RECOMMENDATIONS FOR BASIN WATER-QUALITY REPORT

DECISION SUPPORT: The monitoring and analysis to explain change, will primarily focus on supporting the TMDL and attainment of water-quality standards. Addressing the needs of the CBP partners to address the Bay TMDL, and associated water-quality standards, requires monitoring to support adaptive management and communication of results to inform decision makers. The monitoring results will be used by CBP WQ GIT and other partners, to consider adaptations needed to (1) Evaluate progress toward improving water quality, (2) Help prepare Phase III watershed implementation plans; and (3) Inform implementing practices to carry out the WIPs;

CITIZEN SCIENCE: Citizen Science has tremendous potential but requires coordination, training and continuity. There is a trend of increasing citizen science activity with varying degrees of data incorporation into monitoring programs. It is generally felt that expanding the use of citizen scientists has multiple benefits; allowing for more frequent data collection at more sites, providing more trained eyes observing the ecosystem, and enhancing community engagement.

Citizen science can help supplement the CBP water-quality monitoring in the watershed and tidal waters. Utilization of citizen science for water-quality could help identify areas of high nutrients and sediment to better target local implementation of practices. Areas of poor tidal water quality can be further identified. However, citizen science can't replace the CBP network due to specialized equipment that is required and safety issues for sampling during storm events.

INNOVATION: Technological innovations are beneficial from two aspects: (1) improved interpretation of the monitoring information, and (2) improvements in the monitoring. New statistical techniques such as WRTDS and GAMS are new approaches that will improve our ability to analyze and understand water-quality trends in the bay and its watershed. Other analysis techniques may allow for more detailed data collection at fewer sites without a loss in analytical power. New technologies in monitoring offer multiple possibilities including:

- Continuous monitoring both in the tidal waters and watershed. Continuous monitoring can to improve load estimates to the Bay. This could be targeted at the RIM stations or just the three largest rivers into the Bay (Susquehanna, Potomac, James)
- Vertical water quality profilers, or another technology that can similarly accomplish the task (e.g. Navy demonstrated the use of AUVs to get 3-dimensional monitoring assessments) are needed to support greater spatial resolution of dissolved oxygen patterns for more accurate assessments.
- Enhanced monitoring in distinct source sectors. Many of the monitoring stations in the nontidal network include multiple types of land use so it can be difficult to interpret response to practices associated with a particular source section and very challenging to assess individual BMP effectiveness. More emphasis needs to be placed on monitoring in distinct sources sectors and monitoring smaller watersheds with distinct land uses.
- Sentinel sites would also be useful to assess long-term changes in water quality as practices are implemented.

PARTNERSHIPS: The Bay Program must consistently look for partnering opportunities with local and regional entities. Partnering can provide leveraging whereby each partner benefits by co-locating monitoring efforts and the overall cost of the monitoring effort is reduced as compared to if the monitoring were done independently. Opportunities that should be pursued:

- Working more closely with local governments. Many local jurisdictions have developed monitoring programs to assess conditions and effects of publically financed improvements. The counties surrounding major metropolitan areas are good opportunities to form monitoring consortiums.
- The NERRs network with NOAA, as well as their ChesBIBs buoy system, provides leveraging opportunities with existing infrastructure to further support status and trend assessments in water quality standards attainment.
- Regional partnerships such as MARACOOS. MARACOOS utilizes a network of stakeholder liaisons to broaden individual user's needs into a regional theme. Partners in the regional network see benefits beyond their individual contributions through leveraging.

COMBINING FUNDS. Having agencies contribute funding into a common pool of resources provides opportunities for efficiencies and integration of priorities. This will be a change from the current method of individual agencies managing to meet specific program mandates and would allow the water-quality monitoring network to better keep pace with inflation.

The Puget Sound Partnership has implemented a regional monitoring program funded through contributions by individual municipal storm-water permittees. By creating a common fund, individual costs are reduced and a more robust monitoring program was designed. Similarly, sugar cane growers contribute to fund a monitoring program for the Great Barrier Reef in Australia. And a portion of the funding for Ireland's coastal monitoring program comes from fees for using plastic bags. An advantage of these approaches is that the cost of monitoring is distributed to multiple entities, which makes the overall funding for the network more resilient.

CONTINUOUS IMPROVEMENT. All of these recommendations can result in more robust monitoring, but typically require increased management to succeed. They also require that government entities think beyond their individual programs and what is required to support them. The benefit is an integrated monitoring program, but care must be given that the initial monitoring objectives of the funding are met and communicated.