Designing a Strategic Outreach Education Program

for Local Elected Officials in the Chesapeake Bay Watershed

Contents

Executive Summary

At its core, the 2014 Chesapeake Bay Watershed Agreement recognizes that the Bay watershed is an assembly of streams, rivers and their watersheds and that the active support of citizens and local government decision makers, particularly local elected officials, is key to achieving the vision of the agreement.

The Chesapeake Bay Program partners envision an environmentally and economically sustainable Chesapeake Bay watershed with clean water, abundant life, conserved lands and access to the water, a vibrant cultural heritage and a diversity of engaged citizens and stakeholders.

The importance of a diversity of engaged citizens throughout the watershed is reflected in the Agreement's vision and each of its 10 goals, but it is specifically and most clearly addressed in the *Stewardship Goal -- Increase the number and the diversity of local citizen stewards and local governments that actively support and carry out the conservation and restoration activities that achieve healthy local streams, rivers and a vibrant Chesapeake Bay.*

This report, prepared by the Ecologix Group, Inc. under contract to the Chesapeake Bay Trust, provides recommendations for the design of a strategic outreach and education program for elected officials that will most cost-effectively achieve the 2014 Chesapeake Bay Watershed Agreement *Local Leadership Outcome -- Continually increase the knowledge and capacity of local officials on issues related to water resources and in the implementation of economic and policy incentives that will support local conservation actions.*

The Contract requires EcoLogix to make recommendations that build on the information contained in the management strategy, the work plan summary, and the Chesapeake Watershed Local Leadership

Development Programs Report, reflect the guidance of the coordinator and Chair of the Local Leadership Workgroup and incorporate the information garnered from four focus groups.

With the help of the Chesapeake Bay Program Local Leadership Workgroup and Local Government Advisory Committee to the Chesapeake Executive Council (LGAC), the EcoLogix Project Team met with local leaders representing state and local governments in Virginia, Maryland and Pennsylvania. Reflecting this input and guidance, recommendations are made in five key areas: (1) the content that needs to be conveyed to local elected officials in order to increase their knowledge and capacity for water resource protection and restoration; (2) informational programs and delivery mechanisms – what exists now, and the gaps that need to be filled; (3) the best way to coordinate and focus these delivery mechanisms to tailor to the needs of local elected officials; (4) how much will this program cost and the recommended funding sources; and (5) how to measure progress in meeting the goals and milestones of this program.

This report builds on the work of prior project phases. In 2015, Environmental Leadership Strategies (ELS), including members of the EcoLogix team, interviewed 18 local leaders in Maryland, Virginia, and Pennsylvania. In the 2016 phase of the project, a survey consisting of 11 questions was shared with local officials, including four sessions conducted as focus groups. Over 100 local leaders and agency staff actively participated in providing responses through these focus groups. We sought to learn what issues are most important to local communities, and how natural resource programs relate to overall community priorities. The Strategic Outreach and Education Program recommended here reflects the key elements that local officials highlighted as most important and useful to them.

Recommendations in Five Key Areas

This report is based on extensive outreach to, and engagement with, local officials. Based on our contract and guidance from the Local Leadership Workgroup, Chesapeake Bay Program, Local Government Advisory Committee and others, we developed questions for our focus group sessions and one-on-one interviews that were designed to obtain recommendations in five key areas:

(1) **The content that needs to be conveyed** – what do local elected officials need to know in order to take action to protect or restore the watershed and what are the local issues that connect the elected officials to this information/content;

We recommend that the content be organized in sync with the Chesapeake Bay Agreement goals and outcomes, since this provides a comprehensive framework to provide an overview of the watershed fundamentals and local best practices that local leaders need and want. Achieving most of the goals of the Chesapeake Bay Watershed Agreement relies at least in part on local government action. Increasing the ability of local leaders to take those actions is critical to achieving success in the Bay watershed restoration. To meet the obligations of their office, local leaders must first and foremost address the priorities of their constituents. But they must do this in a way that recognizes both the short and long-term consequences of their actions. Environmental protection and watershed restoration are longer-term efforts that are often seen to be in conflict with local priorities, but in fact, there are many examples where local priorities intersect with the goals of the Chesapeake Bay

Watershed Agreement. The challenge is to identify the intersections and effectively communicate the opportunities and means that exist and to build the public support for actions to address both at the same time.(2) **Informational programs and delivery mechanisms** – what exists now, and what gaps need to be filled;

The Chesapeake Bay Watershed is home to a host of excellent governmental agencies, multi-jurisdictional associations, academic institutions and non-profit organizations that are currently working in the watershed, with the Bay Program Partnership and many already work with and are widely respected by local leaders. We found that many of their existing programs contain excellent information. However, we also found that none deliver the content described above in a way that fully meets the needs of local leaders. A new delivery mechanism for leadership advancement is needed to weave together existing expertise, focus the content on local priorities and fill gaps in current program offerings for local elected officials. The Watershed needs a coordinating delivery mechanism to advance the Local Leadership Outcome.

(3) **The best way to coordinate and focus these programs and delivery mechanisms** – how should the programs be delivered in order to meet the needs of local elected officials;

The recommended program will build upon the existing expertise and networks to provide the following 3 levels of coordination and program delivery:

1) *<u>A Chesapeake Bay-wide coordination function</u> to be established as an additional responsibility of an existing organization or coalition of organizations already working in the watershed;*

2) *<u>State-level coordination</u> through existing state-by-state alliances of local government entities;*

3) *<u>Local partners</u>, existing local organizations that will directly help to implement the program.*

(4) **Estimates of how much this program will cost and funding sources**; what will it cost to deliver these programs to local officials and where will the funding come from;

The program recommended in this study will require funding for the Bay-wide coordinating organization(s) to identify local leader training opportunities in consult with Trusted Sources and to coordinate content development with Bay Program Goal Implementation Teams (GITs) and their affiliated Workgroups. GITs and affiliated Workgroups may also require funding for content and training program development. Technical support and training programs would be provided to local elected officials through the work of the Bay Program GITs and Workgroups. By taking advantage of Trusted Sources' web sites, newsletters, ongoing meetings, trainings, workshops and conferences held by the State and local Trusted Sources, the costs of content distribution would also be minimized.

It is anticipated that the Bay-wide coordinating role could be filled by contracting with an existing organization or partnership of organizations that are already working on local leadership outreach, skilled staff could lead a team of 2 to 4 individuals to set up the program at a cost of about $100,000 for the first year. This does not include Bay Program or jurisdiction funding that would be required by the GITs and Workgroups or other experts developing the content in consult with the Bay-wide

coordinating organization(s). After the first year, additional staffing and funding is likely to be needed for Bay-wide coordination in order to ramp up the local leadership education programs to meet targets necessary to achieve the Bay Program's goals for local government participation.

Bay Program funding is the most likely source for initiation of the program. The Bay-wide coordinating organization(s) selected by the Bay Program for this role ideally should have previous experience and a strong commitment to local leadership development and seeking additional State, local and/or foundation funding to expand the program in future years.

 (5) **Best ways to measure progress** – what are the measures of success in meeting the goals and milestones of a watershed education program for local officials.

The Bay-wide coordinating organization(s) should develop metrics in consult with State and Local Trusted Sources. Content providers from all organizations involved should use the metrics recommended by the Bay-wide coordinating organization(s) and provide the results to the coordinating organization(s) for accounting and reporting purposes.

The metrics should measure participation, knowledge gained, and actions taken. The number of elected officials targeted to receive the information should be established and actual participation tracked (and should reflect the actual funding level provided). Questionnaires should be answered by participants going into the programs and then after they complete the programs so that their increase in knowledge and understanding can be measured. Ultimately, the most beneficial metric would be to track the number and quality of actions taken by the participants to gauge the actual impact of the program. A further refinement of these metrics could be to identify the geographic areas where local government action is a high priority and then track the number of participants from those areas, knowledge gained and the actions taken.

Additionally, the metrics should be categorized by Bay Agreement Goal, to promote some (friendly) competition between GITs and Workgroups with respect to their local leaders outreach/training efforts. Metrics should be compiled and reported to the GITs and Workgroups on an annual basis. The specific metrics should be developed consistent with the findings of the Bay Program funded project currently underway by the Alliance for the Chesapeake Bay.

Below we present our detailed recommendations in each of these areas. The appendix lists the four focus groups we conducted, others who provided input, and the state and regional networks of local governments, referred to here as "Trusted Sources", who are best suited to implement these recommendations.

Acknowledgements

The content that needs to be conveyed

The content that needs to be conveyed was compiled from the Local Leadership Outcome Management Strategy http://www.chesapeakebay.net/managementstrategies/strategy/local_leadership, other Watershed Agreement Management Strategies http://www.chesapeakebay.net/managementstrategies and a report by Environmental Leadership Strategies (ELS) based on interviews of local government officials. The recommendations were further modified based on discussions the project team participated in during conference calls and meetings with the Local Leadership Workgroup, CBP staff to Workgroups working on other Watershed Agreement Goals and special "focus group" meetings with local officials conducted as part of this project. The focus groups provided valuable insights on how achieving the Chesapeake Bay Watershed Agreement goals coincide with and can facilitate achieving local government priorities and what methods of delivering the information local leaders need are most effective.

The Importance of Local Priorities

Achieving most of the goals of the Chesapeake Bay Watershed Agreement relies at least in part on local government action. Increasing the ability of local leaders to take those actions is critical to achieving success in the Bay watershed restoration. To meet the obligations of their office, local leaders must first and foremost address the priorities of their constituents. But they must do this in a way that recognizes both the short and long-term consequences of their actions. Public health and environmental protection and watershed restoration are longer-term efforts that are often seen to be in conflict with local priorities, but in fact, there are many examples where local priorities intersect with these goals. nt. **The challenge is to identify the intersections and effectively communicate the opportunities and means that exist and to build the public support for actions to address them all at the same time.**

In the focus group meetings conducted for this project, participants were asked about local priorities in the context of the Watershed Strategy. Some key local priorities they identified are summarized below and must be kept in mind as the content for local government leaders is developed for each of the Watershed Agreement goals to make sure that as many connections as possible can be made. The more a local elected official sees an action as addressing a local priority the more likely that elected official is to take the action. Currently, Bay watershed restoration projects are not often viewed by local officials as relevant to local issues. Therefore, if we are to encourage local elected officials to take local actions that will help restore the Bay watershed, the content message must be tied to addressing local priorities.

Economic Development

Throughout the Bay watershed, localities experiencing rapid growth and development are challenged to manage that growth. Localities that are seeking to grow, as well as most other localities, are looking for new economic opportunities to expand local businesses and provide entry-level and higher-skilled jobs. While helping to restore the Bay, actions that improve and protect local natural resources and public health will also promote local economic and quality of life goals.

Participants in the Maryland Association of Counties (MACO) made this point strongly.

> *"Clean Water and watershed management are building blocks for a strong tourist-based economy or a strong outdoor-recreation-based economy."*

> *"Newly-elected local officials are interested in economic development strategies that include a water quality focus."*

> *"In Kent County, our top industries (agriculture and maritime businesses) are related to environmental protection."*

Participants in the Susquehanna River Drinking Water Source Protection Partnership also emphasized the need for skilled workers, training and technical assistance, which ultimately serves both the Bay watershed goals and promotes economic development locally:

> *"We need more attention on combined sewer system and stormwater infrastructure, stormwater requirements to reduce turbidity in streams and a qualified workforce to complete the infrastructure needed to assure an adequate supply of safe drinking water."*

> *"The Watershed stewardship program has been very successful in York County. More watershed stewards need to be developed. Funding and training for education of a fresh generation is critically important."*

> *"We also need improvements in protections for working forests -- technical assistance for private landowners to improve forest management practices and forest preservation."*

Keeping and expanding local jobs

Local economic health is central to the ability of local governments to wisely conserve and manage their local natural resources. For example: Maryland's Eastern Shore is emerging as a regional cluster of science and technology based on the environment; elected officials are a key stakeholder group that brings leadership and expertise in strategizing for technology-based economic development. http://www.washacadsci.org/Journal/Journalarticles/V.98-3-Addressing_Eastern_Shore_and_Chesapeake_Bay..._SRood.pdf and Maryland's Chesapeake Harvest economic development program for the Eastern Shore http://chesapeakeharvest.com/about-us/.

Virginia: the Virginia Institute of Marine Sciences (VIMS) - VIMS-Industry Partnership - With the support and assistance of the Commonwealth Secretary of Commerce and Trade, William and Mary established the VIMS-Industry Partnership Committee in December 2003 to advise the Director of the Virginia Institute of Marine Science (VIMS) on the development of long-term partnerships with industry, and steps to improve collaborative research and technology transfer. http://www.wm.edu/offices/economicdevelopment/regionalprojects/chesapeakebay/vimsindustrypartner/index.php

Many local elected officials are confronting the problem of youth unemployment or under-employment. The Alliance for the Chesapeake Bay's READY project (Restoring the Environment and Developing Youth program) in Howard and Anne Arundel Counties is an example of a local youth mentoring and environmental job training program.

Infrastructure maintenance and financing

Our public infrastructure is under severe duress. Local elected officials are largely unable to find adequate funds to keep roads, bridges, dams, water mains, stormwater and sewerage systems working properly. According to the most recent national survey (2015) by the American Society of Civil Engineers, water infrastructure and public parks are the infrastructure categories with the highest proportion of unmet maintenance needs. Nationwide, only about one-third of drinking water and wastewater treatment infrastructure needs are funded – two-thirds of water-related maintenance needs must continue to be deferred.

Throughout the Chesapeake Bay region, local elected officials are grappling with deteriorating water mains, sewer pipes, roads, bridges and transit systems, struggling to find the funds to repair and maintain them. Examples include the collapse of Harrisburg's Mulberry St. Bridge's retaining wall in May 2016. http://www.pennlive.com/opinion/2016/05/crumbling_infrastructure_not_j.html

"I've seen widespread runoff and erosion damage to stream channels linked to exposed and broken public sewers." (participant in MACO Focus Group).

WSSC's Utility Services Team (serving Montgomery and Prince George's Counties in Maryland) repaired 1,918 water main breaks and leaks in 2015. http://wtop.com/maryland/2016/01/wssc-expect-hundreds-of-water-main-breaks-this-winter/ .

The decline in federal and state support for water infrastructure means localities must increase their share of infrastructure financing. Such financing must support maintenance and timely replacement of water infrastructure, including existing sewerage and stormwater systems, which are deteriorating rapidly due to population growth and development, flooding and other pressures including those brought on by climate change.

Public Health and Safety

Drinking water protection, fish and shellfish contamination and recreational illnesses related to water quality are frequently mentioned in the context of discussions of watershed protection and restoration. Watershed-based source water protection to maintain local and regional drinking water supplies is critically important to many local governments responsible for providing adequate safe drinking water, not only for public health, but for new jobs and economic health as well. Existing and new businesses and industries alike rely upon clean, safe potable water to sustain and grow jobs and the economy. Local elected officials are often the ones that are responsible for making the plans, – including local land use plans, setting the policies, putting in place the necessary local ordinances and ultimately ensuring the steady flow of funds to ensure the long-term reliability of drinking water for their communities.

In the focus groups that the project team conducted, **drug abuse** was another often-mentioned problem. The nature of this problem varies widely. www.drugabuse.gov/news-events/news-releases/2016/12/teen-substance-use-shows-promising-decline

How trends in **crime** rates locally and regionally are affecting local governments' priorities, public safety, budgets, and other trends (e.g. real estate trends). There are connections between crime rates, local economic health, natural resource protection and access to natural areas. Good jobs and economic health (both of which are connected to Bay watershed goals, as we state throughout this report) are critical contributing factors, and so are factors impacting quality of life. Academic studies indicate that trees and other vegetation can have a calming effect, evidence that it reduces incidence of aggression, violent crime. The research reports listed below are compiled and summarized by Dr. Kathleen Wolfe, professor at University of Washington: (depts.washington.edu/hhwb/Thm_Crime.html)

- Among minor crimes, there is less graffiti, vandalism, and littering in outdoor spaces with natural landscapes than in comparable plant-less spaces.[4]

- Public housing residents with nearby trees and natural landscapes reported 25% fewer acts of domestic aggression and violence.[5]

- Public housing buildings with greater amounts of vegetation had 52% fewer total crimes, 48% fewer property crimes, and 56% fewer violent crimes than buildings with low amounts of vegetation.[2]

- Studies of residential neighborhoods found that property crimes were less frequent when there were trees in the right-of-way, and more abundant vegetation around a house.[6,7]

- In a study of community policing innovations, there was a 20% overall decrease in calls to police from the parts of town that received location-specific treatments. Cleaning up vacant lots was one of the most effective treatment strategies.[12]

- Vegetation can be managed to create a reassuring environment, reduce fear, and increase citizen surveillance and defensible space. Principles of Crime Prevention Through Environmental Design (CPTED) suggest how to achieve safer places.

General Watershed Fundamentals

Big picture perspective on watershed stewardship efforts, including the fundamentals of watershed conservation and restoration - what is broken, why it matters, and how to fix it

The Chesapeake Bay Watershed Agreement provides a comprehensive framework to organize an overview of the watershed fundamentals that local leaders need and want. **The 10 major goals grouped under 5 headings in the Watershed Agreement are used here to present our recommendations for the content that needs to be conveyed and will be most beneficial to local leaders.** It begins with general content, followed by each of the Watershed Agreement categories in turn – Abundant Life, Clean Water, Climate Change, Conserved Lands and Community Engagement.

For the watershed in general and each specific goal of the agreement, in the following sections we address the watershed fundamentals, the role of local leaders, local priorities, and local best practices that should be of most value to local leaders interested in best achieving both the short and long-term priorities of the constituents and communities they serve. The information available on these subjects is exhaustive. The point of this section is not to provide a comprehensive curriculum, but rather to provide examples of the content and manner in which information should be conveyed to local leaders to be most effective. **<u>Our recommendation is that the Bay Program Goal Implementation Teams and Work Groups charged with developing and implementing the management strategies use these examples to guide the development of educational and technical support materials for local leaders that are specific to the goals and outcomes of the Bay Watershed Agreement.</u>**

The information that local leaders interviewed for this and previous projects have indicated they need to take actions to achieve the goals of the Watershed Agreement fall into two broad categories:

1) Watershed Fundamentals - Local officials need and want to have opportunities to learn more about the connections and dependencies between the natural and human environment to obtain a better understanding of the big picture of watershed restoration, including how each locality's actions contribute to the overall restoration effort, what actions locals are legally required to take to restore the watershed and most importantly, how these actions directly benefit the economy, environment and quality of life in their communities;

Watershed Fundamentals covers all of the natural and human facets of the Chesapeake Bay and its Watershed, as well as its tributary river basins and their watersheds and subwatersheds. Watershed fundamentals include understanding the inter-connections between local groundwater, streams, rivers, reservoirs and the Bay and watershed ecosystem restoration, maintaining public health, public infrastructure, promoting tourism, jobs, economic development and overall quality of life. We all must understand that "*The Bay Starts Here*," and "*Here*" is wherever you are, within the entire Bay watershed, so that local actions can be placed into both a local waterbody and a Bay restoration context.

2) Local Best Practices – Local officials need and want to know how other communities have successfully restored their own community's watersheds by creatively using planning and implementation tools and available funding to effectively communicate the importance of the action(s) being taken and obtain the public support needed to implement them.

Local best practices and the planning and policy tools that protect and restore local watersheds and waterbodies vary across the watershed's rural, urban and suburban landscapes. Local leaders and others have repeatedly emphasized that one size does not fit all. Local leaders are always looking for the "next best thing" for their constituents. Having a mechanism in place to compile a library of local best practices and allow the exchange of best practices in all of these areas, and networks where local leaders can reach out and discuss issues and solutions with their peers, is essential. The sharing of local best practices needs to include "how to" guidance in all forms, including in-person, so that local elected officials can tailor practices to the unique conditions of their own jurisdictions.

Environmental, economic and social benefits of healthy watersheds to the region and local community – value of ecosystem services.

Local leaders need to clearly understand what the Bay watershed is, where their community fits within it and why it is important for them to actively participate in the protection and restoration efforts. There are many good sources for this information, which is an important part of the background understanding that every local leader needs. The Bay Program web page provides a great starting point http://www.chesapeakebay.net/discover/baywatershed.

The local community, and its larger region, benefit from the ecosystem services that healthy and restored waterbodies, and the land that surrounds them, provide. For instance, local groundwater, streams, rivers and reservoirs are the source of drinking water for everyone. It is critical to convey the linkage between our actions, the quality of our local waters and the health of our local communities. The Chesapeake Bay Foundation has compiled information on the economic importance of the watershed and published a
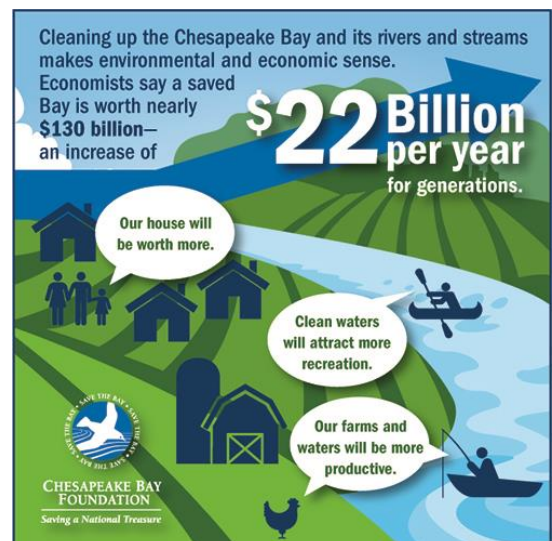
report on the value of the watershed's ecosystem services http://www.cbf.org/issues/what-we-have-to-lose/economic-importance-of-the-bay/index.html?referrer=https://www.google.com/

Drinking water treatment costs and public health hazards are reduced when the drinking water supply (groundwater or surface water) is protected through land conservation strategies. One study of 27 U.S. water supply systems found that protecting forested watersheds used for drinking water sources can reduce capital, operating and maintenance costs for drinking water treatment (Postel and Thompson, 2005). Based on this and similar studies, local officials can choose to incorporate watershed protection into their local economic development, land use planning, capital budget, and other routine decisions.

There are many on-line sources of information about drinking water protection. For example, the Centers for Disease Control provides a basic overview on public water supply protection and public health at: www.cdc.gov/healthywater/drinking-water-faq.html. EPA provides specific guidance to local officials on drinking water supply protection approaches and issues, including funding sources at: www.epa.gov/sourcewaterprotection/local-source-water-protection-planning

Agriculture is a major land use in the watershed, which also depends on an abundant, clean water supply for irrigation and animal health. Agricultural best management practices in the watershed not only preserve valuable soil and farmland, but also play a critical role in source water protection for everyone else as well. The agricultural economy is booming, but so is suburban development in many areas. At the borders between rural and developing areas there are tensions that must be managed and water supply is a key factor. For example, in the rapidly growing lower Susquehanna Watershed area, local governments are facing competing demands for land conservation and development that are threatening water supplies. **Participants from local governments at the Susquehanna River Basin Commission's Source Water Protection Partnership in a focus group meeting for this project reported that rapidly growing population and proper management of that growth is a major concern for the region.** Jobs, health and safety, water supply adequacy and quality are all top local priorities for the communities and elected officials whom these drinking water officials serve. Stormwater pollution, safe drinking water protection, toxic spill prevention/response, shortage of qualified water/ natural resource workers, creating green infrastructure jobs, are some of the priorities that they see as linked to the larger social - economic policy priorities. **These local officials strongly felt that better public education about all of these topics must be a priority.**

Healthy watersheds are also an economic asset. New businesses want to locate where their employees will enjoy a good quality of life and existing businesses can grow by attracting a new generation of employees that value quality of life and recreational opportunities. Examples abound of the economic value of local recreational opportunities and tourism focused on water features and outdoor recreation in restored stream valley parks, lakes, rivers and the Bay. From Otesego Lake at Cooperstown, NY in the headwaters, to Baltimore Maryland's Inner Harbor, the water -- be it a river, lake or bay -- is a central feature and attraction for the region.

What needs to be done? – legal and regulatory requirements, other necessary actions ("voluntary")

There are many legal and regulatory requirements related to these topics that must be addressed. In the broadest sense the different jurisdiction's regulatory requirements have the same goals, but they can differ considerably in the details. The specific regulatory requirements for the Bay Watershed Restoration and water quality protection are very comprehensive and complex, covering, sewage and industrial discharges, stormwater systems, industrial stormwater pollution prevention, confined animal feeding operations and other point sources and nutrient management on urban and suburban land, which can be a regulatory requirement or voluntary best management practice, depending on what jurisdiction you are located in. Regulatory requirements often work in conjunction with "voluntary" incentive-based best management practices for both urban and rural land areas. As noted by the York County Planning Commission staff in addressing the focus group questions presented to the Susquehanna River Basin Commission's Source Water Protection Partnership for this project: *"The regulatory agencies that have authority over the actions that cause and/or fix environmental issues do NOT have the big picture. Federal/State agencies at the top are not familiar with land use decisions/issues at the bottom. Likewise, the municipalities that have land use authority do not understand the picture at the national/state level." Presenting this "big picture" of how regulatory and voluntary actions must act together at all levels will be an important part of the General Watershed Fundamentals curriculum."*
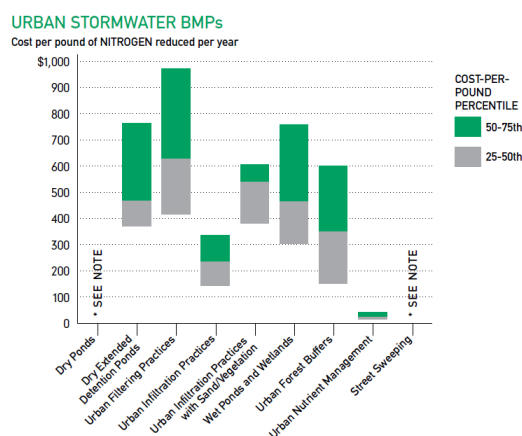
Cost and benefits of best management practices

Everyone wants to get the "biggest bang for the buck", but determining cost-effectiveness for best management practices for watershed restoration is complicated. Cost-effectiveness is highly variable, as can be seen in the figures at left from the document Nutrient Credit Trading for the Chesapeake Bay: An Economic Study Chesapeake Bay Commission May 2012 http://www.chesbay.us/Publications/nutrienttrading-2012.pdf

Benefits of practices are not just for a single nutrient either; they accrue to many different aspects of the economy, society and the environment. Practices that are effective for removing nitrogen from runoff may not be as effective for sediment and vice versa. For example, the figure at the bottom of this page shows the ancillary benefits of urban BMPs in terms of the estimated value of all pollutant removal services. EPA/ORD analysis, 2011 from Abt Associates Presentation http://slideplayer.com/slide/6411414/

Project- or practice-specific information is critical to provide local leaders with the information they need to demonstrate that they are good stewards of taxpayer funds. Resources to help local leaders find and implement the most cost-effective measures include: the webcasts and reports of the Center for Watershed Protection (www.cwp.org) and the Chesapeake Stormwater
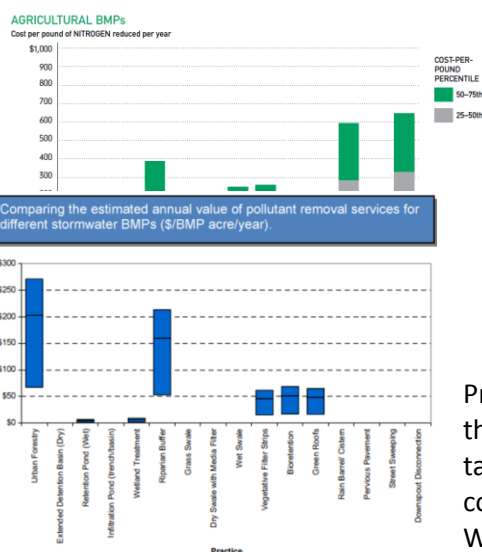
Network (www.chesapeakestormwater.net); the Green Values Stormwater Toolbox of the Center for Neighborhood Technology (www.cnt.org); and the University of Maryland Environmental Finance Center's MOST https://efc.umd.edu/mostcenter.html . These and similar organizations and web-based tools can provide the necessary technical support.

Funding and technical resources available to local governments

Grant and low interest "revolving loan funds" are available in all of the Bay Watershed jurisdictions from private and government sources. Both watershed-wide jurisdiction-specific information is available and must be included as part of the content. For example, Maryland's Water Quality Financing Administration publishes information about a wide range of grant and loan opportunities at http://mde.maryland.gov/programs/water/WQFA/Pages/index.aspx. The Chesapeake Stewardship Fund http://www.chesapeakebay.net/rfps is another example that is watershed-wide in scope. This type of content is critical for supporting local actions.

Abundant Life

Poor water quality and harvest pressure challenge the health of species across the region, while our increasing need for land and resources has fragmented and degraded the habitats they depend on. Supporting sustainable fish and shellfish populations and restoring habitat for native and migratory species will support a strong economy and a balanced ecosystem.

> **Sustainable Fisheries Goal:** *Protect, restore and enhance finfish, shellfish and other living resources, their habitats and ecological relationships to sustain all fisheries and provide for a balanced ecosystem in the watershed and Bay.*

> **Vital Habitats Goal:** *Restore, enhance and protect a network of land and water habitats to support fish and wildlife and to afford other public benefits, including water quality, recreational uses and scenic value across the watershed.*

The Sustainable Fisheries and Vital Habitat Goals and the management strategies developed to achieve them are designed to work closely together to provide a framework that is equally applicable to tidal and non-tidal portions of the watershed, from submerged aquatic vegetation and other tidal habitat that sustains tidal fisheries, to local wetland and riparian habitat that sustains recreational fisheries in our streams, rivers, lakes and reservoirs. The Sustainable Fisheries Goal will be achieved by meeting objectives ("outcomes") for Blue Crabs, Oysters, forage fish and fish habitat. The Vital Habitat goal will be achieved by meeting objectives for: wetlands, Black Ducks, stream health, Brook Trout, fish passage, submerged aquatic vegetation, forest riparian buffers and urban tree canopy.

As explained in the introduction to the Fish Habitat Management Strategy: *"Fish and shellfish in the Chesapeake Bay and its watershed rely on a variety of important habitats throughout the watershed. These habitats, which are key to sustaining fisheries, are being threatened by a suite of stressors such as increased urbanization, poor water quality and climate change. Successful fisheries management depends on knowing where these important habitats are and addressing the potential and realized threats to their integrity. This strategy targets habitats that are used by fish and shellfish species at critical points in their life history including spawning, nursery, and forage areas."*

The role for local leaders and linkages to local priorities

Local leaders play a key role in protecting vital habitats throughout the watershed. In tidal areas, they work together with state and federal fisheries managers, commercial and recreational fishermen toward better management of fisheries and protection of vital habitats like wetlands and submerged grass beds. But they also have a role throughout the watershed. For example, by engaging the community in tree plantings, water quality, habitat, and macroinvertebrate monitoring of streams and rivers and being able to articulate the community/watershed wide benefits of brook trout from a recreational and economic perspective local leaders can build local support for the restoration overall and for a key watershed species to achieve a Bay Agreement management objective.

Local governments, non-profits and watershed associations are also engaged in identifying potential dam removal projects (another Bay Agreement management objective), providing information on fish passage alternatives, and organizing community events related to the dam removal projects. Often, local habitat restoration efforts at the same time can solve other priority problems. For example, Baltimore City is restoring infrastructure and streams with the same projects wherever possible http://publicworks.baltimorecity.gov/pw-bureaus/water-wastewater/surface/restoration.

Chesapeake Bay seafood is critical to the region's culture, tourism, quality of life. At the same time, recreational fishing, canoeing, kayaking, river rafting and associated tourism resources are important to residents and outdoor recreational enthusiasts throughout the watershed and require the same vital habitat protections that also support a healthy Bay. The importance of recreational opportunities for tourism and attracting businesses and people that make up the workforce local governments are seeking to attract cannot be understated. For example, according to the Susquehanna Greenway *"the Susquehanna River meanders 444 miles from its origin at Otsego lake near Cooperstown, New York until it empties into the Chesapeake Bay at Havre de Grace, Maryland. Additionally, the West Branch of the Susquehanna River starts as a narrow stream in the Allegheny Mountains, and journeys 228 miles through dense forests, rolling farmland, and historic towns to its confluence with the North Branch in Northumberland. The Susquehanna River Water Trails are boat routes suitable for canoes, kayaks, and small motorized watercraft. They contain access points, boat launches, day use sites, and/or overnight camping sites for the boating public."* http://www.susquehannagreenway.org/water-trails Tens of thousands of Pennsylvanians and tourists enjoy the Susquehanna and its tributaries year-round.

Local leaders from government, the agricultural and non-profit communities all have a critical role in providing incentives for land owners to establish stream buffers and restore urban tree canopy. As noted in the management strategy for Urban Tree Canopy *"objectives will only be achieved through the efforts of local governments and their urban forestry partners working to plant, protect, and maintain the community's tree canopy. Local governments play a primary role in achieving UTC goals by establishing and enforcing supportive policies and ordinances, providing funding and staffing, building partnerships with non-profit and private entities, and tracking progress in meeting goals. Nongovernmental urban forestry partners, watershed groups, and other conservation organizations often provide critical support to local governments in planting and maintaining trees, engaging volunteers, and building public support. Because community governance varies significantly across the*

watershed in structure, policy, and capacity, the Strategy recognizes that flexible, locally adapted approaches are needed to support UTC goals."

Wetlands and waterways restoration and enhancement not only improves habitat and downstream water quality, these actions also reduce flooding and increase local resiliency to the increasing frequency of more intense storm events. The Susquehanna River as it flows through New York, Pennsylvania and Maryland *"Since record-keeping began 200 years ago … has proven one of the most flood-prone watersheds in the nation. "Tropical storm Agnes in 1972 caused the worst recorded flooding* in the basin. Seventy-two people died and damage topped $2.8 billion – about $14.3 billion in today's *dollars. Flood levels exceeded the record levels of the 1936 flood by as much as six feet in some places. It was the nation's most costly natural disaster until Hurricane Andrew hit in 1992 and Hurricane Katrina in 2004. "Of the 1,400 communities in the river basin, 1,160 have residents who live in flood-prone areas. For these residents, flood warning and flood management and protection are of utmost concern."* http://www.susquehannafloodforecasting.org/flood-history.html.

Restoring health to local rivers and streams not only benefits the fish, wildlife and people using them and living nearby, but also is a necessary step toward meeting water quality standards in the Chesapeake Bay. Stressors degrading streams that originate from watershed land use, stormwater runoff and leaky public and private wastewater infrastructure are very challenging to address because of the scale of the problem, cost of remediation, difficulty of acquiring space for remediation projects, and other challenges. Stormwater control (MS4 permits) and stream restoration must go together to successfully improve water quality and stream habitat. Streambank erosion by stormwater is a major source of pollution to rivers, reservoirs and the Bay. Wetland and stream protection and restoration not only reduce pollution, but also reduce the intensity and frequency of flooding that endangers downstream life and property by serving as filters and retention areas for floodwaters.

Local officials' decisions about land use will also impact the availability of habitat and food sources for wildlife, like migratory and nesting black ducks, a key indicator species for ecosystem health. The Bay Program's management strategy for black ducks recommends that local governments, watershed associations, nonprofits or anyone working in the watershed should be aware of encroaching land use and where potential development intersects with known migration pathways or priority wintering or breeding habitat for black ducks and other species so they can incorporate this knowledge into landscape-scale planning efforts to increase conservation prospects for those landscapes.

The Healthy Watershed Management Strategy notes that *"while state, federal, and regional partners can provide important support for healthy watersheds protection, local governments, watershed associations, nonprofits, and private sector entities also play key roles. Private land trusts, nature preserves, conservation organizations, and other non-governmental entities can often move quickly to protect targeted and available lands through direct purchase or acquisition of easements, development rights, or other means. These organizations often partner with local, state, and federal agencies, and typically provide a sustained level of real-world focus for localized efforts to protect healthy waters and watersheds. Local governments also have the ability to protect sources of drinking water and preserve*

lands valued highly by the public as nature preserves, parks, greenways, recreational areas, and wildlife habitat."

Technical and Funding Resources

There are numerous sources of technical information and funding to support these efforts and most can be easily found on the web. The Heathy Watersheds Management Strategy notes that "l*ocal tools for healthy watershed protection include planning (comprehensive, park and recreation, transportation, economic development, water resources, etc.); official maps; land use regulations including sub-division and land development and zoning; land and easement purchases; post construction stormwater management and mitigation requirements; and a variety of other tools".*

The National Fish and Wildlife Federation *"provides funding on a competitive basis to projects that sustain, restore, and enhance fish, wildlife, and plants and their habitats".* http://www.nfwf.org/whatwedo/grants/Pages/home.aspx Maryland's Watershed Assistance Collaborative provides technical and funding resources to local governments in Maryland http://dnr.maryland.gov/ccs/Pages/healthy_waters/wac.aspx. In New York, *"the Upper Susquehanna Coalition is a network of 16 Soil and Water Conservation Districts in New York and 3 Conservation Districts in Pennsylvania. Our mission is to protect and improve water quality and natural resources in the Upper Susquehanna River Basin with the involvement of citizens and agencies through education, partnerships, planning, implementation and advocating for our water resources."* http://www.u-s-c.org/html/index.htm

State and federal agencies have a critical role in providing support for local governments, as noted in the wetlands management strategy: *"as part of two EPA State Wetland Program Development grants, MDE completed projects to prioritize areas for wetland restoration, preservation and mitigation in Maryland's Coastal Bays in 2004 and throughout Maryland in 2006. The resulting documents, sorted by county and watershed, characterize the aquatic resources in each watershed and identify the highest-priority areas for protection and restoration. These documents also identify and summarize pertinent existing documents and resources, including local watershed plans, Watershed Restoration Action Strategies, Maryland Biological Stream Surveys (MBSS), Stream Corridor Assessments, state plans, local water-quality monitoring reports, 303(d) lists, 305(b) reports, and Total Maximum Daily Load calculations. Based on this information, Geographic Information System (GIS) and desktop data were used to identify desirable and undesirable locations for wetland restoration, preservation and mitigation."* (http://www.mde.state.md.us/programs/Water/WetlandsandWaterways/AboutWetlands/Pages/Programs/WaterPrograms/Wetlands_Waterways/about_wetlands/prioritizingareas.aspx)

The wetland management strategy also highlights useful management tools available to local leaders and others. *"The Watershed Resources Registry (WRR) is a GIS-based watershed planning tool developed through several years of extensive coordination between the Technical Advisory Committee (TAC) that included numerous federal, state, local, and nongovernmental organizations, such as MDE, USACE, USFWS, EPA, MD DNR, Maryland Environmental Services and Maryland State Highway Administration. This GIS-based tool provides a watershed-based planning framework for aquatic*

resources throughout Maryland. The WRR includes the most-pertinent conservation models available in the state, which will be maintained and revised periodically, as new and updated data is acquired. These GIS layers were carefully selected by the TAC to represent the most important resources to protect and restore throughout the State. This initiative is now expanding to other states."
(http://watershedresourcesregistry.com)

Examples of Urban Tree Canopy and Urban Forestry valuation and planning tools available on the web include: i-Tree, a peer-reviewed *"software suite from USDA Forest Service that provides urban and rural forestry analysis and benefits assessment tools."* www.itreetools.org. A 2016 guide from USDA enables local officials to create and successfully implement a sustainable urban forestry plan: www.itreetools.org/resources/content/Sustainable_Urban_Forest_Guide_14Nov2016.pdf

For local leaders, University Extension Services can also be a key source of technical support. For example, technical support for improving forests http://extension.psu.edu/natural-resources/forests/courses and information about finance opportunities http://extension.psu.edu/natural-resources/forests/finance can be easily found on the Penn State Extension web pages. University of Maryland similarly offers many different programs that provide resources to assist local leaders https://extension.umd.edu/programs.

Local Best Practices

Local leaders we have met with throughout the course of this project have themselves or are familiar with others who have accomplished successful habitat restoration. They are most interested in how other local leaders met with success, or not, and what lessons have been learned. Participants in the focus group organized for us by the Metropolitan Washington Council of Governments spoke about successful efforts on the Anacostia in DC and Maryland and Four Mile Run in Arlington, Virginia. They all noted that restoration is expensive and takes a long time and were interested in hearing about other successful efforts from around the Bay watershed where they could find ideas to improve their future efforts.

York County Planning Commission members and staff participating in one of the focus group discussions for this project held in conjunction with the Susquehanna River Basin Commission Drinking Water Source Protection Partnership reported that *"grants to implement such projects are very competitive and limited. Many York County municipalities do incorporate a variety of environmental protection provisions into their stormwater management, subdivision/land development, and/or zoning ordinances. These provisions help to address clean water, habitat, and open spaced/recreation issues without cost to municipalities. The County has created a Land Protection Committee to look at ways to provide additional funding for conservation easements and create a grant program for municipalities to implement land protection measures."*

The Bay Program GITs and Workgroups working on the Watershed Agreement implementation must make a concerted effort to compile as many examples of local best practices as possible to encourage local leaders to act on the restoration.

Clean Water

Excess nutrients, sediment and toxic contaminants degrade our waterways, harm fish and wildlife and pose risks to human health. Reducing these pollutants is critical to creating safe, healthy waters for animals and people alike.

Water Quality Goal: *Reduce pollutants to achieve the water quality necessary to support the aquatic living resources of the Bay and its tributaries and protect human health.*

Toxic Contaminants Goal: *Ensure that the Bay and its rivers are free of effects of toxic contaminants on living resources and human health.*

Healthy Watersheds Goal: *Sustain state-identified healthy waters and watersheds, recognized for their high quality and/or high ecological value.*

The Water Quality Goal will be achieved by meeting objectives ("outcomes") for the Watershed Implementation Plans (WIPs) developed by the jurisdictions to meet the requirements of the TMDL and by monitoring for water quality standards attainment. The Toxics Contaminants Goal will be achieved by meeting objectives for toxic contaminant research, policy development and pollution prevention and the Healthy Watersheds Goal will be achieved by preventing further degradation of all watersheds.

These goals and the management strategies developed to implement them work together to provide a comprehensive approach to restoring polluted waters throughout the watershed and ensuring that healthy waters stay that way (since protection is much less expensive than restoration). The Bay Watershed total maximum daily load (TMDL) and individual watershed and jurisdiction-specific Watershed Implementation Plan (WIP) requirements for each sector (wastewater, agriculture, etc.) are known, at least at a general level, by local leaders, farmers, and many private citizens throughout the watershed. Most are supportive of the concepts and recognize the need for action and much progress has been made, but many believe that others are not doing enough and must do more and the high cost of pollution control gets in the way of their own further action.

The role for local leaders and linkages to local priorities

The economic, public health and social benefits of protecting and restoring our groundwater, streams, rivers, reservoirs and the Bay are widely recognized to be of critical important both regionally and locally for drinking water, recreation, wildlife habitat, flood mitigation, resiliency to invasive species and climate change adaptation. Participants in focus group discussions as part of this project highlighted these as some of the most critical issues for many localities currently.

Drinking water protection is a critical issue of local interest and most of the focus group participants for this project recognize that the same measures that are being taken to protect and restore the Bay watershed are providing the same benefits locally. The Lower Susquehanna Region has over 500 community water systems serving over 1.7 million residents. Another 2.2 million people living in the Baltimore, MD and Philadelphia, PA areas rely upon the Susquehanna as a source of drinking water as well. The importance of this is reflected by the representatives from 45 different local organizations participate in the Lower Susquehanna River Source Water Partnership, facilitated by the Susquehanna

River Basin Commission. Participants in the focus group discussion highlighted preventing the loss of forest and wetlands to development as a major risk factor to water supplies. They also noted that many people don't recognize the connection between their actions and their drinking water and were unified in their recommendation that **"better public education about all of these topics must be a priority"**. One member of the Interstate Commission on the Potomac River Basin Source Water Partnership focus group for this project commented on the challenge of enabling local elected officials to become pro-active and getting ahead of the curve and put policies, funding, and programs into place, to protect drinking water supplies and prevent spills and other contamination crises, **"Elected officials don't often discuss drinking water until there is a problem".**

The risks that polluted water poses to public health in general is another area of local concern. "People eating contaminated fish and shellfish is a problem that connects to public health and safety issues – there is also the problem of bacterial infections from water contact." (Maryland Association of Counties focus group participant). A participant from the Metropolitan Washington Council of Governments focus group noted that "Environmental justice needs to be considered. Fish and wildlife and other issues [are] connected to less-privileged communities." The Waterfront Partnership of Baltimore http://baltimorewaterfront.com/, an organization of waterfront businesses, has developed the Healthy Harbor Initiative that "works to restore and protect our City's most valuable asset—the Baltimore Harbor. … to engage people to the waterfront, create Harbor stewards and have a swimmable and fishable Inner Harbor." There is a strong and growing understanding of the connection between the watersheds and the health of the Harbor, leading to strong support for Baltimore City's efforts to control sewage spills and stormwater pollution.

The Management Strategy for Toxic Contaminant Research also foresees a role for local governments: *"Most of the actions to plan and complete the actual research are expected to be the responsibility of federal, state and academic entities. Local governments and NGOs have been helpful in identifying priorities within the research strategy, including NGOs from Baltimore Harbor, the Elizabeth River, and the Anacostia River. Increasing the awareness of the impacts of toxic contaminants, especially safe consumption of fish and shellfish, will be carried out with local governments and organizations and will be targeted towards areas with diverse and underrepresented populations in the bay watershed."*

Implementation of the pollution control measures for sewage treatment plants and stormwater systems is a major local responsibility of critical benefit to local streams, rivers, reservoirs and the Bay. The Bay Watershed will not be restored without local action in these areas; and a great deal of local action has already occurred. Maryland, Virginia, Pennsylvania and other jurisdiction's local governments are directly responsible for meeting sewage treatment and stormwater permit requirements and have spent billions of dollars collectively so far, but in the face of continued population growth and development, they are struggling to do all that is required to meet water quality standards established under the authority and mandate of the federal Clean Water Act.

Because of the complexity and rapidly evolving nature of permit requirements and the fact that each jurisdiction has a different approach to meeting the federal requirements, there is a great deal of confusion and uncertainty about next steps. All of the focus group participants for this project

expressed the belief that a majority of their citizens support the restoration and desire to take the appropriate action, but are struggling to understand the requirements being placed on each sector (e.g. urban, suburban, agriculture, etc.) and how to pay for them. Universally it was agreed that there is a need for the State and federal agencies to continue to reach out to local governments. This will need to be a key part of the content that is conveyed to local leaders and all of the project focus group participants agreed that each jurisdiction is somewhat different and states need to, and in most cases, are taking a lead role in working directly with local governments to help them understand and implement the restoration requirements.

Technical and Funding Resources

Local leaders are in need of both technical resources and funding to carry out their water quality and watershed restoration responsibilities. The Management Strategies for the WIP and Water Quality Standards Attainment & Monitoring Outcomes highlight this fact and suggest sources for essential information and technical materials being developed by the Bay Program. *"Much of the implementation of the pollution reduction practices, as articulated in the Bay TMDL and the WIPs, will be carried out at the local level. This includes municipalities, counties, soil and water conservation districts and local private sector groups and individuals. Therefore, management approaches should be designed to include timely dialogue with the responsible local agencies and other partners, taking into consideration funding and technical support required by these local partners. The CBP partnership is currently exploring how to express programmatic and implementation goals at the local level in the Phase 6 modeling tools (including CAST/MAST/VAST/BayFAST) as part of the midpoint assessment."*

The Management Strategy also suggests that: "*State and local jurisdictions could target the implementation of actions that not only result in water quality benefits, but address other impairments (e.g. bacteria or toxic contaminants), environmental problems (e.g. threatened or endangered species), safety concerns (e.g. flooding, infrastructure) and 2014 Agreement Outcomes (e.g. wetlands, forest buffers) as well. The CBP partnership is currently exploring the development of an optimization tool for TMDL implementation purposes, but this tool could potentially capture a broader range of ecosystem benefits beyond water quality to help inform decision making in our restoration efforts."*

Interjurisdictional information exchange and technical training for stormwater and flooding control, MS4 permits, etc. are held by all types of jurisdictional, regional and topic-specific groups. For example, the Maryland Association of Counties (MACO), Virginia Association of Counties (VACO) and the Maryland Municipal League (MML) provide this kind of information regularly to their respective local governments at workshops and semi-annual conferences, bringing in experts from State and federal agencies and the private sector. Regional watershed and issue specific groups also are very active. Focus groups were assembled for this project by the Interstate Commission on the Potomac River Basin (ICPRB) and Susquehanna River Basin Commission (SRBC) Drinking water Source Protection Partnership involving local government water utilities and others, and the Metropolitan Washington Council of Governments, a regional group that brings together local officials from DC, Maryland and Virginia. These groups meet regularly to bring local government officials together with State agency and other experts to share best

practices and lessons learned so local official can learn from each other and get their questions answered.

Subject matter experts are also active in bringing their expertise to local leaders. To enhance the capacity of local governments, organizations and landowners to implement beneficial stream restoration and maintenance practices, the Center for Watershed Protection brings watershed restoration expertise from throughout the nation to local governments and others through documentation, training materials and webinars http://www.cwp.org/.   To support better local land use planning, Smart Growth America *"work(s) with local elected leaders to improve public policy and help their municipalities be more attractive, competitive, vibrant, and prosperous—no matter if it's a big urban city or small rural town"* https://smartgrowthamerica.org/our-vision/our-work/. These organizations and many others are working to support local leaders in the Bay watershed and elsewhere.

The American Planning Association On-Demand webinar series *"Water and Growth: Planning as if Water Matters"* www.planning.org/events/course/9103465 provides guidance and valuable case studies for local drinking water source protection. The American Planning Association Growing Smart Legislative guidebook (free, online version) also provides useful information (see chapters 7 - 10 for the local land use/ smart growth planning guidance) www.planning.org/growingsmart/guidebook.

The Trust for Public Land has enabled many local governments nationwide to establish local land conservation funds in order to create and expand local parklands and watershed protection areas. The www.TPL.org website includes access to information and resources on how to do local conservation funding ballot measures; review land conservation funding data and trends at all government levels; and to review the National Conservation Easement Database: www.TPL.org/how-we-work/conservation-tools.

Participants in all of the focus groups also highlighted their concerns about economic factors. The Metropolitan Washing Council of Governments focus group hit this topic hard: "*The economy and affordability of environmental protection are key concerns in all jurisdictions. The public is feeling maxed-out on "taxes", which also includes fees for water, sewer and stormwater. "In DC, the long-term control plan (for controlling combined sewer overflows) calls for a $42 connection fee and for many citizens the money is a major issue. "In Arlington, which is an older established community, stormwater requirements for homeowners are expensive and there is political push back. People are committed to the environment and want to do the right thing and be sustainable, but they can't sustain the bill. Lack of land for parks and open space is also a concern, but there is a shortage of suitable land in heavily developed parts of the jurisdictions."*   A local official participating in the MACO focus group said: *"For all of our small communities in our disparate counties, they need additional funding from the state to balance low tax revenue. We can't always get the resources needed for wastewater treatment plant upgrades, so we need an adjustment to the Bay Restoration Fund to offset these issues."*

Content is already being developed by the Bay Program Partners to address the funding opportunities and economic benefits of restoration. The CPB sponsored the Chesapeake Bay Environmental Finance

Symposium in August 2016, facilitated by the Environmental Finance Center at the University of Maryland and the "*Recommendations and Final Report"* are available at: http://www.chesapeakebay.net/channel_files/25014/appendix_3_-_finance_symposium_final_report.pdf. Each of the jurisdictions also has funding resources available and the CBP and the jurisdictions have established the *"Environmental Finance Symposium Report Action Team"* to act on the recommendations http://www.chesapeakebay.net/calendar/event/25014/.

The EPA has established a national network of 10 centers to provide *"financing information to help local decision makers make informed decisions for drinking water, wastewater, and stormwater infrastructure to protect human health and the environment."* that can provide information on approaches being taken in other regions of the US. https://www.epa.gov/waterfinancecenter/efcn . The University of Maryland Environmental Finance Center is one of these, focusing on watershed restoration technical support. The Municipal Online Stormwater Training (MOST) Center *"will help communities bridge the gap in needed technical and financial resources through a comprehensive training program to help municipalities within the Chesapeake Bay Watershed access and implement innovative stormwater management techniques to improve water quality in the Bay. This will be accomplished through an innovative web based training program that will allow elected officials, program managers, procurement and financial officials, stormwater management staff, and other stakeholders to gain the necessary skill sets and information that can be used to create and enhance effective programs."*

Local Best Practices

In terms of the best types of support, participants in the COG focus group felt strongly that local groups like COG promote information sharing between regional jurisdictions. *"It is most effective to hear directly from peers and local groups like COG where a level of trust has been developed. Need to show people – one on one. Also, civic association presentations and other, more personal interactions are needed. Developers and homeowners needs must be met to encourage implementation."* Many of the larger jurisdictions, such as those in the COG region have been working on stormwater and watershed restoration for years and have a lot of "war stories" that provide valuable lessons learned for themselves and other jurisdictions as they continue to refine and develop their programs.

The Potomac River Basin focus group meeting held in Shepherdstown, WV, participants identified the best information-distribution modes to be "*peer-to-peer, small-site-scale, and field trips and field days, are the best educational /information transmission modes that several members said they have used; they noted that these modes are the most effective both for landowners, and for local officials including elected officials."*

Local leaders are interested in technical and funding assistance workshops for specific regulatory requirements (wastewater, pollution prevention plans, erosion and sediment control, stormwater, etc.), with training conducted by their State environmental agencies and other experts. Representatives of these groups are also members of the Local Leadership Work Group of the Bay Program and assisted with this project and assembling focus group participants. For example, the Virginia Association of Counties, the Maryland Association of Counties and the Maryland Municipal League have numerous

existing forums that would enable the Bay Program to reach local leaders through regular forums and conferences, rather than calling special events.

Climate Change

Storms, floods and sea level rise will have big impacts across the watershed. Monitoring, assessing and adapting to these changing environmental conditions will help our living resources, habitats, public infrastructure and communities withstand the adverse effects of climate change.

> **Climate Resiliency Goal:** *Increase the resiliency of the Chesapeake Bay watershed, including its living resources, habitats, public infrastructure and communities, to withstand adverse impacts from changing environmental and climate conditions.*

All aspects of life in the Chesapeake Bay watershed—from living resources to public health, from habitat to infrastructure—are at risk from the effects of a changing climate. Warming temperatures, rising sea levels and more extreme weather events are already occurring in the region, resulting in coastal flooding, eroding shorelines, increased flooding and changes in the abundance and migration patterns of wildlife. This goal includes management objectives ("outcomes") for **Monitoring and Assessment and Adaptation**. As noted in the management strategy for climate resiliency: "*Local governments should be prepared for a range of possible future conditions with respect to climate change impacts to better anticipate, prepare, recover, and adapt to them over time. Local governments can serve as partners with state and federal regulators and funders in identifying and undertaking implementation opportunities. Local governments, school districts and other public institutions can provide locations for pilot projects that support the monitoring and assessment objectives and can serve as a venue for showcasing successful projects throughout the watershed.*"

The role for local leaders and linkages to local priorities

Maryland has prepared a very comprehensive guide for adapting to the effects of climate change, including important guidance for local leaders, titled: *Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change Phase I: Sea-level rise and coastal storms:* http://climatechange.maryland.gov/wp-content/uploads/sites/16/2014/12/ian_report_1971.pdf

and Phase II: Building societal, economic, and ecological resilience: http://climatechange.maryland.gov/wp-content/uploads/sites/16/2014/12/ian_report_2991.pdf

The Phase I report is primarily directed toward coastal communities and deals with important considerations that directly affect local priorities including: protection of existing infrastructure and buildings that are vulnerable to flooding; controlling future growth and development in vulnerable areas to avoid the financial risk of development and redevelopment in hazardous coastal areas; enhancing preparedness and planning efforts to protect human health, safety and welfare during flooding events; and protecting and restoring shoreline resources, including tidal wetlands and marshes, vegetated buffers, and Bay Islands.

The Phase II report covers a much broader area of climate change impact and adaptation, addressing topics of concern throughout the watershed, including: human health, agriculture, forest and terrestrial ecosystems, Bay and aquatic ecosystems, water resources and infrastructure. Local health departments are dealing with more heat emergency days that can kill elderly and other vulnerable citizens; warmer winters result in survival of tics and other insects that can be disease vectors; warmer water temperatures also can promote water-borne infections ranging from fatal (Vibrio) to nuisance (rash from harmful algal blooms). Local emergency management response plans need to be updated to account for the new reality.

Many communities are concerned about the adequacy of their water supplies, or if they are not they should be. Warming temperatures and shifting rainfall patterns result in dryer summers, increasing demand for agricultural irrigation and dropping water tables that can impact both public and private drinking water wells. Local leaders need to plan for additional sources of water supply and enhance water conservation efforts to ensure their citizens continue to have adequate supplies to meet demand during dry summers.

On the other end of the spectrum, more intense storm events are resulting in increased flooding and destruction of wastewater and stormwater infrastructure. Local leaders need to be planning for bigger floods in the design of infrastructure. Communities need to update their flood maps and building ordinances to ensure property is protected and can qualify for flood insurance.

Of course this is not just an issue for Maryland. Norfolk and Hampton Roads, Virginia are the focus of a similar planning effort, the Hampton Roads Climate Change Adaptation Project http://www.adaptationclearinghouse.org/resources/hampton-roads-climate-change-adaptation-project.html.

Further up in the watershed, flooding is the primary issue of concern. The Pennsylvania Climate Impacts Assessment Update, May 2015, reports that *"The risk of injury and death from extreme weather events could increase as a consequence of climate change. There is a consensus in the literature that climate change will not necessarily increase the number of tropical cyclones, but that it will increase the probability that individual storms will be stronger and with heavier rainfall. Non-tropical extreme rainfall events are expected to increase as a consequence of climate change. **_The most important adaptation strategies to reduce injury and death from increased extreme weather due to climate change are to build homes and infrastructure in ways to minimize the risk to them from flooding, and to invest in storm forecasting and notification systems._**"*

The Pennsylvania report goes on to identify climate change effects on water quality *"affecting health through drinking water and through contact during outdoor recreation. The two primary mechanisms through which climate change could affect surface water quality are 1) increased pathogen loads due to increased surface runoff from livestock farms, sewer overflows, and resuspension of pathogens in river sediments during heavy rainstorms, and 2) increased risk of harmful algal blooms in eutrophic lakes and reservoirs. As with air quality, human health impacts from compromised water quality are due to the combination of pollutant emissions and weather. **_The most important adaptation strategy to reduce_**

__human health impacts from water quality changes due to climate change is to reduce nutrient and pathogen loadings to rivers and streams.__ http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-108470/2700-BK-DEP4494.pdf

Technical and Funding Resources

A NOAA-sponsored website "**Digital Coast**" is *"focused on helping communities address coastal issues and has become one of the most-used resources in the coastal management community."* https://coast.noaa.gov/digitalcoast/training/climate-adaptation.html Maryland's Department of Natural Resources also offers technical support and some funding for coastal protection efforts http://dnr2.maryland.gov/ccs/Pages/funding/czma.aspx . Technical assistance for creation of "living shorelines", which are more resilient to flooding than traditional shoreline protection measures, is available in Virginia http://ccrm.vims.edu/livingshorelines/, Maryland http://dnr2.maryland.gov/ccs/Pages/livingshorelines.aspx and Delaware http://www.dnrec.delaware.gov/Admin/DelawareWetlands/Pages/LivingShoreline.aspx

Further upstream, and throughout the watershed, the Federal Emergency Management Agency (FEMA) National Flood Insurance Program *"aims to reduce the impact of flooding on private and public structures … by providing affordable insurance to property owners and by encouraging communities to adopt and enforce floodplain management regulations. These efforts help mitigate the effects of flooding on new and improved structures. Overall, the program reduces the socio-economic impact of disasters by promoting the purchase and retention of general risk insurance, but also of flood insurance, specifically."* https://www.fema.gov/national-flood-insurance-program Technical information and training for local governments regarding flood plain and flood zone ordinance improvements needed to lower insurance rates is available from most states, many counties and FEMA.

As far as funding goes, most of the same funding resources discussed in earlier sections can be applied to climate adaptation projects. In fact rating and ranking systems for determining project priority for the State Revolving Loan Fund and other state and federal funding programs already recognize climate adaptation as an eligible activity and encourage those types of projects.

Local Best Practices

As discussed in previous sections, local best practices for climate change adaptation provide opportunities to learn from local governments that are taking steps to adapt to climate change impacts – coastal flooding, shore erosion, more intense storm events and stream/river flooding. It is important for the Bay Program Partners to compile, and then share, information on actions other states or local governments are taking – success stories that provide opportunities to learn from local governments that are taking steps to adapt to climate change impacts – coastal flooding, shore erosion, more intense storm events and stream/river flooding. Local officials need both to make contact with peers and have access scientists and technical experts. The Bay Program could take its que from the California Institute for Local Governments and prepare *"Climate adaptation plans, examples and case studies"* to prove a training resources for the Chesapeake's local governments http://www.ca-ilg.org/adapting-climate-change.

Conserved Lands

Changes in land use and development can impair water quality, degrade habitats and alter culturally significant landscapes. Conserving lands with ecological, historical and community value is integral to maintaining a healthy ecosystem and vibrant culture.

> **Land Conservation Goal:** *Conserve landscapes treasured by citizens in order to maintain water quality and habitat; sustain working forests, farms and maritime communities; and conserve lands of cultural, indigenous and community value.*

To meet this goal, the Watershed Agreement includes specific objectives ("outcomes") for Protected Lands, Land Use Methods and Metrics Development and Options Evaluation **that all require significant local government and local leader engagement: "*with the direct involvement of local governments or their representatives*,** *evaluate policy options, incentives and planning tools that could assist them in continually improving their capacity to the reduce the rate of conversion of agricultural lands, forests and wetlands as well as the rate of changing landscapes from more natural lands that soak up pollutants to those that are paved over, hardscaped or otherwise impervious"*.

As noted in the management strategies for this Watershed Agreement Goal, is essential that local governments participate in achieving objectives for **Protected Lands --** *"On-the-ground efforts of local governments and local land trusts are vital to achieving the Protected Lands outcome. Local governance varies significantly across the watershed in structure, policy, and capacity, and this Strategy recognizes that flexible, locally adapted approaches are needed to achieve the two million acre goal.* ***Following sections of this Strategy identify key needs and management strategies related to local engagement, which will be detailed more fully when the Biennial Workplan is developed.*** *These efforts will be closely coordinated with the Local Government Advisory Committee, the Diversity Action Team, and local organizations engaged in the Chesapeake Conservation Partnership.";*

Land Use Methods and Metrics Development – "*the Land Use Workgroup will work with the Local Government Advisory Committee (LGAC) to identify local governments interested in participating in quantifying the impacts of land use change on communities and the environment.* ***Local government stakeholders are needed to advise the Chesapeake Bay Program on the development of the methodology and local level metrics, and in quantifying potential impacts***"); and*

Land Use Options Evaluation – *"Local governments (including regional councils of governments) and nongovernmental organizations also will have a significant role. …****Local government's specific role in achieving this outcome is to assist the Bay Program with evaluating policy options, incentives and planning tools.*** *While not called for specifically, local government should be consulted in developing strategies to support efforts to reduce the rate of conversion. In addition, the advice, guidance and direct assistance of LGAC will be needed throughout the process of implementing this management strategy."*

The role for local leaders and linkages to local priorities

Land use planning and regulation is one of the most significant roles for local governments all across the US. Comprehensive planning – water resources, transportation, parks and recreation, economic

development – and land use regulations – sub-division, zoning, land development, land preservation, easements – are all local actions that have and will continue to have a profound impact on watershed restoration and protection efforts. Local leaders participating in all of the focus groups for this project acknowledge that they need and want education on the value and location of high-functioning landscapes, methods for preventing the loss of forest and wetlands to development and the role of local land use planning and zoning to protect the community characteristics citizens value.

Achieving and maintaining healthy watersheds is not possible without comprehensive planning -- water resources, transportation, parks and recreation, economic development -- are all part of local leaders' responsibilities and intersect with all of the local priorities discussed in our focus groups. Land use regulations – sub-division, zoning, land development, water and sewer plan implementation (sewer systems v. septic systems for large subdivisions), land preservation, easements all must work together to achieve multiple local objectives in addition to protecting and restoring watersheds. Local leaders that we have interacted with in this project are all certainly well aware of this, but are in need of technical assistance, training for staff and funding for implementation.

Land use planning is not just and urban/suburban issue. Local leaders have a major role in agricultural preservation, which is increasingly important and difficult as development pressure increases. Focus group participants from Pennsylvania's lower Susquehanna Watershed certainly recognize the importance of agricultural preservation and the opportunities provided by stream buffers and other best management practices to restore watersheds and protect drinking water sources. On Maryland's Eastern Shore, similar comments including the following from a focus group participant at MACO: *"Coming from a farm background, seeing hedgerows on small farms go out, and bigger equipment come in, farm preservation is a priority. The State has a role in funding farmland preservation. Instead of a farmer getting a windfall when the state buys the whole farm, the state should purchase only the sensitive areas of a farm, such as ravines and riparian zones. This may be a better use of funds, when paying a premium for these lands. This is farmland preservation with a strategic focus on the most sensitive areas, using GIS -- "precision conservation".*

Technical and Funding Resources

There are many sources of technical information from EPA web pages to assist local government with implementation of better land use planning. The document *"This is Smart Growth"* is an example that provides a comprehensive overview of how land use planning can meet multiple community priorities and still preserve open space, farmland, natural beauty and critical environmental areas. https://www.epa.gov/sites/production/files/2014-04/documents/this-is-smart-growth.pdf Many case studies are also available to provide specific examples of what has worked for other local governments in "*Getting to Smart Growth: 100 Policies for Implementation"* and *"Getting to Smart Growth II: 100 More Policies for Implementation"* https://www.epa.gov/smartgrowth/getting-smart-growth-100-policies-implementation.

Valuable guidance on establishment of Riparian Forest Buffers is available from Penn State Extension - Urban and Community Forestry services and programs at: www.extension.psu.edu/natural-

resources/forests/urban-community. The Chesapeake Conservancy also has resources and tools available for riparian forest buffer analysis and conservation at: www.chesapeakeconservancy.org/conservation-innovation-center/analysis-planning.

One of the best sources of technical and funding resources for local governments in the Bay Watershed are the Bay Watershed jurisdictions and members of *"the Chesapeake Conservation Partnership, a regional coalition of over 50 diverse organizations throughout the watershed"* that developed the Protected Lands Outcome Management Strategy for the Bay Watershed Agreement. As noted in the strategy, these experts will work with the Local Government Advisory Committee and the Local Leadership Workgroup to ensure that the best possible information is developed and presented in a form that is most useful to local leaders.

Local Best Practices

There are also many sources of information regarding best practices. A few examples follow, but again, the best sources of this information are the organizations that are already working on this part of Watershed Agreement management strategies and must continue to work closely with the other groups in the Bay Program that are focused on improving the engagement of local leaders.

"The National Award for Smart Growth Achievement recognizes exemplary smart growth projects across the country. Many of the winning projects used various strategies, including compact development, green building, and green infrastructure, to reduce stormwater runoff, improve water quality, and use water more efficiently." https://www.epa.gov/smartgrowth/smart-growth-and-water#awards

"City Green: Innovative Green Infrastructure Solutions for Downtowns and Infill Locations (2016) is for local governments, private developers, and other stakeholders who help shape redevelopment projects in downtowns and infill locations where development has already occurred. It provides inspiration and helps identify successful strategies and lessons learned for overcoming common barriers to using green infrastructure in these contexts. The examples could encourage cities to adopt policies that would expand the number of projects incorporating similar green infrastructure approaches. Twelve case studies showcase projects from around the country that have overcome many common challenges to green infrastructure at sites surrounded by existing development and infrastructure." **https://www.epa.gov/smartgrowth/city-green-innovative-green-infrastructure-solutions-downtowns-and-infill-locations**

In Pennsylvania, land use planning is very dispersed. The York County Planning Commission provided detailed written responses to the focus group questions for this project. The following is an example of the challenges local governments face and provides valuable insights for the Bay Program workgroups seeking to assist local governments in meeting the land use and land conservation objectives of the Watershed Strategy.

> *"Except for a handful of municipalities that are under the jurisdiction of the County Subdivision/Land Development Ordinance, municipalities individually adopt and enforce their own land use ordinances. However, the County has been intimately involved in*

environmental/water issues. It adopted an Integrated Water Resources Plan (IWRP) as a component of the County Comprehensive Plan and endorsed the York County Watershed Implementation Plan, prepared by the York County Coalition for Clean Waters, under the leadership of the York County Planning Commission (YCPC). Additionally, the YCPC led the effort to develop the York County Stormwater Authority (SWA) Feasibility Study and the County Commissioners have given YCPC the thumbs up to develop a countywide SWA implementation plan.

The County Comprehensive Plan includes other components related to resource protection, including Natural Areas and Environmental Resources Inventories, and Growth Management, Agricultural Land Protection, Open Space and Greenways, and Hazard Mitigation Plans, that are being implemented. Additionally, YCPC staff prepared a Sustainable Landscaping Model Ordinance and presented it to local municipalities. Municipalities were encouraged to adopt the ordinance or incorporate the provisions into existing ordinances. The provisions are designed to conserve and restore healthy soils, reduce the use of irrigation for landscapes, improve the quality of surface waters, reduce energy consumption, provide wildlife habitat, and protect and restore native plant communities.

With regard to the IWRP, the "integrated" concept has been hard for people to grasp, so the County's efforts have been characterized as "regional," but continue to encompass coordination of geographic regions, land use types, permit holders, utility/infrastructure projects, regulatory agencies, water quality, and more. Notable, is that the YCPC has been instrumental in getting municipalities to participate in regional efforts to attain local water resource goals and obligations. One example is the York County Stormwater Consortium (YCSWC), created through an Intergovernmental Cooperative Agreement, to implement the Regional Chesapeake Bay Pollutant Reduction Plan (CBPRP), an MS4 Permit requirement. The YCSWC includes 44 municipalities, including the County. Ten of the participants are contributing to implement the Plan even though they were not required to have a CBPRP. They understand that by helping to put BMPs on the ground they are improving local waters and environmental resources."

In Virginia, local authorities including County Supervisors, approve Comprehensive Plans and zoning ordinances that guide local land use. Nelson County, Virginia, in the Blue Ridge headwaters of the James River, worked with Skeo Solutions to produce *Healthy Watersheds, Healthy Communities: The Nelson County Stewardship Guide for Residents, Businesses, Communities and Government* (http://www.gicinc.org/PDFs/Nelson_Stewardship_Guide.pdf). A model for local governments Bay-wide, the Nelson County guide encourages public engagement in the County's Comprehensive Plan update, with a focus on protecting high-quality forests; ensuring clean, healthy water; sustaining agriculture and working farms; and celebrating heritage and recreation.

Engaged Communities

The long-term success of the Chesapeake Bay restoration effort depends on the work of individuals and communities living throughout the watershed. Connecting with current environmental stewards and encouraging future local leaders helps build the network that will keep our work moving forward.

Stewardship Goal: *Increase the number and diversity of local citizen stewards and local governments that actively support and carry out the conservation and restoration activities that achieve healthy local streams, rivers and a vibrant Chesapeake Bay.*

Under this goal the Watershed Agreement includes specific objectives (outcomes) for Citizen Stewardship, Local Leadership and Diversity. The management strategies to meet these objectives identify specific roles for local leaders in Stewardship (*"Increasing the number and diversity of citizen stewards will require leadership on behalf of both nonprofit organizations and local governments."*), Local Leadership (*"increase the knowledge and capacity of local officials on issues related to water resources and in the implementation of economic and policy incentives that will support local conservation actions"*) and Diversity (*"The Bay watershed's state and local governments, watershed associations, nonprofits and private sector entities provide important support for increasing the engagement of diverse communities"*).

Public Access Goal: *Expand public access to the Bay and its tributaries through existing and new local, state and federal parks, refuges, reserves, trails and partner sites.*

Environmental Literacy Goal: *Enable students in the region to graduate with the knowledge and skills to act responsibly to protect and restore their local watershed.*

Under these goals the Watershed Agreement includes specific objectives for Public Access Site Development, Student Educational Experiences, Sustainable Schools and Environmental Literacy Planning. The management strategies to meet these objectives clearly need strong local involvement as seen in the following quotes from the Environmental Literacy Strategy.

"While states have the primary responsibility to advance the Chesapeake Bay Program's environmental literacy efforts, this work is done in partnership with local education agencies or school districts. In most watershed jurisdictions, local education agencies are responsible for defining their own curriculums and implementation strategies to support state standards and priorities."

"Education in most of the states in the Chesapeake Bay watershed are controlled by local education agencies (600+ in the region), each with their own leadership and management structure. With the exception of state laws and regulations, education priorities are largely determined at the local level and may not mirror state priorities. Meaningful Watershed Educational Experiences (MWEEs) and sustainable school practices are often left out of established accountability mechanisms between state and local education agencies."

The role for local leaders and linkages to local priorities

All of the focus groups organized for this project talked about education of citizens as critically important in the context of local priorities. This is probably best summed up by participants in the lower Susquehanna watershed focus group: *"Rapidly growing population and proper management of that growth is a major concern for the region. Jobs, health and safety, water supply adequacy and quality are*

all top local priorities for the communities and elected officials. Stormwater pollution, safe drinking water protection, toxic spill prevention/response, shortage of qualified water/ natural resource workers, creating green infrastructure jobs, are some of the priorities that they see as linked to the larger social - economic policy priorities. **Better public education about all of these topics must be a priority**. … **The Watershed Stewardship program has been very successful in York County. We need more watershed stewards developed. Funding and training for education of the fresh generation is critically important."**

Meeting the public access goal of the Watershed Agreement is important in its own right, but it is also a critical part of engaging and connecting the community in general and school children in particular. Local governments have a major role in public access and in schools. Public access is important for the community to connect to the waterways and it is a driver for tourism and water-based recreation.

Anne Arundel County Maryland's *"Quiet Waters Park is situated between the South River and Harness Creek. Visitors can enjoy trails winding through forests and past grassy fields, children's playground, or picnic among 340 acres of beautiful park land."* http://www.aacounty.org/departments/recreation-parks/parks/quiet-waters/ Quiet Waters and other parks with water access also provide educational opportunities for school children of all ages. http://www.aacounty.org/departments/recreation-parks/recreation/Summer_Camps/summer-day-camp

Virginia State Parks from the *"Heart of Appalachia"* to *"Coastal Virginia Eastern Shore"* feature water access https://www.virginia.org/stateparks/   Pennsylvania similarly has many parks with water access and 24 designated "Water Trails" that are mapped and described for public access and use http://pfbc.maps.arcgis.com/apps/webappviewer/index.html?id=ef4db86320d24c0d8e05e4569b30c06c.

Probably one of the most ambitious public access – public engagement efforts is the private sector driven Waterfront Partnership of Baltimore http://baltimorewaterfront.com/ , which has teamed with the Baltimore City Department of Recreation and Parks to offer beginner kayak tours of Baltimore's Harbor.

Technical and Funding Resources

Stewardship and environmental literacy resources are widely available in the watershed. Many of these state, federal and nongovernmental organizations participated in the development of the Management Strategy. The challenge is to take the wealth of information available and put it into a form that is readily accessible to local leaders for use in their communities. The Fostering Chesapeake Stewardship Goal Implementation Team (GIT 5) and its Education Workgroup are the lead experts for the Bay Program in consultation with LGAC and the Local Leadership Workgroup in development of appropriate content for local leaders. Maryland, Delaware, DC, Pennsylvania and Virginia all have programs as noted in the management strategy.

There are also environmental literacy programs at the National Oceanic and Atmospheric Administration http://www.noaa.gov/office-education/elp and the Environmental Literacy Council

https://enviroliteracy.org/ . Non-governmental organizations such as the Chesapeake Bay Foundation http://www.cbf.org/join-us/education-program/ are also essential partners.

Local Best Practices

As discussed in previous sections, an important part of the content to be developed for these goals is examples and case studies of local "best practices" how local governments have been part of the team that developed and implemented stewardship, public access or environmental literacy programs and projects.

For example, the State of Maryland has been a national leader in development of environmental literacy programs and has worked with local school systems, other state and federal agencies and nongovernmental organizations to develop its program. The Maryland Environmental Literacy Partnership created a formal partnership between school systems and environmental literacy experts in the field to develop the program in conjunction with state, federal and nonprofit agencies and 9 local school districts. http://www.legacy-cbf.org/melp/about-melp

> *"In 2011, Maryland became the first state in the Nation to require students to be environmentally literate as a high school graduation requirement. The requirement does not call for a specific environmental course for students; instead, each local school system will shape its own environmental education program, but the program must align with Maryland Environmental Literacy Curriculum Standards. There are eight state standards: Environmental Issues; Interactions of Earth's Systems; Flow of Matter and Energy; Populations, Communities and Ecosystems; Humans and Natural Resources; Environment and Health; Environment and Society; Sustainability."*   http://dnr.maryland.gov/waters/cbnerr/Pages/ed_EnvLit.aspx

The Maryland State Department of Education's (MSDE) Environmental Education program works "*to enable students to make decisions and take actions that create and maintain an optimal relationship between themselves and the environment, and to preserve and protect the unique natural resources of Maryland, particularly those of the Chesapeake Bay and its watershed*" http://marylandpublicschools.org/programs/Pages/Environmental-Education/index.aspx, in partnership with state and nongovernmental organizations like the MD Department of Natural Resources http://dnr.maryland.gov/waters/cbnerr/Pages/ed_EnvLit.aspx, the Maryland Association for Environmental and Outdooor Education http://maeoe.org/ , the Chesapeake Bay Trust https://cbtrust.org/ and the North American Association for Environmental Education **https://naaee.org/ .**

The Bay Program should also look to local school districts in each jurisdiction, like Montgomery County Maryland, that have developed their own programs that can serve as "best practice" examples for other local governments. http://www.montgomeryschoolsmd.org/curriculum/outdoored/

Existing Informational Programs and Delivery Mechanisms

As clearly evident from the preceding sections discussing the connections between local actions and the success of the Watershed Agreement, local elected officials are key players in restoring and protecting our watersheds. Local leaders play a unique role in determining the health of the Chesapeake Bay, through their decisions that affect its tributary watersheds and often have different needs and play different roles than other public and private decision-makers and stakeholders. However, at present there is no watershed restoration educational program that specifically tailors content to local elected officials in the Chesapeake Bay Watershed in a way that connects the content to local priorities. As a result, in many cases, they do not have the tools they need to make decisions that will meet local needs and at the same time improve the Bay Watershed and its tributaries. They need the information and tools to be timed, tailored, and delivered to meet their needs, and help them take actions that benefit their jurisdictions in both the short and long-term.

Existing educational programs of relevance to local elected officials

In a previous study, completed in 2015, Environmental Leadership Strategies (ELS) assessed the ability and capacity of 20 existing educational/leadership development programs to see if any could fully meet the needs of local leaders. Programs located both within and outside the Chesapeake Bay watershed were evaluated through web-based research. Programs were selected among known programs with the guidance of the Chesapeake Bay Program's Enhance Partnering, Leadership and Management Goal Implementation Team (GIT 6). ELS followed up with interviews of the top 10 programs' principal staff.

The 10 programs featured in the ELS report included:

	Educational Program
1)	Harry R. Hughes Center for Agro-Ecology
2)	Leadership Maryland
3)	Watershed Stewards Academy
4)	Legacy Leadership Environmental Institute
5)	Environmental Leadership Program
6)	Pennsylvania State Association of Township Supervisors
7)	Rural Urban Leadership Program
8)	Virginia Natural Resources Leadership Institute
9)	National Network for Nonpoint Education for Municipal Officials
10)	Sustainable Jersey

ELS concluded that *"these existing programs were found to be accomplished in many respects and could provide some of the necessary components. However, ELS found no single program, as they are currently structured, that demonstrated the ability and capacity to meet all of the needs expressed by the local officials."*

ELS elaborated further in its conclusion that *"certain programs stood out by meeting parts of local officials' needs; these groups might serve as models and/or partners moving forward. Some had relevant, high quality environmental content, such as the Harry R. Hughes Center for Agro-Ecology. Others, such as the Pennsylvania State Association of Township Supervisors (PSATS), did a good job of reaching local officials. The Virginia Natural Resources Leadership Institute (VNRLI) combines high-quality leadership development with environmental content. The National Nonpoint Education for Municipal Officials (NEMO) models the power of collaboration between existing programs which are supported by a central coordinating entity. Sustainable Jersey emerged from a collaborative process that brought together diverse stakeholders, and as such has gained significant acceptance and traction across diverse audiences. However, due to the scale of the watershed's leadership training needs and gaps in each program's abilities no program alone was suitable to shoulder the Watershed Agreement's call to action."*

Program Gaps

ELS further identified the missing elements or "Program Gaps" that needed to be filled in order to have a program capable of addressing the multi-faceted needs of local leaders to encourage their active work within their jurisdictions to protect and restore their part of the Watershed. *"Many of the organizations contain aspects that could help meet the Watershed Agreement's Local Leadership Outcome, however no one program was able to address the entire need. Therefore, **a new delivery mechanism for leadership advancement is needed to weave together existing expertise and fill gaps in current program offerings for elected officials.** There are a wide scope of existing programs in terms of audience, but few target elected officials. There is a wide scope of program content, but none that delivers needed content to the target audience. No single program has emerged to adopt the coordinating role needed to address elected local officials' needs. Thus, **the Watershed needs a new coordinating delivery mechanism to advance the Local Leadership Outcome.** Fortunately, there is no need to start from scratch. There are many leadership development programs doing important and impressive work in the Bay. These organizations may be solicited as partners, engaged in collaboration, and used as models."*

ELS provided 7 recommendations that provide the framework for a new coordinating mechanism to advance the Local Leadership Outcome.

1) Focus on Elected Officials – *"We believe that the most effective way to achieve the Chesapeake Watershed's goal of increasing the knowledge and capacity of local officials is to target elected local officials."*

2) Maximize Program Relevancy – *"To best engage and support elected local officials, based on our interviews and program research, we believe it is vital that programs provide content which is both relevant to and specialized for these leaders."*

3) Educate about Watershed Fundamentals and Local Best Practices – *"From interviews with officials and leadership program staff, we identified local officials' need for education which includes 1) fundamentals about big picture watershed conservation and restoration activities and 2) best practices for implementing these activities and policies at the local level."*

4) Use the Best Educational Activities – *"We recommend five types of educational activities to best advance local leader stewardship."* (described in following section of this report)*.*

5) Implement Certification Programs – *"In our interviews some elected officials agreed that certification could be an effective means to incentivize and reward participation in leadership programs."*

6) Investigate Strategies for Funding and Evaluation (see following sections of this report)

7) Coordinate Existing Programs

Coordination and Focus of Programs and Delivery Mechanisms

Building upon the work of ELS in the 1st Phase of this project as described above, in this section we make recommendations for creation of a new program for local leaders by strengthening and building on existing programs, including ways to tailor programs to meet elected leaders' needs, and enhance local watershed restoration and protection efforts. We recommend ways to make it easiest for local elected officials to obtain information and training, describing best methods to coordinate and focus these delivery mechanisms for local elected officials.

Program Structure

The Chesapeake Bay Watershed is home to a host of excellent government agencies and non-profit organizations that are currently working in the watershed, with the Bay Program Partnership and many already work with and are widely respected by local leaders. The recommended program will build upon the existing expertise and networks to provide the following 3 levels of coordination and program delivery:

4) A **Chesapeake Bay-wide coordination function** to be established as an additional responsibility of an existing organization or partnership of organizations already working in the watershed;
5) **State-level coordination** through existing state-by-state alliances of local government entities;
6) **Local partners**, existing local organizations that will directly help to implement the program.

Each of these three tiers of the program structure is further explained below.

Watershed-wide Coordination

There is tremendous expertise already at work in the Chesapeake Bay Watershed. We do not need to build a new organization, but rather do a better job of coordinating and targeting existing efforts and

expertise to meet the needs of local leaders. As described in the first section of this report, the Goal Implementation Teams and Work Groups that have developed the management strategies and are implementing the work plans are already in many cases identifying the roles for local leaders and engaging local organizations to build support for the necessary actions. We need to build upon these efforts and rely upon the experts in the Bay Program Partnership and in the Watershed who are already working on these issues to further develop the content and provide example case-studies of local success stories to increase the support for and engagement of local leaders. Local leaders want and need to hear from the experts in federal and state agencies, Soil Conservation Districts, academic institutions, etc. in order to understand the implications of their decisions and make well informed decisions.

There are existing Bay-wide non-profits, including educational and training organizations that are best able to coordinate the local leaders curriculum development, match GIT and Workgroup experts to local leader educational opportunities and provide regular updating of locally-tailored delivery platforms available for the GITs and workgroup expert participation. One of these organizations or a partnership of a few should be identified and funded by the Bay Program Partnership through a competitive process to play a coordinating role to bring the experts from the GITs and Workgroups together with local organizations to provide training opportunities for local leaders, make presentations, answer questions and share local best practices.

State-Level Coordination

There are existing state-level organizations that are ready and able to provide the conduit for information exchange and development of the knowledge and capacity of local leaders to take appropriate actions to implement important aspects of the Watershed Agreement while at the same time addressing local priorities described in the first section of this report. Two examples, the Virginia Association of Counties (VACO) and the Maryland Association of Counties (MACO) are described in more detail below as an illustration of the roles they can play, but there other "Trusted Sources" as well that are listed in Appendix C. and should also be included in the development of the new program.

We interviewed Larry Land of VACO for this project to find out the easiest way to incorporate this program into what they are already doing at VACO. He responded that the VACO newsletter and website are important communication tools that can be used. Their November Annual Conference also has a breakout session every year on the Chesapeake Bay TMDL. VACO also will hold a 2018 Supervisors' Forum in Richmond. In general, the scope of the certification classes is broader than just the Bay and includes local budgeting, land use planning, but there may be opportunities to blend in Bay topics. VA DEQ is delegated by EPA to implement the Clean Water Act; set the rules for local governments about Water Quality Standards. The challenge is to convey to local authorities how their land use policies relate to this. In addition, local agency staff tend to have working relationships with state people, but not with EPA. But without clear federal direction, states and localities will themselves lack direction.

Similarly, we interviewed Les Knapp of MACO and posed the question: *"What's the easiest way to incorporate this program into what you're already doing at MACO?"* He responded that it would be best

to develop modularized educational and training options that would enable municipal or county official to select from a menu of modules those topics that make most sense for their county or locality. Tailored presentations (*"no cookie-cutter approaches"*) could be developed to provide a messaging approach and framework for a local jurisdiction's professional staff to present a given issue, through an unbiased, factual toolkit, to their Council or local planning commission. Examples of delivery mechanisms to provide these educational modules include short videos that could be incorporated into a larger presentation; local extension agents; local planning, economic development, and environmental staff. For example, the MACO Summer conference is already set, but Fall, 2017 and Spring, 2018 Symposia, and Winter Conferences are not yet set and there may be possibilities for holding an "open session" related to this local leaders project. It may be possible to devote a whole day (6 hrs) or a half-day (2-3 hrs) at one of these events to a formal session focused on this project.   A session that both updates people on the Baywide TMDL and Phase III WIP, and also conveys the broader watershed vision, would draw attention and could end by providing opportunities for local county officials to sign up for further education and training. Les noted that he was *"pleased with the Winter Conference [focus group] session held for this project. It was a packed room, and a very productive session, with high-quality input."*

He also suggested that CBP local leaders education project staff go out and meet with people. *"The CBP or local leaders outreach group could offer to go out into the Counties' home turf to provide a formal educational/training session with County officials since not every county official is able to attend the MACO & VACO forums and conferences".*   Separate electives could be developed for the MACO **Academy for Excellence** – for topics like environment and natural resources; land use, and economic development (and how these topics relate). This could incorporate online video workshops/ webinars -- factual modular presentations that present all sides of a given topic; e.g. the relationship between land cover and stream health -- to give local elected officials and staffers, bullet points around which they can build their own locally-tailored presentation. Finally, Les topped off these great opportunities for local leaders' education by offering that *"MACO can help us to avoid political minefields in the implementation of this project. We'll need to use factually-accurate messaging, and know our audience – each County is different."*

Local Partners

Just as with the State-level organizations, there are many excellent local partners that the Bay Program GITs and Workgroups can and do in many cases already rely on. These groups already have ongoing relationships and regular meetings with local leaders and provide a ready and willing venue for engaging local leaders.

A few examples include the organizations with whom we partnered for this project to help us set up focus group discussions. The Metropolitan Washington Council of Governments brings together local officials from Virginia, Maryland and DC in a unique multi-jurisdictional organization in one of the Watershed's most heavily developed areas. The Susquehanna River Basin Commission and the Interstate Commission on the Potomac River Basin Source Water Protection Partnerships bring together local officials to focus on one of local government's core priorities, safe drinking water for their citizens. There are many other organizations like these that command the attention of local officials and are

another valuable resource for the Bay Program to reach out to local leaders. Most of these groups are very interested in hearing more about Watershed restoration and how it can help them meet local priorities as discussed in the first section of this report.

Implementation -- Tailoring of Content and Delivery Modes

Implementation of the program must be a joint effort of the Bay Program GITs and Workgroups, jurisdiction representatives and the Bay-wide coordinating organization(s) working with State-level and local Trusted Sources. Both the delivery mechanisms, and the content of the workshops and lectures, must be carefully tailored to meet the needs and priorities of participating localities. The Bay-wide coordinating organization(s) should first reach out to the Local Government Advisory Committee and the Trusted Sources listed in Appendix C for guidance on the development of content that is of interest and will engage local leaders.

 The information gained by the Bay-wide coordinating organization(s) should then be communicated to the Bay Program GITs and Workgroups, who need to coordinate in developing the content, so they can present the information in a way that is locally-tailored – and that finds the commonality and patterns among the issues, so that modules are streamlined and integrated so they can be presented as efficiently as possible.   In developing the content, it is very important to take into consideration the state- and jurisdiction-specific variations in local government structure and decision-making autonomy for local elected officials, in land management, local economic development, and natural resource decisions.

Content that is developed should be archived in a library managed by the Local Leadership Workgroup so that it can be used in other similar localities or serve as a template that can be adjusted for any new localities that are engaged. Each presentation of content should include local examples that are as similar as possible to the locality being addressed. These local case studies of lessons learned should also be archived and associated with key words that can be searched for future use. Over time, this library can be developed into an extremely valuable resource for development of new or more-specifically tailored content.

The ELS report presented the following matrix representation of different educational modes that can be useful in the content for reaching local leaders.

Educational Content

	Watershed Fundamentals Engaging Concise Lectures	Local Best Practices Peer-to-Peer Active Learning
In Person Targeted Audiences	Expert Presentations	Peer-to-Peer Workshops and Site Visits
Online Broadly Accessible	"Shed Talks" (Film Series)	Online Forums with Action Toolkit

Strategic Outreach Education Program for Local Elected Officials in the Chesapeake Bay Watershed

The best delivery mode is for the presentation to be given or field trip to be led by someone involved in its development that is actively working in the area. Local leaders want and deserve to be respected and provided the best possible input from Bay Program experts. Whenever possible, in addition to Bay Program GIT and Workgroup members, local partners should be enlisted to assist in developing content and making presentations as well. To keep costs low, both for the presenters and the local leaders who attend, the presentation of content workshops or site visits should be done in conjunction with the State-level organizations or Trusted Sources at their regular meetings or conferences, combined with outreach presentations through particular State-level organizations and Trusted Sources who request a special seminar, workshop or field trip.

A few examples of successful, innovative programs that bring together local elected officials with other non-profit and private-sector partners include:

Alliance for the Chesapeake Bay Local Government Forums

- Roundtables for elected officials, hosted by a peer, for the purpose of increasing local officials knowledge and comfort discussing watershed protection and restoration topics.

Civic Spark

- California program with Americorps places professional interns in local governments to collaborate for climate change, water resource solutions

Skeo Solutions

- Watershed Walks
- Watershed-based land use plans
- Podcasts on local government sustainability innovations

Potomac Conservancy

- Worked with private landowners to preserve 13,000 headwater lands to date.
- Local elected officials can ally with land conservancy nonprofits to boost number of acres preserved per year, accelerate pace of headwaters land protection.

The Trust for Public Land

- Works with local elected officials and other partners to structure, negotiate, and complete land transactions that create parks and protected natural areas.

Harry R. Hughes Center for Agro-Ecology, Inc.

- *"Brings together diverse interests from the agricultural, forestry, and environmental communities for the purpose of retaining Maryland's working landscapes and the industries they support while protecting and improving the health of the Chesapeake Bay and its tributaries."* https://agresearch.umd.edu/agroecol

Coordination and Outreach Staffing: Recommended Levels

In order to engage local elected officials in this Chesapeake Bay education initiative, at a level that will make a difference through better-informed decisions to benefit both the Bay and local natural resource and other local priorities, it's essential that this program be adequately staffed, particularly at the Bay-wide coordinating level, and also at the State level for the Trusted Sources. We recommend as a preliminary approach that targets be set for the percentage of County and other local jurisdictions within each state that this program will reach each year. As a conservative initial level, we recommend that the program be staffed such that local elected officials from ten percent of Counties per state, and five percent of other types of municipalities per state, in each of the Bay states and the District of Columbia, be reached through this program each year.

Program Cost and Funding

The program recommended in this study will require funding for the Bay-wide coordinating organization(s) to identify local leader training opportunities in consult with Trusted Sources and to coordinate content development with Bay Program Goal Implementation Teams (GITs) and their affiliated Workgroups. GITs and affiliated Workgroups may also require funding for content and training program development. Technical support and training programs would be provided to local elected officials through the work of the Bay Program GITs and Workgroups. By taking advantage of Trusted Sources' web sites, newsletters, ongoing meetings, trainings, workshops and conferences held by the State and local Trusted Sources, the costs of content distribution would also be minimized.

It is anticipated that the Bay-wide coordinating role could be filled by contracting with an existing organization or partnership of organizations that are already working on local leadership outreach, skilled staff could lead a team of 2 to 4 individuals to set up the program at a cost of about $100,000 for the first year.   This does not include Bay Program or jurisdiction funding that would be required by the GITs and Workgroups or other experts developing the content in consult with the Bay-wide coordinating organization(s). After the first year, additional staffing and funding is likely to be needed for Bay-wide coordination in order to ramp up the local leadership education programs to meet targets necessary to achieve the Bay Program's goals for local government participation.

Bay Program funding is the most likely source for initiation of the program.   The Bay-wide coordinating organization(s) selected by the Bay Program for this role ideally should have previous experience and a strong commitment to local leadership development and seeking additional State, local and/or foundation funding to expand the program in future years.

Measuring Progress

The Bay-wide coordinating organization(s) should develop metrics in consult with State and Local Trusted Sources. Content providers from all organizations involved should use the metrics recommended by the Bay-wide coordinating organization(s) and provide the results to the coordinating organization(s) for accounting and reporting purposes. Ideally, the metrics should be categorized by Bay Agreement Goal, to promote some (friendly) competition between GITs and Workgroups with respect to

their local leaders outreach/training efforts. Metrics should be compiled and reported to the GITs and Workgroups on an annual basis.

Some suggested metrics include:

Start with a general survey on what the individual official knows, and actions taken based on that knowledge, about Chesapeake Bay and local waters/watershed issues and practices, before going into the program, and then survey what they know and actions they are taking/intend to take after going through the program.

Set a target number, and percentage, of local elected officials in each Bay state to be reached by one or more educational sessions in this program per year. Then, compare the number of actual participants in each state per year, with the target number.

Document the number and type of training sessions provided; Document the number of local best practice case studies compiled and presented; Conduct follow-up interviews with trainees 1 year after the session to find out if any actions have been taken.

The metrics should measure participation, knowledge gained, and actions taken. The number of elected officials targeted to receive the information should be established and actual participation tracked (and should reflect the actual funding level provided). Questionnaires should be answered by participants going into the programs and then after they complete the programs so that their increase in knowledge and understanding can be measured. Ultimately, the most beneficial metric would be to track the number and quality of actions taken by the participants to gauge the actual impact of the program.   A further refinement of these metrics could be to identify the geographic areas where local government action is a high priority and then track the number of participants from those areas, knowledge gained and the actions taken.

Additionally, the metrics should be categorized by Bay Agreement Goal, to promote some (friendly) competition between GITs and Workgroups with respect to their local leaders outreach/training efforts. Metrics should be compiled and reported to the GITs and Workgroups on an annual basis. The specific metrics should be developed consistent with the findings of the Bay Program funded project currently underway by the Alliance for the Chesapeake Bay.

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Appendix A – Focus Groups and Feedback Sessions Conducted for this Project.

Focus Group Host Organization (and others providing input)	Date	Location	Number of Participants
Interstate Commission for the Potomac River Basin Drinking Water Source Protection Partnership	11/9/16	Shepherdstown, West Virginia	8
Maryland Association of Counties Winter Conference	12/8/16	Easton, Maryland	24
Susquehanna River Basin Commission	12/20/16	Harrisburg, Pennsylvania	50
Metropolitan Washington Council of Governments – Chesapeake Bay and Water Resources Policy Committee	1/12/17	Washington, D.C.	7
Chesapeake Bay Program Local Leadership Working Group (feedback)	4/12/17	Annapolis, Maryland	15
Total Focus Group Participants			104

Appendix B – Questionnaire used for four focus groups

Improving Communication with Local Leaders Regarding Watershed Restoration Goals

The Local Leadership Workgroup and the Local Government Advisory Committee of the Chesapeake Bay Program are reaching out to local leaders to discuss how the Bay Program can improve communication and understanding of Bay watershed restoration goals and information and technical support needs of local government leaders.

A new Bay agreement was signed by the Bay watershed jurisdictions in 2014. One of the agreement's key goals is to increase the knowledge base and capacity of local officials so that they are able to be more effectively engaged in the watershed restoration effort in ways that benefit their local community, environment and their impact on those living downstream. This goal came out of a recognition that local officials are key players in restoring and protecting our watersheds, but they have not received enough support from the Bay Program for them to have the tools they need to be more knowledgeable, supportive and engaged.

The purpose of this meeting and the questions listed below is to get your feedback on what issues are most important to your communities, how clean water, healthy fish and wildlife, conserved forest and wetlands and outdoor recreational access fit within these priorities, what information and support local leaders need about these subjects and the most effective way to convey the information and support they want.

The following questions were developed by the Bay Program to get a better understanding of the interests, concerns and needs of local leaders. We are interested in your feedback on these questions or related issues that you think are important for leaders and citizens of the Watershed to understand and where additional information, training or other support from the Bay Program would be helpful.

If you have any questions or comments or to simply provide your own answers to these questions, please contact Bob Hoyt (bhoyt@ecologixgroup.com), Bob Summers (Robert.Summers.PhD@gmail.com) or Diane Cameron (dianecameron60@gmail.com).

Thank you.

Importance of environmental restoration and protection

1. What would you say are your community's top three priorities?

2. Where do clean water, healthy fish and wildlife, conserved forest and wetlands and/or outdoor recreational access fit within these priorities?

3. Have you been able to adopt policies or take actions that protected and improved these environmental resources in your jurisdiction? Please provide examples.

4. Which considerations (e.g. lack of interest or concern by constituents, knowledge of what to do, high cost, etc.) most often prevent or make it difficult for you to adopt policies or take actions to protect and improve these environmental resources in your jurisdiction? Please provide examples.

Information needed to take action in your jurisdiction

5. What information is useful and important to support your efforts to protect and restore your environmental resources? (For example: risks to public health, economic benefits, recreational opportunities, regulatory requirements, grant/funding opportunities, innovative approaches by peers, potential for job creation, others)

6. What did you know (or wish you had known) about environmental restoration and protection prior to becoming a local leader that was (or would have been) most helpful in addressing your constituents' environmental health protection and restoration concerns?

Best sources and methods of delivery of information

7. What sources of information do you rely upon to better understand the impacts and risks of actions (or lack of action) to protect and restore your environmental resources? (e.g. studies, organizations, educational programs and/or people you find most helpful and reliable)

8. What educational programs have you and your colleagues participated in and what impact did they have? Were field trips and site visits an important and useful part of the programs?

9. What existing programs are most effective at conveying such information and what features of these programs stand out, making them especially effective?

10. What is the best way for you and others in similar leadership positions to get the information you need about issues surrounding environmental health protection and restoration?

Additional information and educational programs needed

11. What new or different information or educational programs would help you and/or your community to commit more resources to environmental restoration -- clean water, healthy fish and wildlife, conserved forest and wetlands and outdoor recreational access?

Appendix C. Leading Trusted Sources for Local Elected Leaders

State	Association	Association Website
MD	MD Municipal League	http://www.mdmunicipal.org/
MD	MD Association of Counties	http://www.mdcounties.org/
MD	Interstate Commission on the Potomac River Basin Source Water Protection Partnership	https://www.potomacriver.org/focus-areas/water-resources-and-drinking-water/drinking-water/source-water-protection/
PA	PA State Association of Township Supervisors	http://www.psats.org/
PA	PA Municipal League	http://www.pamunicipalleague.org/
PA	PA State Association of Boroughs	http://boroughs.org/
PA	PA Municipal Planning Education Institute	http://extension.psu.edu/community/pmpei
PA	American Planning Association (PA Chapter)	https://planningpa.org/
PA	Susquehanna River Basin Commission Source Water Protection Partnership	http://www.srbc.net/programs/partnership.htm
VA	Virginia Municipal League	http://www.vml.org/
VA	VA Association of Counties	http://www.vaco.org/
VA	American Planning Association (VA Chapter)	https://www.planning.org/chapters/virginia/
WV	WV Municipal League	http://www.wvml.org/
WV	Region 9 Eastern Panhandle Regional Planning & Development Council	http://www.region9wv.com/
WV	West Virginia Planning Association	http://www.wvplanning.com/index.php
DE	DE County Conservation Districts/ Association of Conservation Districts	http://www.dnrec.delaware.gov/swc/district/Pages/ConservationDistricts.aspx

Appendix C. Leading Trusted Sources for Local Elected Leaders

State	Association	Association Website
DE	DE Department of Natural Resources & Environmental Control	http://www.dnrec.delaware.gov/Pages/Portal.aspx
DE	American Planning Association (DE Chapter)	http://www.delawareapa.org/
NY	NY State Association of Regional Councils	http://www.nysarc.com/
NY	Upper Susquehanna Coalition	http://www.u-s-c.org/html/index.htm
NY	American Planning Association (NY Upstate Chapter)	http://www.nyupstateplanning.org/
DC	Metro Washington Council of Governments	https://www.mwcog.org/
DC	Advisory Neighborhood Commissions	https://anc.dc.gov/