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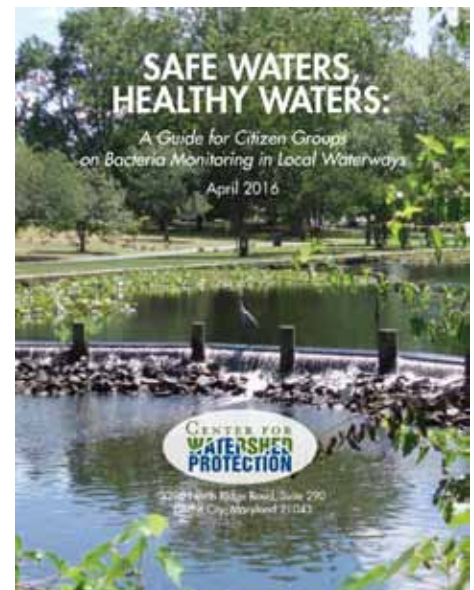
Center Releases *Safe Waters, Healthy Waters* Guide for Citizen Groups on Bacteria Monitoring

Today, the Center for Watershed Protection released its *Safe Waters, Healthy Waters* guide for citizen groups on bacteria monitoring in local waterways.

Water quality data compiled by EPA in 2015 show that 39% of assessed rivers and streams, 13% of assessed lakes, reservoirs and ponds, and 30% of assessed bays and estuaries in the U.S. are not clean enough to support recreational uses such as fishing or swimming. One of the most commonly identified pollutants in our Nation's waters is bacteria and, in urban waters, a primary source of bacteria is untreated or partially treated sewage from sanitary sewer overflows (SSOs) and leaks from old and deteriorating systems, dumping, illegal sewer connections and failing septic systems. Water that is contaminated with sewage presents a serious health risk to the public, particularly in areas where people recreate, such as beaches and swimming holes.

The Center has been working to address the important issue of sewage discharges, including authoring a national guidance on illicit discharge detection and elimination in 2004 and working with more than 20 communities to apply the monitoring protocols for identifying and tracking the sources of illicit discharges. This work has shown some surprising results about the prevalence and contribution of sewage discharges in urban areas:

- Even in cities such as Baltimore, Maryland, where MS4 permit requirements and consent decrees for SSOs are being enforced, initial sampling showed that 53% of outfalls tested had bacteria levels above the recommended threshold for contact recreation.
- In the same Baltimore watershed, the bacteria load from outfalls with suspected illicit discharges was estimated to be 51% of the bacteria reductions required under a local TMDL.
- Other communities have missed detecting a portion of their illicit discharges simply because they don't sample small outfalls or do not use ammonia as an indicator.



- Eliminating illicit discharges can be significantly more cost-effective than most other practices, including green infrastructure, to reduce nutrients and other pollutants.

It is clear from these findings that local government agencies need help to effectively address sewage discharges. A recent report from the Izaak Walton League entitled *Clean Water: Your Right to Know* (www.iwla.org/righttoknow) uncovered some startling results that also underscore the need for greater monitoring efforts by non-governmental organizations to enhance State and local government programs:

- States are effectively monitoring water quality in only 2% of rivers and streams nationwide.
- Testing sites are often randomly located and limited in number, and most information about water quality in streams is 5 to 10 years old.
- More than half of all states (26) received D or F grades for the overall effectiveness of the state's stream monitoring efforts.

Citizen monitoring programs can help to sample where other agencies aren't testing or provide data to convince local agencies to establish monitoring programs. Citizen monitoring is also an effective way to improve the public's knowledge of the safety of their water and to act as a "watchdog" to ensure that local agencies are addressing the problem.

The *Safe Waters, Healthy Waters* document provides guidance for citizen groups on how to identify, narrow down sources and communicate about bacterial contamination, with a specific focus on human sewage sources and monitoring techniques that are simple, reliable and low-cost. It also includes a series of case studies of successful citizen monitoring efforts. The guide is available for download on the [Online Watershed Library](#).

Funding to develop the guide was provided by the Ittleson Foundation and the Cornell Douglas Foundation. For more information, contact Laurel Williamson, Stormwater and Watershed Planner, Center for Watershed Protection, at lw@cwpl.org or 434-293-5793.

New Nutrient and Sediment Reduction Credit Approved for Street Sweeping and Storm Draining Cleaning

The Chesapeake Bay Program recently approved an updated protocol to credit street sweeping and storm drain cleaning practices as a result of recommendations made by an Expert Panel in May 2016. The Expert Panel, which included the Center's own Dr. Neely Law, was formed to re-evaluate the nitrogen, phosphorus and sediment pollutant reduction credits adopted in 2011. The 2011 protocol presented challenges for jurisdictions to apply the credits towards the Chesapeake Bay total maximum daily load (TMDL) given the required frequency of street sweeping, and it did not provide guidance on reporting and tracking for BMP verification for either street sweeping or storm drain cleaning. Further, new research suggested an improved understanding of the effectiveness of these practices and the type material removed. Consequently, the panel recommendations will result in a phase-out of the existing methods for calculating pollutant reduction for street sweeping, while providing clarification and guidance to incentivize practices to remove material from storm drains.

Cleaner streets should result in cleaner streams given the direct connection of roads and storm drain infrastructure to surface waters. In its extensive review of the literature, the Panel concluded that material picked up from street sweepers is associated with a suite of pollutants to include sediment, nutrient, organic matter, toxics, and trash, with a somewhat consistent pattern of particle size distributions. Emerging research also illustrated the significant amount of leaf litter that is collected during the Fall in residential areas with tree canopy. However, despite long-standing street sweeping and storm drain cleanout programs, research has been unclear on demonstrating the effectiveness of these practices from water quality monitoring alone. Consequently, the Panel adopted a modeling approach to inform recommendations on the pollutant removal effectiveness from street cleaning programs.

The Panel agreed to use the Source Loading and Management Model (WinSLAMM) model, adopted for use in the Chesapeake Bay watershed, to estimate sediment reductions from a variety of street sweeping scenarios. A spreadsheet tool was used to apply nutrient enrichment ratios, derived from the literature, to the mass of sediment to estimate the nitrogen and phosphorus reductions. The WinSLAMM scenarios reflected a range of frequencies, timescales (seasonal and annual), road types, and street parking controls for mechanical and vacuum-assisted technologies. The model output informed the nutrient and sediment reductions associated with 11 different street sweeping scenarios. This is a vast improvement in the credit options available for

street sweeping compared to the singular frequency (26 times per year) of the previous credit. However, the model output illustrates the very limited credit available for mechanical street sweeping technology.

In addition to the protocols to define nutrient and sediment reductions for street sweeping practices, the Panel provided recommendations to credit storm drain cleaning. Compared to street sweeping, fewer studies with more variable results were found to evaluate the effectiveness of storm drain cleaning. The frequency at which inlets and storm drains are cleaned is typically once or a few times a year at best, and therefore, there is much opportunity for material to be flushed into the stream between clean-out events. This material decomposes, leaches and transforms pollutants such as nitrogen. As such, the Panel elected to recommend a mass-loading approach, similar to the 2011 credit, to derive nutrient and sediment reduction credits for storm drain cleaning. However, the new protocol provides updated values to calculate the credit along with opportunities to use a broader range of techniques that would be eligible for credit following a set of qualifying conditions. The sediment credit is based on the dry-weight of the mass of solids captured and removed from catch basins, within storm drain pipes, or at the stormwater outfalls. Similar to the street sweeping protocol, nutrient enrichment factors are applied to generate the pounds of nitrogen and phosphorus.

Practice Number	Technology Type	Sweeping Frequency	TSS Removal (%)	TN Removal (%)	TP Removal (%)
SCP1	Advanced ¹	2 per week	21	4	10
SCP2	Advanced	1 per week	16	3	8
SCP3	Advanced	1 per 2 weeks	11	2	5
SCP4	Advanced	1 per 4 weeks	6	1	3
SCP5	Advanced	1 per 8 weeks	4	0.7	2
SCP6	Advanced	1 per 12 weeks	2	0	1
SCP7	Advanced	Seasonal 1 or 2 ²	7	1	4
SCP8	Advanced	Seasonal 3 or 4 ³	10	2	5
SCP9	Mechanical Broom	2 per week	1	0	0
SCP10	Mechanical Broom	1 per week	0.5	0	0
SCP11	Mechanical Broom	1 per 4 weeks	0.1	0	0

¹ Advanced technologies include Regenerative-air and Vacuum Assisted sweepers

² Spring sweeping from March to April, either one pass every or every other week, monthly otherwise

³ SCP7 and Fall sweeping from October to November, either one pass every or every other week, monthly otherwise

Check out the Center's On-line Watershed Library (OWL) to download the final report as well as a literature review and survey on street sweeping. Go to <http://owl.cwp.org/> and search "street sweeping" to download all three!

NEW- May 2016 issue of the Watershed Science Bulletin is available!

Evaluating the environmental effectiveness of grassroots environmental stewardship organizations in Maryland, USA

By Sarah L. Close, Dana R. Fisher, William Yagatich and Anya Galli

Small organizations that conduct environmental stewardship projects often lack access to the research capacity, funding, or tools needed to evaluate scientifically the environmental effectiveness of the measures they undertake. Still, evaluation of environmental effectiveness, defined here as the implementation of specific local goals, is prudent where projects are carried out with environmental stewardship goals in mind. We propose and test a process for evaluating environmental effectiveness of stewardship programs in a rigorous, yet feasible, approach through analysis of archived documents, program materials, and project inventories, as well as a survey of program participants. Using three franchises of the Watershed Stewards Academy in Maryland as a case study, we evaluate the environmental effectiveness of the stewardship work conducted by these organizations.



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The Watershed Science Bulletin is the journal of the [Center for Watershed Protection Association](#). This peer-reviewed online journal features practical, science-based solutions to watershed and stormwater management issues. An Editorial Committee composed of nationally-respected watershed and stormwater management professionals reviews and selects articles for publication based on their quality, presentation of original or novel information, and ability to further the mission of the journal. Archived issues are available to read online at the Center's [Online Watershed Library](#).

CWPA Member Highlight

The Arlington County Office of Sustainability and Environmental Management appreciates being a CWPA member for access to the extensive research library and discounts on the excellent educational webcasts. Arlington was the first local government in Virginia to begin implementing the new generation of MS4 Permits with Chesapeake Bay TMDL requirements, and the Center's resources and information have helped us strengthen our stormwater program to meet the new requirements. Arlington also partnered with the Center for Watershed Protection to complete a [stormwater retrofit study](#) of the County in 2013, to identify locations for new stormwater facilities.

Arlington is excited to have several major stormwater projects ready to begin construction in 2016. The Four Mile Run Restoration project, a long term revitalization plan for the lower two miles of Four Mile Run, will begin construction later this summer. The project will replace rip rap along the Four Mile Run stream with living shorelines and native plants. The West Little Pimmit Run Storm Sewer project includes a storm sewer upgrade, water main replacement, and four bioretention facilities, and will also begin construction later this year. Learn more about these projects, and several others on the [Arlington County](#) web site!