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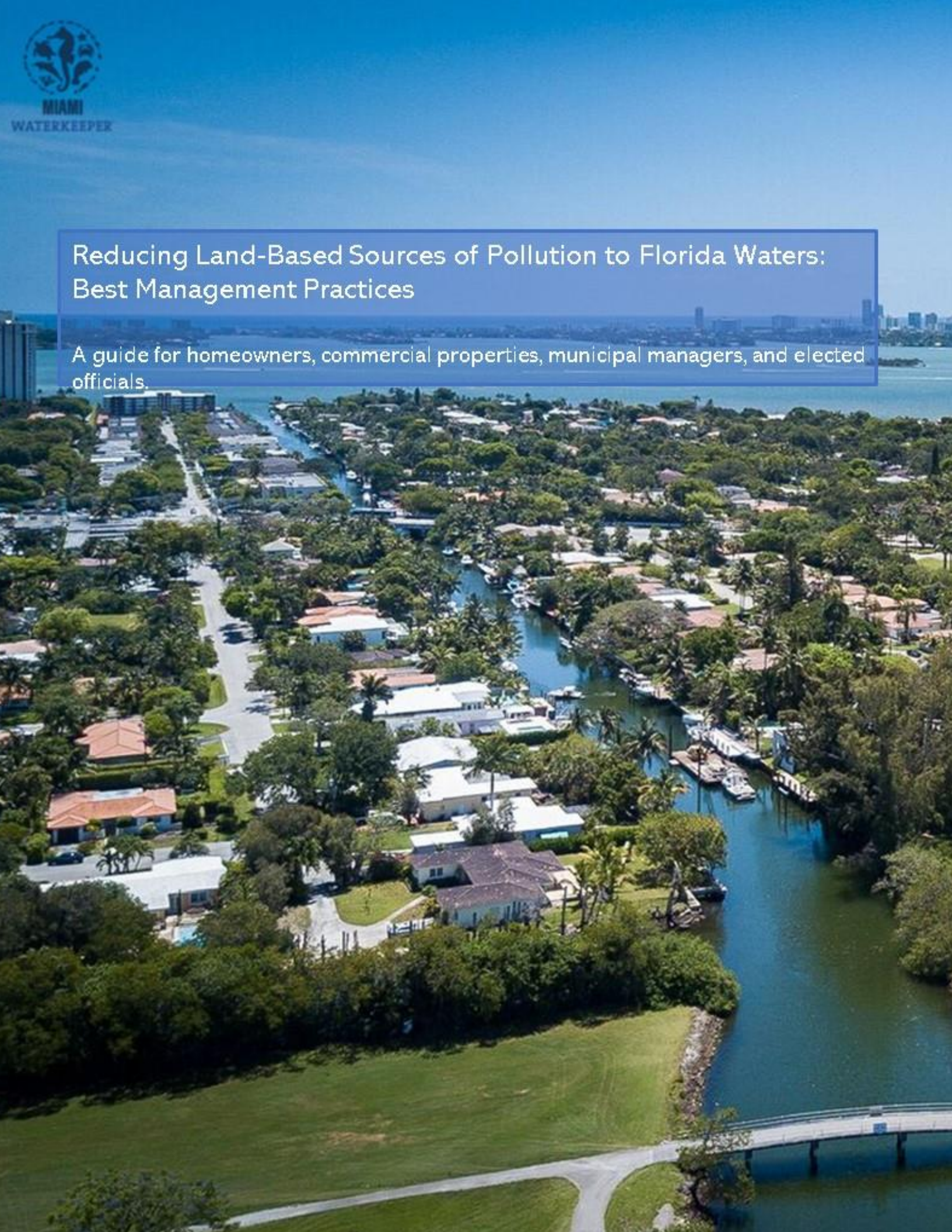
Reducing Land-Based Sources of Pollution to Florida Waters: Best Management Practices

A guide for homeowners, commercial properties, municipal managers, and elected officials.



MIAMI WATERKEEPER®

DEFENDING, PROTECTING, AND PRESERVING MIAMI AND THE SURROUNDING WATERS THROUGH CITIZENS INVOLVEMENT AND COMMUNITY ACTION. MIAMI WATERKEEPER WORKS TO ENSURE SWIMMABLE, DRINKABLE, FISHABLE WATER FOR ALL.

Dear South Floridians,

South Florida waters, including the open ocean, Biscayne Bay, and the Everglades, are ecologically and economically essential to South Florida, with over 80% of the approximately 14 million overnight visitors to Miami in 2013 visiting the beaches and/or participated in watersports and other water-based activities. Biscayne Bay-related recreation activities contributed over 10% to the total Miami economy, accounting for over $12 billion and over 130,000 jobs, and the waters also support a diverse assembly of marine organisms, including fish; dolphins, whales and manatees; sharks and sawfish; and seagrasses and corals.

However, due to overdevelopment, industrial, commercial, and residential stormwater runoff, illegal (and legal) pollutant discharges, and numerous other stressors, Miami's water quality is increasingly at risk. Nutrients, toxic chemicals, debris, and other pollutants continually pour into the once-pristine Biscayne Bay. Many of these pollutants originate on land, and run-off into surface waters after rain. Preventing land-based pollution runoff into our surface waters is therefore critically important to maintaining the integrity of our surface waters.

This guide collects and describes Best Management Practices (BMPs) for preventing pollution runoff to surface waters that are particularly suited for the South Florida environment. They include BMPs that may be of interest to homeowners, commercial businesses, municipal managers, and anyone else interested in preventing pollution to the Bay. BMPs can range from technical fixes to policy changes to educational programs. These BMPs are not meant to be exhaustive; at the end of the document we provide links to other resources that may be of use.

If you have any questions about these BMPs, about water quality issues generally, or if you see a pollution event on the water that you think should be reported, please contact us!

Thank you again for taking action to support the waterways that belong to all of us.

See you on the water,

Rachel Silverstein
Executive Director & Waterkeeper

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About Miami Waterkeeper

Miami Waterkeeper's Mission

Miami Waterkeeper's (MWK) mission is to defend, protect, and preserve South Florida's watershed through citizen engagement and community action rooted in sound science and research. We work to ensure swimmable, drinkable, fishable water for all members of our community in Miami-Dade and Broward Counties.

Who we are

The origins of the idea of a citizen water advocate go back to England in the Middle Ages, when villages would hire a private citizen to look after the trout streams so that no one could abuse the waterways that were owned, utilized, and enjoyed by all of the people in the villages.

The Waterkeeper movement was started by a group of commercial fishermen on New York's Hudson River in 1966 who organized against industrial pollution and polluters that were destroying their way of life. Their grassroots environmental activism resulted in some of the first "citizen suits" filed under the Clean Water Act and sparked the Hudson River's protection and recovery -- and inspired others to launch Waterkeeper groups around the world.

Today, there are more than 300 Waterkeeper Organizations patrolling and protecting more than 2.5 million square miles of rivers, lakes, and coastal waterways on six continents. Miami Waterkeeper is a proud member of this Waterkeeper Alliance.

Miami Waterkeeper

Founded in 2010, Miami Waterkeeper has become an influential advocate for marine ecosystems, clean water, and a resilient South Florida. Before MWK was founded nearly a decade ago, Miami's waters were marred by chronic sewage spills and polluted runoff, resulting in health-related impacts, and frequent swim advisories closing our beaches. More than 47 million gallons of sewage spilled into Biscayne Bay around this time. MWK's founders recognized the need for a locally-based nonprofit to help organize community members and groups to fight for clean water in Miami.

MWK recognizes the critical link between clean water and healthy communities and is committed to empowering citizens to lead a grassroots movement to protect our environment, economy, and quality of life. Recognizing that policy and decision-making processes are often highly complex, we translate these processes into actionable opportunities for everyday citizens, providing them with the science and information necessary for them to make their voices heard.

We employ a powerful, multi-faceted approach utilizing science, education, and advocacy to ensure protected marine ecosystems, clean water, and a sea level rise ready South Florida.

About this Guide

What is the purpose of this guide?

This guide was drafted to provide general information about how the general public, businesses, and municipalities can reduce pollution from entering South Florida's waterways. It provides a general guide to surface water quality issues in South Florida, and describes Best Management Practices (BMPs) that can be implemented to reduce discharges of pollution to our surface waters.

How is this guide organized?

This guide first discusses how land-based pollution can pollute our surface waters in South Florida, including lakes, canals, the ocean, and Biscayne Bay, and then discusses what BMPs are. It then describes specific BMPs that can help protect South Florida waters, dividing BMPs into four categories of stakeholders: Homeowners, businesses, municipal managers, and elected officials.

Background

How do land-based sources pollute Biscayne Bay and other surface waters in South Florida?

Stormwater tends to pick up pollutants from the ground it travels over, and transport them to areas of lower elevation, particularly surface waters. This is particularly true in areas that have been paved over, as water is less able to percolate through the ground.

What is nutrient loading and why is it a problem?

Nutrients are chemicals that plants – including algae and other marine and aquatic plants – need to grow. Though these nutrients are required to maintain healthy ecosystems, when there are too many nutrients it can throw ecosystems out of balance, leading to environmental degradation. When too many nutrients enter surface waters, algae are able to reproduce quickly and in large amounts, overwhelming the ecosystem. As these algae die, the chemical reactions that occur as part of their decomposition remove oxygen from the water, significantly killing or driving away fish and other organisms, and reducing overall water quality.

What kind of pollutants cause nutrient loading?

Two of the most important nutrients needed by plants are nitrogen and phosphorus. Unfortunately, those chemicals are found in a number of substances that end up in our waters. Unsurprisingly, fertilizer tends to contain significant amounts of both, as well as other chemicals that promote plant (including algae) growth. A lot of cleaning compounds contain both nitrogen and phosphorus forms as well, including both household and industrial cleaners. Finally, wastewater – both treated and untreated – contains high amounts of nutrients, and sewage or

septic tank leaks can quickly lead to high nutrient loads and the resulting environmental problems.

What other surface water pollutants can come off land?

There are numerous other types of pollutants that can end up in our surface waters. Heavy metals, such as lead and copper, can leach from old pipes or contaminated soils. Oil can wash off pavement and create slicks on the surface of the water. Toxic organic compounds in pesticides can persist in the environment, and bioaccumulate off. And, of course, plastic debris can be picked up by stormwater and enter the marine environment, where it can decades or even centuries to break down.

What laws and regulations govern land-based pollution sources to surface waters?

A number of different local, state, and federal laws protect surface waters from land-based pollution. Perhaps the best known is the federal Clean Water Act, which prohibits discharging pollutants into the waters of the United States without a permit. By requiring a permit, the federal government can set conditions that require the permitholder to minimize, reduce, monitor, and otherwise manage pollutants being discharged to surface waters.

What are Best Management Practices (BMPs)?

BMPs are individual actions that when put into use can mitigate or eliminate the environmental risks posed by certain activities. In this guide, we describe BMPs tailored to prevent, to the extent possible, the discharge of pollutants on land that end up in South Florida's surface waters. BMPs provide ready-made toolkit to allow individuals and organizations to minimize the damage their actions cause to the environment, and individual BMPs can be mixed and matched as appropriate. Keep in mind BMPs are a tool, not an end in themselves; a BMP is only as good as its effectiveness, and following BMPs does not necessarily mean environmental damage is being mitigated.

What kind of BMPs are there?

BMPs can take a wide variety of forms, including anything from technical devices, to processes, to education and communication, to regulation and enforcement activities.

Where can I find more information about BMPs?

This guide is intended to provide a brief overview of important BMPs for homeowners, businesses, and municipalities in South Florida, but there are numerous additional resources available.

For businesses and municipalities subject to Clean Water Act permitting requirements, your permit may describe required BMPs.

Some more comprehensive descriptions of BMPs suitable for South Florida are:

- The South Florida Water Management District's *Best Management Practices for South Florida Urban Stormwater Management Systems*, found online at: https://www.sfwmd.gov/sites/default/files/documents/bmp_manual.pdf
- The Florida Department of Environmental Protection's NPDES Stormwater Program website guidance and web links section, found at: https://floridadep.gov/water/stormwater/content/guidance-and-web-links
- The Florida Department of Environmental Protection's Florida Stormwater, Erosion and Sedimentation Control Inspector's Manual provides a comprehensive review of BMPs, particularly those referring to construction sites, found at: https://floridadep.gov/dear/florida-stormwater-erosion
- The Florida Department of Environmental Protection also has a guide titled *Florida Friendly Best Management Practices for Protection of Water Resources by the Green Industries*, available at: https://ffl.ifas.ufl.edu/pdf/grn-ind-bmp-en-12-2008.pdf
- The U.S. Environmental Protection Agency's online National Menu of Best Management Practices (BMPs) for Stormwater, found online at: https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#edu.

Best Management Practices for Homeowners

BMPs: Manage Household Chemicals Safely

Household chemicals like cleaners or solvents can pose a danger to the environment as well as public health. Because federal, state, and local laws tend to regulate household chemical wastes less strictly than industrial or commercial ones, they often end up being casually disposed of and can runoff into surface waters where they can pose an environmental or health risk. Many household chemicals contain nutrients that can lead to algae blooms or low-oxygen conditions. Household chemicals which can cause environmental problems include, but are not limited to, oil-based paints, solvents, pool chemicals, oil, and household cleaners.

Suggested Practices:

- Purchase only the amount of chemicals necessary; often extra household chemicals never get used before they leak or expire.
- Use more environmentally friendly alternative products; there are increasing numbers of biodegradable and/or nontoxic chemicals that are better for the environment available for sale.
- Store household chemicals safely; do not store them where containers can become corroded or where spills can result in chemicals reaching storm or sewer drain systems. Keep an absorbent type material, like kitty litter, on hand in case of spills. Check your stored chemicals periodically to make sure there are no leaks.
- Recycle or dispose of fluids properly; do not pour used household chemicals into storm gutters or onto pavement. In Miami-Dade County, household chemicals can be brought to the County's Home Chemical Collection Centers; they can be found at:

  https://www8.miamidade.gov/global/service.page?Mduid_service=ser14647986156485 35

  In Broward County, where you can dispose of household chemicals depends on your municipality. Residents of Fort Lauderdale can find information about chemical disposal at:

  https://gyr.fortlauderdale.gov/greener-government/recycling-waste-reduction/solid-waste-events/household-hazardous-waste-drop-off

  Several Broward municipalities have Participation Agreements with Broward County that allow residents of those municipalities to drop off chemicals at County sites. Those sites can be found at:
  http://www.broward.org/WasteAndRecycling/WasteDisposal/Pages/HouseholdHazardousWaste.aspx

If you live in a Broward municipality not identified here, please contact your muncipality's Public Works Department.

- If you discharge washing machine water to your backyard or alleyway, make sure it does not flow off-site. If you must discharge water that way, discharge to an area where the water can be absorbed into the ground, or construct a drywell to store the water until it can percolate through the soil. Clothing detergent is often high in the nutrients phosphorus and nitrogen. Use phosphate-free detergent.

BMPs: Prevent Pollutant Runoff from Driveways and Garages

Driveways and garages are significant sources of pollution to surface waters. Often the site of activities like vehicle washing and oil changing, contaminants can easily wash down impermeable pavement and reach drainage ditches, stormwater pipes, canals, and ultimately the ocean or Bay.

Suggested Practices:

- Drain fluids from wrecked, unused, or "parts" cars you keep on your property.
- When changing your car's oil, make sure to capture used motor oil and bring it to an appropriate disposal site. The Florida Department of Environmental Protection maintains a database of places that will accept used motor oil at: https://floridadep.gov/waste/permitting-compliance-assistance/content/used-oil-recycling

  If you live in Miami-Dade County, the following site provides information on used motor oil disposal: https://www.miamidade.gov/environment/tips-oil-disposal.asp

  In Broward County, where you can dispose of used motor oil depends on your municipality. Residents of Fort Lauderdale can find information about used motor oil disposal at: https://gyr.fortlauderdale.gov/greener-government/recycling-waste-reduction/solid-waste-yard-waste-recycling-services/green-your-routine-waste-disposal-directory/automotive-waste/mo

  Several Broward municipalities have Participation Agreements with Broward County that allow residents of those municipalities to drop off used motor oil at County sites. Those sites can be found at: http://www.broward.org/WasteAndRecycling/WasteDisposal/Pages/HouseholdHazardousWaste.aspx

  If you live in a Broward municipality not identified here, please contact your municipality's Public Works Department.

- When cleaning your car, minimize the amount of water used, and either divert runoff to grassy areas where it can filter through the ground; if possible, simplify the process by driving your car onto a grassy area on your property and washing it there.
- Sweep up debris and litter from your garage and driveway frequently.

BMPs: Landscape Responsibly

Lawn and grounds maintenance can cause special problems for local water quality. Pesticides and herbicides often contain toxic chemicals that can disrupt natural systems and bioaccumulate in organisms that are ultimately eaten by humans. Fertilizer overuse plays a particularly destructive role in marine and aquatic ecosystems in South Florida; when residents or businesses use too much fertilizer, or add too much water to fertilized ground, much of it can be washed into local surface waters where it can create algae blooms or low-oxygen conditions. High nutrient levels in our surface waters due to things like fertilizers have increasingly placed Biscayne Bay at risk, destroying seagrass beds, creating algal blooms, and may even increase the numbers of dangerous bacteria at beaches.

Suggested Practices:

- Carefully read the labels on fertilizer products, pesticides, and herbicides to be sure you do not apply more than is necessary. Spot treat if possible.
- Place plants in areas where water will pool and be absorbed into the ground rather than run off your property; water that percolates through the ground is naturally cleaned.
- Plant native plants that are naturally adapted to the South Florida environment and thus do not require additional water or fertilizer.
- Fertilize only during the dry season (Nov. 1-Winter).
- Do not irrigate if it is likely to rain.
- If you hire professional landscapers, make sure they are Green Industries Best Management Practices Certified. More information about this program can be found at: https://ffl.ifas.ufl.edu/professionals/BMP_overview.htm
- During the rainy season, use iron supplements like ferrous sulfate or chelated iron instead of nitrogen fertilizer; they can lead to greener grass and less overgrowth.
- If you must use fertilizers, use organic fertilizers and pesticides, which tend to be far less environmentally destructive.
- If you must use non-organic fertilizers, try to use fertilizers that do not contain phosphates. Florida soil has enough phosphorous already, and Biscayne Bay is particularly susceptible to phosphorous pollution.

BMPs: Reduce Litter and Debris

Litter and debris, whether artificial (like plastic bottles) or natural (like lawn clippings) can negatively impact our waterways. All debris can stop up stormwater pipes. Plastic debris is especially destructive; plastics do not biodegrade, remaining in the environment for decades or even centuries and may release toxic chemicals as they are slowly broken down through physical

processes. During that time, they also pose a danger to marine animals who may consume them, mistaking plastic objects for food. Even natural debris like branches or lawn clippings can be harmful to marine and aquatic ecosystems, increasing nutrient levels when they decompose.

Suggested Practices:

- Throw away or recycle litter, as appropriate.
- Pick up litter on your property before it can enter the stormwater system.
- Dispose of grass clippings, leaves, or other landscaping debris as garbage or through composting.
- Make sure garbage cans and recycling containers contained outside are kept closed.
- Collect yard waste and mulch, compost, or dispose of in the garbage.

BMPs: Prevent Pollutant Runoff from Home Improvement Projects

Though large-scale construction and development can cause significant degradation of water quality if construction sites are not properly maintained, smaller home improvement projects may also discharge pollutants to surface waters. Even when BMPs are not legally required, homeowners can still do their part to protect our surface waters by following basic BMPs, or requiring their contractor to follow them.

Suggested Practices:

- Tie down piles of sand and soil with tarp to prevent erosion from stormwater and wind.
- Inspect construction sites after ever rainfall.
- If high-velocity stormwater is running off your home and eroding the surrounding soil, place large rocks where the water is hitting the ground to reduce erosion.
- Make sure that vehicles are not tracking soil or sediment off-site.
- Leave as much vegetation as possible, for as long as possible, at construction sites.
- Stabilize disturbed areas as quickly as possible.

Best Management Practices for Commercial Properties

BMPs: Reduce Litter and Debris

Commercial spaces are a significant source of litter and debris entering our surface waters, both artificial and natural. This is particularly true of commercial sites that see significant traffic from customers. As noted above, litter and debris (particularly those made of plastic) can negatively impact aquatic ecosystems and clog up stormwater infrastructure.

Suggested Practices:

- Ensure there are sufficient trash and recycling containers for customers, employees, and visitors.
- Frequently empty trash and recycling containers to eliminate spillover. Make sure maintenance staff have a written policy mandating that trash and recycling containers are emptied and/or monitored on a consistent schedule.
- If you operate a retail establishment, reduce the amount of plastic packaging, or even better, move to biodegradable packaging materials such as cardboard and paper.
- Pick up litter on your property before it can enter the stormwater system or surface waters.
- Dispose of grass clippings, leaves, or other landscaping debris as garbage or through composting or mulching.

BMPs: Secure Construction Sites

Construction sites, whether large-scale or small-, are frequently sources of pollution into local surface waters. Under regulations created under the Clean Water Act, most construction sites that will disturb one acre or more and have the potential to discharge stormwater offsite are required to obtain a permit under the National Discharge Elimination System ("NPDES"), and use BMPs to minimize polluted runoff, particularly of sediment-filled water. Furthermore, under Florida law, some construction activities may also require a separate Environmental Resource Permit ("ERP") if your activities are changing the landscape in a way that affects surface water flows. If you have any question as to whether you are required to obtain an NPDES permit and/or ERP, contact the Florida Department of Environmental Protection at (850)245-8336.

Due to the special risk caused by construction sites, particularly large-scale construction sites, state, local, and federal agencies have developed comprehensive BMPs to deal with them; we summarize below a few of the more important general BMP types for preventing pollutant discharge, but every commercial construction site should employ knowledgeable stormwater inspectors to ensure compliance with NPDES permits and applicable laws and regulations. Importantly, sites should be inspected at least once every seven calendar days, and within 24 hours of the end of a storm event with ½ inch precipitation or more. The Florida Department of Environmental Protection's Florida Stormwater, Erosion and Sedimentation Control Inspector's Manual provides a comprehensive review of BMPs applying to construction sites. The Handbook is available at:
https://floridadep.gov/dear/florida-stormwater-erosion

Construction sites subject to NPDES requirements are required to periodically hold inspections to alert site managers of potential problems that may need remediation. The following general BMPs are offered here to give a general overview; all construction sites should follow legal and regulatory requirements, as well as permit conditions.

- Use erosion control devices to minimize the speed and strength of water. Riprap, baffles, and vegetation can blunt the force of moving water, slow it down, and reduce erosion and sedimentation.
- Maintain – or plant – green spaces as much as possible. Vegetation is highly effective at preventing pollutant runoff. Plants not only reduce the velocity of stormwater, they also prevent soil erosion.
- Use stormwater retention systems to collect runoff and hold it until it can percolate into the ground or be released in a controlled manner. Things like retention ponds, detention ponds, exfiltration tanks, and trenches can capture and hold stormwater rather than let it run offsite.
- Place things like portable toilets, garbage containers, chemicals, and other potential sources of pollution away from storm drains.
- Construct perimeter controls around the entire site. Use things like silt fences, temporary earthwork berms, and floating turbidity barriers to prevent eroded sediment from being transported offsite and into surface waters.
- Secure slopes to prevent polluted runoff. Cover dirt or soil slopes with vegetation, grid confinement systems, riprap, filter blankets, or similar.
- Vehicle and concrete washing stations should be constructed in areas where runoff won't enter water bodies, and used concrete wash water should be captured and re-used, or moved off-site.
- Equipment maintenance and repair areas should be in locations where things like oils, solvents, or grease do not runoff site.
- Storm sewer inlets should be protected to prevent polluted runoff entering them. Surround them with filter socks or similar devices to protect them.

BMPs: Landscape Responsibly

The same problems caused by lawn and grounds maintenance at households apply to commercial properties, where those problems can be compounded by the typically larger size and scope of commercial space landscaping activities. Overuse of pesticides, herbicides, and fertilizers can seriously degrade natural waters, particularly at properties like golf courses, housing complexes, and large corporate offices that frequently have extensive grounds under landscaping.

Suggested Practices:

- Hire only groundskeeping staff and third party landscapers that use Green Industries Best Management Practices.
- Ensure that grounds keeping staff and third party landscapers understand landscaping

- Eliminate or reduce irrigation during the wet season.
- Plant native plants that are naturally adapted to the South Florida environment and thus do not require additional water or fertilizer.
- Fertilize only during the dry season (Nov. 1-winter).
- Do not irrigate or apply fertilizer, pesticides, or herbicides near wetlands; leave a ten-foot wide no-maintenance zone between landscaped grounds and wetlands.

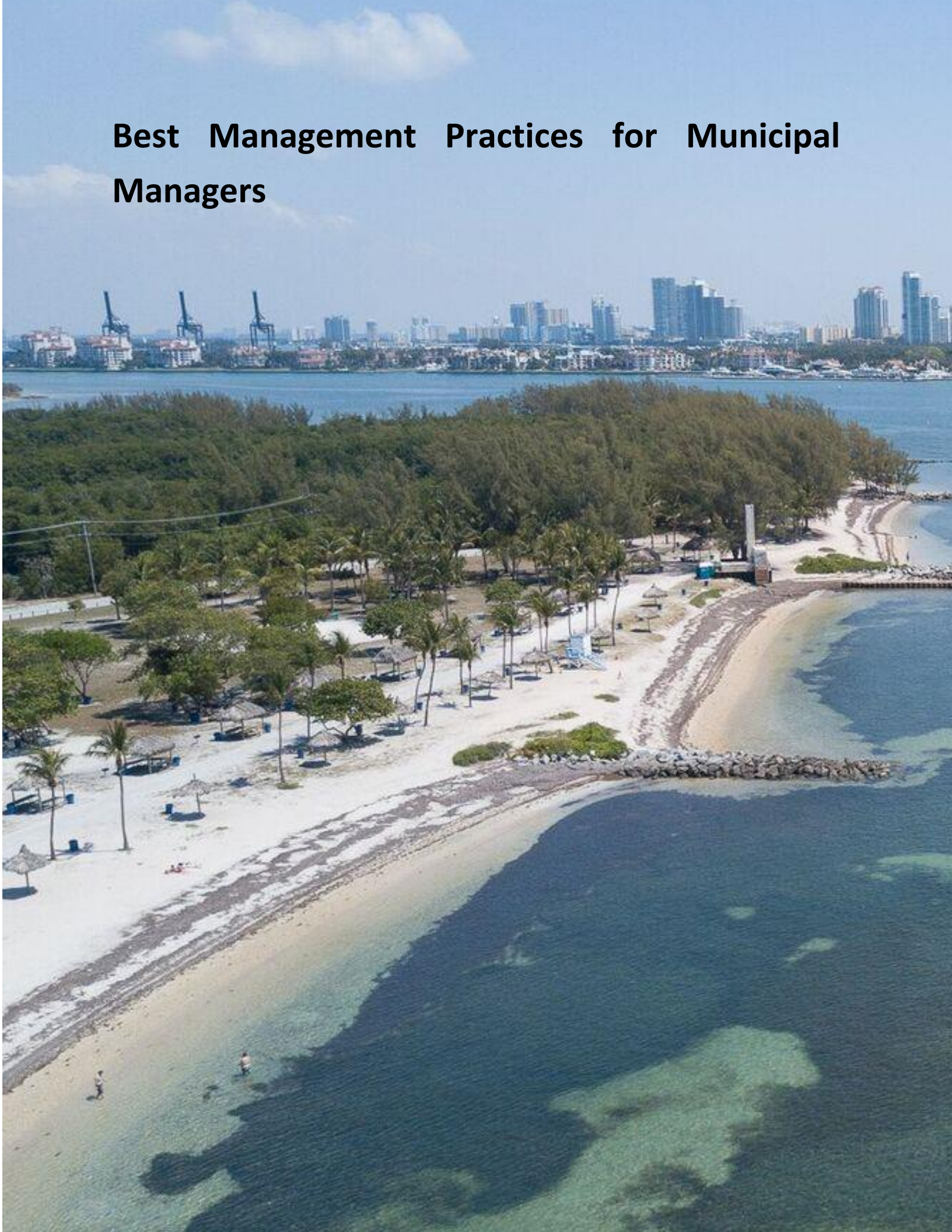
BMPs: Educate Employees, Residents, and Others About Site BMPs

To effectively implement BMPs, it is critically important to let people on your property know about them. Employees, visitors, and third party contractors should be informed about BMPs followed at the site and what they need to do to help comply with them.

Suggested Practices:

- Post written information about BMPs such as litter and debris management in employee lounges and other areas in which employees congregate.
- Ensure that written policy guides are distributed to new employees.
- Create a hotline that allows employees to report environmental problems onsite.
- If applicable, post signs or other information directing customers on-site to recycling and garbage containers.
- Hire environmental professionals to periodically inspect your property and identify possible sources of pollution to surface waters.

Best Management Practices for Municipal Managers



BMPs: Create Education and Outreach Campaigns

As noted previously, BMPs are not just technical fixes or physical processes – they also include education and outreach activities that let stakeholders know what they can do to prevent pollution to surface waters – or what they are required to do under the law. Municipalities and government agencies have a critical role in ensuring that not only they but homeowners and businesses within their borders take steps to reduce land-based pollution to surface waters.

Suggested Practices:

- Provide municipal information officers or customer service lines with materials that can be distributed to interested residents.
- Ensure that grounds keeping staff and third party landscapers are aware of BMPs and apply them in their work.
- Maintain and update a website listing suggested and/or required BMPs for city residents and businesses.
- Let residents know where household chemicals, used motor oil, electronics, and other potentially hazardous waste can be disposed of safely. If the capability exists, have periodic events at additional locations where such materials can be brought.
- Encourage volunteers to assist with activities like park and beach cleanups.

BMPs: Detect Illicit Leaks

Stormwater systems and wastewater systems are supposed to be separate operate in parallel in South Florida but they may interact with each other with potentially catastrophic consequences. Municipal stormwater and wastewater systems are required to be permitted under the Clean Water Act, with such permits generally requiring significant monitoring requirements. As with the other BMPs here, this guide is a general overview of BMPs for an audience that might not be familiar with them; municipal managers responsible for implementing illicit leak detection programs should follow all laws, regulations, and permit conditions applicable to their activities.

Suggested Practices:

- Implement regular monitoring of stormwater and wastewater systems to identify and repair leaks.
- Examine stormwater outlets for sediment buildup.
- In areas of septic tank use, monitor signs of septic tank leaks, such as vigorous growth around residential drainfields.
- If your municipal stormwater system connects with neighboring municipalities, make sure to set up communications channels with managers in those municipalities in order to
- Facilities staff at government buildings should be instructed to periodically inspect plumbing infrastructure in order to identify leaks and other problems.

- Where available, monitor water quality monitoring data in the waters adjacent to your municipality to identify areas that may be receiving illicit discharges, for example by finding areas of increased nutrients or turbidity.

BMPs: Enforce Environmental Laws, Regulations, and Ordinances

Unfortunately, environmental laws, regulations, and ordinances frequently go unenforced. Vigorous enforcement of these rules not only can stop pollution before it happens, but can also create an atmosphere of deterrence.

Suggested Practices:

- Regularly patrol waterways, streets, and green spaces to identify and stop illegal activities that harm the environment.
- Provide an anonymous hotline that allows residents to report suspected violations of environmental laws.
- Ensure that municipal law enforcement officers recognize violations of such laws, regulations, and ordinances, and know the steps they should take against violators.

Best Management Practices for Elected Officials

BMPs: Pass a Fertilizer Ordinance

Fertilizer use is a major source of nutrient pollution in South Florida. With a tropical climate, a year-round growing season, extensive areas of green space, and high rainfall, fertilizers pose a special threat to our surface waters. Though education and outreach about BMPs to homeowners, commercial properties, and landscaping companies can help reduce the amount of fertilizer being discharged to South Florida's surface waters, a binding municipal ordinance with penalties for violations can help ensure that BMPs are followed.

Miami Waterkeeper has created a draft municipal fertilizer ordinance as a resource for municipalities that want to address the destructive impacts of fertilizer overuse. You can find the sample ordinance on our website at:

www.miamiwaterkeeper.org/biscayne_bay_habitat_focus_area

Some elements of an effective fertilizer ordinance follow below under "Suggested Practices."

Suggested Practices:

- Prohibit application of fertilizers containing nitrogen and/or phosphorus to turf or landscape periods during flood watches or warnings, hurricane watches or warnings, or if heavy rain is likely.
- Prohibit application of fertilizers containing nitrogen or phosphorus to turf or landscape plants from June 1 through September 30 (the wet season in South Florida).
- Prohibit application of fertilizer at any time to anything other than actively growing turf or landscape plants.
- Prohibit the application of fertilizer within 15 feet of any pond, stream, wetland, or other waterbody.
- Prohibit the application of nitrogen at a rate greater than .7 lbs. of readily-available nitrogen per 1,000 square feet, based on the soluble fraction of formulated fertilizer, with no more than 1 pound total nitrogen per 1,000 square feet applied at any one time.
- Prohibit the application of phosphorus at a rate greater than .25 lbs. of phosphorus per 1,000 square feet per application, or .5 lbs. of phosphorus per 1,000 square feet per year.
- Require spreader deflector shields when fertilizing via rotary spreaders, with deflectors positioned such that fertilizer granules are deflected away from all impervious surfaces, fertilizer-free zones and water bodies, including wetlands.
- Prohibit the application, spill, or deposition of fertilizer on impervious surfaces, with any such fertilizer so deposited immediately removed to the greatest extent practicable.
- Prohibit the release of vegetative material to water bodies, stormwater drains, ditches, conveyances, water bodies, wetlands, sidewalks or roads.

- Require all commercial and institutional applicators of fertilizer to successfully complete the "*Florida-friendly Best Management Practices for Protection of Water Resources by the Green Industries*" offered by the Florida Department of Environmental Protection through the University of Florida's extension "Florida-Friendly Landscapes" program, or an approved equivalent.
- Impose penalties of violation of any fertilizer ordinance provisions as follows: First violation – written notification and education; Second violation – $50 dollars; Third violation -- $100; Fourth and subsequent violations – $500 per violation.

BMPs: Require Municipal Properties to Follow Green Practices

Though municipalities can in certain circumstances create ordinances to require property owners to reduce or eliminate pollutant discharge off their properties into surface waters, sometimes this is not legally or politically feasible. However, municipalities have significantly more control over municipal properties such as government buildings, public parks, and recreational facilities. Many of the BMPs identified in the sections above can be applied to municipal properties. Some examples are listed below.

Suggested Practices:

- Ensure that groundskeeping crew, whether staff or third party contractors, use Green Industries Best Management Practices.
- Mandate the use of Integrated Pest Management rather than pesticides alone. Integrated Pest Management focuses on long-term management of pests and their damage through biological control, habitat modification, cultural practices, and use of pest-resistant plants. Integrated Pest Management focuses on minimizing harm to the environment and public health.
- Use green building practices, like green roofs, to reduce runoff from municipal properties.
- Prohibit the use of plastic containers, packaging, and straws at municipal properties and concessions.
- Ensure that city properties are sited to minimize flooding and polluted runoff.

BMPs: Educate Voters and Residents About Managing Pollutants

Elected officials can serve as information sources to their constituents. Through town halls and other voter outreach events, residents can learn about what they can do to reduce land-based sources of pollution to surface waters.

Suggested Practices:

- Hold town halls specifically devoted to discussing local water quality issues.

- Distribute flyers and other educational information to residents regarding BMPs. For example, distribute brochures (like this one!) that inform people about water quality problems and how they can help to mitigate them.
- Function as advocates for the public in dealing with federal and state authorities regarding local pollution issues.

BMPs: Create and Maintain Green Spaces

Parks and other green spaces do not only offer recreational and health benefits to municipal residents: They also can help control polluted runoff from stormwater, reduce erosion and sedimentation, and ensure that precipitation enters the ground and recharges aquifers rather than running off on paved surfaces into surface waters. Depending on the municipality, some of these decisions can be made by elected officials, while others are part of municipal managers' and agencies decision-making. Elected officials should work closely with municipal managers to ensure these BMPs are implemented efficiently and successfully.

- Create rain gardens, or vegetated depressions that can capture and filter stormwater, on municipal properties like parking lots, building grounds, and street medians.
- Use conservation easements, or voluntary agreements with private property owners, that limit the type of development that can be carried out on their property to reduce pollutant runoff.
- Redevelop previously-developed land to replace impermeable surfaces with turf, vegetation, or permeable artificial materials. Create parks, wilderness areas, and preserves.
- Create riparian or forested buffers between urbanized areas and surface waters like canals to capture polluted runoff.

Contact Miami Waterkeeper

Every community is different and we are happy to help you navigate the challenges and opportunities your community faces with respect to water resources! Get in touch and we will answer any questions you may have.

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