



4.12 Stormwater Management

Stormwater runoff is the water from rain and melting snow that flows across the land to local water bodies. As this water runs off the land, it has the potential to pick up pesticides, silt, oil, and other contaminants along the way. Stormwater management aims to reduce the impacts of stormwater runoff pollution on coastal and inland waters. Stormwater management strategies can include regular operations, maintenance, and future improvements to the structural drainage system.

Many stormwater improvements are inexpensive, some can be costly, while others cost nothing more than the time it takes to let people know what they need to do. One of the most important things a marina can do to prevent stormwater pollution is to inventory its drainage system, identify potential sources of pollutants that may be washed into the system, and make simple improvements.

BMPs for reducing stormwater pollution can include either:

- practices that prevent pollution from coming into contact with rain water, or
- practices that clean polluted stormwater before it enters coastal waters.

Many of the practices discussed in previous chapters, such as hull maintenance and fueling, prevent pollution from coming into contact with rain water. The practices discussed below more generally focus on operations and maintenance, and future improvements to the site's drainage system. See *Stormwater Management Volume Two: Technical Handbook* available at www.state.ma.us/dep/brp/ww/wwpubs.htm#storm for more information on BMPs.

Hazard Alert

Planning for control of stormwater pollution from boat repair, maintenance work, and fueling is required by federal law under EPA's Nonpoint Pollution Discharge Elimination System (NPDES) Program.

LEGAL REQUIREMENTS

The following laws apply to stormwater pollution. All marinas should refer to the summaries of these programs provided in Chapter 6.

- National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit (MSGP) for Industrial Activities
- Massachusetts Wetlands Protection Act, Stormwater Management Policy
- Massachusetts Clean Waters Act

Refer to Stormwater Management Volumes One and Two for more detailed information on the Massachusetts Stormwater Management Program. This document can be downloaded from the DEP website at www.state.ma.us/dep/brp/ww/wwpubs.htm#storm.

Best Management Practices

Proper Operations and Maintenance

A marina can act to prevent stormwater pollution by reducing pollutant loading in surface runoff. The following BMPs will help accomplish this goal.

- ▷ **Catch Basin Maintenance:** If your marina parking lot contains a traditional drainage system with catch basins, manholes, and subsurface drainage pipes, have them inspected twice annually and clean them out when needed. If the sump is half full, the sediment should be removed.
- ▷ **Street Sweeping:** Frequently sweep streets, parking areas, boat maintenance areas, and other paved surfaces, including walkways, to maintain a clean marina. Some marinas employ small mobile vacuum sweepers to daily drive around their paved areas. However, regular sweeping with a dust pan and broom, particularly near catch basins, can be just as effective.
- ▷ **“Don’t Dump” Stenciling:** Stencil “Don’t Dump” signs next to catch basins. This will help inform the general public that catch basins are directly connected to coastal waters. Call a local environmental group to find out more about storm drain stenciling.
- ▷ **Prohibit Hosing Down Hard Surfaces for Cleaning:** Prohibit the practice of hosing down pavement, sidewalks, and other hard surfaces for the purpose of cleaning them. This method will clean pollutants off the surface, but wash them into coastal waters.

Facility Improvements

Consider making improvements to the facility site to decrease drainage impacts on coastal waters. While these improvements need to be planned and funding mechanisms developed, these improvements will be investments in your business. The following BMP’s include some typical design modifications that can improve your marina’s appearance while reducing impacts on coastal waters.

- ▷ **Vegetated Buffers:** Plant vegetated strips between the developed area and the water. This will reduce impervious area while making your facility more attractive. You may be able to direct surface runoff to vegetated areas for treatment. A 25-foot strip is optimum for water quality control and infiltration; however, any vegetative strip is an improvement. The plants you use will depend on site-specific considerations. Consult with a nursery to select shrubs that look nice, but are hardy, low maintenance, and fit the intended purpose of the buffer. Grass is effective for trapping sediment particles. Bayberry is a good choice because it is a native shrub that survives well near the ocean and requires little maintenance. Evergreen shrubs such as holly and arborvitae are hardy, low maintenance, and provide screening. If runoff is directed to a vegetated area, water tolerant plants such as cattails or sweet pepperbush may



Vegetation between parking areas and the water provide buffers that remove pollution.

For More Info

Contact the University of Massachusetts Cooperative Extension Office at (413) 545-4743, or a local garden center or garden club for advice on selecting plants that will thrive at your marina.

be appropriate selections. These changes will likely improve the look of your marina and could enhance your business by attracting more customers.

- ▷ **Reduce Pavement Area:** Remove pavement where it is not necessary and switch to grass or gravel.
- ▷ **Move Parking Areas:** If possible, relocate parking areas away from the water. There may be opportunities to move parking off-site, which will allow you to maximize your facility space and improve its visibility.

CONTROL STORMWATER

Vegetated swales are narrow grassed areas that collect stormwater, slow its flow and collect sediments, and then allow the stormwater to discharge off-site or just to soak into the earth. They can be designed with deep sandy beds underlain by a perforated pipe, which promotes infiltration of water into the swale and then quickly drains the clean water. In most coastal sections of Massachusetts, the soil is very sandy and has excellent drainage, which may make the use of underground drain pipes unnecessary. Other designs may be used depending on the facility site. The benefit of vegetated swales is that they can be squeezed along the margins of work sites and incorporated into landscaping improvements that help make the facility more attractive to customers.

Improving the Site Drainage System

Consider retrofitting your existing site drainage system with traps or filters that will clean runoff flowing from the marina. These practices have long been incorporated into site planning and highway/roadway design to prevent flooding, erosion, and sedimentation. Civil engineering firms with experience in site development can design these types of systems into your site if you plan to make any major facility modifications. Some of these systems can be expensive (see vendor cost information), so start by creating a specific account for this improvement and develop a dedicated environmental fee to pay for the cost. For even the most dedicated Clean Marina operator, this may be a long-term improvement process. Examples of subsurface structural measures include:

- ▷ **Oil/Grit Separators:** These devices are placed in the drain line to remove oil and sediment. Water passes through several chambers, trapping oils that float on top of the water and sediments that fall out. These devices should be maintained (inspected and cleaned out, if necessary) annually.
- ▷ **Leaching Basins:** These basins generally replace or modify your existing catch basins by adding an area of crushed stone to help filter stormwater. Leaching basins need to be maintained annually or they will not function properly.
- ▷ **Filters in Catch Basins:** Filter screens can be placed under catch basin grates to collect large sediment particles. This approach is a relatively cheap fix, but the screens do need to be inspected after every storm.

- ▷ **Sand Filters:** Sand filters collect runoff and filter it through a sand medium, which is effective in removing sediments and oils. Numerous designs are available. Some use small check dams to slow surface flow and promote infiltration. Others are underlain by a perforated PVC drain pipe wrapped in geotextile fabric to move the treated runoff off-site. Where soils are porous, the runoff will infiltrate into the subsoils.

LOCAL EXAMPLE

A sand filter system was installed at the **Hingham Town Beach** parking lot when the town prepared the area for regrading and paving. The system employs check dams and a PVC drain to control runoff before and after the sand filter cleaning system. Call the Hingham Conservation Commission office at (781) 741-1410 for more information.

- ▷ **Proprietary Technologies:** Several new technologies for stormwater control have been developed by private companies and are in use in Massachusetts. Some systems have been certified by the Massachusetts Strategic Envirotechnology Partnership (STEP) and as a result are approved for meeting stormwater treatment requirements of the Massachusetts Stormwater Management Policy. Over time, other products may become available, so call the Massachusetts Department of Environmental Protection, Division of Wetlands and Waterways at (617) 292-5695 for updates. Some vendors of stormwater technologies are listed in Appendix C.

Useful Contacts

1. The CZM Coastal Pollutant Remediation (CPR) Program provides financial assistance for remediating stormwater pollution from municipal marinas. CZM can also provide technical assistance to marinas to help solve stormwater problems. Call CZM at **(617) 626-1200**, or look on-line at www.state.ma.us/czm/.
2. Massachusetts Department of Environmental Protection, Division of Wetlands and Waterways can provide you with regulatory information about the stormwater management policy. Call **(617) 292-5695** or see their website at www.state.ma.us/dep/brp/www/rpwwhome.htm.
3. US Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Program — Call **(617) 918-1615** for information about the NPDES Program and requirements or look on-line at www.epa.gov/owm/sw/industry/msgp.
4. Boston Water & Sewer has new requirements for oil & grit separators for all new and rehabilitated sewer lines. Call **(617) 330-9400** for more information.
5. Center for Watershed Protection (CWP) — a private organization that works with government and business to develop scientifically sound solutions for protecting urban watersheds. Call (410) 461-8323 to discuss your stormwater problems, or log on to CWP's web site at www.cwp.org.

For More Info

STEP is a unique collaboration of the Executive Office of Environmental Affairs and the University of Massachusetts system. STEP effectively helps develop and promote technology-based solutions to environmental challenges across the Commonwealth. For more information about STEP, call (617) 626-1000 or look on-line at www.state.ma.us/envir/step.htm.



STORMWATER MANAGEMENT

All marinas generate stormwater pollution, and therefore, all should complete this checklist.

The facility contains: Paved Areas such as Lots and Walkways Subsurface Drainage Structures

Check either the "Yes" or "No" column to indicate if you are using each of the BMPs listed below. If the BMP does not apply (you are using a different BMP or the activity does not occur at your marina), put "NA" in the "Yes" column. In the "Action" box, list the next steps for all BMPs where you have checked the "No" column.

BMP	YES/NA	NO	Refer to Page	Action
Catch Basin Maintenance			4-64	
Street Sweeping			4-64	
"Don't Dump" Stenciling			4-64	
Prohibit Hosing Down of Hard Surfaces for Cleaning			4-64	
Reduce Pavement Area			4-64	
Move Parking Area			4-64	
Vegetated Buffers			4-64	
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NOTES:
