MASONVILLE COVE SMALL WATERSHED ACTION PLAN

NATIONAL AQUARIUM

PREPARED FOR:
Masonville Cove Watershed Stakeholders
and Masonville Cove Small Watershed Action Plan Steering Committee

PREPARED BY:
National Aquarium

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- The National Fish and Wildlife Foundation
- The Chesapeake Bay Trust
- The Center for Watershed Protection
- Maryland Port Administration
- Maryland Environmental Service
- Living Classrooms Foundation

In addition, the Aquarium wishes to acknowledge the following individuals and organizations for serving on the Masonville Cove Small Watershed Action Plan Steering Committee.

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EXECUTIVE SUMMARY

Masonville Cove, a reclaimed waterfront within Baltimore City limits, is quickly becoming a model project for urban habitat reclamation and restoration. Initiated by the Maryland Port Administration (MPA), the restoration of the cove was meant to provide community-supported environmental enhancements and water access to local citizens in return for a locally-sited Dredged Material Containment Facility (DMCF).

In 2009, The Masonville Cove Environmental Education Center opened to the public, as a prototype net-zero energy efficient facility. In 2012, the first portion of Masonville Cove's restored nature area opened to the public and in October 2013, Masonville Cove was designated as the nation's first Urban Wildlife Refuge Partnership.

As an extension of the restoration work occurring at the water's edge, Masonville Cove partners identified a need to expand the reach of restoration and environmental education efforts upstream into the target watershed and to bring together diverse partners and volunteers to improve the health of the Masonville Cove watershed and the quality of life in the Brooklyn/Curtis Bay communities. The goals of this effort would be to develop priorities that would augment the downstream restoration work at the Cove, engage and empower local citizens to become active stewards and champions of clean and healthy neighborhoods, and feed into upcoming mandated efforts to improve water quality.

The Masonville Cove Small Watershed Action Plan (SWAP) process was developed to accomplish these goals and to eventually prioritize projects and efforts that would both have strong support by the local community and a high potential for the greatest impact on local water quality. To do this, existing data was analyzed, the community was engaged and technical assessments were made.

FINAL PRIMARY RECOMMENDATIONS:

- Implement a Bioretention Project that has the capacity to treat 7.6 acres of stormwater runoff and remove 2.9 pounds of phosphorus per year and 42.2 pounds of nitrogen per year
- Implement a Regenerative Stormwater Conveyance Project that has the capacity to treat 9.5 acres and remove 2.4 pounds of phosphorus per year and 32.9 pounds of nitrogen per year
- Develop a comprehensive education/outreach/stewardship plan around reducing litter in the two affected communities of Brooklyn and Curtis Bay

SECONDARY RECOMMENDATIONS:

- Increase the tree canopy within the watershed
- Promote environmental stewardship
- Promote environmentally friendly development

It is the intention of the steering committee and Masonville Cove partners to use the SWAP to inform decisions around future projects (including stormwater retrofit and community enhancements) as additional resources and opportunities become available. Most predominantly, due to the timing of Baltimore City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit and the upcoming Watershed Implementation plans, the steering committee is championing the inclusion of a number of priority retrofit projects identified in the SWAP to be added to the possible list of stormwater projects needed to meet permit requirements.

SECTION 1: INTRODUCTION

MASONVILLE COVE URBAN WILDLIFE REFUGE PARTNERSHIP

The Maryland Port Administration (Port) created the Masonville Cove Dredged Material Containment Facility (DMCF) as a placement option for material dredged from Baltimore Harbor as part of a comprehensive Dredged Material Management Plan. The Port's participatory community-based decision-making process generated community support for timely construction of the DMCF. As part of the negotiations for siting the facility, the community suggested that a set of enhancements occur in tandem with the construction. Enhancements consisted of three core elements: a comprehensive restoration of Masonville Cove; an environmental education facility to be located near the cove; and five years of seed funding for environmental education programming for activities in the building and throughout the Cove.

More than six years ago, the National Aquarium, Living Classrooms Foundation and community organizations became stakeholders in the Port's Masonville Cove project. As such, they forged a partnership with the state and each other to engage the local community and students in environmental education and restoration at Masonville Cove. In 2009, The Masonville Cove Environmental Education Center opened to the public as a prototype net-zero energy efficient facility. Living Classrooms and the National Aquarium have provided environmental education at the center since it opened and in local schools since 2007. To date, they have reached over 5,500 students and 226 teachers.

In 2012, the first portion of Masonville Cove's restored nature area opened to the public. Visitors can enjoy walking trails, fishing from a designated pier and bird watching. In October 2013, Masonville Cove was designated as the nation's first Urban Wildlife Refuge Partnership. The US Fish and Wildlife Service (FWS) has been working with the Masonville partners for almost two years to provide assistance with visitor services and wildlife management. The designation of the Masonville Cove Urban Wildlife Refuge Partnership is a formal recognition of excellence under the Service's urban wildlife refuge initiative. Under the initiative, the Service is striving to make programs relevant to the lives of urban audiences and provide ways for them to participate in a variety of nature-based experiences and opportunities.

Through the Masonville Cove Small Watershed Action Plan (SWAP) process, the National Aquarium has worked to expand the reach of restoration and environmental education efforts upstream into the target watershed and bring together diverse partners and volunteers all working to improve the health of the Masonville Cove watershed and the quality of life in the Brooklyn/Curtis Bay communities.

MASONVILLE COVE WATERSHED CHARACTERISTICS

Masonville Cove is located on the southern side of the Baltimore Harbor on the Middle Branch of the Patapsco River in Baltimore, MD. The surrounding watershed is approximately 76 percent urban and 42 percent impervious with medium- to high-density residential development and industrial areas covering much of the watershed. A portion of the 1.2 square mile watershed lies within Anne Arundel County, but the majority of the drainage area can be found within the city limits. In this highly urbanized watershed, trash and debris are a huge problem, affecting not only water quality but also quality of life in the surrounding neighborhoods.

It is clear that local water quality is poor. The annual Chesapeake Bay report card developed by the University of Maryland Center for Environmental Science (UMCES) has consistently given the Patapsco River a grade of D or worse since 2006. Even closer to home,

the Healthy Harbor report card has graded the Inner Harbor area and Middle Branch of the Patapsco (location of Masonville Cove) with an F for the past two years. Indicators that are used to develop the grade include dissolved oxygen, total nitrogen, total phosphorus, water clarity and bacteria levels.

In addition to excess nutrients, sediments and bacteria levels, a Total Maximum Daily Load (TMDL) for debris/floatables/trash is being established for the Middle Branch of the Patapsco under federal Clean Water Act requirements. The fact that there are only three rivers in the United States currently under a TMDL for trash underlies the pervasive pollution issues plaguing this region.

WATERSHED PLANNING AND SMALL WATERSHED ACTION PLANS

Watershed planning is defined as "cooperative local and regional land use planning that recognizes watershed boundaries rather than political boundaries and considers water resources management as the central planning objective." Watershed planning is a highly effective strategy for improving water quality and for improving local communities. Specific benefits include:

- Provides a framework for prioritizing resources
- Provides educational opportunities for citizens to understand how natural resources management interacts with existing and future development
- Gives citizens an active voice in protecting and restoring natural resources that are important to the community
- Provides a structure for communities to target geographic areas for land conservation and development to maximize the efficiency of community planning efforts
- Improves water quality
  Protects wildlife habitat and improves natural resources
- Provides a framework and retinal to pursue various funding opportunities

A small watershed action plan, or SWAP, identifies strategies to bring a small watershed into compliance with water quality standards and goals, in collaboration with community partners. A SWAP goes beyond traditional government capital projects and includes actions in partnership with local watershed associations, citizen awareness campaigns and volunteer activities.

This watershed plan fulfills requirements of National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit issued to both the City and the County by the Maryland Department of the Environment. It also addresses the Chesapeake Bay TMDL developed by the EPA for nitrogen, phosphorus and sediment by providing each jurisdiction with necessary information to implement their Watershed Implementation Plans.

MAP 1: *Masonville Cove Watershed Boundary*

SECTION 2: SMALL WATERSHED ACTION PLAN PROCESS AND GOALS

SMALL WATERSHED ACTION PLAN PROCESS

Small watershed action plans, or SWAPs, use innovative processes to engage community members, non-profit partners and business leaders around water quality standards and goals. The Masonville Cove Small Watershed Action Plan used a 10-step process:

1. **ASSEMBLE STEERING COMMITTEE**
   In this step, interested parties reach out to community partners including, community organizations, churches and schools and watershed planning experts from local businesses, non-profits and municipalities. Organizations and/or individuals that are interested in the SWAP process are asked to serve on the Steering Committee.

2. **GATHER EXISTING DATA**
   The assembled Steering Committee members seek out and gather data that may already exist including scientific papers, community reports and neighborhood strategic plans that pertain to the small watershed.

3. **DEVELOP INITIAL GOALS**
   Steering Committee members use existing data and their knowledge of the community and small watershed to draft a list of initial goals.

4. **STAKEHOLDER MEETING**
   The Steering Committee presents its list of draft goals to the community through a stakeholder meeting and solicits feedback on community priorities for the SWAP. Based on this information, the Steering Committee finalizes a list of goals for the SWAP.

5. **CONDUCT WATERSHED ASSESSMENTS**
   Experts from the Steering Committee assess the current state of the watershed through a stormwater field assessment. Community members provide detailed neighborhood assessments to identify and document trash hotspots in the community.

6. **COMPILE DATA COLLECTED**
   Steering Committee members compile data collected to create a comprehensive portrait of watershed health and potential action items to improve any concerns identified. Using input from technical experts and community members, the Steering Committee prioritizes potential projects.

7. **DRAFT ACTION PLAN**
   Background information, collected data and proposed projects are compiled by Steering Committee members into a draft action plan.

8. **STAKEHOLDER MEETING**
   The draft action plan is presented to community members at a stakeholder meeting. Steering Committee members review the SWAP process, present collected data and propose prioritized projects. Stakeholders are asked to give feedback on initial findings and offer suggestions for potential projects.

9. **FINALIZE ACTION PLAN**
   Based on community feedback, Steering Committee members finalize the action plan and officially release the SWAP to the stakeholders and the broader public.

10. **IMPLEMENT ACTION PLAN**
    Steering Committee members and partner organizations work together to find funding and other support required to implement priority projects. Whenever possible, community members participate in the actual implementation of the projects.

DEFINITIONS:

Steering Committee Members: representatives from the community that have committed to serving on the SWAP steering committee.

Steering Committee: the core team of representatives from community organizations, local non-profits, local government and local businesses that works to guide the SWAP process and to fully engage the community at every step of the process.

Stakeholders: community members that live, work or play in the small watershed and/or anyone that may be affected by implementation of the action items.

MASONVILLE COVE SMALL WATERSHED ACTION PLAN GOALS

Steering Committee members drafted a list of initial goals for the Masonville Cove SWAP in December 2013. Based on feedback gathered at the February stakeholder meeting from community members and students, the following list of goals was finalized:

- Community involvement
- Improve and maintain stream conditions
- Reduce pollution from stormwater runoff
- Promote environmentally sensitive development
- Reduce trash in alleys and streets
- Promote increase in tree canopy
- Promote environmental stewardship
- Support Masonville Cove restoration efforts

The Steering Committee's experts and community representatives relied heavily on these goals through the SWAP process, using them as the primary benchmark for evaluating progress.

SECTION 3: MASONVILLE COVE WATERSHED DATA COLLECTION

The steering committee used a multi-faceted approach to data collection:

- Use existing data
- Capitalize on community knowledge
- Enlist expert help
- Use city-wide crowd sourcing

GATHERING EXISTING DATA

In fall 2013, Steering Committee members worked to gather existing data that pertained to the Masonville Cove Watershed and/or the surrounding neighborhoods. Four key documents were identified:

1. MASONVILLE COVE TRIBUTARY: WATERSHED STUDY; STRAUGHAN ENVIRONMENTAL SERVICES, INC.

In 2009, as part of habitat restoration plans for Masonville Cove, the Maryland Port Administration commissioned an evaluation of the stream that flows into the Cove. Valuable data collected from this report was used to provide some baseline information about existing watershed conditions.

2. BALTIMORE CITY SUSTAINABILITY PLAN

In the city's comprehensive Sustainability Plan, one of the strategies to improve water quality includes the creation of "watershed-based natural resource management plans" for each subwatershed.

3. BROOKLYN/CURTIS BAY STRATEGIC NEIGHBORHOOD ACTION PLAN (SNAP)

The Brooklyn/Curtis Bay SNAP is one component of a citywide initiative to reverse decades of disinvestment in Baltimore's older neighborhoods by strengthening their character, quality and livability to benefit existing residents and attract new private investment. Then Mayor Martin O'Malley launched the SNAP program to create comprehensive plans for select clusters of neighborhoods throughout the city, following his administration's philosophy of putting Neighborhoods First and building on established strengths.

4. MIDDLE BRANCH MASTER PLAN

The Middle Branch Master Plan acts as an overlay plan to the existing communities. It is intended to complement and support existing plans and programs. Residents work with their neighbors across traditional boundaries, as well as with City agencies and other stakeholders (including nonprofits, churches, institutions and businesses).

STAKEHOLDER MEETING

February 26

On February 26, the Steering Committee hosted a stakeholder meeting at Benjamin Franklin High School. Experts from the Committee presented background information on watershed planning, SWAPs and the initial goals developed for the Masonville Cove SWAP. A total of 38 stakeholders participated in the meeting, including high school students, community members and representatives from local businesses, from Baltimore City and from non-profit partners.

Community members were divided into small groups for discussion about the SWAP process, the Brooklyn/Curtis Bay neighborhoods, community priorities and concerns about watershed health. Each small group was led by a facilitator from the Steering Committee and guided by prepared questions. Small group discussions resulted in rich qualitative data about the Masonville Cove Watershed and the Brooklyn and Curtis Bay neighborhoods. Conversations about challenges to the watershed's health led naturally to suggestions for community-based solutions. Below is a summary of some of the key themes and potential solutions identified in the small group discussions (see Appendix for full notes):

EXPLORING THE PROBLEMS	BRAINSTORMING SOLUTIONS
Strong connection between rats/trash	Community gardens
Trash accumulates in the alleys	Composting
Trash cans are the big problem	Rat-proof trash cans
▮ They aren't rat-proof	Recycling
▮ Some people don't have them	Small Watershed Action Plan
Food waste is what attracts rats	Education and outreach
People are the reason for pollution	Community organizing
Public green spaces are not maintained	

Stakeholders were also asked to mark key spots on maps of the Masonville Cove watershed including their homes (green stickers), places they have seen trash accumulate (pink stickers), places they have seen trash dumped (yellow stickers) and places they have seen flooding (orange stickers). This resulted in valuable on-the-ground data from the people that know the Brooklyn/Curtis Bay neighborhoods best (see Appendix for detailed copies of maps from community meeting). The Steering Committee used this information to help identify hotspots for trash and illegal dumping.

COMMUNITY-BASED WATERSHED ASSESSMENTS

Training and Data Collection

Engagement of the stakeholders was expanded to include data collection. With this goal in mind, the Steering Committee conducted a Watershed Assessment Training on March 13. Experts from the Center for Watershed Protection and from the National Aquarium trained 20 student and community volunteers to conduct neighborhood assessments and document their findings. The volunteers learned how to use GPS units, complete a technical data sheet, tally trash found in the watershed and identify potential factors affecting localized pollution. These dedicated volunteers were then tasked with collecting important data for the SWAP.

Completed community watershed assessment data sheets pointed to the same problems of trash in the neighborhood that the community meeting highlighted (see Appendix A for complete data sheets). The most common trash items documented were plastic, including plastic bottles and bags.

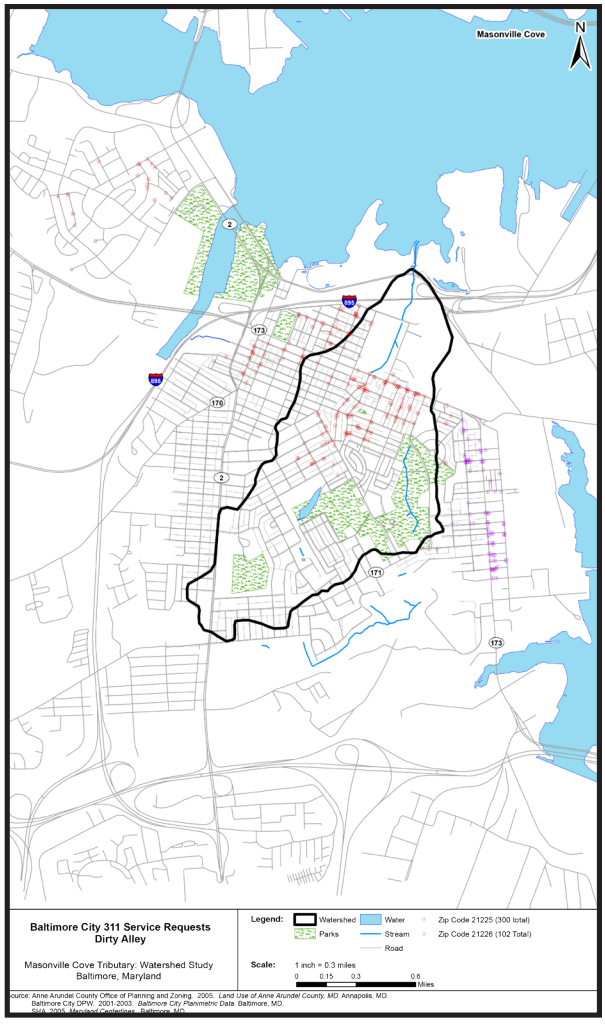
COMMUNITY-BASED WATERSHED ASSESSMENTS

In addition to the community-based data collection, experts from the Center for Watershed Protection (CWP) conducted an extensive technical assessment of the Masonville Cove watershed. Their primary goals were 1) identify sites for potential stormwater retrofits and 2) conduct an informal neighborhood assessment. After reviewing all of the current data on the watershed, CWP staff used available GIS layers and aerial imagery to identify potential stormwater retrofit locations. At each of these potential locations, staff from the CWP and from the National Aquarium collected technical data to determine project feasibility, potential water quality impact and estimated project implementation costs. Based on this data, CWP experts provided recommendations on priority stormwater retrofit projects and community initiatives.

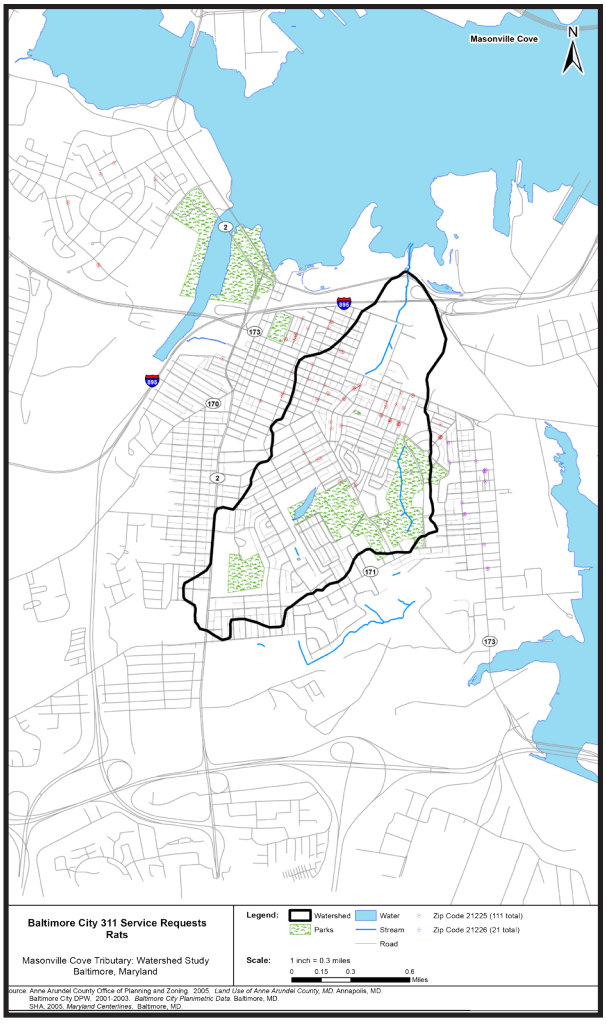
DATA COLLECTED FROM 311

The City of Baltimore collects extensive crowd-sourced data through the 311 Call Center. When city residents have a question or complaint, they can call 311 for help or to report a concern. City representatives on the Masonville Cove SWAP Steering Committee tapped into this resource to collect GPS-based data on 311 phone calls about 1) dirty alleys 2) flooded streets 3) rats and 4) storm inlet chokes (see maps in Appendix C). Not surprisingly there is extensive overlap between 311 calls about dirty alleys and rats. This data also corresponds closely with the trash hotspots identified at the stakeholder meeting in February.

MAP 1. *Baltimore City 311 City Requests–Dirty Alley*



MAP 2. *Baltimore City 311 Service Requests–Rats*



SECTION 4: RECOMMENDED WATERSHED MANAGEMENT STRATEGIES

Through the SWAP process, two priority stormwater retrofit projects were identified and the need for a comprehensive trash/litter outreach and education program was recognized. Additionally, the Steering Committee has identified several in-progress initiatives that may help to address trash concerns in the Brooklyn/Curtis Bay communities and in Masonville Cove.

STORMWATER RETROFIT PROJECTS

The Center for Watershed Protection's (CWP) technical report names a total of 23 potential stormwater retrofit projects in the Masonville Cove watershed. The majority of proposed projects include bioretention practices, but the list also includes one regenerative stormwater conveyance system, two locations for impervious cover removal and one wet swale project.

DEFINITIONS:

Bioretention: the process in which contaminants and sedimentation are removed from stormwater runoff typically through a constructed treatment area

Regenerative Stormwater Conveyance: a specialized type of stream restoration focused on preventing erosion along headwater streams and/or stormwater outfalls

Impervious Cover Removal: removal of concrete, assault, sidewalk, roadway or other impervious surface and replacement with pervious pavers, gardens, forest or other permeable surface

Wet Swale: a constructed, gently sloping, shallow channel that is designed to reduce stormwater pollution

Based on the estimates for project costs and impact to local water quality, CWP staff recommend two priority retrofit projects 1) a bioretention project at Farring Baybrook Park at West Bay Ave and Tompkins Ct (#11C) and 2) a regenerative stormwater conveyance in Farring Baybrook Park near the Rec Center (#18A). Both of these projects have the potential to reduce a significant amount of the sediment entering Masonville Cove. The Steering Committee highly recommends that these projects are actively pursued.

The Steering Committee is also well aware of current efforts to develop plans around proposed use of Farring Baybrook Park and plans by the Baltimore City School System to work on school properties in the near future. It is believed that the two perspective projects will not interfere with either of these planned enhancements.

COMPREHENSIVE TRASH/ LITTER OUTREACH AND EDUCATION

Community members communicated at every step of the SWAP process that trash was a major concern for the health of the Brooklyn/Curtis Bay communities and for the health of Masonville Cove. Data gathered at the stakeholder meeting, during the watershed assessments and during CWP's technical assessment all confirmed that trash is pervasive throughout the watershed and throughout Masonville Cove. This trash is threatening the health of the community and the health of the environment.

To address this widespread problem, the Steering Committee recommends the creation and implementation of a comprehensive trash/litter outreach and education program. This initiative should target all members of the community, including school children, homeowners, business owners, community associations, churches, renters, etc. Potential components of this program include:

- School-based education about urban-runoff, trash and watersheds
- Community workshops that highlight the connection between rats and trash and educate residents on how to properly dispose of compostable
  materials, recyclables and trash
- Community clean-up days
- Dumpster days to help community members dispose of bulk trash items in a free, legal and environmentally-friendly way
- Provide rat-proof trash cans to residents who can't afford their own

Steering Committee members and community stakeholders agree that education and outreach are the long-term solutions to an unhealthy watershed. This comprehensive plan needs to focus on long-term outcomes. While every community citizen contacted throughout the SWAP effort agreed that trash was a major issue in the neighborhoods, the students involved were much more likely to want to create change. Harnessing their energy and creativity should be a focus of future community-based debris reduction efforts.

LARGER PROJECTS TO ADDRESS TRASH/LITTER

Throughout the SWAP process, Steering Committee members identified two projects that are already in progress that will help address some of the trash/litter concerns identified by the community. In the spring of 2014, the City of Baltimore implemented a comprehensive Street Sweeping Program and recently announced that 1,600 tons of debris were removed from roadways in the first six months of the program. The program includes sweeping city streets on a monthly schedule and expanding to include areas of the city formally underserved in debris removal efforts, including the neighborhoods of Brooklyn and Curtis Bay. The 311 data collected for this report related to trash in the neighborhoods was collected prior to the implementation of the Street Sweeping Program. It will be interesting to revisit the same data query one year after roll out of the program to see if there is a significant difference in trash reported on the roadways.

In addition to street sweeping, a trash interceptor is scheduled to be installed at the single outfall into Masoville Cove. The Maryland Port Administration is supporting this interceptor as a mitigation requirement for disturbances in the Cove itself. Installation of the trash interceptor is scheduled for the end of 2014. While these types of systems have been shown to be effective in removing debris from the system before entering a body of water, they do not address the source of the debris issue. Any long-term debris reduction strategies will have to involve the local communities and must focus on behavior change of local residents and businesses.

- Baltimore Sustainability Plan User's Guide to Watershed Planning in Maryland
  cwp.org/online-watershed-library/cat_view/64-manuals-and-plans/81-watershed-management-plans-and-guidance
- Brooklyn/Curtis Bay SNAP
- EPA 9 Elements of a Watershed Plan
  epa.gov/region9/water/nonpoint/9elements-WtrshdPlan-EpaHndbk.pdf
- EPA Surf Your Watershed
  cfpub.epa.gov/surf/locate/index.cfm
- 2013 Healthy Harbor Report Card
- Masonville Cove Tributary Study – Straughan Environmental Services
- Maryland DNR Eyes on the Bay
  mddnr.chesapeakebay.net/eyesonthebay/
- Middle Branch Master Plan
  archive.baltimorecity.gov/Government/AgenciesDepartments/Planning/MasterPlansMapsPublications/MiddleBranchMasterPlan.aspx
- My WATERS Mapper (EPA)
  map24.epa.gov/mwm/mwm.html?fromUrl=02060003