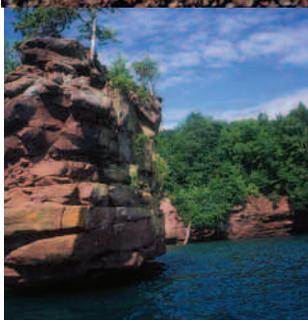


# A Citizen's Guide to Protecting the Great Lakes



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## Acknowledgments

Named “the most influential environmental organization” in a poll by the Aspen Institute, the Sierra Club gives the public the information and the means to make their voices heard. As the world’s oldest and largest grassroots environmental organization, the Club’s 1.3 million members and supporters possess the unique ability to empower people and influence public policy through community activism, public education, lobbying, and litigation.

The Sierra Club’s Great Lakes Program works to turn back specific threats to the region. Based in Madison, Wisconsin, the Program has coordinated

efforts for more than 30 years to protect the Great Lakes ecosystem and to engage the region’s population. The Sierra Club is a founding member of the Healing Our Waters Coalition, a group of over 100 organizations working to implement manageable solutions to restore and protect the Great Lakes. Learn more about the Coalition and join our combined efforts at [www.healthylakes.org](http://www.healthylakes.org).

This activist’s guide was inspired by the Great Lakes Regional Collaboration and has been crafted through the work of a number of Sierra Club volunteers and staff, including Ashley Brenke, Melissa Damaschke, Emily Green, Lino Grima, Chris Honecker, Erin Islo,

Suku Menon, Jan O’Connell, Dale Olen, and Rosemary Wehnes.

Thanks to the Brico Fund, the Patrick and Anna M. Cudahy Fund, the Healing Our Waters Coalition, the Joyce Foundation, and the Sierra Club Regional Conservation Strategy Team for their generous financial support.

Additional thanks to Jennifer Feyerherm, Judy Hofrichter, Emma Ingebretsen and Dylan Mathieu for their continuous assistance, Tingalls Dzyn for design work, and Wells Print and Digital for printing services.

*(Above) “Sleeping Bear Dunes” US EPA Great Lakes National Program Office (GLNPO) and Michigan Travel Bureau, Robert de Jonge. (Cover large photo) US EPA GLNPO and Minnesota Extension Service, Dave Hansen. (Smaller photos left-to-right) Wisconsin Department of Natural Resources (WDNR); WDNR; Rhonda Anderson; US EPA GLNPO and Michigan Travel Bureau; US EPA GLNPO and Illinois-Indiana Sea Grant, David Riecks. (Facing Page) “Great Lakes from Space” SeaWiFS Project, NASA/Goddard Space Flight Center*



## A Citizen's Guide to Protecting the Great Lakes

The Great Lakes hold one fifth of the world's fresh surface water and currently provide drinking water to over 42 million people. Yet each day, our Lakes are damaged economically and ecologically by untreated sewage, industrial pollutants and invasive species. Unless we invest in a solution today, the price we will pay tomorrow will be much higher and future generations may never experience the Lakes as we know them.

The Great Lakes Regional Collaboration is a coalition of many regional partners working to implement solutions dedicated to restore and protect the Great Lakes. The coalition developed the Great Lakes Regional Collaboration Strategy (GLRCS)--a comprehensive regional plan to protect our drinking water, economic future and way of life. Congress, state governments, local governments, businesses, and individuals must now put this plan into action.

This toolkit offers many actions you can take and resources you can use to help put the GLRCS into effect. It is organized around five major issues that affect the Great Lakes and contains specific strategies you can use in your own home and community to protect the Lakes. It also highlights the major policy changes that state and federal governments need to make, as recommended by the GLRCS, to ensure that future generations can use and enjoy the Lakes as we do today.



Univ. of MI Center for Great Lakes and Aquatic Sciences

Beachgoers have to contend with beaches littered with sharp zebra and quagga mussel shells, bird kills from botulism, and pungent algal blooms. Boaters have to clean mussel colonies off of boat bottoms and motors. Anglers' lines are fouled by colonies of the spiny water flea. And one of the most recent discoveries, VHS or *viral hemorrhagic septicemia*, is a flesh-eating virus that is causing large fish kills in some areas.

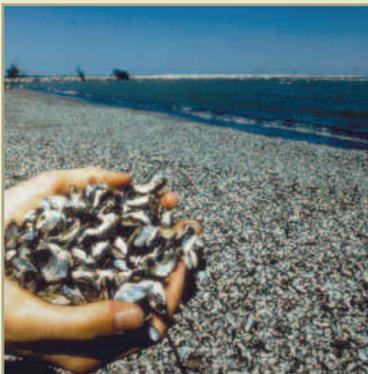
Invasive species also cost us a lot of money. Some industries must spend \$2 million annually, just to clean colonies of zebra mussels off their water intake pipes.<sup>1</sup> The region as a whole spends an estimated \$5 billion a year to control invasive species. To add insult to injury, the existence of these species puts our \$4.5 billion sport fishery at risk.<sup>2</sup>

# Invasive Species

Each day, invasive species like the zebra mussel and sea lamprey cause damage to the Great Lakes. They have forever changed our use and enjoyment of the Great Lakes, affecting many businesses, industries and just about anyone who visits or uses our vital waters.

For example, anglers are left with fewer and smaller sport fish because of invasive species. Zebra and quagga mussels reproduce so quickly and are so efficient at filtering food out of the water that they leave little for small fish to eat. As the small fish disappear, so do the larger sport fish that rely on them for food.

The sea lamprey, along with chemical contamination, wiped out the lake trout—the top natural predator and one of the best sport fish in the lakes—in four of the five Great Lakes. Only Lake Superior has a naturally reproducing population of lake trout. The rest of the Lakes must rely on annual fish stocking and expensive sea lamprey controls to maintain a population of lake trout.



NOAA GLERL

Fortunately, there are solutions to prevent the introduction of new invasive species and to reduce the spread of those already here, but we must act now. Every day we wait, we risk introducing another invasive species that could throw the ecosystem permanently out of balance and affect our enjoyment of the Lakes. Once in the Great Lakes ecosystem, invasive species cannot be eradicated – we are simply forced to live with their impacts.

Invasive species are introduced and spread by individuals in a variety of ways, both intentionally and unintentionally. Boaters and anglers can unknowingly transport zebra mussels and other invasives in bait wells, engine intakes, on trailers, and so forth. Other species, such as Eurasian water milfoil, were introduced when aquarium owners dumped live aquarium fish and plants into local water bodies.

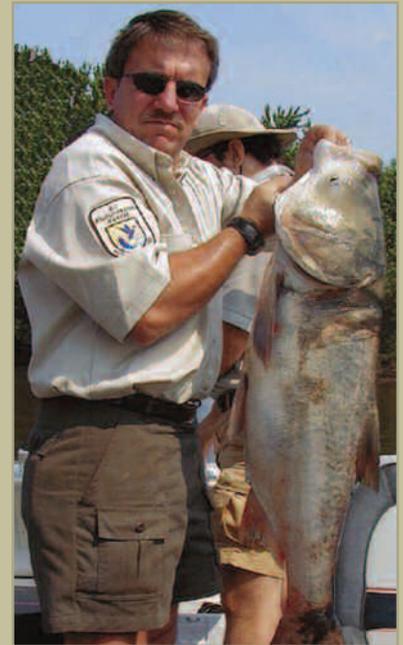


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The majority of aquatic invasive species in the Great Lakes entered in the ballast water of ocean-going ships, which dump their ballast into the Lakes when they off-load or take on cargo. These ships do not currently have to treat or filter their ballast water prior to dumping it into the Lakes. Many of the region's most problematic invasive species, like the zebra and quagga mussels, entered in ballast water.

## On Our Doorstep...

Asian carp are traveling north through the Mississippi River system towards Lake Michigan and are within 20 miles of a temporary fish barrier. These fish are prolific feeders, reproduce rapidly, and grow to be more than 4 feet long and 100 pounds. Asian Carp have comparatively little economic value and out-compete native fish for resources. This can dramatically disrupt ecosystem processes and damage commercial and sport fisheries. In parts of the Mississippi River system, they have virtually taken over, wiping out all other fish in the river, causing communities to cancel annual fishing tournaments. On parts of the Illinois River, people no longer venture onto the water in motorboats as the carp, startled by the sound of a motor, will leap out of the water and have caused broken noses and even broken ribs. To prevent the asian carp from entering the Great Lakes, the federal government should finish and turn on a permanent electronic fish barrier in the Chicago Ship Canal and should study options for the permanent separation of the Great Lakes and Mississippi River systems.



## Take Action

Preventing new arrivals of invasive species and reducing the spread of those already here will require individuals and local groups to take action, along with changes in state and federal policy. We all have a responsibility to help prevent the introduction and spread of invasive species.

### You can slow the spread of invasive species.

- If you are an angler or a boater, power wash your boat and trailer before putting it into another body of water, or let it dry for at least five days.
- Drain your bait wells, bait buckets, and other equipment onto land, not into the water.
- Never release live bait into local waters.
- Never release live fish or aquatic plants into the wild, such as aquarium fish or species such as the asian carp.
- Do not leave the bank or shore of any water with any live fish or live fish eggs, including leftover minnows.

You can urge state and federal governments to implement the Great Lakes Regional Collaboration Strategy (GLRCS).

**To prevent the introduction of invasive species like the zebra mussel, the GLRCS recommends national policy that:**

- Requires ocean-going freighters to filter or treat their ballast water to meet an environmentally protective standard,
- Develops new screening tools to prevent species from being imported into the U.S. if they have the potential to become invasive, and
- Includes rapid-response provisions to help us quickly control species that manage to enter the system.

**To prevent the asian carp and other species in the Mississippi River system from entering the Great Lakes, the GLRCS recommends that the federal government:**

- Finish and turn on a permanent electronic fish barrier in the Chicago Ship Canal as quickly as possible, and
- Study options for permanent physical and/or biological separation of the Great Lakes and ecosystems linked to the Great Lakes via canals, including the Mississippi River system.



Rhonda Anderson

# Coastal Health and Polluted Runoff

The Great Lakes currently provide drinking water to over 42 million people and support a multibillion dollar recreation industry. Unfortunately the water and beaches of this natural resource are threatened by pollution from stormwater runoff and outdated wastewater treatment plants. There are almost 10,000 miles of shoreline along the Great Lakes that house beaches where many go to recreate every year. An increasing number of beach closings points to the fact that more needs to be done to protect our coastal health.

In 2006, cities dumped over 23 billion gallons of raw sewage into the Great Lakes.<sup>3</sup> With this sewage overflow pollution comes human pathogens which contribute to beach closings. Pollution from failing sewage treatment systems contributed to a combined 3,269 days of Great Lakes beach closings and advisories in 2006.<sup>4</sup> Funding is needed to improve out-of-date sewage treatment facilities and prevent sewage overflows.

While pollution from sewage pipes and industries is regulated, polluted runoff – or nonpoint source pollution – is not. Pollution from these diffuse sources contributes up to 60% of pollution in the nation's waterways, yet there is little in place in terms of regulatory mechanisms to reduce this pollution.<sup>5</sup>

## Spotlight on Detroit

The Detroit Wastewater Treatment Facility is the largest discharger in the Great Lakes basin, processing between 700 million and 1 billion gallons of municipal and industrial wastewater every day. The plant is also the largest discharger of wastewater into the Detroit River. The city reported over 200 sewage overflows in 2005, earning it the lowest grade of "D" on the Sierra Legal Defense Fund's "2006 Great Lakes Sewage Report Card."

A combined sewage overflow happens during and after wet weather events, when rainwater or melting snow overloads many combined sewer systems. In such instances, large volumes of untreated domestic sewage and industrial wastewater flow directly into local water bodies.

In the Detroit area, combined sewage overflows are more likely to contain industrial waste in concentrations that have the potential to negatively impact water quality. The wastewater treatment facility treats industrial

waste from over 250 major industries. The facility has approximately 80 outfalls to deal with its heavy burden of wastewater. According to the U.S. EPA, the facility has lenient oil and grease pretreatment limits. In the event of a combined sewage overflow, the pretreated material that bypasses the Detroit Wastewater Treatment Facility and is discharged in the Detroit and Rouge Rivers may contain industrial waste, including oil, grease, and other materials. Historically, the Detroit facility has had difficulties complying with permit requirements.

Pollution from combined sewage overflows causes considerable damage, including drinking water contamination, beach closings, algal blooms, basement backups, waterborne illness, closed fishing grounds, loss of tourism, and depressed property values.

Polluted runoff comes from both urban developed areas – construction sites, city streets, parking lots – and from rural farm fields. Runoff from these areas contains toxins, such as pesticides, herbicides, metals and other contaminants. It also contains nutrients, such as phosphorus from lawn and farm fertilizers, that cause algal blooms. Blooms of blue-green algae can cause fish kills when they decay and deplete oxygen in the water. Another type of algae, *Cladophora*, is an annoyance in the Great Lakes region. *Cladophora* has a distinct odor, fouls beaches, and can provide breeding grounds for E. coli bacteria.

Polluted runoff is exacerbated by the loss of wetlands in the Great Lakes region. Wetlands serve as the kidneys for the Great Lakes, filtering pollution from our water. A growing source of pollution throughout the Great Lakes, polluted runoff is likely contributing to the resurgence of the dead zone in Lake Erie. Buffer strips, green roofs, rain gardens, conservation tillage, and other projects can greatly reduce the polluted runoff from urban and rural areas.

## Take Action

You can reduce polluted runoff and protect our beaches:

- **Install a rain barrel**

Rain barrels collect rainwater from downspouts and prevent it from running onto paved areas and eventually into the sewers and our lakes. The collected rainwater can instead be reused for activities such as watering dry parts of your lawn or watering your plants. The Maryland Department of Natural Resources has a site detailing how to build a rain barrel at [www.dnr.state.md.us/ed/rainbarrel.html](http://www.dnr.state.md.us/ed/rainbarrel.html).

- **Build a rain garden**

Rain gardens collect water through shallow depressions in your yard which are full of native species. In addition to looking great, polluted runoff is reduced as the rainwater instead filters through the ground. The Wisconsin Department of Natural Resources has information on rain gardens at [www.dnr.state.wi.us/org/water/wm/nps/rg/index.htm](http://www.dnr.state.wi.us/org/water/wm/nps/rg/index.htm). Many cities also provide assistance to those wanting to build rain barrels and rain gardens.



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- **Disconnect your downspouts**

If you live in an urban area where your downspouts are connected directly to the storm sewer, disconnect them and use rain barrels or a rain garden to capture and use stormwater on your own property. This will reduce the amount of water going to the sewage treatment plant during heavy rains and will help prevent sewage overflows.

- **Don't put yard waste in streets**

Yard detritus, such as leaves and grass clippings, left in the street enters the storm water system and drains into waterways. The nutrients from this organic matter cause algal blooms which decrease water quality and deplete oxygen in the water, killing fish. Compost yard waste in your own compost bin if possible, or keep it piled on the curb, and not in the street, until it is collected. Learn how you can put together a simple compost bin at: <http://www.montana.edu/wwwpb/pubs/mt9204.html> or <http://www.compostguide.com/>.



- **Reduce use of pesticides and fertilizers**

Many of the chemicals used on lawns end up being washed away into sewers and eventually into the area's rivers and lakes. Once in our waterways, the additional nutrients provided by these contaminants can cause algal blooms and harm aquatic species. As an alternative, plant native species that are easier to maintain and that can survive without extra pesticides and fertilizers. Use organic gardening techniques such as composting and mulching to control weeds and keep plants healthy.

You can urge your state and federal governments to implement the Great Lakes Regional Collaboration Strategy (GLRCS). The GLRCS calls on federal, state and local governments to:

- **Repair aging sewage treatment systems**

Sewage treatment plants in the Great Lakes region are old and many are failing, unable to keep up with the demands of a growing population and increased service areas. Leaky pipes allow untreated wastewater to enter local streams, and systems that do not have enough capacity overflow during heavy rain events. We must repair our aging sewage treatment infrastructure to prevent the continued release of raw sewage into our Great Lakes. Just as we all have to do regular maintenance on our houses or cars, it is time for our government officials to do some maintenance and repair work on this basic infrastructure to protect our Great Lakes and our drinking water supply.



Leanna Klyza Lin

- **Install buffer strips and protect shorelines**

Buffer strips are regions of vegetation between waterways and developed land that act as natural filters of toxins and contaminants. They also prevent erosion and provide habitat for many species. This program is popular and one of the main limitations is funding. The Great Lakes Regional Collaboration recommends creating 335,000 new acres of buffer strips by 2010. Cities across the nation are also taking steps to restore urban streams. One example is Lincoln Creek in Milwaukee. The concrete that once lined the waterway has been removed, which stabilizes banks, creates a more natural area, and provides better habitat for fish and wildlife.

- **Preserve and restore wetlands**

Over two-thirds of the historic Great Lakes wetlands have been filled or drained, with more threatened. Wetlands clean pollutants from water and reduce the impact of nonpoint pollution. The Great Lakes Regional Collaboration recommends restoring 550,000 acres of wetlands over the next five years.

- **Reduce run-off from farm fields**

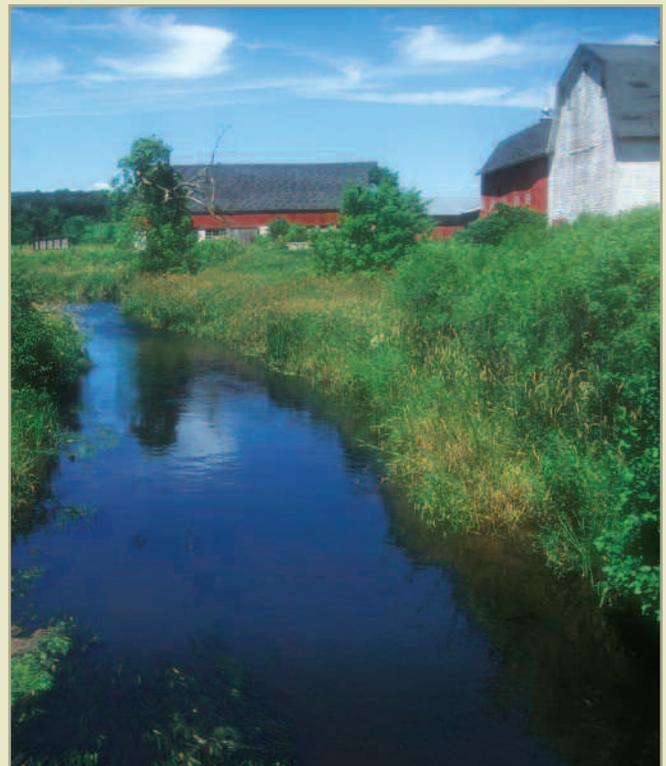
Rain carries sediment, fertilizers and pesticides off of farm fields and into local water bodies. The GLRCS recommends putting 2.8 million acres of cropland under erosion management practices that will reduce soil loss by 40 percent.

- **Encourage low impact development and comprehensive land use planning**

Minimizing impermeable surfaces through low impact development and regional planning allows for more water to trickle through the ground and filter out toxins. The Sierra Club has issued two reports at [www.sierraclub.org/buildingbetter](http://www.sierraclub.org/buildingbetter) which highlight steps communities across the nation are taking to reduce the ecological footprint of development. One project highlighted is from the Sisters, Servants of the Immaculate Heart of Mary in Monroe, MI. When they were renovating their Motherhouse, the Sisters improved water quality by restoring nearby wetlands and retrofitting their parking lot with vegetated depressions to reduce stormwater runoff.

- **Encourage green rooftops and other sustainable building practices**

The city of Chicago offers incentives to builders who install green rooftops and has a green roof on its city hall. The soil in the installations absorbs precipitation and prevents it from running off rooftops and into sewers. This is especially beneficial during heavy downpours when sewer systems can overflow, sending untreated sewage and stormwater into the Great Lakes. There are a variety of methods to use, from installing an entire garden to including a few potted plants.



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# Toxic Pollution

The Great Lakes are home to a \$4.5 billion sport fishing industry. Anglers across the Great Lakes enjoy world class fishing for walleye, lake trout and other sportfish. However, many of those fish are not safe to eat in large quantities, particularly for children, women of childbearing age, and other sensitive populations.

A legacy of toxic contamination—pollutants like PCBs and DDT—has accumulated in rivers and harbors around the region. These chemicals are now banned in the United States, but because they do not easily break down in the environment, they remain in sediment for long periods of time and accumulate in fish and other aquatic organisms. Other toxins, like mercury, dioxin, and pesticides continue to be released into the environment where they also build up in fish.

All of the Great Lakes and their tributary rivers are covered by fish consumption advisories for one or more toxic pollutants. Forty-three sites around the region are designated “Areas of Concern” where pollution has caused a dramatic impact on the ecosystem, marring these sites with more severe fish consumption advisories, beach closings, habitat loss and other impacts. We must clean up the legacy of toxic pollution in the Lakes while preventing new inputs, if we want to safely eat fish from the Lakes and restore some balance to the ecosystem.

Fortunately, we can act to clean up these areas. Our experience shows we can use modern technologies to safely remove and dispose of this contamination, thus reducing human health risks and giving us fish that are safe to eat. The Great Lakes Legacy Act has successfully cleaned up contaminated sites.

National Park Service



## Contaminants

Four major contaminants in the Great Lakes are PCBs, DDT, dioxin, and mercury. PCBs, DDT and dioxin are probable human carcinogens and developmental toxins. PCBs and DDT are no longer manufactured in the U.S., but significant concentrations of PCBs remain in the sediments of many rivers and harbors across the region. Dioxin is emitted to the air by incinerators, burn barrels and other combustion sources—it is eventually deposited into the Great Lakes where it accumulates in fish. Mercury is a potent neurotoxin that is emitted primarily from coal-fired power plants. Like dioxin, rain deposits mercury onto the land and into local waterbodies, where it builds up in fish. EPA estimates that 1 in 6 women of childbearing age currently have enough mercury in their bodies to put a developing child at risk.<sup>6</sup>

## Take Action

### You can reduce the flow of toxic contaminants into our Great Lakes:

- **Reduce use of pesticides and fertilizers**

Many of the chemicals used on lawns end up being washed into sewers and eventually into our lakes, where they can contribute to toxic hotspots, cause algal blooms and harm aquatic species.

As an alternative, plant native species that are easier to maintain and that can survive without extra pesticides and fertilizers. Use organic gardening techniques such as composting and mulching to control weeds and keep plants healthy.

- **Use non-toxic cleaning products in your home**

Any cleaning products that go down the drain in your home end up in the sewage treatment system and, ultimately, in the Lakes as sewage treatment plants do not remove chemical contaminants from wastewater. Many commercial cleaners contain chlorine and other toxins that are bad for local waterways.

As an alternative, try using baking soda and vinegar, lemon, or “green” cleaners such as Seventh Generation, Clorox Green Works and Simple Green. Visit [www.care2.com/greenliving](http://www.care2.com/greenliving) for more home cleaning tips.

- **Carefully dispose of oil, paint, solvents and other products**

Never dump waste oil, paint, solvents or other products down storm drains. These drains generally lead straight to a local stream—anything dumped down the drain will ultimately end up in the Great Lakes. Avoid flushing them down your sink, as sewage treatment plants are unable to remove chemical contaminants from wastewater.

As an alternative, take such products to your local hazardous waste drop site.

Cans with small amounts of left-over paint can be left open to dry—once dried out, they can be disposed of in your trash.

Utilize resources such as [www.freecycle.org](http://www.freecycle.org) to offer products that you no longer need to others who may be able to use them.

- **Do not use a burn barrel to dispose of trash**

Burning paper, plastic and other household wastes in a burn barrel produces dioxin and other toxic pollutants. These pollutants ultimately end up in local waterbodies, where they accumulate in fish and other aquatic life.

As an alternative, take household waste to a local landfill or drop-off location. Purchase products in bulk and/or products with minimal packaging to reduce the amount of waste that you have to dispose of.

Look for products that are washable and reusable to replace disposables. For example, replace paper napkins with cloth; use washable/reusable plates and silverware for parties rather than paper plates and plastic utensils; use cloth rags and sponges for cleaning, rather than single-use wipes. Avoid single-use products wherever possible.



USEPA

## Spotlight on Detroit River Black Lagoon:

In winter of 2005, the Black Lagoon of the Detroit River became the first project successfully cleaned up with funding from the Great Lakes Legacy Act. The site was contaminated with polluted sediment containing toxins like mercury and PCBs that had accumulated over the years from upstream industries. Dredging removed the contaminants and helped restore the health to this area and its shoreline and will allow for future redevelopment projects to move forward. A recent Brookings Institute study found that cleaning up toxic pollution in Areas of Concern will directly raise coastal property values by \$12 billion to \$19 billion.<sup>7</sup>



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- **Dispose of medications at proper locations**

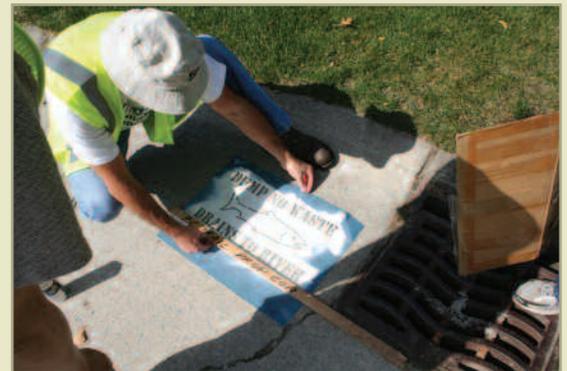
Instead of dumping old prescriptions down the drain, it is important to take them to proper disposal sites. Many cities have special medication collection days where you may drop off medications you are finished using.

Drugs placed in our drains often end up in our waterways where they can harm fish. The US Geological Survey has found prescription drugs, such as birth control pills and antibiotics, in all of the streams and waterbodies that they have tested.<sup>8</sup> Research indicates that high levels of substances such as birth control pills can lead to the feminization of fish by altering important hormones.<sup>9</sup>

**You can urge local, state and federal governments to implement the Great Lakes Regional Collaboration Strategy (GLRCS). The GLRCS calls on federal, state, and local governments to:**

- **Use the Great Lakes Legacy Act to clean up contaminated sites**

The Great Lakes Legacy Act dedicates federal funds to clean up toxic hotspots in the Great Lakes. Local and state governments must come up with a local cost share and must get projects ready to go in order to take advantage of Legacy Act funding and keep these cleanup projects afloat.



- **Support energy efficiency, conservation, and the development of cleaner, renewable sources of energy**

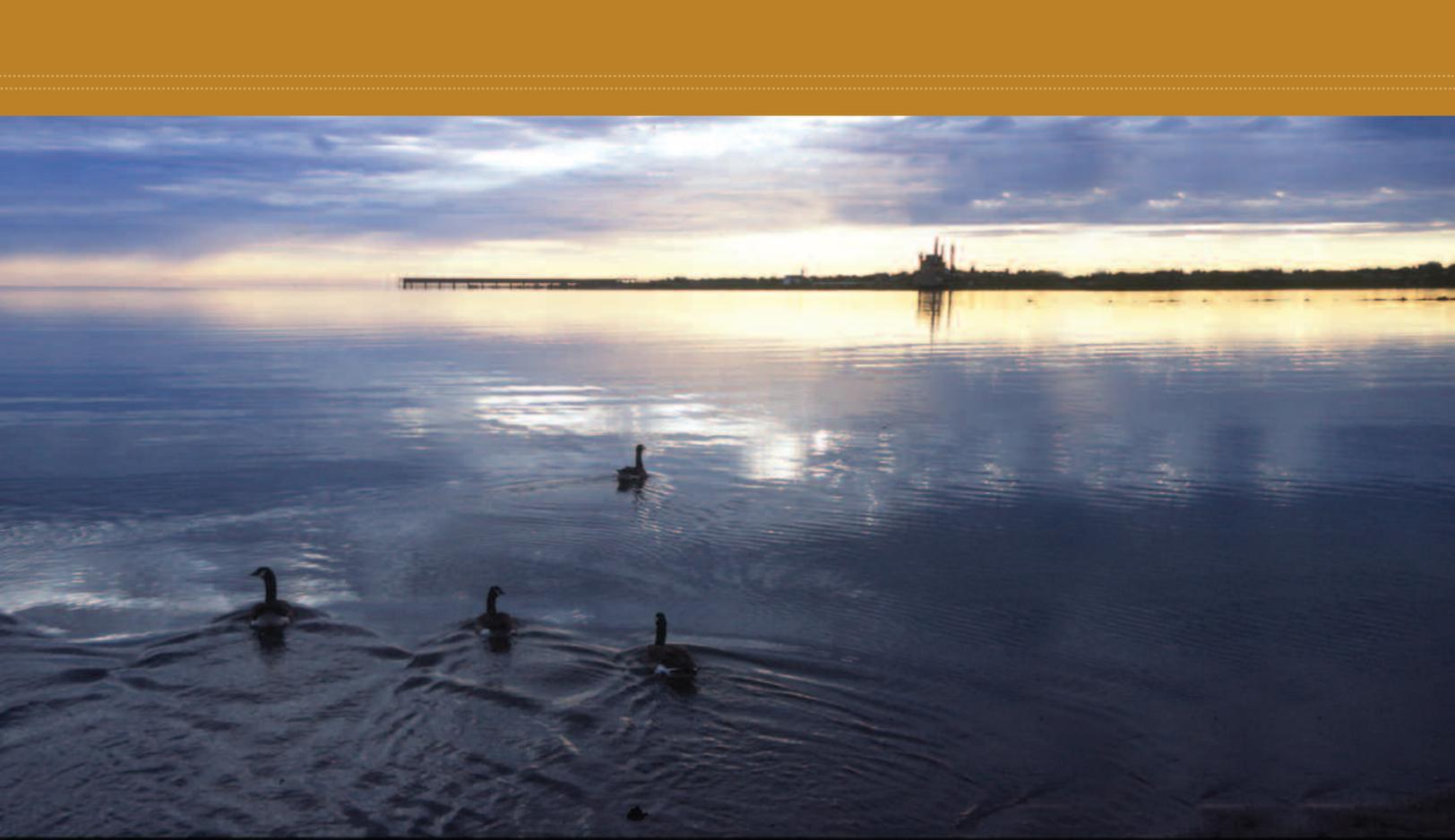
The majority of energy in the Great Lakes region comes from burning fossil fuels, especially coal. Coal-fired power plants are a major source of mercury to the Lakes. Using less energy and generating energy from cleaner, renewable sources reduces the amount of global warming pollution emitted and reduces the amount of mercury entering our waters and fish.

- **Prevent new toxic chemicals from entering the Great Lakes basin through aggressive pollution prevention programs**

Federal and state agencies should reduce the production, use and disposal of persistent toxic chemicals through traditional regulatory programs and through incentives, technical assistance, and other services aimed at pollution prevention.



(Top) "Storm Sewer Stenciling" Italia Millan. (Bottom) DOE/NREL



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## Habitat Loss

The Great Lakes are a natural wonder of the world. For the people of the Great Lakes states, they hold the key to our economic health, to our recreation, and to irreplaceable family experiences. Unfortunately, the quality of life the Lakes have fostered is threatened by habitat loss and degradation. The stability of this fragile and unique ecosystem depends greatly on the condition of the wildlife, aquatic and plant life, and water quality. The Great Lakes region relies on the Lakes' health to maintain the social, recreational and economic vitality of surrounding communities and to provide services for the entire nation.

There are 10,000 miles of Great Lakes coastline that is made up of 530,000 acres of coastal wetlands, sand and cobble beaches, and the world's largest system of freshwater dunes. The thousands of tributaries and streams are essential to distributing nutrients throughout the watershed. These habitats are also important in providing homes for many species, including endangered plants and animals.

Great Lakes habitat faces many threats, from the filling of wetlands, to sprawling development to invasive species. These

threats have resulted in the loss of more than two-thirds of the area's wetlands, 60% of the forest lands and almost complete obliteration of savannahs and prairies.<sup>10,11</sup> This decreases water quality as wetlands are important natural filters, trapping toxins and sediment. The destruction of Great Lakes habitat is also harmful to our drinking water, since wetlands and green buffers remove contaminants from our waterways.

A damaged environment is also less appealing for recreation, an important part of Great Lakes states' history and economy. Recent studies suggest that over \$50 billion in annual economic activity in Great Lakes states is due to such activities as boating, fishing, hunting and wildlife watching.<sup>12</sup> These activities are dependent on healthy habitats that support diverse fish and wildlife populations. In addition, these resources provide for thousands of jobs and are especially important to the Tribal Nations that depend on a healthy ecosystem for their way of life.

Action needs to be taken NOW to protect and restore the remaining natural habitats in the Great Lakes so that future generations can enjoy them as we do today.

## Take Action



USDA NRCS

### You can protect Great Lakes habitat in your own backyard.

- Reduce your ecological footprint by using less resources and energy.
- Use native and/or non-invasive plants in your garden – ask your local nursery if you are not sure about the status of certain species.
- Participate in or organize local restoration efforts. For example, organize a group of friends to raise and release the beetles that eat purple loosestrife. Purple loosestrife is an aggressive invasive plant species that is damaging headwater wetlands by crowding out native wetland vegetation, reducing food, habitat and nesting sites. Visit [dnr.wi.gov/invasives/action\\_water.htm](http://dnr.wi.gov/invasives/action_water.htm) for more information.
- Participate in your local town or county comprehensive planning efforts to encourage smart growth principles.

### You can urge local, state and federal governments to implement the Great Lakes Regional Collaboration Strategy (GLRCS). The GLRCS recommends that federal, state and local governments:

- **Preserve and restore wetlands**  
Over half of the historic Great Lakes wetlands have been filled or drained, with more threatened. Wetlands clean pollutants from water and reduce the impact of runoff pollution. The Great Lakes Regional Collaboration recommends restoring 550,000 acres of wetlands and associated uplands over the next five years, and protecting or restoring 1 million acres of wetlands in the long term.
- **Restore river and nearshore habitats to support the return of native fish**  
The GLRCS recommends restoring 10 Great Lakes tributaries to support the return of coaster brook trout and lake sturgeon. In the long term, we should restore or emulate natural flow regimes in river habitats and related upland areas, and restore coastal habitat to support native fish species, like lake trout, in nearshore waters.
- **Protect or restore 10,000 acres of high priority coastal upland habitat per year**
- **Encourage smart growth**  
Smart growth, regional planning and redevelopment of urban areas will reduce the amount of habitat destroyed for new development. The Sierra Club has issued two reports at [www.sierraclub.org/buildingbetter](http://www.sierraclub.org/buildingbetter) which highlight steps communities across the nation are taking to reduce the ecological footprint of development. There are other resources available to citizens, local planning departments and town boards to help local governments adopt smart growth principles on the internet: [www.smartgrowth.org](http://www.smartgrowth.org), [www.smartgrowthamerica.org](http://www.smartgrowthamerica.org), [www.epa.gov/dced/index.htm](http://www.epa.gov/dced/index.htm)



USDA NRCS, Don Poggensee



USDA NRCS, Don Poggensee

# Keeping Our Water in the Great Lakes

Water abounds in the Great Lakes basin. These five lakes hold one-fifth of the fresh surface water in the world. If you poured all the water from all the lakes, ponds, rivers, streams and reservoirs in the U.S. into 100 gigantic buckets, 95 of those buckets would be filled with Great Lakes water. If you then distributed those 95 buckets across the lower 48 states they would form a lake ten feet deep.

With all that water do we really need to be concerned here about draining the Great Lakes and drying out our wells?

Yes, we need to be very concerned.

Examples are piling up of vast water supplies that “will last forever” now drying up and vanishing. The great Ogallala Aquifer, approximately the same volume as Lake Huron and stretching across the United State’s mid-section from Texas to the Dakotas, has dropped over 150 feet from World War II times. The water is being drawn from the aquifer, primarily for irrigation, up to 100 times faster than the aquifer is recharging. Eventually, the aquifer will completely run dry and cause agriculture in America’s bread basket to decline.

And the mighty Colorado River, a constant source of fresh water for 11 western states, no longer reaches the people of northern Mexico. Lake Powell, the giant reservoir fed by the Colorado River, was full to capacity in 1999. In five short years, as a result of water demand, Lake Powell now stands three-fifths empty. Lake Lanier, which supplies drinking water to Atlanta, GA, has dropped precipitously in 2007, forcing Georgians to conserve water and look for new water supplies.

All of these waters have been drained by a variety of human activity, mostly through irrigation of farm land and by cities’ daily consumption of drinking water. With the rapidly increasing scarcity of water and the increasing demand for it, cities, businesses and families are turning their eyes toward the upper Midwest and laying plans to draw water from the Great Lakes.



US EPA Great Lakes National Program Office, Karen Holland

## Take Action

There is no question that we could permanently lose our water if we do not quickly set boundaries around its distribution and use it in a thoughtful and sustainable way. To protect the Great Lakes from being depleted by outside demands and to preserve this precious treasure of the earth, there are two actions that you can take:

- You can reduce considerably the amount of water you use through conservation practices and installing water efficient hardware.
- And you can support the Great Lakes Compact, which does not allow diversions of water outside the Great Lakes basin.

## Conserving Water in Your Daily Life

Set a goal to reduce your water use by 25%. You can accomplish this by changing your personal behaviors and by installing water-efficient appliances and hardware. A helpful way to approach this project is to go room-by-room in your dwelling and study your water use in each area.

## Bathroom

The bathroom is where most water is used in homes.

- **Sinks:** Turn off faucets when brushing teeth or shaving and place a small amount of water in the sink for washing and rinsing. Wash with cold water to avoid running water until it warms up. Put an aerator on your faucet.
- **Toilet:** Check for leaks by putting a couple of drops of red food coloring in the tank. Install a 1.6 gallon low-flow toilet if you have an older 5 or 7 gallon toilet.
- **Shower:** After the toilet, the shower is the biggest user of water in a home. Try to encourage all members of the family to take five-minute showers or less. Install low-flow showerheads.

## Kitchen

- **Dishwasher:** Only run the dishwasher when it is full. Try to run it at night when water and electric usage is lower. Do not run it during heavy rainstorms as it adds more water to the storm sewers. If purchasing a new dishwasher, buy a water-efficient as well as energy-efficient model. Try to scrape food scraps off plates without using water before putting them in the dishwasher.
- **Hand-washing dishes, pots and pans:** Wash pots and pans in soapy water in one sink and rinse in clear water in a second sink. Try not to leave water running while washing and rinsing.
- **Garbage disposal:** Try to use the disposal as little as possible. Dispose of waste in the garbage or in a compost pile.
- **Kitchen faucet:** Try to use as little water as you can when washing dishes and cleaning fruits and vegetables. Of course, install low-flow faucets and aerators. Consider installing an instant water heater on your kitchen faucet so you don't have to run water until it warms up. Thaw foods in the microwave rather than running water over them. Soak pots and pans rather than scrubbing them with running water.

## Basement/Utility Room

- **Wash machines:** Try to run full loads as often as possible. When buying a new machine, buy a water-efficient model.

## Lawn and garden

- Water the grass as little as possible. When you must water, do so in the early morning or evening and water deeply.
- Consider replacing your grass with ground cover that doesn't need much water.
- If you have automatic sprinklers, make sure they are not running during rain events.

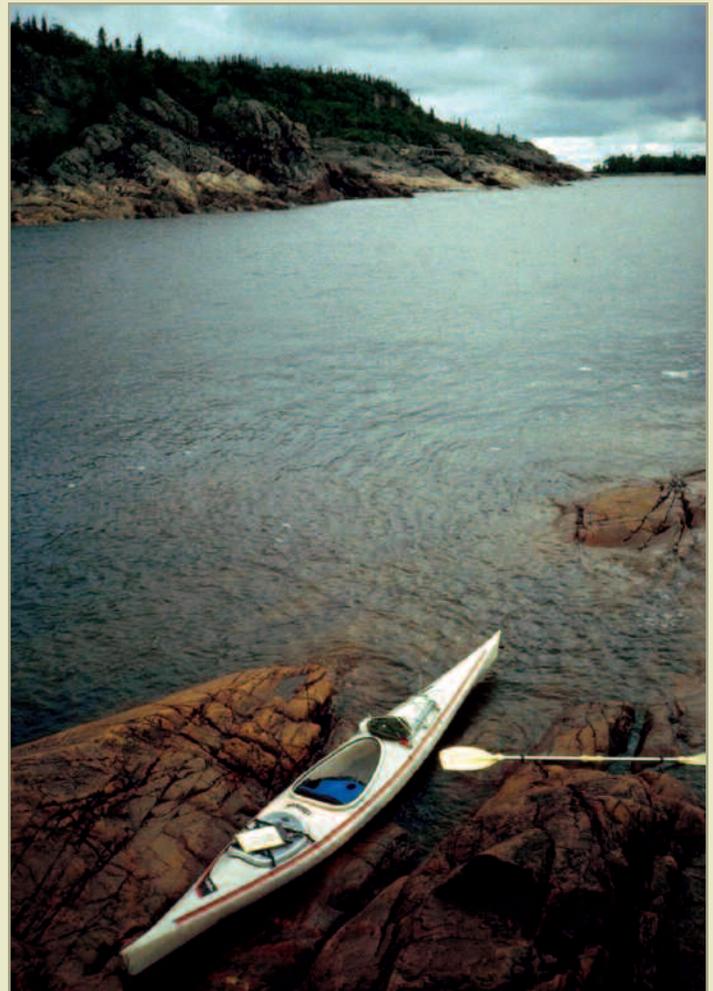
## Beyond your Residence

Moving beyond your own residence, you can organize a group to:

- Meet regularly to work on a neighborhood water conservation project;
- Support one another in your personal conservation efforts and suggest additional water-saving techniques;
- Work with your municipal leaders to create a community-wide water conservation program in your city;
- Encourage your water utility to change the rate structure for water use from a decreasing block structure to an increasing block structure. In other words, people and businesses would pay higher fees when they use more water, rather than lower fees for using more water, which is the structure now often employed.

## Support the Great Lakes Compact

The governors from the eight Great Lakes states (Wisconsin, Michigan, Minnesota, Illinois, Indiana, Ohio, Pennsylvania, and New York) and the premiers of Ontario and Quebec recognized the threat to the Great Lakes from other



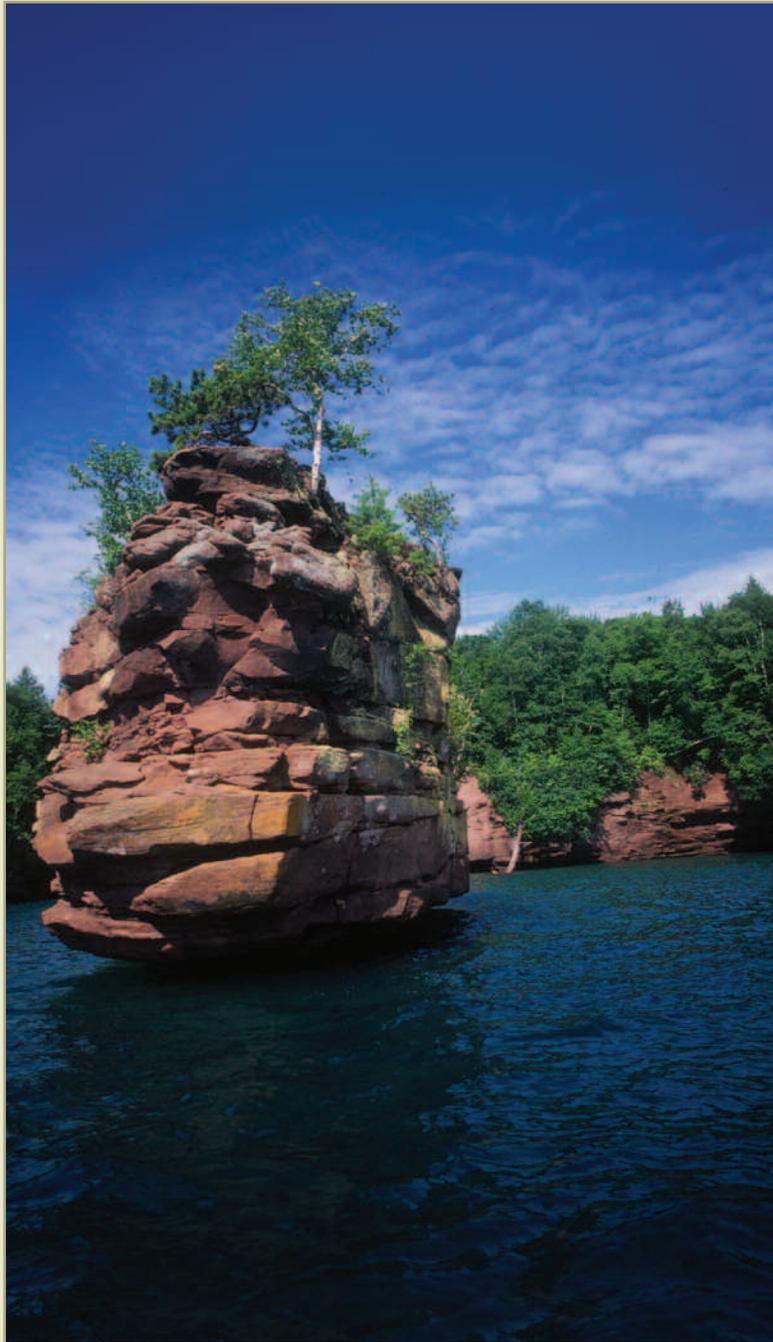
R. Beltran

communities and businesses wanting to siphon away our water and negotiated an agreement to better manage and protect the Great Lakes. In December 2005, they signed an agreement—a draft interstate compact—that will put limits on who can have access to Great Lakes water and set standards for those taking water from the Lakes. For the Compact to go into effect, it has to be implemented in each of the Great Lakes states and then approved by the U.S. Congress.

This is where you come in. You can write your State representatives, your governor, and your state environmental agency urging them to protect our water—implement the Great Lakes Compact now. Let your decision-makers know: It is urgent to implement a strong Compact now, as the pressure to send Great Lakes water to the south and to western states is growing with every day of drought. The sooner we implement the Compact, the faster communities are likely to fix their water problems through a fair process, using standards that will apply equally to everyone.

The Compact will stop the threat of entities around the world from tapping into the Great Lakes. The Compact will protect Great Lakes water levels and will strengthen our region's business, manufacturing, agriculture, sporting and tourist industries.

Putting the Compact in place now will put force behind the voluntary water conservation efforts of some communities and



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will press all communities within the Great Lakes basin to protect our drinking water by conserving it. By protecting the quantity and quality of our water, the Compact will help to improve the health and quality of life for our citizens, especially our children and future generations.

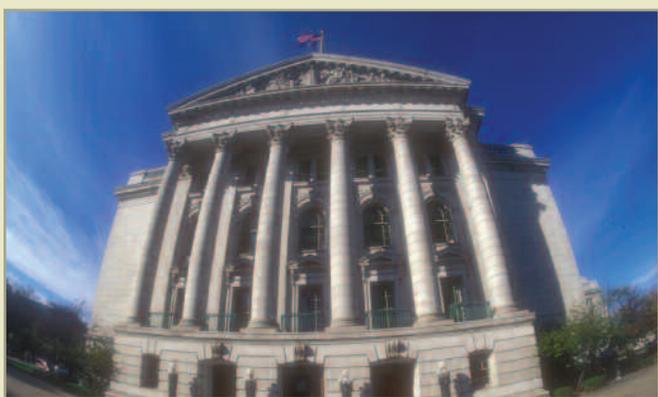
The water of the Great Lakes is a one-time gift given to us over 18,000 years ago when the great northern glaciers melted, created the lakebed and filled it with icy, clear, clean water. As the water leaves the lake today, there is no significant source to replenish it. In fact, rainwater recharges the lake by only 1%. Certainly, a portion of water is returned to the lakes from the rivers within the basin and the sewers, but if we continue to take out more water than we return, gradually the water will disappear as it has in the Ogallala Aquifer and the Colorado River. There are no more glaciers to fill this vast natural resource.

It helps to think about our water and the way we use it by imaging retiring from work and living off our retirement savings. We decide to live off the interest of that retirement fund and not cut into the principal. We are going to make our retirement fund sustainable and pass the principal on to our children. The Great Lakes are our retirement treasure. We need to budget our use of its water and make sure we are not cutting into the treasure itself, but living off its interest. Only in this way can we be sure to pass on to our children and grandchildren our inheritance—the fresh, glacial water of the Great Lakes.

# How to get Involved

The Great Lakes are a jewel we need to preserve for future generations. Whether by taking individual action, contacting your local decision-makers or however you choose to get involved, we can reduce the threat to our Great Lakes.

It is too costly to wait—we must act now. We must implement the Great Lakes Regional Collaboration restoration plan and the Great Lakes Compact today to ensure that our children and their children will be able to use and enjoy the Lakes tomorrow.



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**Policy changes will only happen if you get involved, contact your state and federal decision makers, and let them know these are issues you care about. It is also important to get the word out to your community. There are many steps you can take to help keep the Great Lakes secure for future generations. To let your voice be heard:**

**1) Write a letter to local officials. Our input on environmental issues shapes the way policies are created and implemented.**

To write an effective letter:

Limit your letter to one page and one issue. Choose the three strongest points of your argument and develop them clearly. Too much information can distract from your position.

Identify yourself and the issue. In the first paragraph of your letter state who you are and what issue you are writing about.

Make it personal. Tell why the issue matters to you and how it affects you, your family, and your community.

Be polite and take a firm position in your letter. Be confident in your understanding and thank decision makers when they take action on your issue.

**2) Write a letter to the editor. Decision makers monitor this section to gauge local opinion on issues.**

Keep it short and focused. Many newspapers have strict length limits and edit letters for space. A concise, single-issue letter has a better chance of retaining its salient points and keeping the reader's interest. Also, make specific references. While some newspapers will print general commentary letters, most prefer letters that respond to a specific article.

**3) Attend a public hearing or community meeting and make comments on a particular project.**

This kind of community involvement can make a strong statement. When you speak, focus on your main points. You will often be able to submit written statements which will allow you to address additional concerns.

**4) Meet with elected officials to let them know how you feel about certain issues.**

A meeting allows you to tell elected officials what you think about a certain issue and ask her/him to take action. The key to any successful meeting is to request a specific action. It's a good idea to leave a fact sheet and to follow up with a letter that recaps your discussion and thanks the official for the meeting.

**5) Coordinate a postcard or petition drive to let your elected officials know how you and other concerned citizens feel.**

This action organizes local community members and sends a strong message to elected officials about an issue.

**6) Host a house party to inform others of Great Lakes issues.**

This is an excellent opportunity to engage other members and community residents. The relaxed atmosphere of a house party invites conversation about Great Lakes issues and allows for the showing of films on important environmental topics. During the party the host/hostess can hold a letter writing campaign.

**7) Organize an outing to show the impact of the Great Lakes.**

The Sierra Club has a variety of events to get people out on the Lakes. Many water utilities also have tours which can show what happens to your stormwater and wastewater. Take advantage of these and organize a group of your friends and neighbors to attend and learn more about our Great Lakes.

## Want more information? Check out these additional resources:

### Visit [www.healthylakes.org](http://www.healthylakes.org)

This is the website of the Healing Our Waters coalition, a coalition of more than 100 organizations working to protect and restore the Great Lakes and deal with issues like invasive species. The Sierra Club is a founding member of this coalition and we urge our members to get involved.

### Great Lakes Information Network

This site, [www.great-lakes.net](http://www.great-lakes.net), provides background information about the Great Lakes and detailed information about major environmental issues facing the Great Lakes.



*"Building a Rain Garden" Wisconsin Department of Natural Resources*

### Learn how to build a rain barrel or rain garden

The Maryland Department of Natural Resources has an excellent site detailing how to build a rain barrel at [www.dnr.state.md.us/ed/rainbarrel.html](http://www.dnr.state.md.us/ed/rainbarrel.html) and the Wisconsin Department of Natural Resources has a site on rain gardens at [www.dnr.state.wi.us/org/water/wm/nps/rg/index.htm](http://www.dnr.state.wi.us/org/water/wm/nps/rg/index.htm). Many cities also provide assistance to those wanting to build rain barrels and rain gardens.

### Visit the University of Wisconsin Sea Grant Institute at [seagrant.wisc.edu](http://seagrant.wisc.edu)

This website provides information on invasive species and on a wide variety of other Great Lakes issues.

### Check out the GLRC's proposals

The website of the Great Lakes Regional Collaboration [www.glrc.us](http://www.glrc.us) provides additional recommendations to protect our beaches and waters in its Strategy to Restore and Protect the Great Lakes.

### Contact your local officials

Visit [www.cglg.org](http://www.cglg.org) to find out how to contact your Governor. To contact your national Representatives and Senators, call the United States Capitol switchboard at 202.224.3121. It is also important to contact your state legislators.

### Contact your local Sierra Club organization

There are many ways to learn more and work on Great Lakes issues with the Sierra Club at the local group, state, and regional level. From constructing rain barrels to organizing petition drives, there are a variety of ways to get involved. Contact the Sierra Club Great Lakes Program for more information.

### Sierra Club Great Lakes Program

122 West Washington Ave, Ste 830  
Madison, WI 53703  
608.257.4994  
[www.sierraclub.org/greatlakes](http://www.sierraclub.org/greatlakes)

## Resources

- 1 "Major Zebra Mussel Infestation in Harbor Impacts Native Mussels, Boaters." Marie Zhukov. January 2001. Minnesota Sea Grant.
- 2 "Aquatic nuisance species in the New York State Canal and Hudson River systems and the Great Lakes Basin: an economic and environmental assessment." Environ Manage. 2005 May;35(5):692-702.
- 3 Sierra Legal Defense Fund "The Great Lakes Sewage Report Card"
- 4 Natural Resources Defense Council "Testing the Waters." 2007
- 5 Alliance for the Great Lakes - [http://www.greatlakes.org/water\\_quality/restoration.asp](http://www.greatlakes.org/water_quality/restoration.asp)
- 6 U.S. EPA, Methylmercury: Epidemiology Update, Presentation by Kathryn Mahaffey, PhD at the National Forum on Contaminants in Fish, San Diego, CA (January 25-28, 2004)
- 7 Austin, J., Anderson, S., Courant, P., and Litan, R., America's North Coast: A Benefit-Cost Analysis of a Program to Protect and Restore the Great Lakes, September 2007.
- 8 Canadian Institute for Environmental Law and Policy, There is No "Away" and US Geological Survey <http://toxics.usgs.gov/regional/emc/index.html>
- 9 Palace, V, R.E. Evans, K. Wautier, L. Vandenbyllardt, W. Vandersteen and K. Kidd. 2002. Induction of vitellogenin and histological effects in wild fathead minnows from a lake experimentally treated with the synthetic estrogen, ethynylestradiol. Water Quality Research Journal of Canada 37(3):637-650
- 10 EPA Great Lakes Atlas
- 11 Great Lakes Regional Collaboration Strategy
- 12 NOAA's Great Lakes Region - [www.ppi.noaa.gov/Regional\\_Collaboration/Regional\\_Overviews/GreatLakesRegionOverview\\_042507.pdf](http://www.ppi.noaa.gov/Regional_Collaboration/Regional_Overviews/GreatLakesRegionOverview_042507.pdf)



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## Sierra Club Great Lakes Program

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