Case Studies: Our Waters, Our Towns

Counties & Cities Develop Effective Watershed Programs

Local Government Advisory Committee to the Chesapeake Executive Council

Alliance for the Chesapeake Bay

Local Governments Improving Waterways and Communities

November 2012–The timeline and complexity of the new Chesapeake Bay Total Maximum Daily Load (TMDL) and its required Watershed Implementation Plans (WIPs) are creating uncertainty in many jurisdictions. Some view it as a challenge and others an opportunity for partnership and innovation.

As leaders and decision makers, we are faced with economic challenges, yet many communities are finding creative ways to improve water quality in local streams, rivers and tributaries. For years, our colleagues in cities and counties all over Pennsylvania, Maryland, the District of Columbia and Virginia have completed watershed improvement projects and seen measurable results. They have used a variety of techniques to clean the local waters resulting in healthier communities and job creation.

This collection of examples follows our recent publication "*Our Waters, Our Towns: Local Governments' Role in the Watershed Implementation Plans*," which provided useful information about the new requirements and emphasized the importance of local government and elected officials engaging in the Phase II WIP process. After all, we know our communities best!

As you may recall, the Local Government Advisory Committee is made up of representatives from Pennsylvania, Maryland, Virginia and the District of Columbia—the jurisdictions that are signatories to the Chesapeake Bay Agreement. There are 21 members and we advise the Executive Council of the Chesapeake Bay Program, the body that makes policy and sets the bay restoration goals. The Executive Council is made up of the governors of Pennsylvania, Maryland and Virginia, the mayor of D.C., the representative of the Chesapeake Bay Commission (which represents the states' legislators on the council) and the administrator of the Environmental Protection Agency.

Our focus has been peer education and representing the interests of local government within the Bay Program to ensure the states and the federal government partner in financing the projects within our local WIPs. We are also seeking credit for those communities that have made water quality a priority through their past investment.

Here you will find examples of local governments that have developed planning processes that may be applicable in your community. Two examples are the Hampton Roads Planning District Commission, which created a process that may be replicated by other Virginia districts, and Anne Arundel County, Md., which developed an urban county approach. We have also found approaches that drew on what the local government had learned from residents. An example is the District of Columbia's "RiverSmart Homes" project. Meanwhile, Lycoming County, Pa., has created a countywide nutrient trading program after engaging many of the local stakeholders.

We also discovered a creative financing model using multi-government agency and private sources. The City of Havre de Grace, Md., is integrating environmental education and public recreation into a larger water quality/public safety/high school athletic field improvement project, thus leveraging funding to accomplish many community goals.

Take a look. Use the ideas that work for your community and share your own success stories. Your on-the-ground knowledge of your community is valuable, and learning from others is necessary in our work to clean local waterways and the Chesapeake Bay. We hope this information is helpful, and we ask that you let your state's members on our committee know what's happening in your community.

Sincerely,

Mary Ann Lisanti

Mary Ann Lisanti
County Councilwoman, Harford County, Maryland
Chair, Local Government Advisory Committee to the Chesapeake Bay Program

Case Study One: City of Lancaster, Pennsylvania

Project:
Green Infrastructure Plan

Issue/ Sector Being Addressed:
Stormwater

Cost, Source of Funds and/ or Partners: $141 million over 25 years from stormwater utility fees

Outcome:
A green sponge to sop up a billion gallons of water

Most of the time, the City of Lancaster's advanced wastewater treatment plant can readily handle the volume of water flowing to it through the aging system of pipes that combine both stormwater runoff and wastewater from homes. But about 15 percent of the time, during rainstorms or heavy snowmelt, the system is overwhelmed by the sheer volume of water from downspouts, streets, sidewalks and parking lots. Over the course of a year, a billion gallons of this dirty water—a combination of untreated sewage and the grit, oil, and other pollutants swept from roofs and streets—overflows the combined sewage system and runs into the Conestoga River. Eventually some of the pollution reaches Chesapeake Bay.

Faced with the need to improve water quality in the Conestoga and to meet the requirements of the Chesapeake Bay Total Maximum Daily Load (TMDL), the city had a problem to solve: How to eliminate, in 25 years or less, one billion gallons of storm water runoff from entering its aging sewage system. And how to do it at a price the city and its residents could afford.

The traditional engineering approach to fixing an old combined sewage system like Lancaster's is to increase capacity and flow in the system by putting in massive holding tanks, bigger pipes and pumps, and greater treatment capacity at the plant. The estimated cost for this approach was at least $250 million, and that was on top of $18 million already spent to improve the system.

Faced with those numbers, the city opted to substantially develop its "green infrastructure" while increasing the efficiency of its existing gray infrastructure. It has developed a plan to engage homeowners and businesses in an effort to catch as much rainwater as possible and divert it from the sewage system. The city has also identified a series of public works projects to improve streets, parking lots, and playgrounds.

The techniques include porous pavements, sidewalks, rain gardens, retention ponds, green rooms, trees and planter boxes to filter water into the ground or evaporate it; and rain barrels, cisterns, and ponds to capture and slowly release water.

There are many benefits for Lancaster residents. The green infrastructure recharges ground water, saves energy, and improves the quality and quantity of water reaching local streams. It provides cleaner air, beautifies neighborhoods, and creates recreational opportunities. And it costs less. And here's an additional small benefit: neighbors near a new, pervious-surface basketball court (one of many the city hopes to install) report it is quieter. In the next five years, the green infrastructure is projected to reduce the suspended solids reaching the local river by 252,000 pounds annually, phosphorus by 4,800 pounds, and nitrogen by 10,700 pounds at a cost about half that of a traditional approach of redeveloping the gray infrastructure. In 25 years the pollution reduction will be many times that, and the savings just as great.

Contact: Charlotte Katzenmoyer, Director of Public Works, 717-291-4739, CKatzenmoyer@cityofLancaster.com

Case Study Two: Lycoming County, Pennsylvania

Members of the Lycoming County Chesapeake Bay Tributary Strategy Advisory Committee tour a riparian buffer. Credit: Megan Lehman, Lycoming County Planning

In Pennsylvania, where townships make many of the land use decisions and independent authorities operate the sewage treatment plants, the Lycoming County Commissioners made a bold decision. They chose to invest half a million county dollars to bring the whole community to the table to develop a plan for how to meet water quality standards required to restore the Chesapeake Bay. Their decision, made more than three years ago, led to a model county approach with important benefits for local residents.

Seven wastewater treatment plants in the county needed upgrades at an estimated cost of $225 million. The plants faced tight deadlines, with the last upgrades due by 2013. The commissioners feared that putting that full burden on ratepayers might convince industries to leave the county and would exceed many residents' ability to absorb costs.

At the same time, some urban communities being asked to make these investments pointed toward the impact of agricultural runoff, and talk began of a Chesapeake Bay TMDL that would impact all sources. Farmers began to worry that they would be next, with enhanced enforcement of Pennsylvania's nutrient management laws.

The solution devised by Lycoming County's stakeholders was a county-based nutrient trading program, created within the boundaries of Pennsylvania's nutrient trading program administered by the Pennsylvania Department of Environmental Protection (DEP). Lycoming County farmers who meet the baseline requirements for nutrient reductions can install additional measures to stop even more pollution. These extra measures are certified by the state, and the extra nitrogen and phosphorus they prevent from entering the waters can be counted as nutrient reduction credits. The credits can be sold to permitted point sources, and they could reduce their compliance costs and provide the farmer with an additional income source to sustain the farm operation.

Wastewater treatment plant operators or others who need to reduce the amount of nitrogen they put in local waters can buy the credits to help meet their goals. Buying the credits may help the plants avoid upgrades entirely, or allow them to do less expensive upgrades and offset any shortfall in pollution reduction with the credits. Buying credits can also gain the plants time to evaluate future needs or arrange capital.

Project: Countywide Nutrient Trading Program

Issue/ Sector Being Addressed: WWTPs; Agriculture

Cost, Source of Funds and/ or Partners: $850,000 from county funds

Outcome: Model trading plan involves whole county

For the County, the approach has many benefits. Nutrient trading can:

- Provide flexibility to wastewater treatment plants, which in turn enables the exploration of more cost-effective options for reducing pollution.
- Improve financing options for local sewer authorities, because a regional approach increases the viability of funding from state and federal government sources that prefer to address environmental issues on a larger geographic scale. This will help minimize the impact on ratepayers.
- Multiply environmental benefits, as local investments in best management practices improve the county's natural habitat, recreational uses and tourism, stormwater management, and flood control.
- Enable economic growth, because businesses are attracted to a county that demonstrates innovative approaches to compliance. By controlling costs at existing wastewater treatment plants (WWTPs) in core communities, the feasibility of redeveloping old industrial sites and targeting economic growth to planned growth corridors served by existing infrastructure is enhanced.
- Drive cost-effective compliance and enable local control.

In Fall 2010, the first statewide nutrient credit auction, administered by the Pennsylvania Infrastructure Investment Authority (PENNVEST), generated nearly $93,000 in revenue for six county farmers and the county. The county plans to increase the numbers of farmers in the program.

Contact: Megan Lehman, Environmental Planner, Lycoming County, at 570-320-2115 or mlehman@lyco.org

Lycoming County Water and Sewer Authority's wastewater treatment plant. Credit: Megan Lehman

Cattle rest in a paddock of the rotational grazing system installed on the Lycoming County Farm. Credit: Megan Lehman.

Case Study Three: Anne Arundel County, Maryland

Project:
Phase II WIP Planning

Issue/ Sector Being Addressed:
WIP Planning for Urban Counties

Cost, Source of Funds and/ or Partners: EPA

Outcome: Early adapter develops a guide for others

There are probably few county Public Works Departments across the Chesapeake Watershed that have spent more time thinking in detail about the Phase II WIP process than has Anne Arundel County's. Last year the county was invited by the Maryland Department of the Environment to participate in a pilot program to develop a template to guide other urban Maryland counties through the intricacies of the process. Since then, a detailed plan has emerged, and Director of Public Works Ron Bowen has hit the speaking circuit to present the findings.

The plan Anne Arundel developed illustrates two points:

First, the reduction in nitrogen, phosphorus, and sediment that the TMDL requires demanded a comprehensive approach that addressed all sources and that balanced pollution reduction techniques against costs in order to return the greatest reductions at the least costs.

Second, the exercise illustrated that a robust framework and method that can provide sound strategic direction can be developed even when working with uncertainty and imperfect or incomplete information. Uncertainty and incomplete information is a given in the current Phase II WIP process. Across the watershed, local governments await detailed numbers to come down to them from the federal and state agencies. But by moving ahead, Anne Arundel gained insight on what to do when numbers arrive.

Anne Arundel is heavily urbanized in the north where suburbs to Baltimore City blend into suburbs around Annapolis. Only the southern half of the county is rural. As a result, agriculture is not a leading contributor of pollution. The county's sediment, nitrogen and phosphorus pollution comes from sewage treatment plants, urban stormwater runoff and eroded streams, and failing septic systems. The county's Phase II WIP addresses all three, but has an emphasis on addressing storm water runoff through stream and outfall restoration as well as upgrades of existing storm water management ponds. Septic systems will be retired by extending sewer service in urbanized areas within the Critical Area (land within 1,000 feet of tidal waters) and within 1,000 feet of non-tidal streams. The County Health Department will continue requiring enhanced nitrogen removal systems within the Critical Area.

Bowen has said that addressing the Chesapeake Bay TMDL will substantially improve conditions in the county's streams and rivers. Creating the WIP has engaged many of the county's federal, state, and city stakeholders. In response to requests from other local governments and advocacy groups, Bowen is going to other counties and explaining what Anne Arundel has learned.

Contact: Ron Bowen, Anne Arundel County Department of Public Works, 410-222-7500

Case Study Four: Washington, D.C.

Rain barrel provided to residents as part of the RiverSmart Homes program. Credit: RiverSmart Homes

Washington, D.C. rain garden. Credit: RiverSmart Homes

With a half-inch of rain, Washington, D.C. faces a problem: Its combined sewage treatment system, which serves one-third of the city, begins to overflow, sending raw sewage and trash from the city's streets into the Anacostia River.

Across the nation, 770 cities face similar problems. They all have combined storm-water and sanitary sewer systems. Built a century ago, these systems were thought to be the best way to handle urban runoff. The cities generally embrace the same set of solutions, too. They must increase the capacity the system can store and decrease the runoff that goes into the system.

Decreasing the amount of runoff entering the system is far cheaper than re-engineering the sewers. However, it requires engaging property owners to take strong measures to keep rainwater on their properties, rather than letting it run off into gutters and storm drains. Cities have found that programs to engage homeowners often under-perform. The D.C. Department of Environment (DDOE) RiverSmart Homes program can serve as a guide to other jurisdictions interested in engaging homeowners and showing them how to make the best usage of stormwater.

The District's RiverSmart Homes Program aims to reduce stormwater runoff by offering subsidies to District homeowners to install rain barrels, shade trees, rain gardens, BayScaping, and pervious pavers. The way the program operates is simple.

Project: RiverSmart Homes

Issue/ Sector Being Addressed: Homeowner Stormwater Management

Cost, Source of Funds and/ or Partners: ARRA funds of $1 million over two years

Outcome: Lessons from homeowners sharpen program's design

Finishing touches on bay scaping, then-DDOE director George Hawkins, Rock Creek Conservancy (formerly FORCE) Executive Director Beth Mullin and RiverSmart Homeowner Frank Matthews. Credit: RiverSmart Homes

Interested residents sign up for the program and, within two months, are contacted by a DDOE official, who visits the home and conducts an assessment of the home property. The assessment, which usually takes up to an hour, offers the homeowner an opportunity to ask questions and to get information on stormwater retention measures.

Convenience to homeowners is key in implementing the District's RiverSmart Home Program. Rain barrels, trees, or materials to create a rain garden, for example, are brought directly to homeowners, many of whom use public transportation as a means of getting around and have limited access to vehicles big enough to transport these products.

Additionally, most homeowners don't necessarily know how to install rain barrels, pervious pavers, or how to plant trees or design and build rain gardens. So there needs to be expertise available to them. The RiverSmart Homes program relies on non-profit partners to get the materials to the homes and install the recommendations. Homeowners also need to be taught how to maintain the installations, and the non-profit partners handle that.

Cost-sharing is important. The RiverSmart Homes project provides a subsidy of up to $1,200 toward the costs of landscaping, rain barrels, or other recommended practices. However, the homeowner also contributes at least 10 percent of the project's costs. The District Department of the Environment found that District residents felt more invested and they better maintained the installations if they chipped in for the cost of the installation.

The RiverSmart Homes project, which began in 2007, is now active in all of the city's wards. More than 2,000 homeowners participate. As more cities in the Chesapeake region begin to rely on citizen involvement to reduce stormwater runoff, the lessons learned in the RiverSmart Homes project will prove valuable.

Contact: Jenny Guillaume at 202-535-2252

Case Study Five:
Hampton Roads, Virginia

Project:
Local planning district model

Issue/ Sector Being Addressed:
A best process for WIP planning, primarily urban stormwater

Cost, Source of Funds and/ or Partners: $80,000, Locality per capita funds and stormwater committee. Applying for grants to fund the remainder.

Outcome: Accurate, shared data and local strategies for Virginia's WIP process

The Hampton Roads Planning District Commission (HRPDC) has committed to assist Virginia by coordinating the local government input for Virginia's Phase II Watershed Implementation Plan for the Chesapeake Bay TMDL. HRPDC developed a two-tiered approach to coordinate stakeholder involvement for the Phase II WIP throughout Hampton Roads, consisting of a regional steering committee and a group of local teams.

The local tier is made up of 14 local government teams composed of staff from all departments affected by or affecting nutrient load reductions. The local teams were formed by the City Managers and County Administrators at the request of the HRPDC and will develop the localities' nutrient reduction strategies by selecting a combination of best management practices or BMPs (nutrient reduction methods) that meet the localities' nutrient reduction target. Local government teams have been formed and are reviewing information provided by DCR for accuracy and adjusting information based on local data.

The regional tier is a Steering Committee composed of local representatives, federal and state agencies, agriculture representatives, and selected environmental groups. The Steering Committee provides a forum for local government representatives and other stakeholders to communicate their questions and concerns as they identify the management actions they will implement to meet the nutrient and sediment reduction goals necessary for a clean Bay.

HRPDC staff will work with Virginia and EPA staff to address the local government concerns and provide technical assistance to develop management action scenarios. The following issues have already been identified for the Steering Committee to address:

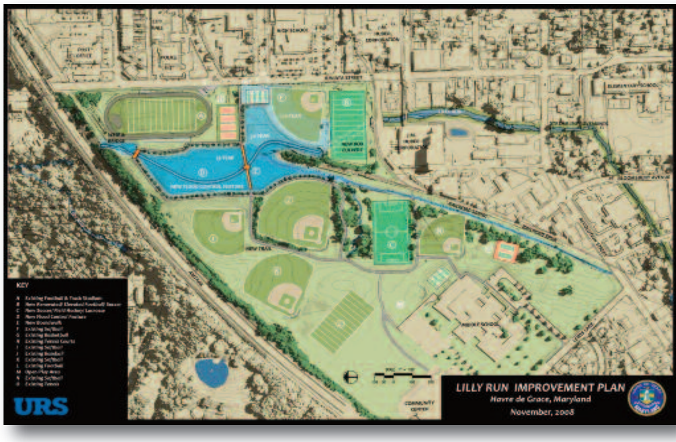
1. Divide nutrient loads based on land use and ownership (Agricultural, Virginia Department of Transportation, Department of Defense, and so on) to clearly identify the portion of the nutrient reductions that the locality must implement.
2. Coordinate with the EPA and the Department of Conservation and Recreation (DCR) to expand the types of BMPs that can be incorporated into the Bay model. For example, by establishing efficiencies for BMP maintenance upgrades and conversions to more efficient BMPs (such as converting dry detention pond to a bioretention areas), and developing a process to credit nutrients removed through correction of sewer overflows.
3. Provide regional feedback to the state on what localities need from the state such as more authority, regulations or funding.

The Steering Committee also serves as a forum for stakeholders to share information and learn about innovative solutions to reduce nutrient and sediment loads. A valuable part of each meeting is a roundtable discussion that allows each locality to report on their progress and the challenges they face in developing their nutrient reduction strategies. The Steering Committee held its first meeting in July and will hold monthly meetings through the completion of the Phase II development process in Spring 2012. Locality staff and additional stakeholders on the Regional Steering Committee have identified priority issues and questions and sent them in a letter to DCR for response, a process the Steering Committee will continue as the WIP is developed.

HRPDC staff has created a webpage to provide local governments and other stakeholders with a location to access information and data related to the Phase II WIP. http://www.hrpdcva.gov/PEP/ChesBayTMDLInfo.asp

Contacts: Whitney Katchmark (wkatchmark@hrpdcva.gov)or Jenny Tribo (jtribo@hrpdcva.gov) at 757-420-8300

Case Study Six: Havre de Grace, Maryland



Lilly Run may be a small stream, but it poses a variety of significant public safety and environmental problems to Havre de Grace, Md. Lilly Run drains a watershed of 970 acres, most of which is located at a much higher elevation than the sea level waterfront city, a topography particular to where the Piedmont Plateau and the Coastal Plain meet. In addition, scenic, historic Havre de Grace is located at the confluence of the Susquehanna River and the Chesapeake Bay. Those factors combine during heavy rains when swollen streams can be exacerbated by astronomical high tides and storm surges from the Bay, creating unmanageable flooding as we saw with 2011's Hurricane Irene and Lee.

Lilly Run floods due to the proximity of the stream to development and inadequate infrastructure to convey stormwater through the city, which is the second oldest municipality in Maryland.

The City has a long standing history of being a good environmental steward of the Susquehanna and the Bay, as both contribute to the quality of life and local economy. Over the past 50 years, flooding by Lilly Run has posed a threat to public safety, but as the Chesapeake Bay's health has become more of a priority, a newer and more urgent focus has been the quality of the water Lilly Run poured into the Susquehanna River and headwaters of the Bay.

The Mayor and City Council funded a study to identify solutions to problems associated with Lilly Run flooding. The study suggested the design and replacement of 17 structures within the City's stormwater system and the creation of an environmental living classroom developed around a temporary water holding facility on Board of Education property connecting the Middle and High schools.

This concept provided the opportunity for the City to gain an additional partner and the students to learn more about water quality, nutrient load and drainage issues in the watershed. This flood mitigation feature is only possible because the local school system is one of the project's primary partners and the land that connects the middle and high schools was large enough to fulfill project requirements. This setting gave project designers the room to incorporate additional water quality, education, recreation, and environmental features that set this project apart from most stormwater management projects. The plan also includes a loop trail system for the community's enjoyment.

While the City has not yet secured construction funding, it is leveraging existing multi-jurisdiction funding to proceed. The City views the Chesapeake TMDL as an opportunity to invite environmental and hydrology experts to demonstrate their techniques and provide assistance to achieve multi-sector load reduction and secure the remaining construction dollars.

The Project Director envisions this project, upon completion, to be a regional showpiece that will include innovative concepts for managing water flow, quality and the reduction of nutrients. Already several multi-disciplinary professionals have joined the project partners to create a one-of-a-kind project opportunity to combine known best practices with scientific advances.

Project:
Lilly Run Improvement Project

Issue/ Sector Being Addressed:
Stormwater management, flood control and sediment reduction

Cost, Source of Funds and/ or Partners: City of Havre de Grace, Harford County Board of Education and Dept. of Public Works, Huber Corp. and Lower Susquehanna Heritage Greenway Inc.

Outcome: Little Lilly Run provides big opportunity

Contact: John Van Gilder, Inter-Governmental Affairs Manager at 410-939-1800 or jvg@havredegracemd.com

Cover Photos:

Top left: Walt Nicholson of the Williamsport Sanitary Authority explains their West Plant operations. Credit: Megan Lehman, Lycoming County Planning.

Bottom left: Chesapeake Bay Program

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