



# Healthy Beaches Action Guide: How You Can Help Your Great Lakes Shoreline

by Lyman C. Welch and Julie L. Kinzelman



# Table of Contents

---

<b>1. Educate Yourself</b> . . . . .	1
Great Lakes Beaches Need Your Help . . . . .	1
Beach Closings are a Public Health Issue . . . . .	1
Stormwater Runoff, Sewer Overflows, Wildlife and Fertilizers Contribute to the Problem . . . . .	2
<b>2. Start Small</b> . . . . .	3
Be a Responsible Beachgoer . . . . .	3
Practice Proper Pet Management . . . . .	3
Eliminate Boating Waste . . . . .	4
Make Changes Around Your Home . . . . .	4
<b>3. Take Action</b> . . . . .	5
Identify Contamination Sources . . . . .	5
Stop Sewage Overflows . . . . .	5
Make New Development Blue Development . . . . .	6
Minimize Impact of Agricultural Sources . . . . .	7
Three Steps for Taking Action . . . . .	7
Demand Better Public Notification of Beach Closings and Their Causes . . . . .	8
Best Management Practices for Healthy Beaches . . . . .	8
Being a Part of the Solution – Managing Private Beaches . . . . .	9
<b>4. Get Involved!</b> . . . . .	11
Online Resource Links . . . . .	12

We gratefully acknowledge the support of  
The Searle Funds at The Chicago Community Trust  
and The Field Foundation of Illinois, Inc.

Special thanks to former Alliance staff member Laurel O’Sullivan  
for writing *A Prescription for Healthy Beaches*  
which is the foundation for much of this Action Guide.

# 1. Educate Yourself

## Great Lakes Beaches Need Your Help

Great Lakes beaches serve as gathering spots for friends, families and people of all ages, cultures and backgrounds.

They help weave us together as communities and add to our quality of life. Many Great Lakes beaches are healthy and safe for swimming and recreation during most of the summer beach season. Unfortunately for some communities, bacteria, viruses, other germs and algae blooms can harm our beaches and prevent us from swimming at the beach. These pollutants make their way into the Great Lakes and their tributaries from sewer overflows, waste from wildlife and stormwater runoff from urban streets and agricultural sources.

Beach closings and swimming advisories are on the rise in the Great Lakes. Most of the beach closing and swimming advisory days were issued because water quality monitoring showed bacteria levels exceeding health and safety standards.

This Action Guide will lead you through easy steps to help you understand what factors play a role in beach health and what you can do to help keep them healthy.



Photo: Arnold W. Ehram



Photo: Arnold W. Ehram

## Beach Closings are a Public Health Issue

Beach pollutants can linger in water and wet sand where they can result in water quality advisories and beach closures. High levels of beach pollutants can make you and your family ill if your eyes, nose, ears and mouth come in contact with them. Bacteria and viruses can cause vomiting, diarrhea, stomachache, nausea, headache and fever. Everyone who uses coastal areas for recreation — including kayakers and swimmers — is at risk if polluted water is present. Children are the most susceptible because of their size, developing immune system and since they are more likely to swallow water when swimming. Local officials are compelled by protective federal and state standards to issue water quality advisories or even close beaches to swimming when bacteria levels are too high.

## Stormwater Runoff, Sewer Overflows, Wildlife and Fertilizers Contribute to the Problem

**Stormwater Runoff:** Stormwater, either discharging from the end of a pipe or entering a body of water after flowing over the land, is a threat to water quality. Stormwater may carry a variety of substances as it makes its way to the water: grit, oils and litter from city streets and parking lots; waste from domestic and wild animals; nutrients such as phosphorous from lawns, gardens and farms; yard waste; and sediment and bacteria. All of these substances can harm water quality.

**Sewer Overflows:** Many sewer systems in urban areas were built more than 100 years ago and were designed for a much smaller number of users. Some cities have “combined sewer systems,” combining the pipes that carry rainwater from storm drains with the pipes that carry industrial and household waste — the same water you use for showering, flushing the toilet and washing dishes. When these sources of waste come together into one sewer system, especially during heavy rains, the system can fill to capacity and force the release of untreated wastewater into nearby lakes, rivers and streams — making them unhealthy for people. These “combined sewage overflows,” or CSOs, release waste from humans, animals and industry to our Great Lakes. More than 24 billion gallons of raw sewage mixed with stormwater are released into the Great Lakes each year via CSOs from 20 major cities.<sup>1</sup>

**Fertilizers and Nutrients:** Nutrients, particularly phosphorus and nitrogen, can be carried into water bodies from farm fields, the discharge of untreated sewage, and the use of phosphorus-based fertilizers and detergents at home. Nutrients and phosphorous are a source of food used by plants to encourage growth. Scientific research shows that phosphorus and nutrient levels may be connected with algal blooms in the Great Lakes.<sup>2</sup> Algae on the beach is not only unsightly and smelly for beachgoers and boaters, it may harbor potential human pathogens such as Salmonella.<sup>3</sup> Algal blooms in water, if allowed to remain to the point of decay, can adversely impact water quality.



Photo: Cathy Rose



**Wildlife:** Gulls and other birds and wildlife are a natural part of the Great Lakes ecosystem. However, increasing urbanization has led to an abundance of food available for wildlife in public places like our beaches in the form of trash, resulting in increased local populations of seagulls and geese. Geese, gulls and other wildlife that spend their days in coastal areas leave behind fecal material high in bacteria.<sup>4</sup>

1 See “Protecting Public Health, Caring for Chicago’s Waters,” 2007, online at <http://www.greatlakes.org/Document.Doc?id=142>; NRDC Testing the Waters 2008, Chapter 1, online at <http://www.nrdc.org/water/oceans/tw/chap1.pdf>; and Great Lakes Sewage Report Card (November 2006), online at <http://www.ecojustice.ca/publications/reports/the-great-lakes-sewage-report-card/attachment>

2 Bootsma and Janssen, “Cladophora,” 2004, Great Lakes WATER Institute, online at <http://www.gliwi.uwm.edu/research/aquaticceology/cladophora/index.php>

3 See Ishii, et al. Cladophora (Chlorophyta) spp. Harbor Human Bacterial Pathogens in Nearshore Water of Lake Michigan Applied and Environmental Microbiology, July 2006, p. 4545-4553, Vol. 72, No. 7 and Byappanahalli, et al. Seasonal stability of Cladophora-associated Salmonella in Lake Michigan watersheds, Water Research, February 2009, p. 806-814, Vol. 43, No. 3.

4 Kinzelman, McLellan, Amick, Preedit, Scopel, Olapade, Gradus, Singh and Sedmak, “Identification of human enteric pathogens in gull feces at Southwestern Lake Michigan bathing beaches,” Canadian Journal of Microbiology, Volume 54, Number 12, 1 December 2008, pp. 1006-1015(10), abstract online at: <http://www.ingentaconnect.com/content/nrc/cjm/2008/00000054/00000012/art00007>

## 2. Start Small

### Be a Responsible Beachgoer



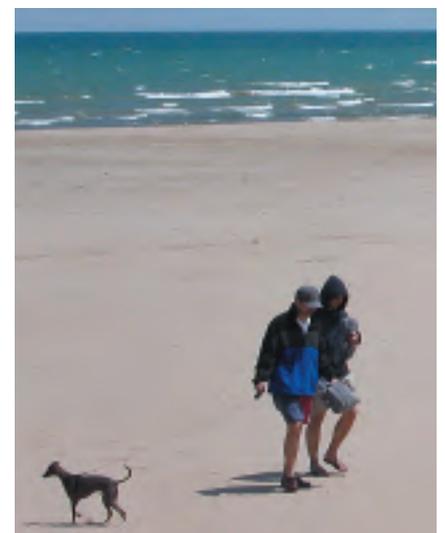
Waste from wildlife is a source of bacteria on the beach and in the water. Garbage — especially leftover food — can attract gulls, raccoons and other wildlife to the beaches. Nearly half of the trash collected at beaches by Alliance Adopt-a-Beach™ volunteers are food-related items. Food waste attracts wildlife. In turn, wildlife leaves its waste on local beaches and can cause contamination. Here's what you can do:

- **Don't feed seagulls or any other wildlife at the beach.** Animals quickly become accustomed to people feeding them and, if fed frequently enough, will spend more time on the beaches and leave more waste behind.
- **Properly dispose of your trash in trash bins.** Ask your local beach management agency to provide bins that are large enough to contain waste, even from long holiday weekends. Make sure they have lids to keep waste inside and away from animals. Let them know if you see garbage bins overflowing. If your beach provides recycling bins, use them to recycle bottles and other recyclable items. If no recycling bins are provided at your beach, encourage your local park district or beach manager to install recycling bins in addition to trash bins.
- **Avoid swimming in the lake when ill with diarrhea.**
- **Frequently change diapers of infants and toddlers while at the beach.** Discourage children from using the lake as a toilet. Research suggests that waste from children can contribute to beach contamination.

### Practice Proper Pet Management

Pet waste, whether from our yards or at the beach or city streets, is a source of bacteria that can contaminate our beaches. You can help reduce the impact of pet waste by following these common-sense measures:

- **Pick up after your pet at the beach.**
- **Remove and properly dispose of any pet waste on your lawn and when walking your pet.** Once left on lawns, sidewalks or alleys, pet waste can wash into local sewers and waterways during rains.
- **Dog beaches should be properly located and carefully controlled so as to not contribute to bacterial pollution. Avoid locating dog beaches close up-current from bathing beaches.**



## Eliminate Boating Waste

Our lakes provide a wonderful playground for boating and sailing. If you use the lakes for boating, please protect them by taking care of your waste properly.

- **Discharge your waste at pump-out stations.** These stations are located in most harbors and docks. Strongly encourage fellow boaters to do the same. If your harbor doesn't have a station, lead an effort to have one installed and make sure it is marked with a large, visible sign.
- **Bring a portable marine sanitation device if your boat is not equipped with one.**
- **Encourage your local marina to participate in a clean marina program in your state.** Marinas that participate in this program work to improve water quality and reduce pollution at their facilities. *Visit: <http://coastalmanagement.noaa.gov/marinas.html>*



## Make Changes Around Your Home

The way you use your water in your home is a great first step in helping our beaches and water resources. You can start by practicing water conservation at home. Reducing sources of pollution from runoff through the use of residential stormwater best practices can ease pollution to our local waterways and beaches. Every bit counts.

- **Reduce your water use during rain events.** Delay activities that require a lot of water during and just after rain events, such as laundry or using dishwashers to reduce the amount of water going into our sewer systems. This extra water increases the chances that untreated sewage will be released to a river, lake or stream.
- **Properly maintain your septic system.** If you rely on a septic system for your household waste it is important to keep it in proper working order. An overloaded or broken septic system can leak sewage into the surrounding groundwater that feeds local water resources. Have your septic system pumped out annually and inspected regularly.
- **Install a rain barrel to capture runoff.** Rain barrels are a good way to capture runoff from roofs to prevent it from being sent to other hard surfaces, such as driveways and walkways. They are also a great way to reduce your water use, save energy and reduce the cost of your water bill. Rain barrel water can be used for watering vegetable and flower gardens. *See page 12*
- **Install a rain garden to capture and create runoff.** Channeling your downspouts and sump pump discharge hoses through a rain garden will retain stormwater and recharge groundwater during downpours, reducing the amount of water available to travel as surface runoff to your beach. Rain gardens are a combination of plants and soils placed in and around your yard that capture and filter stormwater. *See page 12*
- **Minimize your use of fertilizer on gardens and lawns.** During rainfalls, nutrients and waste materials can get washed into local sewers. Try using composted food waste, vegetables and fruits only, from home as a fertilizer for gardens.
- **Eliminate phosphorus in your lawn fertilizer.** Generally, only new lawns require phosphorus for root growth. Mulching grass clippings is a natural way to fertilize your lawn. If you choose to apply fertilizer use one with a zero for the middle number. This indicates that the fertilizer does not contain phosphorous.

*Photo: Carole Y. Swinehart*

## 3. Take Action

### Identify Contamination Sources

Once you know where beach pollution comes from, you can work to eliminate it at the source. The Alliance offers a year-round Adopt-a-Beach™ program so you can gather and report information on beach conditions and identify pollution sources at your local beach. This volunteer program is aligned with beach survey programs used by the U.S. Environmental Protection Agency and other beach managers around the Great Lakes.

Generally park districts or public health departments are responsible for managing public beaches. Public beaches should provide contact information to you if you have concerns about maintenance or trash at your beach. Often a state or county health department is responsible for reporting bacteria monitoring results and issuing beach closures and advisories. U.S. EPA has a website with this information online at: [http://iaspub.epa.gov/waters10/beacon\\_national\\_page.main](http://iaspub.epa.gov/waters10/beacon_national_page.main)

The Alliance also provides some contact information for Great Lakes beach managers, which can be found on our website at: [www.greatlakes.org/beachcontacts](http://www.greatlakes.org/beachcontacts)

Once you know whom to contact, there are a number of questions you can ask to start your quest to help your beach. You can ask how your agency:

- **Monitors for bacterial pollution.** How often do they monitor? What testing method do they use?
- **Identifies sources of beach contamination,** including local sewer lines that empty into the lake, rivers, or even underground — where pollution can seep into area waters.
- **Interacts with other agencies and planning authorities** to reduce pollution sources.
- **Surveys underground sewers to keep them from leaking pollution.**
- **Manage large wildlife populations,** such as seagulls, that may contribute to animal waste on the beach.

If your agency is doing all or most of the above things, you can ask if they have been successful in eliminating the sources of beach contamination. If your beach management agency does not do any of these things, persuade its members to start as soon as possible!

### Stop Sewage Overflows

Now that you know what sewage overflows are and why they happen, you can start to help eliminate them in your community by asking the right questions of your local sewerage agency:

- **Does your agency promote “green” development?** Green rooftops, permeable pavement and other techniques can help to capture stormwater so it doesn’t overburden our sewer systems and can help prevent sewer overflows.
- **Does your community require stormwater downspouts from roofs to be separated from sanitary sewers?** This is most effective if completed during construction of a new building but it can be easily accomplished later with the assistance of a knowledgeable friend or contractor. Even simply putting in rain barrels can help and does not require much change or knowledge. *See page 4*
- **Does your agency’s sewer system have adequate capacity to handle large storms?**
- **Urge government officials in your community to take action** if your agency is not taking appropriate steps to stop sewer overflows.

## Make New Development Blue Development



Photo: Todd Marsee, Michigan Sea Grant

Local officials can help to significantly reduce stormwater runoff and sewage overflows by working with communities to ensure that new development is managed properly.

Poorly planned development can harm local waterways and beaches. This happens when new homes or businesses are connected to a treatment plant that is already struggling to keep up with the amount of waste generated in a community. Fortunately, there are a number of things you can do to help beaches, while limiting uncontrolled “sprawl” in your area at the same time:

- **Ask your local government to consider encouraging developers to incorporate natural elements into their design plans.** For example, native grasses and other soft landscapes can hold water during heavy rains and prevent it from entering a sewer system. Surfaces that do not absorb water, such as concrete and asphalt, cause stormwater to run into sewers.



Photo: Todd Marsee, Michigan Sea Grant

This increases the risk of overloading a sewer system. *Visit:* <http://www.greatlakes.org/stormwater>

- **Ask your local government to consider requiring developers to direct water runoff from roofs into “green” spaces or rain gardens near the development rather than into sewer lines.** Plants and soils help filter rainwater and return it naturally to the ground without straining sewers. For existing homes and businesses, you can redirect roof runoff in this manner. Collecting rainwater in barrels for use on lawns and gardens during dry weather also helps reduce the volume of water entering the sewer system.



Photo: Jeff Vanuga

## Three Steps for Taking Action:

- Ask beach managers if they consider whether nearby agricultural sources contribute to pollution at your beach.
- Investigate whether large farms and agricultural land near Great Lakes tributaries use conservation practices to reduce runoff of nutrients and phosphorus.
- Support state regulatory efforts to set specific water quality standards for phosphorus and nutrients. Push for stricter standards on waste management at farms with a large number of animals.

## Minimize Impact of Agricultural Sources



Photo: Don Breneman

Just like at home, fertilizers applied to agricultural fields contain the nutrients nitrogen and phosphorus. Nutrients promote crop growth, but a percentage of what is applied eventually winds up in the Great Lakes and promotes excessive algal growth.<sup>5</sup> Nutrients

from agriculture also come from animal manure from large animal farms. This type of waste can also contribute to bacterial pollution.

Pollution from agriculture can be reduced by using a variety of conservation practices and advanced technologies. Keeping soil and nutrients on the land using drainage management and restoring wetlands and creating riparian (river) buffer strips all help to minimize harm to the Great Lakes. Advanced tools such as soil testing and GPS technology allow farmers to precisely apply fertilizer to the areas where it is needed.



Photo: U.S. Fish and Wildlife Service

<sup>5</sup> Miller et al. 1982. Agriculture and Water Quality in the Canadian Great Lakes Basin: III. Phosphorous. *J Environ Qual* 11:487-493 and Sharpley and Withers. 1994. The environmentally-sound management of agricultural phosphorus. *Nutrient Cycling in Agroecosystems* 39(2): 1385-1314.

## Demand Better Public Notification of Beach Closings and Their Causes



You need timely and accurate information when beaches are closed. This helps both to keep you from coming in contact with polluted water and to determine the likely source of the problem. Sewer agencies must promptly notify beach managers and the public when a sewer overflow event occurs.

- **Contact your local beach authority to find out if or how the beach authority or sewage authority notifies the public of sewage overflows.** If they don't notify the public encourage your local sewage authority or beach authority and elected officials to make sure they do so. Immediate electronic notification via an easily accessible website is best.
- **Urge your local sewage authority and elected officials to ensure that warning signs are posted close to sewage or stormwater pipes that empty near beaches and waterways.** These signs should warn people to avoid swimming or playing in the area.

## Best Management Practices for Healthy Beaches

Beaches come in all shapes and sizes. The size, shape, location and other factors about the beach can influence how and if it becomes a public health risk. Proper circulation of water is important for a healthy beach. Healthy beaches should have a proper balance between human access and natural areas, and should have a gentle slope towards the water's edge. Healthy beaches should be free of stagnant water on the shore, as wet sand is more likely to harbor bacteria.



## Being a Part of the Solution – Managing Private Beaches

Successful beach management techniques employed on a large scale by cities and parks around the Great Lakes may be adapted on a smaller scale for private use. If you're fortunate to own a slice of beach front property, you can contribute to the protection and restoration of the Great Lakes by taking the following steps:

- **Reduce Nutrients**

Most lawns do not need phosphorous containing fertilizer to remain healthy and green. If you fertilize, look for phosphorous-free varieties with the number zero in the middle. Excess nutrients can contribute to algae blooms — a recognized problem for public and private land owners.



Photo: Dave Brenner, Michigan Sea Grant

- **Stormwater Management**

Reduce the amount and improve the quality of stormwater coming from your property. In addition to rain barrels and rain gardens that everyone can use, property owners can plant native plants and grasses to create a buffer zone between their home and beach.

**Check with your local agency to ensure you have all necessary permits before making physical changes on your beach.**



Photo: Miller Engineers & Scientists

**Vegetated swales.** A swale is a shallow depression that collects water during storm events. Vegetated swales located in the beach area close to your home can function in a similar manner to a rain garden by retaining and improving the quality of stormwater before it gets to the open water.

**Buffer zones.** If your property contains a stream, creek, canal or stormwater channel discharging to your beach area you may consider creating an adjacent buffer zone of plants. In its simplest form, this area can be an unmowed area of tall grass several feet wide between your lawn and the water's edge. Buffer zones reduce the amount of contaminants reaching the water by filtering the runoff before it gets to the channel.

If geese are a problem, both swales and buffers may reduce their numbers as geese prefer to gather on mowed areas.

## • Beach Maintenance

Private homeowners can employ some of the same tactics used by municipal beach managers to maintain their private beaches.



Photo: Racine Health Department

**Beach raking** may be accomplished through the use of a standard thatching rake available at many hardware stores and lawn and garden centers. Simply raking wet sand and letting it lie exposed to the air and sun may reduce contamination. If your beach belongs to a homeowners' association, you may want to consider other options for cleaning the beach on a larger scale. Check with a state agency such as the Department of Natural Resources or your local beach authority to find out what options may be available to you. **Natural beach vegetation plays an essential role in protecting water quality and providing habitat to wildlife. Do not rake naturally-occurring vegetation.**

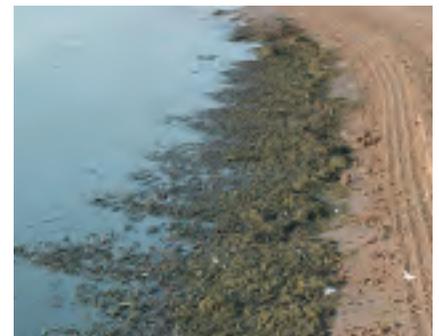
### Reducing standing water & wash-outs

Standing water should be avoided if at all possible by ensuring that your beach has proper drainage. Though we all enjoy digging giant holes or being buried in the sand, it is important to fill these in afterward in order to maintain the gentle slope characterizing a healthy beach. Wash-outs resulting from large rains should be filled to prevent shoreline erosion.<sup>7</sup> **Check with your local, state and federal agencies before undertaking beach reconstruction work to obtain all necessary permits and approvals.**



### Removal of algae

Research has shown that algae can reduce water quality at beaches when left in the near-shore water or stranded on the shore.<sup>6</sup> Though small amounts of plant material are a natural part of coastal areas, large accumulations should be removed promptly by raking the plants ashore and moving them above the high water line. **Removing algae in any way other than manually, i.e. by hand or raking, may require a permit; check with a state or local agency.** Algae that washes ashore should not be pushed back into the water.



<sup>6</sup> Paul J. Garrison, Steven R. Greb, and Gina LaLiberte, "Western Lake Michigan Nearshore Survey Of Water Chemistry and Cladophora Distribution, 2004-2007," Wisconsin Department of Natural Resources, Bureau of Science Services (May 2008) PUB-SS-1038 2008, online at: <http://dnr.wi.gov/org/water/greatlakes/cladophora/Cladophorareport08.pdf>

<sup>7</sup> University of Minnesota Extension Service. 1998. "Stabilizing Your Shoreline to Prevent Erosion-Shoreland Best Management Practices." Number 7 of 18 in the Series. Communication and Educational Technology Services, University of Minnesota Extension. <http://www.extension.umn.edu/distribution/naturalresources/components/DD6946g.html>

## 4. Get Involved!

---

The only way to ultimately keep our beaches healthy is for citizens to press for change. Beyond the above suggestions, residents can get involved with others who are working to solve the problem:

- **Participate in the Alliance's Adopt-a-Beach™ program.** Visit [www.greatlakes.org/adoptabeach](http://www.greatlakes.org/adoptabeach) for more information.
  - **Educate others!** Pass along the information in this plan to others so they can be part of the solution.
- 



Photo: Lloyd DeGrane

## Online resource links

---

### **Stormwater and Non-Point Source Pollution:**

After the Storm – A Citizen’s Guide to Understanding Stormwater. US EPA #833-B-03-002.

Available online: <http://www.epa.gov/weatherchannel/>

Planning with POWER – Stormwater and Non-Point Source Pollution. Purdue University Extension #FNR-256.

Available online: <http://www.extension.purdue.edu/extmedia/FNR/FNR-256.pdf>

Planning with POWER – Stormwater Runoff. Purdue University Extension #FNR-255.

Available online: <http://www.extension.purdue.edu/extmedia/FNR/FNR-256.pdf>

### **Runoff & Erosion Protection:**

Runoff & Erosion Protection. Conservation Ontario, November 2007.

For more information contact Conservation Ontario at [info@conservation-ontario.on.ca](mailto:info@conservation-ontario.on.ca)

### **Shoreline Plants, Wetlands, and Buffer Zones:**

Constructing Nature’s Solution – Stormwater Wetlands. Sustainable Land Development Today, Vol. 4, Issue 3 (March 2008). Available online: <http://www.sldtonline.com/content/view/412/86/>

Shoreline Plants & Landscaping. UW-Extension.

Available online: <http://clean-water.uwex.edu/pubs/pdf/home.shorlpl.pdf>

Coastal Ecology of the Bahamas – Best Management Practices for Site Design and Construction,

<http://henge.bio.miami.edu/coastalecology/sustainable%20development/Best%20Practices.htm>

Managing Stormwater – Vegetated Swales. Greenworks TV.

Available online: <http://www.greenworks.tv/stormwater/vegetatedswales.htm>

Riparian Buffer Zones – Vital to Healthy Rivers and Streams. Middlebury River Watershed Partnership.

Available online: <http://www.greenworks.tv/stormwater/vegetatedswales.htm>

### **Rain Barrels:**

Maryland Department of Natural Resources: <http://www.dnr.state.md.us/ed/rainbarrel.html>

Milwaukee Metropolitan Sewage District – Rain Barrels, <http://v2.mmsd.com/RainBarrels.aspx>

### **Rain Gardens:**

Wisconsin Department of Natural Resources: <http://www.dnr.state.wi.us/org/water/wm/nps/rg/index.htm>

Rain Gardens – A How-To Manual for Homeowners. UW-Extension.

Available Online: <http://clean-water.uwex.edu/pubs/pdf/home.rgmanual.pdf>

Rain Gardens – How to Design and Construct a Successful Professional Rain Garden. Rain Gardens of West Michigan. Available online: [http://www.raingardens.org/docs/rain\\_garden\\_factsheet.pdf](http://www.raingardens.org/docs/rain_garden_factsheet.pdf) and

[http://www.raingardens.org/docs/bioretenion\\_tools.pdf](http://www.raingardens.org/docs/bioretenion_tools.pdf)

Root-Pike Watershed Initiative Network, Rain Garden Initiative.

Available online: <http://www.rootpikewin.org/RainGardenInfo.pdf> (good examples of rain gardens located on the banks of a pond, small inland lake, and a river within a watershed emptying to Lake Michigan).

### **Composting:**

Montana State University: <http://www.montana.edu/wwwpb/pubs/mt9204.html>

Compost Guide: <http://www.compostguide.com/>

### **Pet Waste:**

Pet Waste and Water Quality. UW-Extension.

Available online: <http://clean-water.uwex.edu/pubs/pdf/home.pet.pdf>

### **Beach Grooming/Beach Slope:**

Remediation and Control Measures, Water Quality Research. City of Racine, WI

Available online: [http://www.cityofracine.org/Depts/health/remediation\\_control\\_measures.aspx](http://www.cityofracine.org/Depts/health/remediation_control_measures.aspx)

---

## **Other References**

Alliance for the Great Lakes: [www.greatlakes.org](http://www.greatlakes.org)

A Citizen's Guide to Protecting the Great Lakes. Sierra Club: [www.sierraclub.org/greatlakes](http://www.sierraclub.org/greatlakes)

Great Lakes Forever – Our Lakes, Our Responsibility (Biodiversity Project):

<http://www.greatlakesforever.org/index.html>

Testing the Waters – Swimming in the Great Lakes. National Resource Defense Council:

<http://www.nrdc.org/water/oceans/ttw/greatlakes.pdf>

Great Lakes Regional Collaboration Beach Initiative: <http://www.glrc.us/initiatives/beaches/index.html>

Great Lakes WATER Institute: <http://www.glwi.uwm.edu/>



### **About Adopt-a-Beach™**

Thousands of volunteers create positive changes for the Great Lakes every year by participating in the Alliance for the Great Lakes' Adopt-a-Beach™ program. Schools, families, businesses and community groups adopt beaches and shoreline areas in their local communities to monitor, remove litter, conduct water quality testing, restore habitat and identify beach pollution sources. Adopters work with the Alliance to locate a beach to adopt, log the information they gather into an online database, and use it for pollution prevention and educational purposes.



### **About Alliance for the Great Lakes**

Alliance for the Great Lakes serves as the voice of the 40 million people who rely on Great Lakes water for drinking, recreation and commerce. Formed in 1970, it is the oldest independent Great Lakes protection organization in North America. Its mission is to conserve and restore the world's largest freshwater resource using policy, education and local efforts, ensuring a healthy Great Lakes and clean water for generations of people and wildlife. Its headquarters are in Chicago, with offices in Cleveland, Grand Haven, and Milwaukee.

### **Alliance for the Great Lakes**

17 N. State Street, Suite 1390  
Chicago, Illinois 60602  
T: (312) 939-0838  
F: (312) 939-2708

[www.greatlakes.org](http://www.greatlakes.org)