maryland oyster is deeply involved in politics." From the beginning of Chesapeake science, politics was involved. Keiner's research studied whether oysters should be a product of nature, or a product of human cultivation. Keiner looked at periods of relative stability within the oyster population. She found that while there were several peaks and valleys in population, overall, there was relative stability between 1930-1980 in oyster populations. Today, we would love to go back to 2-3 million bushels of oysters a year, but unfortunately, that is not the reality we are facing today.

Keiner indicated that scientists must look at human actions, such as legislation, and the impacts of those interactions. For example, in the 1920s, Maryland implemented a system of oyster bed replacement, by returning oyster shells back to the Bay. Keiner questioned why Maryland did not take additional steps in implementing a much stronger capital-based system. According to Keiner, the political geography of Maryland has a lot to do with that decision. In Maryland, there are more tidewater counties than non-tidewater counties. Historically, representation in Maryland's legislature was based on county units, not population. Each county had one member of the State Senate, which meant that tidewater state senators had more control over non-tidal senators. This gives us insight as to how the watermen had so much control over oyster legislation.

Keiner sees a lack of historical awareness in the Chesapeake when it comes to oyster regulation and policies. When thinking about potential insights into broader Bay restoration, Keiner told members that it is important to understand that just because Chesapeake Bay scientists were not able to implement their ideal vision of oyster management, that does not mean science has been compromised. A focus on shared interest is necessary for creating feasible policies. Co-management has been seen to be largely successful at sustaining fisheries, and improving livelihoods. Social science research has a great role to play in understanding why people act the way they do. We should not assume that simply applying science is going to make the environmental policy process easier. Restoring the Bay involves value judgments, such as what people want to restore the Bay back to (e.g. 1982 or 50 years ago). Acknowledging the uncertainties, and the history of this culture is a very important part of understanding fisheries management.

Facilitated Group Discussion with Four Primary Goal Groups: Fisheries; Habitat; Water Quality; Stewardship

Hershner described his expectation of the break out groups, and what he hoped each group would accomplish during their discussion. Unfortunately, the GIT goals are still in development, so STAC members were not to necessarily assess the exact language of the goals. Hershner explained that itt is important that STAC members have a "higher level view" of what will be happening in the ecosystem over the next 25 years. This is important in understanding and evaluating each goal. Members were asked to determine how realistic, appropriate, and practical these current goals are based on how STAC views the future of the Chesapeake Bay. For example, each group was asked to determine what are the human, physical, biological, and chemical factors that could influence the outcome of each goal. Then, what is the ability to manage that goal, based on those determined factors. Hershner would also like members to think about the issues with the perspectives that were presented earlier in the day. Additionally, Hershner would like STAC to think in terms of the trajectory of the system. By the end of the meeting, the collective group will determine the key parameters that need to be forecast, and inform a decision about the reality of the goals that are being developed.

Proactive workgroups met separately to assess the current Chesapeake Bay Program GIT goals. The membership and participants broke into four separate groups: fisheries; habitat; water quality; and stewardship. The four groups discussed current GIT goals well into the night. Please see the appendices for summaries from each of the group discussions.

Dinner Keynote Speaker: The Past and Future of Bay "Service" and "Values" - Doug Lipton (UMD)

Over the years, society has changed its value of fish. Fisheries can be classified in one of three categories: commercial, recreational, or ecological. The commercial value of fish has declined over the years, mainly due to globalization and aquaculture. Additionally, the real value of Chesapeake Bay seafood has declined in value since 1950. At the same time, the demand for seafood has increased over that same time period. Imported seafood into Maryland and Virginia has increased over the last 20 years. The future of commercial fisheries in the Chesapeake Bay depends on the successful restoration of the Bay. Recreational fishing has increased in recent years. Lipton believes this is due to a wealthier society. There is no doubt that fish plan an important ecological role within the Chesapeake Bay ecosystem. Lipton feels it's important to invest in measuring the ecological value of fish. Overall, there needs to be a balance between the allocation of fish between its role as seafood, recreation, or contributor to ecological health.

Developing a BMP Verification Protocol for the Chesapeake Bay - Rich Batuik (EPA-CBPO)

There is a growing demand for the tracking and reporting of BMPs, and the technologies being implemented around the Bay watershed. Jurisdictions have traditionally relied upon state agricultural departments, environmental agencies, USDA, and county conservation districts to report implemented practices. Individual homeowners are now implementing and reporting practices. All of these practices need to be implemented appropriately, and CBP would like

STAC's participation in the process of developing the BMP Verification Protocol. Batuik would like to use STAC's advisory role within the Bay program to help develop this protocol. This new protocol will fully account for federal cost share practices, prevent double counting, and offer an opportunity to the clean up historic data, and build in practice life spans to BMP data. CBP hopes to have a set of principles that can go across the jurisdictions so each jurisdiction can make changes to how they track and report these practices. CBP would like STAC's help in identifying recognized regional, national verification/certification experts to serve on the BMP Verification Panel, and to consider appointing STAC member(s) to participate on the WQGIT's BMP Verification Steering Committee. CBP would also like STAC to identify STAC members who can serve as 'sounding boards' on verification issues as they arise between STAC meetings. Additionally, Batuik requested updates/briefings at upcoming STAC quarterly meeting up through final PSC adoption of this protocol. It is also important to ensure STAC is represented at the Management Board table and at Principal Staff Committee meetings where decisions on the BMP verification program are being sought. This issue will be a politically charged issue, so CBP wants to make sure there is a clear sense of independence.

ACTION: Rich Batuik (EPA - CBPO) will send Matt Johnston (CRC) additional information about the BMP panel, including a charge, and suggested expertise needs. Johnston will distribute those documents to STAC members for additional input.

ACTION: An ad-hoc group of STAC members including, Jim Pease (VT), Susan Julius (EPA), Brian Benham (VT), David Sample (VT), Jack Meisinger (USDA-ARS), and Bill Dennison (UMCES) will coordinate with Matt Johnston (CRC) and Rich Batiuk (EPA-CBPO) to provide nominees and advice to the CBP's BMP panel.

STAC Discussion: Develop a Collective Evaluation of Particular Goals - Kirk Havens (VIMS) and Carl Hershner (VIMS)

Workgroups from the previous day reported back to the Committee on the discussions that took place in each private session. The facilitators from each breakout group presented their findings. See the attached appendices for the group summaries, and findings.

STAC members and participants had a candid conversation regarding each of the breakout group discussions. One member suggested that STAC members become more involved with a GIT or a CBP workgroup. Natalie Gardner (STAC Staff) suggested that STAC members send Gardner a list of GITs or workgroups the members would like to be a liaison for. STAC Staff understands the time commitment it would take for each STAC member to be directly involved at every GIT/workgroup meeting or conference call. Members also suggested that there may be better ways to engage the GITs and workgroups. STAC Staff will work with the Executive Board to determine the best way to engage GITs and workgroups moving forward.

ACTION: Natalie Gardner (CRC) will send volunteer STAC liaison list to STAC members (attached). If members wish to change the GIT or workgroup they are signed-up for, please make edits, and send to gardnern@si.edu before April 25, 2012.

To conclude the meeting, Hershner agreed to synthesize the breakout group discussions, and forward STAC's recommendations to the Bay Program.

ACTION: Carl Hershner (VIMS) will synthesize the workgroup discussion from March 27, and send it back to STAC members for feedback.

ACTION: Carl Hershner (VIMS) will communicate the workgroup discussion synthesis to the GITs.

<u>Appendices</u>

<u>Habitat Discussion</u>
<u>Framework</u>

Will it work?
- Site selection
    - evidence based
    - habitat quality
    - restorability -(short-term and long-term, technical, site constraints)
- Availability of sites - availability of acres
- Can you ensure the baseline
- External drivers that directly affect the goal (e.g. farm bill; biofuel targets; population; climate change)
- Context specific opportunity cost (e.g. agriculture, developed; etc.)
- Institutional Synergism
    - Barriers
    - Targets by other institutions
    - Identification
- Identify ecological services - existing and restored
- Hydrology - changes in patterns
- Methods of restoration
    - public perception
    - public visibility
- Uncertainty in estimate
- How well do we understand the science?
- What is the role of habitat in restoration goals?

Did it work?
- Monitoring Restoration
- What is the value of restoring the goal?

Will it keep working?
- Maintenance required
- Probability of success of restoration
- Risk of Land use change
    - zoning
    - ownership
- Resilience to climate change/sea level rise
- Opportunity Cost/Environmental Benefits/Trade-offs

- o monetary benefits/costs
- o benefit indicators
- o use conflicts (legal, political, social)

What is work?
Did the meaning of work change?
Can we make it work better?
       Adaptive management
       How to provide incentives?

What is STAC's role???

Review Adaptive Management Process
Provide initial input
Review Established process
Advise GIT's on logical model planning
STAC Review GIT logic models

Notes for the Fisheries Group

What to consider for any sustainable fisheries goal:

- Monitoring funds and capacity to monitor/restore
  - Do you have the capability to monitor the needed parameters to adaptively manage?
  - Post - restoration monitoring (can we actually do it all)
  - ID pre and post restoration monitoring needs and capabilities
  - Is there enough available bottom land to meet the restoration goal?
- Food-web pressures
  - These can come from climate change (temperature, salinity, etc.), water quality, land use changes, connections between the continental shelf and the Bay, etc.
  - Restart phytoplankton and zooplankton survey
  - Expansion of aquaculture
- Property Rights/ Governance Domains
  - Property rights both on the land and in the water are changing;
  - Structures of management (zoning, permitting, etc.) differ across the watershed;
  - What will it all look like in 25 years?
  - Political Decisions (ex - potential impacts of shutting down menhaden fisheries)
- Economics of Fishing
  - International supply and demand pressures (import/export)
  - Amount of consumption
  - Non-fisheries uses
  - Type of fishing pressure (recreational/commercial)
  - Type of fishing communities
  - By-catch
- Societal Support
  - Changing and more diverse stakeholders
  - Changing demographics
  - Changing cultural values
    - Change in demand for services from Bay
    - Change in stewardship priorities (ex - fish passage efforts)
  - Change from local to global
  - ID users
  - Things to measure
    - Data about people
    - Data about people's attitudes
    - Network analysis of governance structure

- What should be STAC's role in this process:
  - Come back to us personally for science strategic elements while you build a business plan

Fostering Chesapeake Stewardship – STAC March 27-28, 2012 (Sarah, Susan, Gary, John G., Randy, Kirk, Rick, Bill)

Uniformed →(**Education** to become)→informed → (**Engagement** to become) → engaged → (**Empowerment** for) → effective change

Education

- Who is targeted with the information and what is the prioritization for information dissemination?
- What is the type and level of Meaningful Waterway Educational Experience (MeWEE) contact necessary for a truly meaningful experience to shift to a lifestyle commitment?
- What is the definition of environmental literacy for the Chesapeake Bay?
- Who is doing what in environmental literacy programs – formal and informal?
- How many of the students educated through environmental education programs actually stay in the Chesapeake Bay watershed?
- Where do decision-makers/local government officials get their Chesapeake Bay environmental information?
- What are the potential teaching moments and what preparations are necessary to take advantage of them?

Factors that could influence ability to achieve goals
- Identification of priority demographics – educate non-conservation-minded, encourage conservation-minded.
- Changing Standards of Learning criteria
- Establishment and maintenance of teacher enthusiasm regarding Chesapeake Bay environmental education.

Engagement

Factors that could influence ability to achieve goals
- Ability to communicate and engage the public.
- Identification of priority demographics – educate non-conservation-minded, encourage conservation-minded.
- Ability to make Chesapeake Bay stewardship personal.
- Lack of citizen monitoring.
- Economics – income level that may inhibit engagement.

Empowerment

- Where do decision-makers/local government officials get their Chesapeake Bay environmental information?
- What mechanisms are available to enable decision-makers to obtain environmental information?
- What socio-economic factors impact pre-disposition for being for/against behavior change?

Factors that could influence ability to achieve goals

- Lack of civic governmental knowledge as part of environmental education.
- Lack of knowledge of what a restored Bay looks like.
- Economy vs. environment myth – information source.
- Lack of case study success stories.

Questions to ask when presented with Fostering Stewardship Goals

Have you looked into the potential changing characteristics of population/demographics over the next 25 years that can influence stewardship goals (cultural, economical, social)?

Have you looked into characteristics of the Bay under changing climate over the next 25 years that can affect stewardship goals?

Have you considered potential technology changes over the next 25 years that can affect stewardship goals from a communications, transportation, restoration perspective?

Water Quality/Healthy Streams GIT Discussion
Goals & Approaches: Basically reduce loads through tracking implementation & setting BMP
efficiencies to meet the TMDL

Limitations to Meeting these Goals
1) Nutrients are over-applied to the land
   - Need a national policy to treat/regulate animal waste just as mandated for human waste
     - Vehicle: Public health concerns over EDs, pharmaceuticals & regulations to prevent human illness by eliminating fecal bacteria
   - Options/future variables that might alter over-application
     - Global costs of fertilizer
     - Must shift to alternative and profitable uses of wastes (wastes as resource rather than pollutant) for market-driven nutrient reduction
     - Land-use changes and loads from that change
   - WG identification of 1) sector-dominated small watersheds where WQ improvements could be attributed to intense sector-specific BMP implementation; 2) O&M requirements for BMPs to insure long-term efficiencies; and 3) denitrification strategies.
2) Small system responses: 1) point source systems are easy to monitor but 2) non-point systems are not easy to monitor.
3) Need adoption of consistent regional county codes for development for zero/minimal nutrient & sediment loading as current and future population densification impacts critical to waste generation & may also partially govern/limit future locations to apply wastes
4) Must soon address reservoirs of legacy sediment and P, e.g., Conewingo pool will likely overwhelm gains with every major storm (small ponds/reservoirs similar story)
   - ID Lag Times for system response to implementation
   - 15-25 year WQ is down in Susquehanna vs. 05-15 WQ is up: attributed to implementation?
5) Transition to *in water* sensor arrays for continuous measurements of nutrients & sediments as routine technology in tidal and non-tidal waters, providing data streams for modeling and storm-driven major loadings
6) Future reality: Many demands for limited funds so need same zeal ('glory days') for the bay as seen in the national frenzy for the environment that led to adoption of the 1972 CWA
   - must include technological advances
   - Who met implementation goals and what are the consequences if they did not meet their goals?