



June 2012

# Protecting Local and Regional Water Quality

## Stormwater Management in the Metropolitan Washington Region



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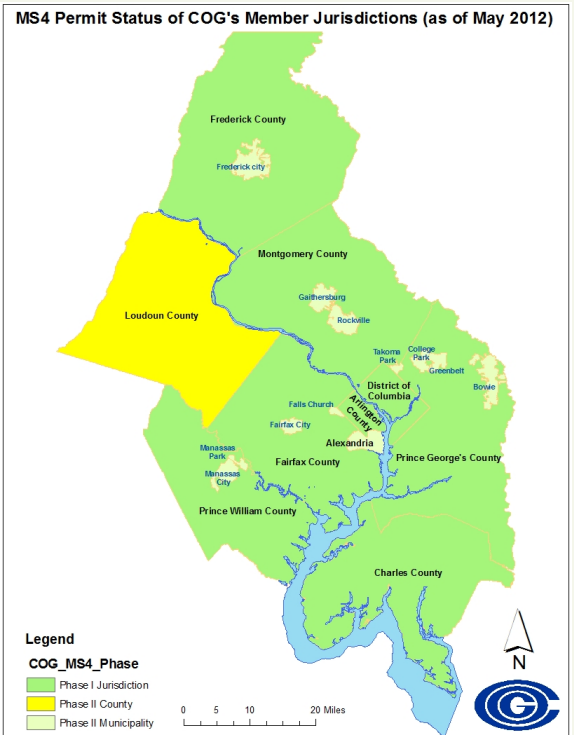
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## STORMWATER MANAGEMENT – MEETING THE MANY CHALLENGES

This fact sheet provides an overview of the challenges, accomplishments and financial implications of local government stormwater programs in the Washington metropolitan region, as well as a sense of the many deadlines that these programs are operating under.

Local governments in the region have been working since the 1930s to protect local and regional water quality. Great progress has been made, largely through employment of ever more sophisticated water quality technology at the area’s wastewater treatment plants starting in the 1960s. Despite this progress, there is a need to do even more, particularly in response to the pollution budgets known as **Total Maximum Daily Loads (TMDLs)**. In addition to their wastewater efforts, COG’s member governments are now also focused on the challenge of reducing the negative water quality impacts of stormwater runoff.

COG’s members have accomplished a lot in the stormwater arena. This includes the pioneering development and implementation of new types of “best management practices,” or **BMPs**, known collectively as “low impact development” (**LID**) and “environmental site design” (**ESD**) practices. It also includes implementation of dedicated stormwater program funding mechanisms by most of COG’s members. Today, the region’s local government stormwater programs continue to adapt in response to changing federal and state regulations. This includes a new generation of municipal stormwater permits and the need for new revenues at a time of limited local government funding. And much of this has been happening at a very accelerated schedule over the past 10 years.



### STORMWATER PROGRAM DRIVERS *(See timeline on page 3)*

**State and Local Stormwater Management Regulations** - Outline requirements for erosion and sediment control during the construction process and for the installation of BMPs to address stormwater runoff post-construction.

**MS4 (Municipal Separate Storm Sewer System) Permits** - Issued by the states and EPA, these require local governments to implement a variety of programs (ranging from detection and correction of illicit discharges to public outreach and education) to lessen the volume of pollutants carried by their municipal stormwater conveyance systems. These regulatory permits require consistency with the pollution budgets of applicable TMDLs; and have been issued over time (i.e., **Phase I** for larger jurisdictions, and **Phase II** for smaller municipalities—based on population).

**Local TMDLs** - Established by the states and EPA, these TMDLs set target reductions for pollutants (nutrients, sediment, bacteria, trash and PCBs) in a number of waters in the region that have been designated as ‘impaired’ (e.g. the Anacostia River, Four Mile Run and Seneca Lake).

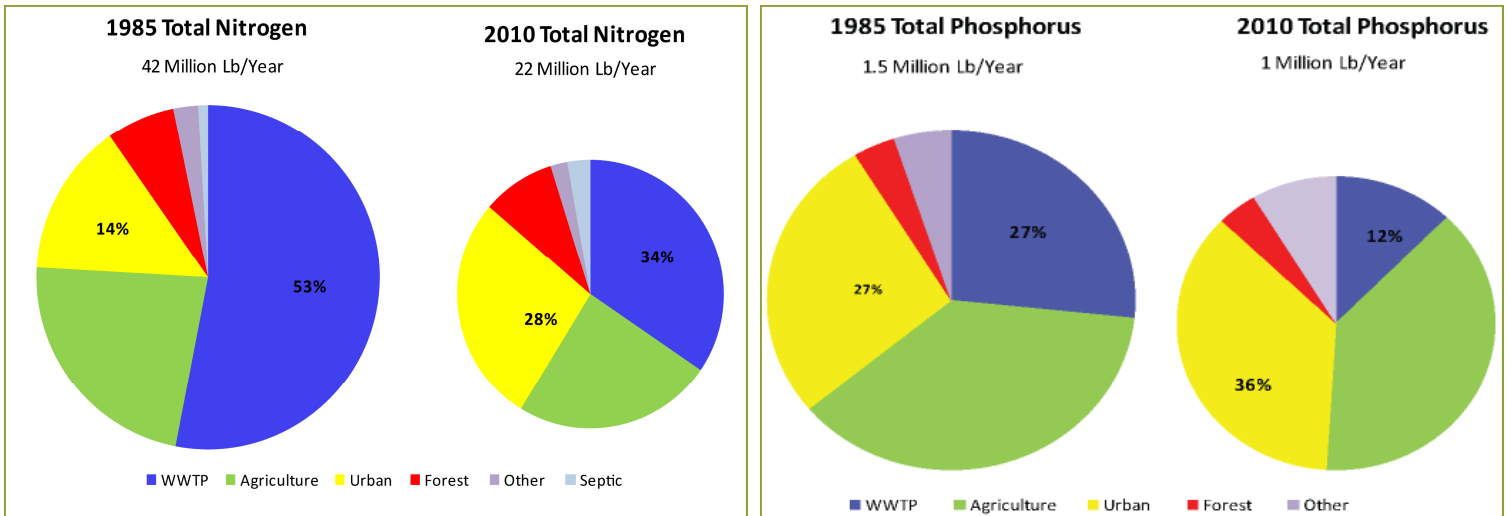
**Chesapeake Bay TMDL** - Established by EPA in December 2010, this massive pollution budget requires reductions in nutrient (nitrogen and phosphorus) and sediment pollution throughout the Bay watershed and for major tributaries such as the Potomac River.



## URBAN STORMWATER RUNOFF: A GROWING BAY-WIDE CHALLENGE

As illustrated in the charts below, in 2010 urban (stormwater) runoff accounts for about 28 percent of the nitrogen and 36 percent of the phosphorus amounts that reach the Bay from the COG region, according to estimates from the latest EPA models. This is about the same amount of both nutrients lost from agriculture and about the same amount of nitrogen discharged by wastewater plants in the region. The relative percentage of urban loads are also changing as the loads attributed to the region’s wastewater plants have decreased significantly over the past twenty-five years.

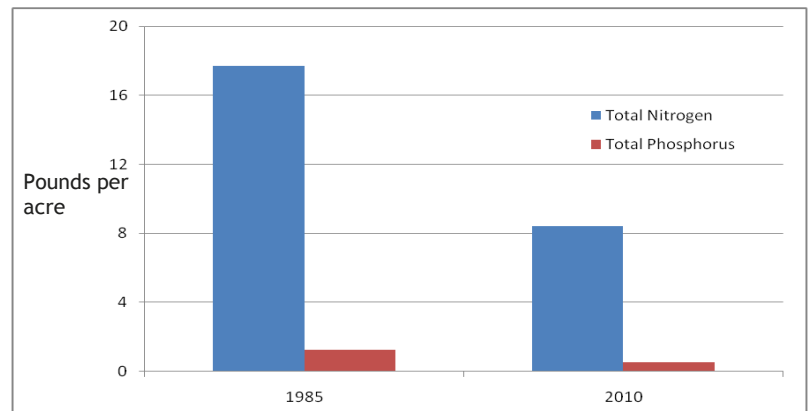
### COG REGION: PERCENTAGE OF ANNUAL BAY NITROGEN AND PHOSPHORUS CONTRIBUTIONS BY SOURCE *estimated for 2010 by EPA’s Chesapeake Bay Watershed Model)*



Stormwater is often singled out as the only significant source of pollutants to the Bay that has increased in recent years, but this characterization ignores the fact that the overall amount of land devoted to urban uses has increased a lot in recent years both in the region and throughout the watershed. The Chesapeake Bay Program estimates that urban land acreage in the COG region increased 35 percent in the last 25 years. However, **the pollutant loads associated with urban lands have increased at a much lower rate because of the widespread use of stormwater best management practices on new and re-development sites.** This can be seen by looking at the amount of nutrient pollution generated on a per-acre basis by urban land in 1985 compared to 2010 as shown in the chart below (again, as estimated for the COG region as-a-whole by EPA models),

### COG REGION: IMPACT OF STORMWATER MANAGEMENT ON URBAN LANDSCAPE OVER TIME

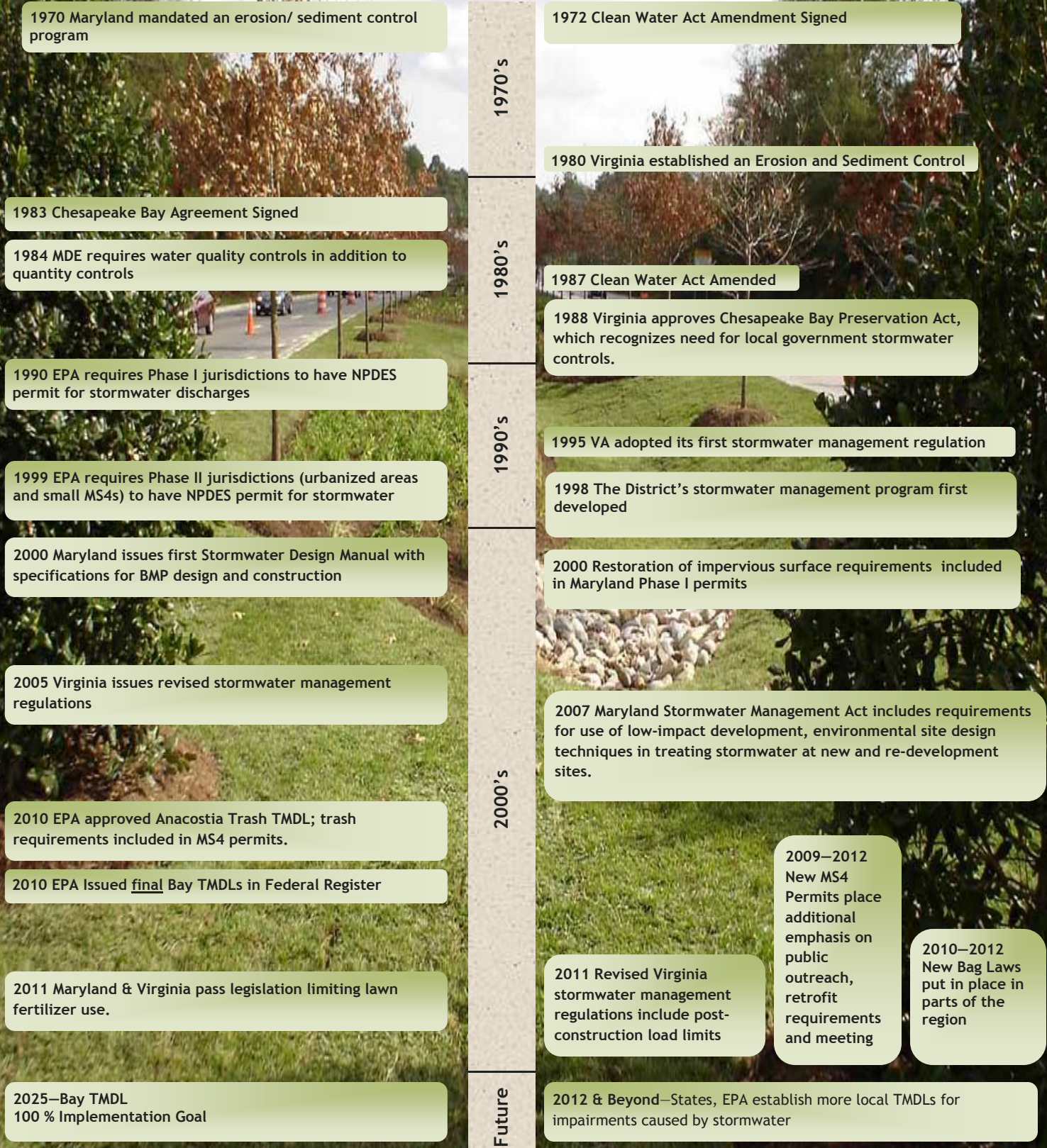
Despite these successes, the Bay TMDL and other drivers are forcing stormwater programs to also address pollution from the runoff from urban areas built before 1985, when stormwater BMPs first became widely used. The most common way of addressing this legacy pollution is through what are known as **stormwater retrofits**, in which various modern urban stormwater BMPs are incorporated into older existing urban landscapes. These retrofits, which tend to cost a lot more to install than BMPS on new developments, are now a requirement of MS4 permits in Maryland and the District of Columbia—and it is likely that they will become requirements in Virginia permits as well.





# REGIONAL STORMWATER TIMELINE

This timeline of regional stormwater mandates and programs dates back to the 1970s. Note that a majority of the regulations and requirements are recent developments (from 2000 to date) - reflecting the accelerated pace of stormwater management nationally and regionally.







Broadly stated, the goals of stormwater management are: (1) water quality protection, (2) stream channel erosion control and (3) flood reduction. Every jurisdiction, as part of its municipal separate storm sewer systems (MS4) permit requirements, has a suite of stormwater management practices in place to accomplish these goals. Stormwater management consists of a combination of the following diverse services, to varying degrees by locality. See illustrative boxes for examples of accomplishments throughout the COG region (or visit our [website](#) for even more information about local activities):

## STORMWATER ACCOMPLISHMENTS ACROSS THE COG REGION

(A FEW EXAMPLES ARE NOTED IN THE ILLUSTRATIVE BOXES BELOW)

### Project Design Construction Management & Oversight

- Permitting and plan review for new or retrofit construction, including roads in Maryland and the District of Columbia
- Facility inspection, maintenance and enforcement (public and private Best Management Practices (BMPs))

### Physical

- Impervious surface reduction/ disconnect
- Structural BMPs (including environmental site design, such as rain gardens and green roofs)

### Education/outreach

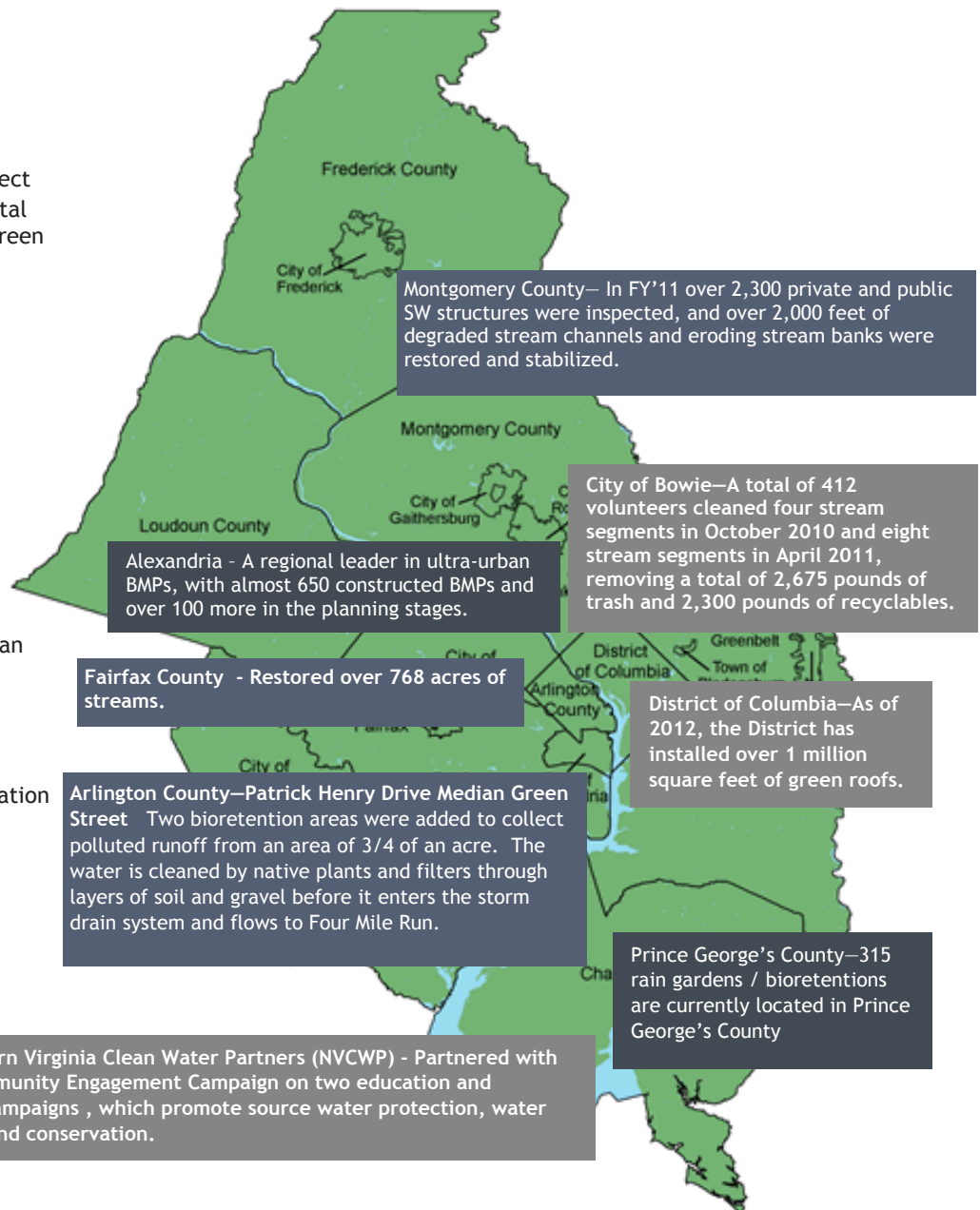
- Fertilizer reduction
- Integrated pest management
- Pet waste
- Anti-littering
- Homeowner stormwater management incentives programs
- Trash / litter removal

### Mitigation/Restoration

- Installation of riparian buffers and urban tree canopies
- Stream restoration
- Wetland restoration
- Street sweeping/inlet cleaning
- Illicit connection detection and elimination

### Water Quality and Aquatic Habitat Monitoring

- Nutrient, Metals, Pesticides, Organics, Bacteria
- Sediment and Physical Habitat
- BMP Performance Monitoring



## HOW ARE STORMWATER PROGRAMS FUNDED?

Unlike the wastewater sector, whose nutrient reduction efforts have received significant cost-share monies from state and federal governments—in addition to major local funding investments, stormwater programs are funded almost entirely at the local level, either by developers who install BMPs during construction or through the stormwater programs conducted by local governments. The latter are funded through a variety of means, but more and more local governments have turned to dedicated taxes or utility fees to fund their stormwater management programs.

### LOCAL STORMWATER FUNDING IN THE COG REGION

**Where** - All but three COG member jurisdictions have either established their own dedicated taxes or fee program or are subject to the tax and fee programs of other jurisdictions.

**When** - The majority of these local programs have been established in the last 5 years, although at least two of them date back to the late 1980s.

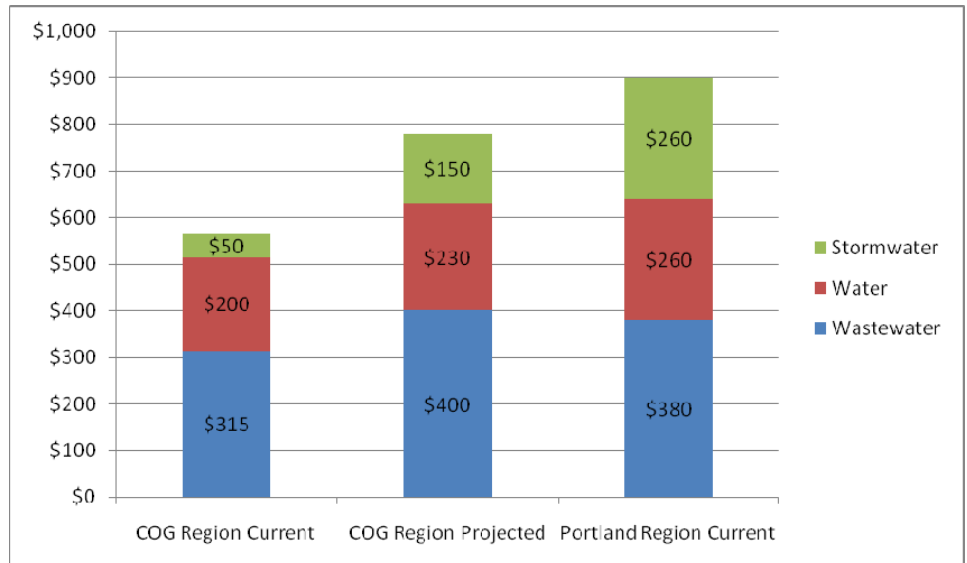
**Who Pays** - The tax/fee programs cover residential property owners; the majority of programs also cover commercial and multi-family properties.

**How Much** - The cost per household currently ranges from an average of about \$26 to an average of about \$74/year; the median cost is about \$50/household/year. Some of the fee programs are based on a sliding payment scale based on the size of the property or the extent of its impervious footprint. Some programs provide a credit for property owners who voluntarily install BMPs.

While both the extent and cost of the upgrades in stormwater management infrastructure to meet future regulatory requirements is still uncertain, it is clear that local governments will have to do a lot more in terms of both capital projects and annual operations and maintenance programs. As can be seen in the chart below, stormwater programs currently account for about 10 percent of the average total residential cost for water, wastewater and stormwater costs in the COG region. Current ballpark-level projections for future stormwater program costs show that stormwater may account for as much as 20 percent of the total water sector service costs in the next five years. This is about the same as current costs for water, wastewater and stormwater in the Portland, Ore., region, which is known for its cutting-edge stormwater technology.

### COMPARISON OF AVERAGE ANNUAL HOUSEHOLD COSTS/YEAR FOR STORMWATER, WATER AND WASTEWATER

Current COG Region costs for water and wastewater derived from a study of 2001-2010 costs conducted by the District of Columbia Office of the Chief Financial Officer. Current COG Region stormwater costs were provided by COG’s 2011 Stormwater Fee Survey. Projected costs were extrapolated from the 10-year trend for water and wastewater and estimated for stormwater from budget projections from several COG members .



**COG Members**

- District of Columbia
- Bladensburg\*
- Bowie
- Charles County
- College Park
- Frederick
- Frederick County
- Gaithersburg
- Greenbelt
- Montgomery County
- Prince George's County
- Rockville
- Takoma Park
- Alexandria
- Arlington County
- Fairfax
- Fairfax County
- Falls Church
- Loudoun County
- Manassas
- Manassas Park
- Prince William County

\*Adjunct Member

**COG's Water Resources Program**



The Department of Environmental Programs (DEP), Water Resources Program assist COG's local

government members, and affiliated wastewater treatment and drinking water utilities, with protecting, restoring, and conserving the region's water resources as well as addressing the policy and technical implications of various state and federal initiatives that have water quality. Visit our [Web Site](#) for additional information about our program and regional activities (including the Anacostia Program).

**Anacostia Restoration - A Local Example**

The Anacostia Watershed Restoration Steering Committee (SC) was established by COG Board Resolution R28-06 in June 2006; and created the Anacostia Watershed Restoration Partnership (Partnership). The Partnership's role is to oversee the accelerated restoration of the Anacostia River and its tributaries. The membership is drawn from the District of Columbia, Montgomery and Prince George's counties, the state of Maryland, the Anacostia Watershed Citizens Advisory Committee (AWCAC), academia, federal agencies, foundations, businesses and NGOs. While the Partnership was created through COG Board of Directors action, and is administered through COG; it functions as an independent entity in terms of adoption of policy, as well as work program, budget and other financial matters. Since the Partnership was reconstituted, its members have accomplishments include:



- **Anacostia Restoration Plan** – Includes 1,781 stormwater retrofits
- **Trash TMDL** - The second enforceable trash limit implemented in the Nation
- **Strongest Stormwater Ordinances & Permits** - Local requirements lead the Nation
- **Focus on Green Streets** - Six new green streets projects planned for the watershed
- **Designation as 'Urban Water of National Significance'** - Partnership's strong coordination function was a strong factor in receiving this designation
- **Stakeholder Involvement** - Developers, environmental groups, municipalities and funders are all engaged in a regular dialog with governmental agencies and entities
- **Bag Fee** - Strong bag fee bills have been adopted to help reducing trash in the waterway

More information is available at the Partnership's web site at <http://www.anacostia.net/>

**SUMMARY**

The overall picture of stormwater management in the COG region will change dramatically in the next few years as local government programs adapt to the challenges posed by new permits and regulations. More efforts will be made to retrofit older developed areas. And COG's member governments will gain further experience with LID and ESD techniques that are being promoted by state and federal regulation. Stormwater funding mechanisms at the local level will also continue to evolve. COG expects to continue to work with its members to collect and update cost and performance data that will help shape the future direction of stormwater management. COG and its members will also continue to evaluate the potential implications of climate change impacts on the frequency, duration, and intensity of precipitation patterns and runoff volumes which is the basis of stormwater management.

**Region Forward—Sustainability Goal**

**Target:** By 2025, achieve 100% of Chesapeake Bay Program's Water Quality Implementation Goals  
Local goals have been set for wastewater treatment plants, but have not yet been defined for the region's stormwater programs. As long as current construction schedules and funding sources are maintained, all of the region's wastewater plants have already or are on schedule to meet their implementation goals. Goals for the region's stormwater programs have not yet been quantified, but are expected to be defined later in 2012 .

**Target:** By 2050, 50% of all sentinel watersheds will be in good or excellent condition  
Achieving the regional watershed target for sentinel watersheds will require a broad number of strategies including retrofitting stormwater controls in impervious areas. Visit [www.mwco.org](http://www.mwco.org) for more information.

