Scientific, Technical Assessment, and Report (STAR) team: Enhancing Science Coordination Activities to Support the New Chesapeake Bay Watershed Agreement

Need: The new Chesapeake Bay Agreement will require additional monitoring, modeling, and analysis to help decision makers effectively achieve goals and associated outcomes. CBP science activities are coordinated through the **Scientific, Technical Assessment, and Report (STAR) team**. Over the past several years, STAR had a heavy emphasis on water-quality activities as the partners implemented the Bay TMDL. To address the needs of the new Bay Agreement, STAR is evolving to have more of an ecosystem-based science mission.

Overview of Purpose and Functions

Purpose: *Coordinate monitoring, modeling, and analysis needed to update, explain, and communicate ecosystem condition and change to support decision making to achieve CBP goals and outcomes.*

The major functions will include:

- Manage CBP-funded monitoring networks and coordinate with additional science providers to utilize expand networks to address the new Chesapeake Watershed Agreement.
- Ensure information quality, management, and access.
- Update, and deliver, the status and trends (indicators) of ecosystem conditions.
- Explain ecosystem condition and change.
- Expand modeling to better understand and predict ecosystem response.
- Coordinate climate change activities.
- Synthesize and communicate results to support the CBP decision framework being used by the Goal Teams to develop and implement management strategies for the New Agreement.

Much of the technical expertise to address these functions already exists within the Goal Teams and with science providers (federal, state, and academic partners) involved in the CBP. The STAR would facilitate collaboration between science providers and Goal Teams to carry out these functions. The collaboration is critical to effectively provide the science needed to support the Goal Teams as they develop and implement management strategies, using the CBP decision framework, to achieve the goals and outcomes of the new Bay Agreement. The STAR can also advocate support of the CBP Office Science Cluster to provide data to address issues that benefit multiple Goal Teams. The products from many of these STAR efforts (such as explaining ecosystem change or synthesis products) would be “owned” by the science providers. STAR would help promote the products to decision makers.

Relationship between STAR and STAC

STAR has a collaborative relationship with STAC and each has a distinct role:.

- STAC provides independent review and recommendations to the CBP to enhance science (monitoring, modeling, and research) for decision making.
- STAR coordinates with science providers and Goal Teams to address the STAC recommendations.

Developing and implementing the management strategies for the new Bay Agreement is a new opportunity for STAC and STAR to support the Goal Teams and help them employ the CBP decision (adaptive management) framework (figure 1).

To be most effective, it is important for the GITs to understand how STAC and STAR plan to advise them during the development of their management strategies. Through collaboration, STAC and STAR will work together to assist each GIT during this process. Below is how each group plans to advise the GITs.

Management Strategies

STAC:

- Advisors of the adaptive management process
- Link to the scientific community
- Provide guidance during the development of factors influencing and management approaches with STAR and GITs

STAR:

- Collaborate with GITs to identify factors influencing agreement outcomes
- Assist GITs in development of management approaches using STAC guidance
- Work with GITs to identify additional science providers that can help inform management strategies and prioritize science activities that can benefit multiple management strategies

Monitoring

STAC:

- Advisors of the adaptive management process
- Link to the scientific community
- Provide guidance during the development of the monitoring needs of the Chesapeake Bay Agreement (which are based on outcomes in the new Agreement).

STAR:

- Coordinate monitoring effort of implementing the Bay Agreement
- Determine feasibility of STAC recommended monitoring needs
- Based on STAC recommendations, work with the GITs to identify the current capacity of the monitoring programs and gaps in monitoring. Work with GITs on opportunities for implementing additional monitoring through partnerships with more science providers.

Assessment (Indicators and assess performance)

STAC:

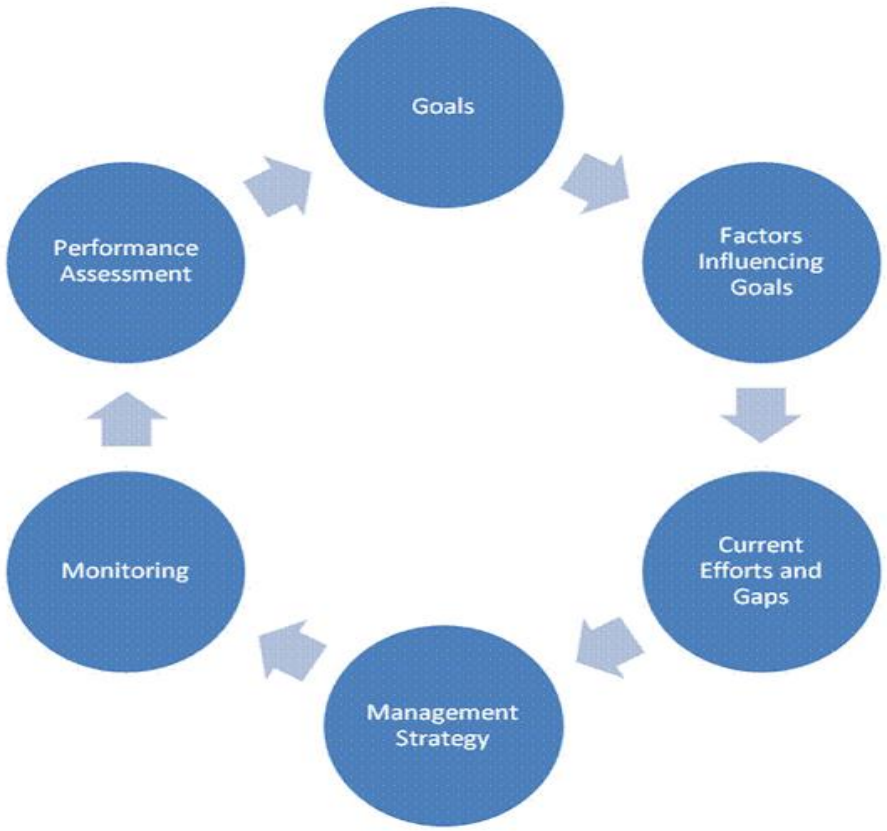
- Advisors of the adaptive management process
- Link to the scientific community
- Provide guidance during the development of the thresholds and indicator needs of the Chesapeake Bay Agreement with STAR and GITs

- Communicate thresholds and indicators to the Management Board
- Review and advise the GITs during the 2 year evaluations

STAR

- Based on STAC recommendations, work with the GITs to implement the new indicator framework and communications products.
- Work with GITs to assess and explain change in response to management practices and policies.
- Assess if actions are achieving performance thresholds and work with GITs and STAC to revise strategies when necessary.

Figure 1: CBP decision framework that will be used to develop and implement management strategies



Description of STAR Functions, Workgroups, and Potential Staffing

The following is a description of the major functions of STAR and anticipated support needs.

- **Manage CBP monitoring networks and coordinate with additional networks to address the new Chesapeake Watershed Agreement.** The CBP currently manages several water-quality monitoring networks including a watershed network and several estuary networks (water quality and SAV). The networks are complex with multiple partners collecting data. There is additional monitoring that needs to be conducted to address the outcomes of the new Bay Agreement. The STAR will work with the CBP Goal Teams to assess existing networks (or identify gaps that can be

utilized to assess the new outcomes. The use of Citizen monitoring will be examined to help meet the expanded monitoring needs and applied as appropriate. STAR has begun the process to assess monitoring designs and coordination through the **B**uilding **A**nd **S**ustaining **I**ntegrated **N**etworks (BASIN) process. The initial work is too evaluate the water-quality networks, followed by assessing options to address monitoring needed for outcomes in the new Bay Agreement.

- Anticipated Support Needed: (1) Monitoring design and analyses needs for water-quality networks of BASIN. Coordinate with multiple Goal Teams and Agencies/partners to address monitoring needs for new Agreement (next phase of BASIN).
  (2) Evaluate and coordinate use of citizen science to as part of BASIN process.
- Proposed Workgroup: Integrated Monitoring Networks WG

- **Ensure information quality, management, and access.** The STAR will lead coordination of CBP partners to ensure the quality of information and improve management, access, and sharing of data. The CBP monitoring team would continue to lead efforts to quality assure data being collected by the program and also evaluate use of citizen-based data that support a range of analysis applications. The CBP data center, a part of STAR, will continue efforts for developing a Data Enterprise which can be used to more effectively manage, share and access data. The CBP GIS group would oversee compilation and support of spatial data needed by the Goal Teams. All of these activities would be coordinated through a new WG that would address field methods, laboratory analysis, data management, use of citizen science, and integrated information access.
  - Anticipated Support Needed: Extra help with data management needed for expanding monitoring networks and data to produce CBP indicators.
  - Proposed WG: Methods, quality, and information access WG

- **Update status and trends (indicators) of ecosystem conditions.** Many of the Goal Team and associated WGs have the lead responsibility to update CBP indicators. The STAR will collaborate with the Goal Teams and science providers to ensure updating of the indicators, or plan for additional indicators that are needed for the new Bay Agreement. The CBP GIS group would oversee compilation and support of spatial data related to the indicators to have it on the CBP WWW site. The STAR will work with the CBP communications team to have the results reported on the CBP WWW site, in ChesapeakeStat, and the annual Bay Barometer. Finally, delivery of status and trends will be enhanced through ChesapeakeStat, which is being redesigned and other data delivery tools.
  - Anticipated Support Needed: (1) analysis of water-quality data to update progress toward meeting WQ standards attainment, (2) develop and maintain new indicators needed for the outcomes in the Chesapeake Bay agreement. Will require analysis and "coordination" skills to interact with GITs and data providers.
  - Proposed WG: Status and Trends WG

- **Explain ecosystem condition and change.** Explaining ecosystem condition and change is needed for specific goals (fisheries, habitat, water quality, healthy watersheds, and land conservation) and key ecosystem linkages between goals. To explain ecosystem condition and change, several activities needed to be coordinated including modeling, monitoring, and analysis. Given the large

scope of the effort, the STAR will work with Goal Teams and science providers to carry out these primary activities:

1) Work with the GITs to make sure technical workgroups exist to address the outcomes of the new agreement. Technical workgroups already exist within the GITs. STAR would work with them to attract additional science providers. In some cases STAR may establish a workgroup or team to address a technical need to the GITs. An example is a STAR having an workgroup for climate change since it is a cross cutting need for the GITs.

2) *Host technical exchanges (in conjunction with STAC)* between technical WGs and additional science providers to discuss progress in supporting the new Bay Agreement. Use the technical exchanges to identify topics where synthesis products are needed to improve decision-making.

3) *Work with GITs to summarize information and produce synthesis products* to enhance decision-making for the selected topics. Some examples of topical issues include: (1) Estuary fisheries (shellfish and finfish) changes in response to land change and management policies, (2) Enhancement and restoration of wetlands to support black ducks, waterfowl, and water quality, (3) Ecosystem (WQ standards attainment) response to management practices to reduce nutrients and sediment, (4) Stream conditions and other factors affecting the recovery and protection of brook trout populations and freshwater fisheries, (5) Effects of toxic contaminants on fisheries and wildlife, (6) Conserving lands and healthy watershed in the face of a growing population, (7) All of the above should include potential effects of climate change and population growth.

- Proposed WG: Assess and Explain Ecosystem Change but would have self-directed teams instead of one large workgroup.

- **Enhance modeling to better understand and predict ecosystem response.** Modeling to understand the impacts of a changing ecosystem, such as the infilling our major reservoirs and the impacts of climate change on ecosystem response. In addition modeling needs to support the evaluation of management decisions to achieve outcomes in the new Bay Agreement. Modeling is an integrating tool and the concept of multiple models will be used to create a collaborative environment for integrating disparate scientific studies. The modeling would need to expand out from water quality and address/coordinate with ecosystem modeling efforts supporting other goal and outcomes. Opportunities to better collaborate with Chesapeake Community Modeling Partnership will also be explored.
  - WG: Modeling workgroup

- **Coordinate Climate Change Activities**

STAR will coordinate efforts to address climate effects for the CBP since it is a cross-cutting topic for the CBP. The WG will address the two outcomes on Climate Resiliency in the new Agreement.

  - WG: Climate-change workgroup

- **Synthesize and communicate results to improve decision making**. STAR will work with Goal Team to identify technical topics where a synthesis product would help communicate results to decision makers. STAR would work with science providers and CBP communications office to summarize technical results of above efforts and communication findings and management implications to a wider range of audiences. Prepare communication products that are tailored to specific audiences and ensure the science is correctly portrayed.

- Anticipated staffing support: Help communicate results of STAR efforts to a wider range of audiences
- WG: May not be a WG but a joint effort with Communications Office, WWW team, and ChesapeakeStat that would focus on specific products and topics.

- Staffing needs for STAR: in addition to above function there is also a need to staff STAR so it can run more effectively to serve the CBP partnership

STAR Workgroups and Functions					
Integrated Monitoring Networks WG	Methods, Quality and Data Access WG	Status and Trends WG	Explain Ecosystem Condition and Change WG	Modeling WG	Climate Change WG
WG Functions					
Manage water quality networks Coordinate Monitoring supporting the 2014 Bay Agreement outcomes: "BASIN process" Build upon Citizen Science and other networks	Field methods Laboratory analyses Citizen science field, lab, methods and data management Chesapeake Bay Data Center and GIS team	Updates of Status and Trends (mostly be each GIT) CBP Indicators outputs organized and prepared Delivery supported in ChesapeakeStat and WWW CBP GIS team support	Coordination with technical WGs in GITs WQGIT: STAR team to explain water-quality change; Land WG Fisheries GIT: GIT Teams contribute to fisheries responses Habitat GIT: SAV WG; Wetlands WG; stream health WG Healthy Watersheds GIT: Land WG Stewardship GIT: Land Protection WG	Predicting ecosystem response to management approaches Support for WG GIT: Mid-point; Scenario builder Enhance collaboration with other modeling efforts to support GITs	Carry out research and assessment outcome of the Climate Change Goal Work with GITs to develop adaptation strategies.
Synthesis and Communication of Information from all groups					
Working with CBP Communications WG, UMCES-IAN, STAC					

Next steps to implement new STAR purpose and functions

1. Revise STAR WGs to carry out new functions.
2. Enhance collaboration with each GIT. STAR will increase collaboration with each Goal Team by (1) having a STAR liaison to each Goal Team, and (2) working with the CRC staff for each GIT to communicate the current science information that is available to meet their science needs and help prioritize unmet GIT science needs. The GIT-STAR liaisons are essential to facilitating this interaction and tracking activities in this regard.
3. Increase interaction with STAC and propose workshop topics. The STAR work with GITs to propose topics for STAC workshops and work with STAC to identify science providers to address GIT topics (see previous section).
4. Enhance science coordination. Based on the recommendations of STAC workshops, STAR will help to facilitate gathering the science providers and GIT WGs needed to address and implement STAC recommendations.
5. Expand membership. STAR will expand its membership to include science providers to be on the WGs to carry out each of its major functions. STAR will also work with the Goal Teams to have chairs of their technical workgroups be part of STAR so they can enhance collaboration monitor, assess, and explain ecosystem change. The STAR leadership will expand to include all STAR WG chairs and CBP WG leads.
6. Refine Meetings. STAR will have two types of meetings: (1) full membership meetings (every other month or once a quarter) and (2) leadership meetings (months between full STAR meetings). The full membership meetings will focus on supporting and coordinating science needs of the GITs. They would have key presentations of findings and coordination opportunities that should be of interest to multiple GITs. The leadership meetings would focus on reviewing progress of WGs to provide the science requested by the GITs. Seminars, hosted by UMCES, could also be part of either the full or leadership meetings.
7. Change name. We recommend a name be changed to the Science Coordination (or collaboration) Team to better reflect our new purpose and function.

(Updated Sept 9, 2014)