Suggested Guidance for the 2013 Panel Discussions of Chesapeake Bay Program Monitoring Networks (draft Nov 1, 2013)

Overview: The Chesapeake Bay Program (CBP) is reviewing approaches to ensure the long-term sustainability of its monitoring networks in the face of reducing federal funding. The progress, known as **B**uilding **a**nd **S**ustaining **I**ntegrated **N**etworks (BASIN) has three phases. Phase I process has been completed and focused on a short-term effort to address a federal funding reduction of estuary and watershed water-quality networks. Phase II will review the anticipated costs of the CBP water quality-monitoring networks to 2025 and formulation long-term strategies to modify and sustain the networks. During this phase we want to review how other National Programs conduct and fund their monitoring networks and associated data management activities. Phase III is expected to consider CBP monitoring requirements beyond water quality to support the breadth of commitments (such as fisheries, habitat, land protection) in the new Chesapeake bay Agreement. Members of the CBP Scientific and Technical Analysis Reporting (STAR) team are gathering the information to prepare a report for Phase II of the process.

What we are asking for your participation and contribution to Phase II of the process by providing an overview of your monitoring program. We are working to have 2-3 talks during a session so we can learn about different approaches to sustaining monitoring networks. These sessions would be Webinars to reduce travel requirements and be run by CBP STAR members. In preparing a presentation for a session, we would greatly appreciate if you could use the following outlines as a guide to preparing your 30-35 minute talk:

- What are the objectives of the monitoring network(s) and supporting network design
- What is the operational model of how the sample collection, lab analysis, and data management are conducted?
- What is the business model of how the network is funded?
- What is the governance structure of the restoration effort and how do they oversee the monitoring program?
- List the three biggest successes and challenges in sustaining the network(s)

Below is a more detailed discussion of information we want to cover for each item. We have provided examples from the Chesapeake networks to help see the breath of information to consider.

1. **What are the network objectives and design?** Please list the major objectives of your network and the design to achieve the objectives. We are not asking for a very detailed explanation so consider 5 minutes of your presentation time for this.

Example from Chesapeake Bay: In August 1984, the Chesapeake Bay tidal monitoring program was created to achieve three objectives: characterize the baseline water quality conditions; detect trends in water quality indicators; and increase the understanding of ecosystem process and factors affecting Bay water quality and living resources (MD OEP 1987). Undergoing adaptive changes over the almost three decades as the partnership's management needs and requests have significantly evolved over time (CBP 1989a, 1989b; USEPA 2003a; MRAT 2009), the Chesapeake Bay tidal monitoring network includes the following:

- Tidal water quality monitoring for 26 parameters at over 150 stations distributed over the 92 Chesapeake Bay tidal segments across Delaware, the District of Columbia, Maryland, and Virginia
- Shallow-water monitoring addressing a select set of segments on a rotational basis
- Benthic infaunal community monitoring at fixed and random stations across the tidal waters
- Annual aerial and ground surveys of underwater Bay grasses
- Decadal records of phytoplankton and zooplankton monitoring
- Fisheries independent population monitoring programs and surveys

Each component of the tidal monitoring network has been designed to support the four Bay jurisdictions' tidal water Bay section 303(d) listing decision makings, addressing DO, water clarity, SAV, and chlorophyll *a* criteria attainment assessments and benthic infaunal community-based impairment decisions

2. Describe the operations model that supports the annual sampling and analyses of your long term monitoring program.

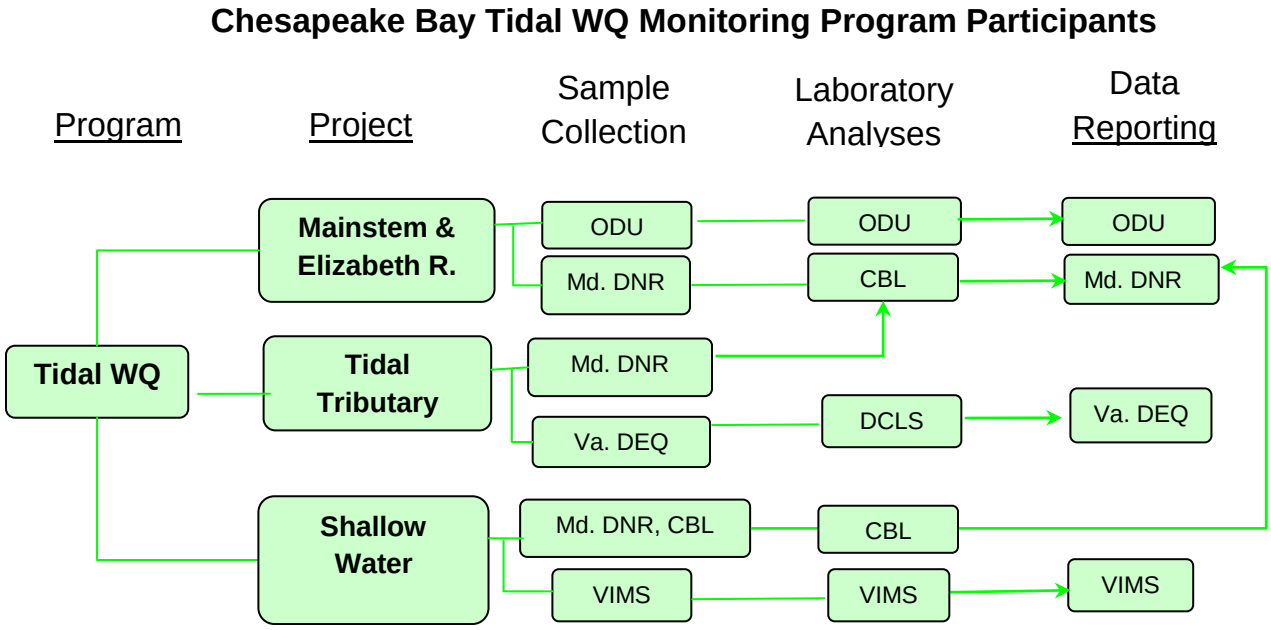
Highlight the program changes and innovations that have been made to improve cost efficiency or time efficiencies in the monitoring program. Also discuss how your network(s) is operated by multiple partners carrying out sample collection, lab analysis, and information management. Some the questions to address include:

- Have you taken innovative approaches to acquiring samples in a more cost or time effective manner?
- Have you incorporated new technologies into your field sampling program, sample analysis, data management or data analysis that provided a greater return in information for the monitoring funding you have available?
- Are you incorporating citizen science volunteer support to help sustain or grow your monitoring program?
- Does a single institution collect the samples, process the samples, collate the data, statistically analyze and summarize the results and produce communications products for diverse audiences?
- Is your workload supporting the monitoring and analysis tasks dispersed among contractors, academic institutions, graduate students, local, state and federal agency personnel, nonprofits, others?
- Do you have any special partnerships supporting data collection, management and reporting?

Chesapeake examples: DATAFLOW surface mapping of water quality has been incorporated into Chesapeake Bay Clean Water Act 303d list water quality standards assessments of water clarity (Baywide) and chlorophyll (VA – James River).

- There is some use of citizen science measurements that also provide support to 303d listing assessments for Bay water quality standards.
- Vertical profile technology has been piloted for high temporal density water quality sampling in the Bay. While this remains a solid frontier of information needs for understanding water quality behavior and responses to management actions, the technology is largely being used in more quiescent regions, it is helping to provide new insights into water quality behavior, has supported innovative testing of analyses options but has not yet been shown to be cost effective compared to the existing boat-derived water quality monitoring assessments.

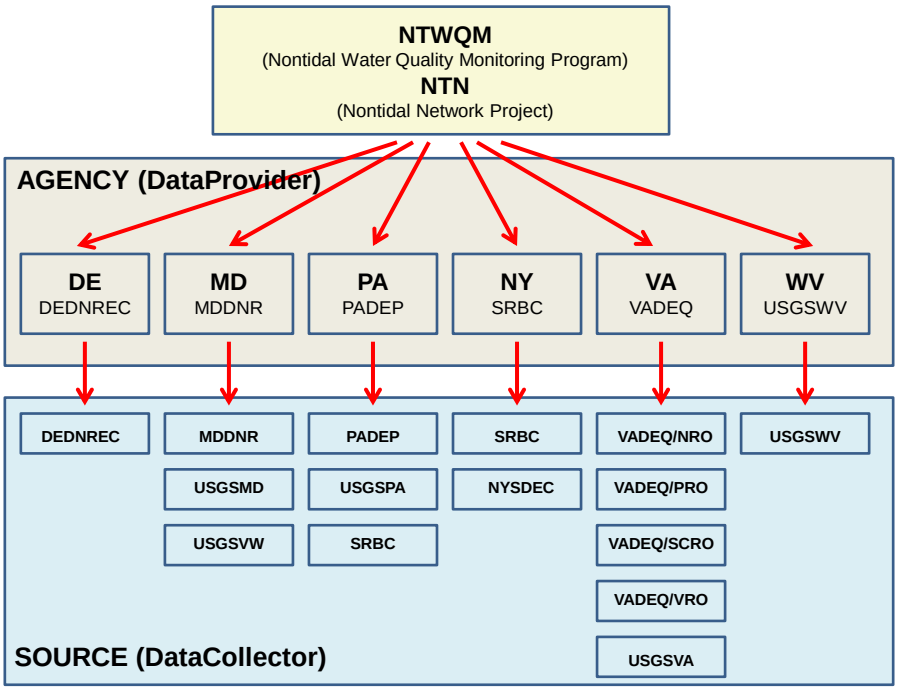
Example of operations flow chart showing the workflow across monitoring program elements.



Abbreviations: Md. DNR – Maryland Department of Natural Resources; Va. DEQ – Virginia Department of Environmental Quality; CBL – University of Maryland Chesapeake Biological Laboratory; DCLS – Virginia Department of Consolidated Laboratory Services; ODU – Old Dominion University Water Chemistry Laboratory VIMS – Virginia Institute of Marine Sciences

E.g. The Bay tidal monitoring network operated, and maintained through a longstanding state-federal-university partnership that produced the fundamental monitoring data supporting Bay TMDL development. This data is also utilized in public reporting on the health of the Bay, its tidal rivers, and supporting ecosystem; assessment of achieving the Bay jurisdictions' Chesapeake Bay WQS regulations; evaluation of the effectiveness of actions to reduce nitrogen, phosphorus, and sediment

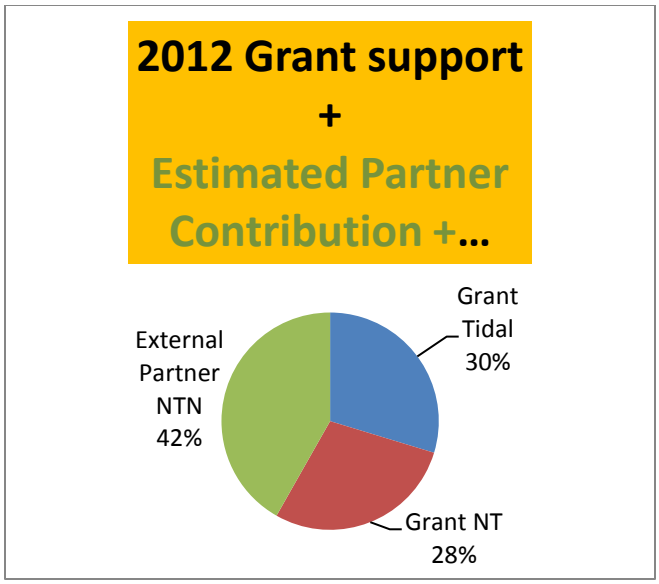
pollution loadings from the surrounding watershed; developing, calibrating, verifying and applying models; and generating and reporting water quality and living resource indicators. Below is an example of the nontidal monitoring network, agencies and ultimately the source data providers for the program:



3. Describe the <u>business model</u> that funds the monitoring program.

Please describe and/or illustrate your funding to support the sampling, lab analysis, and data management associated with your monitoring network(s). Can you please show the relative proportional distribution of funding that sustains your monitoring program across sample collection, sample processing, data management, data analysis, and synthesis and reporting?

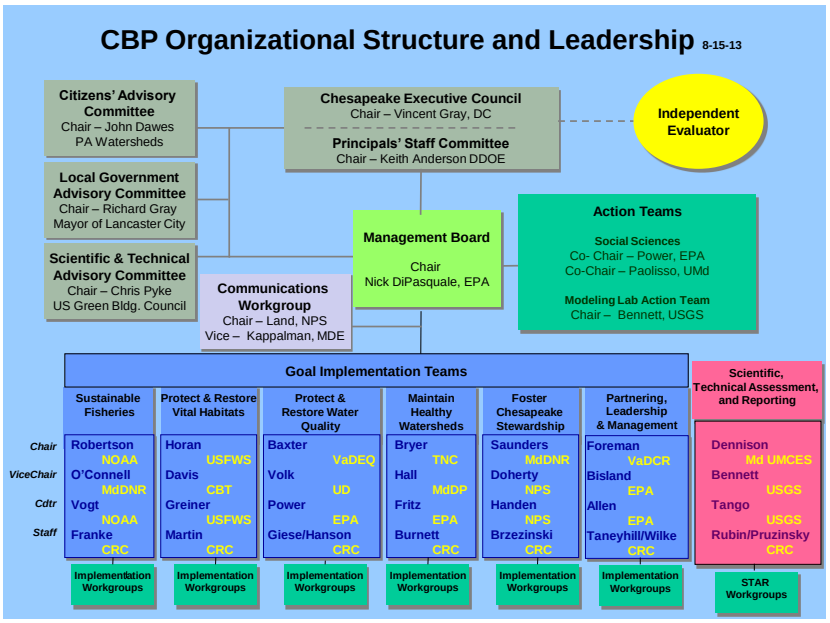
<u>Chesapeake Example:</u> This illustration below is a generalized example (not published, not citable) regarding one view of how the Chesapeake Bay tidal + basin water quality monitoring programs are supported. Tidal grants are Federally based, 50:50 matching grants; the nontidal monitoring network is supported by a combination of the Federally based EPA 117d program grants that have 5% match requirements; the external partner contributions are funds that a wide range of state, local, federal, or interstate institutions leverage to sustain water flow and quality monitoring of the Chesapeake Bay 126 station nontidal network. Other similar graphics could be used to show the distribution of money spent on sampling, processing, data management, etc.



Please note: This graphic is just an example, not to be used for public consumption.

4. What is the governance for the restoration effort and how do they oversee the network? Discuss how the information and results of the network are delivered and used by organization(s) overseeing restoration. How are the needs of the management community assessed, re-evaluated, and translated into monitoring objectives?

Chesapeake Example: The Governance structure of the Chesapeake Bay Program includes a Management Board under which there are Goal Implementation Teams, and the Science, Technical Assessment and Reporting Team (STAR). The CBP-Scientific and Technical Advisory Committee provides in depth study, analysis and review of key monitoring and modeling related issues. A wide range of workgroups make up STAR and support the monitoring design, analysis and reporting needs of the CBP community. A communications team links CBP outputs to public messaging.



5. Describe your 3 greatest successes and 3 greatest challenges in sustaining your monitoring network and associated information management. These will be important insights you have gained while sustaining your network during times of funding reductions and constraints.

Chesapeake Examples.

Successes: The long-term Chesapeake Bay and watershed monitoring networks have accomplished many objectives in the past 29 years including the following:

- Classifying status and tracking trends in tidal Bay and Bay watershed water quality and living resources response to management actions and other anthropogenic and natural factors
- Supporting a scientific basis for targeting a dual nitrogen/phosphorus load reduction strategy for Bay water quality and habitat health recovery
- Identifying eutrophication as the primary cause of the SAV decline
- Providing sufficient and diverse data supporting scientifically based and peer-reviewed estuarine water quality criteria development to guide restoration targeting and water quality assessments (e.g., CWA section 303(d) listing/delisting decisions)

Challenges:

- 2004: Decisions to end a nearly 20 year zooplankton monitoring program in the Bay to redirect funding support and initiate a Shallow Water water quality Monitoring Program in the Bay plus establish EPA contributions to the Chesapeake Bay Nontidal Network of 85 stations.
- 2009: Redirect funding from the tidal water quality monitoring program into support for expanding the watershed monitoring network, additional data management and analysis work.

- 2013: Adjust monitoring funding between EPA and the Chesapeake Bay Partners to address a nearly 1M gap in federal funding support while sustaining as much of the integrity of the long term Bay and Basin monitoring effort as possible. Re-evaluate