A Guide to the Mid-Atlantic Tributary Report Cards

A variety of organizations, both government and citizen-led, monitor the health of streams, rivers, and other waterbodies in the mid-Atlantic region. Recently, a number of groups concerned with the health of watersheds in the Chesapeake Bay region have begun to produce ecosystem health report cards much like EcoCheck's annual Chesapeake Bay report card. The goal of this newsletter is to highlight these report cards as well as the efforts of the Mid-Atlantic Tributary Assessment Coalition (MTAC). MTAC is working to further coordinate and strengthen the assessment capabilities of the tributary groups and to integrate their data with the Bay-wide report card.

Producing report cards

Ecosystem health report cards are detailed scientific assessments that are generally produced annually. They are designed to communicate ecosystem condition in a timely and geographically detailed manner.

Many watershed and river organizations in the mid-Atlantic region are beginning to produce report cards for their tributary or watershed. For example, at least eight organizations (the Chester River Association, the Maryland Coastal Bays Program, the Magothy River Association, the Nanticoke Watershed Alliance, the Patuxent Riverkeeper, the West/Rhode Riverkeeper, the Sassafras River Association, and the South River Federation) plan to produce some version of a report card in 2010.

These groups have found that report cards are important outreach tools for generating community interest and increasing citizen understanding of ecosystem health, water quality, and watershed issues. Report cards can also be used to provide useful and timely information on environmental issues to local decision-makers, and can highlight actions that residents can take to become involved in the improvement and protection of their communities.

The report card process generally begins with the gathering of data relevant to local environmental issues. This may involve collection of new data by volunteer monitoring programs and/or use of data from other federal or state programs. Commonly collected data relating to water body health include dissolved oxygen, water clarity, chlorophyll *a*, aquatic grasses, benthic habitat condition, and nutrients.

Data are usually collected from spring through early fall, because most biological activity occurs during the warmer months. Groups then organize and analyze their data and release their report cards during spring or early summer of the following year. Often, a media event announces the release of a report card.

Figure 1. This map shows all of the tributary groups that have produced an ecological report card as a part of the MTAC effort.




(Left to right) Promoting environmental protection through the local media is an important part of a report card release; education and outreach are combined in the use of sturgeon touch tanks; presenting report card results to decision-makers; a Chester Tester citizen scientist tests water quality in the Chester River watershed. Photo credits: J. Hawkey, E. Daniels, E. Nauman, Chester River Association.

Why are tributary report cards useful?

Historically, state and federal government programs have monitored the health of waterways for regulatory and management purposes. For example, Maryland and Virginia perform most of the monitoring activities for the overall health of the Chesapeake Bay, with support from the Chesapeake Bay Program and other partners. Unfortunately, it is not economically or logistically feasible to place sampling stations in all desired areas of the Bay because of its large size. Therefore the sampling site locations have been carefully chosen to maximize coverage in order to adequately assess Bay-wide conditions (Figure 2a).

Despite intense monitoring and assessment for more than two decades at this Bay-wide scale, there is a growing recognition that more information is needed at finer scales (i.e., individual watersheds within Bay-wide reporting regions; Figure 2b) to evaluate management actions taken at local scales within tributary watersheds. Collection of data at the scale needed for these types of assessments is currently being carried out in many places by Riverkeepers, watershed associations, and other citizen monitoring groups, which are all intended to act as watchdogs of human and ecosystem health for their local communities.

For example, the Chester River Association assesses data that are collected from the Chester River watershed, located in the Upper Eastern Shore region of the Bay. Their monitoring sites include numerous non-tidal creeks and detailed tidal sections of the river (Figure 2c). The data that 'Chester Tester' volunteers collect allow a much more detailed assessment of the health of the Chester River than can be obtained from Bay-wide monitoring sites.

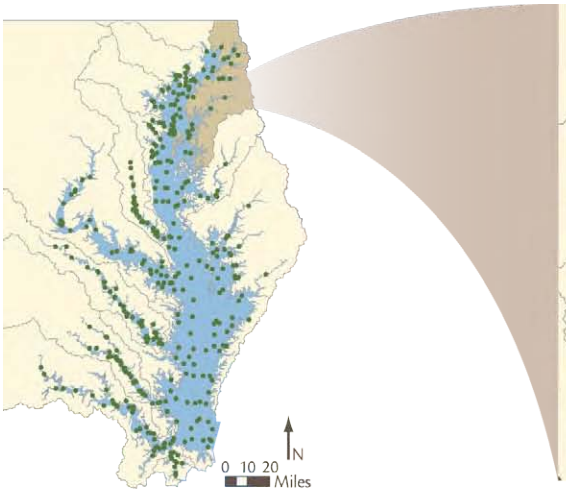

Figure 2a: The Chesapeake Bay Program monitoring sites are located throughout the tidal Bay area. Information at this scale is used for a Bay-wide health assessment (e.g., annual EcoCheck report card: www.eco-check.org).

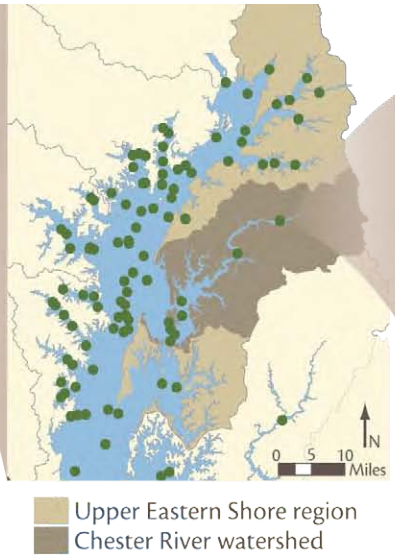

Figure 2b: The Upper Eastern Shore region, used in Bay-wide assessments, groups several watersheds together because few Chesapeake Bay Program sites are located in this area of the Bay.

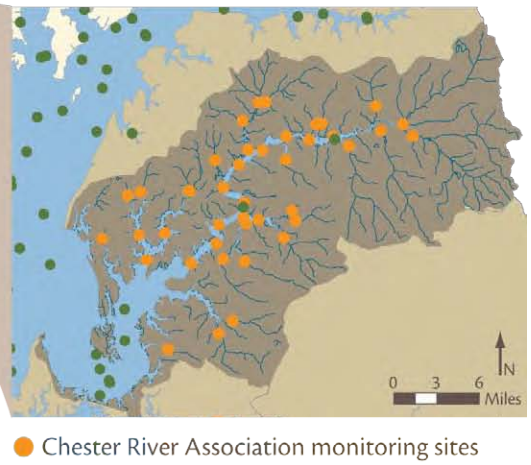

Figure 2c: The Chester River Association focuses on monitoring just the Chester River and its tributaries and therefore has a higher data density in that watershed than is provided by Bay-wide monitoring efforts.

DECIDING WHAT TO MONITOR AT THE LOCAL SCALE

Data collected by watershed groups are very useful for providing detailed assessments of local environments. However, groups choose to monitor different indicators based on unique local issues. These varying methods and indicators make it difficult to compare data and results across watersheds.

Currently, efforts are under way to establish methods and a set of core indicators that all mid-Atlantic tributary groups will monitor. This will create a common framework for obtaining and analyzing data for ecosystem health assessments, and will also add substantial value to the data collected by individual groups by allowing direct comparison of results from one watershed to another. Collected data can then also be integrated into Bay-wide assessments, like EcoCheck's annual Chesapeake Bay report card. Six core indicators are beginning to be integrated into monitoring programs by MTAC members: dissolved oxygen, water clarity, chlorophyll *a*, total nitrogen, total phosphorus, and aquatic grasses (Figure 3).

As can be seen in the table on the next page, groups currently use a combination of both core and elective indicators in their ecosystem health assessments. Elective indicators are important to monitor in addition to core indicators because they provide data relevant to each watershed.

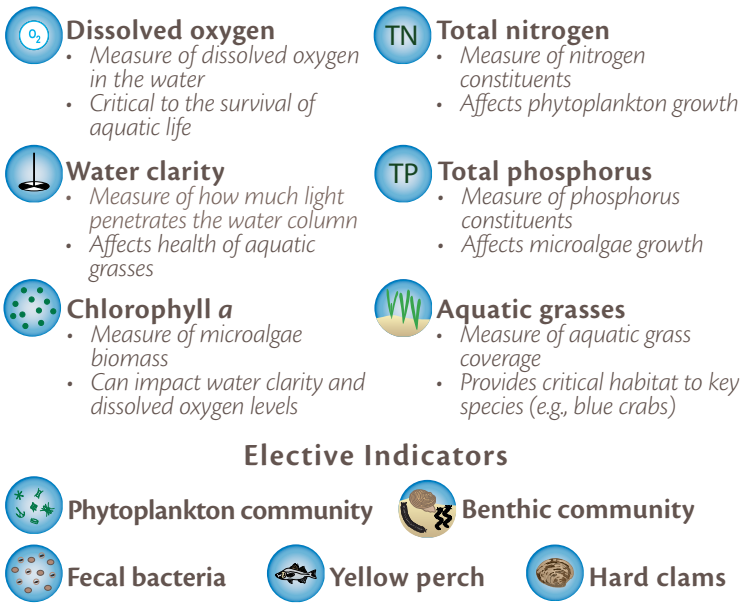

Figure 3: Core and selected elective indicators. For more information, please see each group's website, listed in the table on the following page.

Comparison of report cards

The table below shows the report cards that are currently produced by watershed organizations as well as the core and elective indicators used to calculate their report card scores. Further information about the groups, including more details about the watersheds and indicators used as well as each group's most recent score, can be found on their listed website.

Generally, the report card for a given year uses data from that year, but is not released until the following spring or summer. For example, the report card for the calendar year 2009 comes out in spring or summer of 2010. Exceptions to this are the South River Federation and West/Rhode Riverkeeper—both of these organizations label their report card with the year of production, rather than the year the data were collected.

What are Citizen Scientists?

A citizen scientist is a volunteer who is trained to collect accurate environmental data that can be analyzed and integrated into a monitoring program. Citizen scientists are crucial to comprehensive monitoring and protection of their watersheds because they can help to capture data in small regions that might otherwise be less well covered by larger-scale monitoring efforts. They volunteer their time to work with an organized program supported by resources from various institutions and agencies. These programs should use quality control guidelines to ensure high quality data collection, storage, and analysis. The report cards produced by watershed groups in the mid-Atlantic region would not be possible without the dedication and hard work of their citizen scientists.

Tributary/Waterbody	Indicators: Core	Indicators: Elective	First year of production	Link to most recent score
Chester River *Chester River Association*	O_2, Bottom, Grass	Fish, Crab	2007	chesterriverassociation.org
Coastal Bays (MD) *Maryland Coastal Bays Program*	O_2, TP, Algae, Grass, TN	Oyster	2009	mdcoastalbays.org
Magothy River *Magothy River Association*	O_2, Bottom, Grass		2003	magothyriver.org
Nanticoke River *Nanticoke Watershed Alliance*	O_2, TN, Bottom, TP	Algae	2010	nanticokeriver.org
Patuxent River *Patuxent Riverkeeper*	O_2, Algae, Bottom, Grass	Fish, Crab	2008	paxriverkeeper.org
Sassafras River *Sassafras River Association*	O_2, Algae, TP, Bottom, TN, Grass		2010	sassafrasriver.org
Severn River *Severn Riverkeeper*	O_2, Bottom, Grass	Fish	2009	severnriverkeeper.org
South River *South River Federation*	O_2, Algae, TP, Bottom, TN, Grass	Crab, Algae	2007	southriverfederation.net
West and Rhode Rivers *West/Rhode Riverkeeper*	O_2, Algae, TP, Bottom, TN, Grass	Fish, Crab	2009	westrhoderiverkeeper.org

MTAC—working together to standardize assessment and reporting

Although watershed and community groups collect data at a local scale that is unachievable by state and federal efforts, greater consistency in the data collected by these organizations is necessary for the information to be used in larger-scale analyses, including Bay-wide assessments such as EcoCheck's annual Chesapeake Bay report card. Data at this scale would allow comparative assessments between tributaries and evaluation of the effectiveness of restoration and management actions. However, since each group collects, analyzes, and reports their data slightly differently, the utility of the data has so far been limited to individual watershed assessments.

MTAC was formed specifically to improve the consistency of data collection and analysis for key ecosystem health indicators among participating organizations. The goal is to reach consensus on a group of tidal and non-tidal indicators that will be collected by all groups, using similar methods for sampling, analysis, and reporting. MTAC participants are currently working to produce written protocols that will help ensure uniform and scientifically rigorous monitoring, sample analysis, quality control, and data management for all indicators among current and future groups. The MTAC group currently meets once per month to work on developing these protocols, which are scheduled to be completed by October 2010. Although the protocols are still in development, many participants are already adjusting their methods to be consistent with the group. Some of these adjustments can be seen in the current year's report cards (Table, Page 3).

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Members of the MTAC group and other participants of an Integration and Application Network science communication course work together to draft a report card.

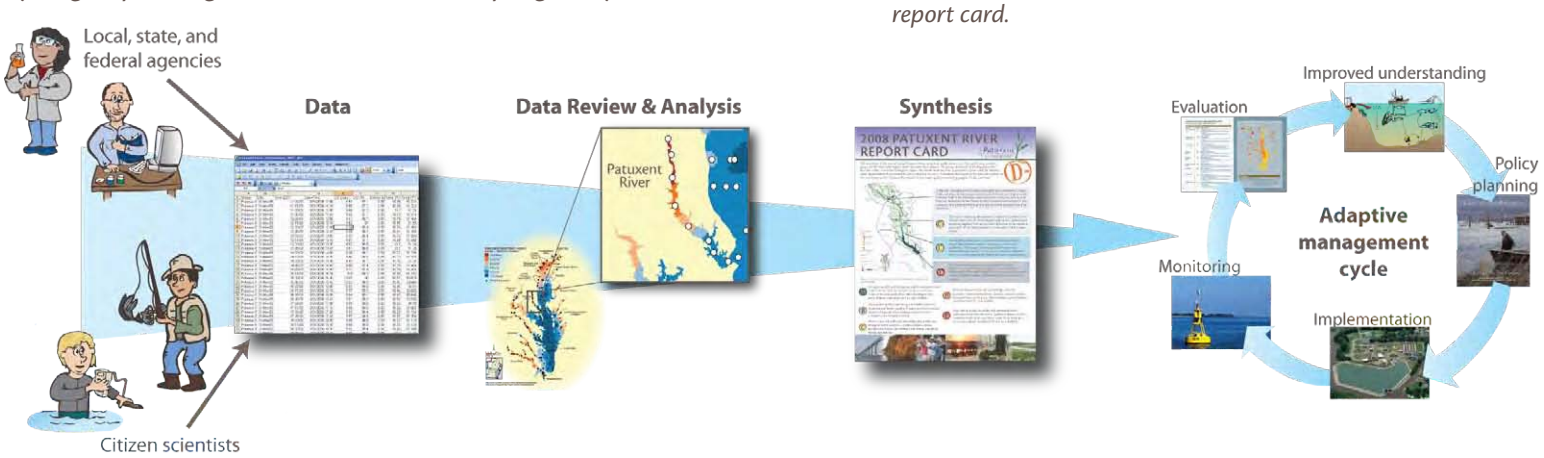

Figure 4: Standardization of data collection and analysis will improve data consistency such that it can be integrated into a larger management framework. This will allow more comprehensive assessments and have a greater impact on management decisions.

The resulting consistency of indicators and methods is intended to allow direct comparison of data and report card scores from each region, and also to create high-quality data at a local scale. That data could be incorporated into a larger management framework, enabling more comprehensive assessments and analyses, which can then influence both large- and small-scale management decisions (Figure 4). For example, the Virginia Department of Environmental Quality incorporates citizen monitoring data into their regulatory and assessment processes via multiple pathways (http://www.deq.virginia.gov/cmonitor/). Exploring the possibility of a similar procedure for the entire mid-Atlantic region is one of the goals of MTAC.

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