

Making a Great Lake Superior!



NEWS FROM THE LAKE SUPERIOR BINATIONAL PROGRAM

Spring 2005

Lake Superior

Terrestrial and aquatic habitat...deep, crystal-clear, frigid waters silently guarding the final resting place of more than 350 shipwrecked vessels...These are some of the images invoked by the "greatest" of the Great Lakes—Lake Superior, or as the Ojibwe people named it, *Gichigami*.

Lake Superior is the cleanest, clearest, and coldest of the Great Lakes. It contains low concentrations of nutrients, suspended sediments, and organic materials, which creates an underwater visibility of about 27 feet (eight metres). Acid precipitation in the form of rain and snow does fall on the lake, but the lake is so large that it hasn't noticeably affected overall quality.

Yet there is a less pleasing side to what appears to be a pristine Lake Superior basin. While toxic pollution is low compared to the other Great Lakes, pollutants such as mercury, dioxin, and PCBs still pose a threat because they do not break down. The lake has a long history of industrial pollution, which has created many contaminated areas near cities and towns. Other human activities that are changing the water quality and surrounding natural ecosystems include:

- Population growth expanding beyond urban areas
- Development of rural and waterfront vacation properties without proper planning and regulation
- Stormwater runoff
- Continuing deposition of pollutants from the air.

These activities can have long-term consequences because water that enters Lake Superior stays in the lake for an average of 173 years before it exits through the St. Marys River in Sault Ste. Marie, Ontario.

All of us have to be vigilant stewards as we try to preserve a lake that contains 10 percent of the world's available surface fresh water.

This special news supplement highlights the people, programs, and partnerships that have successfully restored or protected the lake and its basin. The articles highlight American and Canadian activities that are successfully improving the lake's ecosystem.

What Is the Lake Superior Binational Program?

"Water is life and the quality of water determines the quality of life."

-Lake Superior Binational Program vision statement

In the Great Lakes Water Quality Agreement, Canada and the United States agreed to develop and implement, in consultation with State and Provincial Governments, Lakewide Management Plans (LaMPs) for open lake waters and Remedial Action Plans (RAPs) for Areas of Concern (AOCs). The Lake Superior LaMP is being developed and implemented through a Binational Program.

The *Binational Program to Restore and Protect the Lake Superior Basin* began in 1991 through an

agreement between the federal governments of Canada and the United States, tribal governments, the Province of Ontario and the States of Michigan, Minnesota and Wisconsin. The administrative framework through which these jurisdictions jointly act on the commitments identified in the agreement is known as the Lake Superior Binational Program (LSBP). The Program identifies two major areas of activity: A Zero Discharge Demonstration Project and The Broader Program.



Lake Superior's North Shore, Minnesota, Photo courtesy of Minn. Extension Service, Dave Hansen

The Zero Discharge Demonstration Program

Lake Superior is a unique, vast resource of fresh water that has not experienced the same levels of development, urbanization, and pollution as the other Great Lakes. Because of this uniqueness, the International Joint Commission recommended to the US, Canadian, and tribal governments that Lake Superior be designated as a demonstration area where no point source discharge (from a pipe) of any persistent toxic substance will be permitted.

The Zero Discharge Demonstration Program (ZDDP) established Lake Superior as the world's first model to eliminate toxic chemicals and reach zero discharge and emission of the following nine toxic, persistent, and bioaccumulative chemicals from a lake:

1. Mercury
2. Total polychlorinated biphenyls (PCBs)
3. Dieldrin/aldrin
4. Chlordane

5. DDT
6. Toxaphene
7. Hexachlorobenzene (HCB)
8. Octachlorostyrene (OCS)
9. 2,3,7,8-TCDD (Dioxin)

The goal is zero discharge by 2020 to be achieved in a step-wise manner. Voluntary pollution prevention is the preferred way to achieve zero discharge, but regulations might also be necessary.

The **Broader Program** is the other part of binational efforts to protect and restore the lake. Recognizing that the Zero Discharge Program alone will not be enough to restore, maintain, and protect Lake Superior, the *Broader Program* focuses on habitat and wildlife issues. The *Broader Program* coordinates the basin's many environmental agencies to address issues about forests, wetlands, wildlife, fish, and surface and groundwater. Government and tribal agencies and groups from Michigan, Minnesota, Wisconsin, and Ontario, along with both countries' federal governments, have taken

steps that will restore degraded areas and protect this unique lake through wetlands and habitat restoration and rehabilitation projects, invasive-free demonstration zones, fish rehabilitation projects, and stream/inland lake restorations.

You can help!

Involvement of the public is needed to make the Lake Superior Binational Program successful. The *citizens* of the basin are also partners in the Binational Program. The Zero Discharge Program will succeed only if residents of the Lake Superior basin are aware and willing to make changes in how they use the lake and its resources. Getting to zero means changing from a *consumer* society to a *conservator* society. By working together, we can help make a Great Lake truly *superior*.



Isle Royale,
Lake Superior
Keweenaw
County, Michigan
Michigan Travel
Bureau

Zero Discharge Demonstration Program Achievements

Achievements on 2000 targets:

- Reduced mercury emissions from in-basin sources by 60 % from 1990 levels
- Achieved 24% destruction of PCBs in Canada
- Progress on Dioxin/HCB/OCS and pesticides targets.

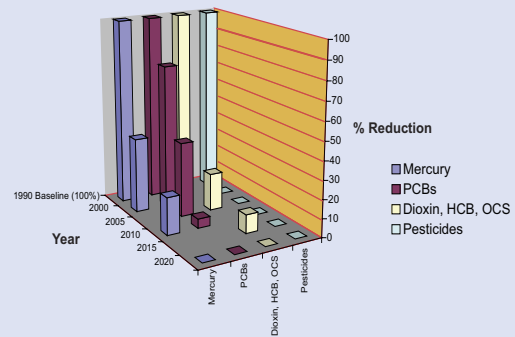
Achievements on 2005 targets will be assessed and reported in 2006.

Lake Superior Binational Program Goals and Activities

Supported by government and industry funding, the following are some examples of activities to reduce pollutants:

- Municipalities are upgrading their storm water and sewage treatment infrastructure
- Dentists are installing amalgam separators to recover mercury
- Programs are in place to recover mercury switches from automobiles, fluorescent lamps, thermostats, thermometers and button batteries
- Schools are learning that going mercury-free is safer for everyone
- Old appliances are being collected to recover mercury switches and PCB ballasts or capacitors
- Municipalities and industry are removing mercury and PCB containing equipment, changing industrial processes, destroying/recycling stockpiles, and researching new pollution control technologies
- Energy conservation and alternative energy sources are being promoted
- People are learning that it's safer to stop burning their garbage so that dioxins are not released (no more burn barrels!)
- Household hazardous waste collection programs are recovering old pesticides, mercury and pharmaceuticals
- Contaminated sediment is being assessed and cleaned up
- Outreach and education programs are being undertaken
- Monitoring of emissions, air, water, sediment and biota are ongoing

Lake Superior LaMP Zero Discharge Demonstration
Critical Pollutant Load Reduction Goals



Lake Superior Binational Program Environmental Stewardship Awards Program

In 2004, the Binational Program restarted an annual awards program to honor outstanding environmental achievements of youth, adults, businesses or industry, and community groups or First Nations/Tribes that are protecting or restoring the natural environment of the Lake Superior basin.

The award paid tribute to seven individuals and organizations that have demonstrated a commitment to environmental stewardship through leadership in their respective categories. The Binational Program hopes to encourage all residents in the basin to start actions similar to those awarded wherever they live, work, or play.

Finalists from the US and Canada were selected based on several criteria: importance of the activity to the protection or restoration of the environment; positive impact on the water or land; and whether the activity could be reproduced in other areas.

2004 Award Recipients

Adult Individuals

Roy Johnson, Cloverland, Wisconsin. converted 160 acres of farmland to restored wetlands, including shallow ponds, deep marsh, sedge meadows, and mudflats. Once home to crops and cattle, the wetlands now host a number of sensitive wetland birds and plants.

Josephine Mandamin, Ontario, an Ojibwe woman living in Thunder Bay, organized a 1,300-mile/2,080 kilometre "Water Walk" around the entire coast of Lake Superior to honour Anishinabe women's responsibility to protect water quality. Mandamin served as the lead Water Walk "grandmother" to help raise awareness about the importance of keeping water clean and free from privatization.

Industry and Business

A tie in the US: Minnesota Power and Pinehurst Inn at Pikes Creek.

Minnesota Power, Duluth, Minnesota, is working on the issue of mercury emissions from coal-fired



Kayak beached on rock, Lake Superior Pukaskwa National Park, Ontario, Robert F. Beltran

power plants from both power production and consumption. The company carried out full-scale mercury emissions control technology testing at their Laskin Energy Center (which is within the Lake Superior watershed) as part of an Electrical Power Research Institute study. In an emissions study, Minnesota Power found carbon injection and chemical additives show some promise towards removing mercury from that facility's stack.

To reduce mercury emissions at a consumer level, the company constructed an energy-saving house called the *Millennium Star* in Duluth. The model house showed that building design, materials, and construction techniques can significantly reduce energy consumption and costs.

Pinehurst Inn at Pikes Creek, Bayfield, Wisconsin, is a bed and breakfast that consists of an historic inn and a modern Garden House. The Garden House was built using "green building" techniques, materials, and systems that complemented natural systems. These features minimize the inn's impact on Lake Superior and the surrounding environment by reducing its contribution to air and water pollution, minimizing solid wastes, and enhancing the inn's natural landscaping.

Canadian Pacific Railway, Thunder Bay, Ontario.

The company reconstructed at their own expense several railroad water crossings on McKellar Creek (near Terrace Bay, Ontario) to enhance fish spawning opportunities on the creek. Fish surveys in fall 2003 showed that fish were migrating through the new structures, which indicated that the company had successfully restored important fish habitat.

Community/Organization Category

City of Superior, Wisconsin. Staff at the city's wastewater treatment facility has conducted extensive reduction and education programs that prevented mercury from entering the lake through wastewater discharges. By working with state agencies, tribes, schools, and private businesses, the city has kept 300 pounds/136 kilograms of bulk mercury, 400 lab thermometers, 4,000 fever thermometers, and 1,000 vehicle switches that contain mercury out of landfills and waterways.

City staff have incorporated mercury reduction curriculum and activities in public schools, and conducted campaigns for builders, dentists, and the public.

EcoSuperior, Thunder Bay, Ontario.

EcoSuperior is a not-for-profit organization that provides Ontario residents with information and motivation for building healthy, sustainable communities. Staff delivers programming in a number of areas including water and energy conservation, waste reduction, green space naturalization, and pollution prevention. The group has delivered effective outreach programs that help change many wasteful or destructive behaviours, including composting Halloween pumpkins and Christmas trees, organizing hazardous waste material collections, and conducting a campaign about the dangers of open garbage burning.

The Binational Program will sponsor the awards program every year. The nomination period runs from February 15 through April 15. For more information, visit the Forum's web site at www.superiorforum.info

Lake Superior Binational Forum



Since 1991, the Lake Superior Binational Forum has served as a partnership of 24 citizen volunteers that provide input and analysis to American and Canadian governments about ways to protect and restore the Lake Superior basin. Through quarterly public input sessions, the Forum also gathers input from citizens and shares this input with binational governments to help shape public policy.

Recently Forum members began to look at how they could also help implement critical priority projects from the Lakewide Management Plan, and have been conducting outreach activities around the basin to raise awareness about:

- Harmful effects of mercury
- Effects of chemical pollutants on human health
- Invasive species
- Dangers of open garbage burning.

Current outreach projects include promoting a basin-wide Lake Superior Day celebration and an environmental stewardship awards program (see articles in this insert).

Forum members agree, as summarized in the group's vision statement, that "water is life and the quality of water determines the quality of life." The Forum recognizes that the Lake Superior region cannot have a sound economy without a healthy environment. This philosophy helps the group make decisions that protect and restore the lake's natural resources.

Who are the members?

Both Canada and the United States select 12 people from a diverse cross-section of community sectors in the Lake Superior basin including businesspeople, environmentalists, industrialists, First Nations/Tribes, municipal officials, and academics. Each member brings his or her own professional experience, sector perspectives, and skills to the Forum's decision-making processes. This diversity strengthens the group. The list of current members is on the Forum's website.

For more information:

In the US, call
(715) 682-1489

In Canada, call 807-343-8811
toll free at (888) 301-LAKE

Or visit the Forum's website at

www.superiorforum.info

Lake Superior Day July 17, 2005

What is Lake Superior Day and why is it being celebrated?

You've heard of *Earth Day*, which focuses on the importance of taking actions that protect the planet. *Lake Superior Day* is a day to celebrate our connection to the world's largest freshwater lake (by surface area) while finding ways to protect and restore basin communities.

Although Lake Superior is the cleanest of the five Great Lakes, it too is being threatened by pollution, contaminated fish, invasive species, loss of habitat,

and overdevelopment. The purpose of a special day is to remind people how important the lake and its natural resources are to our health, food supply, recreation opportunities, weather, and lifestyles. Lake Superior Day highlights the many ways we use the lake every day and encourages citizens to take action to restore and protect it.

When is it celebrated?

Lake Superior Day is celebrated every year on the third Sunday in July all around the lake and wherever people around the world want to acknowledge their appreciation for this spectacular lake.

How do I celebrate this day?

People will celebrate this day in many ways—through contemplation, action, art, political means, or recreation. How you celebrate it is up to you.

Where can I get more information?

The Lake Superior Binational Forum will publish an events calendar, a list of celebration ideas, and articles about events on its website at www.superiorforum.info. Please visit the site to register your event or activity or submit media reports so the Forum can help promote your event and you can see what others are doing to celebrate.

A Burning Issue

The average resident of the Lake Superior watershed creates about seven pounds/3.2 kilograms of garbage each day, or 2,555 pounds/1,600 kilograms per year. What happens to all that material? Much of it goes into landfills or is recycled or composted. Some is illegally dumped in backyards, ditches, and the woods, or buried in backyards. The rest is burned.

Many an old-timer remembers that it was the children's job to burn the trash once or twice a week. Sometimes it was burned in a pit, a 55-gallon drum, a woodstove, or a household incinerator. In those days, people burned mostly paper, fabric, rubber, metal cans, and leather.

The old-timers' trash heap was very different from today's trash. Plastics and electronics have joined the heap, and some modern papers and fabrics now contain plastics. And, everyone is now throwing away more and more trash.

Even though the types and amount of trash have changed, people are still using an old-fashioned disposal method - burning trash. They do this for lots of reasons. They may not want to pay for trash service, or they're trying to cut down on how much trash they send to the landfill, or it's a "tradition" to burn garbage.

However, some traditions should be broken, because burning trash creates toxic chemicals. For example, pound for pound, a backyard burn barrel creates 20 times as much dioxin (which causes cancer) as a well-run municipal incinerator. The smoke also can sicken people, especially those who have respiratory illness. Dioxin in the smoke deposits on agricultural fields and can accumulate in the food we eat. In Wisconsin and Minnesota, about 40 percent of wildfires are caused by improper backyard burning. In fact, there are so many problems associated with burning trash that it is illegal in many places.

What can you do instead of burning garbage?

- Sign up for trash pickup service.
- Take your trash to landfills or transfer stations.
- Recycle as much as you can.
- Reuse as many materials as possible. For example, take usable items to a resale store, or repair broken items.
- Compost your organic materials such as food scraps or leaves and grass clippings.
- Try to minimize packaging that will become trash as soon as you get it home.

For more information, visit this binational web site about open burning:

Canadian Centre for Pollution Prevention
<http://www.openburning.org>
Or EcoSuperior, Thunder Bay
<http://www.ecosuperior.com/openburning.html>

Coastal Wetlands: Jewels Along the Shore

Many magical coastal wetlands exist along the shores of Lake Superior. Some are drowned river mouths, or secluded wetland refuges behind sand spits, protected from the vicious action of wave and ice. These are places where cold water meets warmer water, where wetland vegetation emerges from silty bottoms and provides underwater refuges for aquatic life, such as young fish and frogs. These places serve as the lake's dinner plate and home for many of its resident and migrating animals such as beaver, birds, and snails.

These wetlands help keep Lake Superior healthy. One very special creek and its wetland in northern Wisconsin was recently designated as a National Wildlife Refuge. The U.S. Fish and Wildlife Service is currently restoring **Whittlesey Creek** near Ashland as a home for fish and wildlife.

Historically, human impacts such as logging and farming changed the creek's natural flow. Floods were more intense because water flowed faster off the land after trees were removed. Farms,

homes, and cropland along the floodplain near the creek mouth were often under water during these floods. Ultimately, the water won. Flooding, along with persistently high groundwater, proved too much to take, and most farms and homes near the creek mouth were abandoned.

The goal is to return the creek and its floodplain to its natural residents—sora rails, brook trout, swamp sparrows, yellow warblers, and frogs, to name a few.

The U.S. Fish and Wildlife Service will eventually purchase 540 acres from willing sellers. It's a small piece of land. But, because these coastal wetland areas are so critical to the lake, such action will have a big impact. The Service has already acquired 208 acres and has restored wetland habitats and planted about 10,000 trees on abandoned farmland.

The Service, along with the Wisconsin Department of Natural Resources, has also started to restore the coaster brook trout to Whittlesey Creek. Coasters spend part of their life in Lake Superior and spawn in its creeks or rocky shores. Once common in



Lake Superior, populations are only found in a few locations now. Overfishing by early settlers, along with dramatic land use changes, nearly depleted their population.

The Service and its partners hopes to bring this fish back to the Wisconsin waters of Lake Superior. Experimental stocking efforts began in August 2003 when area residents and partners released 80 adult coaster brook trout into the creek. Future stocking will consist of placing various age groups, from eggs to adults, in Whittlesey Creek, through 2009. Results of this experiment will be monitored through 2030.

Though the refuge is still being developed, it is open to limited public use. For more information visit http://midwest.fws.gov/ashland/whitt-cr/whitt_crk.html.

Stop The Invasion!

They may not be slipping in on flying saucers, but alien creatures are finding their way into the Lake Superior basin. These alien plant and animal species are causing serious problems in the Great Lakes basin.

What is an alien or non-native species?

Non-native species are those that do not naturally exist in an environment, but have been intentionally or unintentionally introduced by human activity or other means. They can be aquatic or land plants, fish, insects, invertebrates, mussels, or crustaceans.

You might also hear them called invasive, non-native, exotic, introduced, non-indigenous, or foreign species.

How did they get here?

Non-native species can sneak into the lake or land in a variety of ways:

- Intentional stockings
- Ballast water carried in international commercial vessels. *Ballast water* is fresh or salt water held in ships' cargo holds to make them heavier and less likely to roll. Upon entering a port, the water is discharged from the ship into the water.
- Building of canal systems
- Gardening and mowing lawns and roadside ditches
- Angling and recreational boating

- Release of unwanted live fish, either from aquariums or ponds, or live fish sold to be consumed
- Through natural methods such as the wind or animal droppings.

Why do they cause problems?

Invasive species negatively affect the *environment* and the *economy*. In the environment, non-natives prey upon native species and compete with them for food or habitat. For example, the ruffe, a small fish that is native to Eurasia, was first observed in Lake Superior in 1986. It was introduced through the ballast water of an ocean-going ship. It now competes with native fish for food and habitat, has no natural predators, and has a very successful reproductive rate, which affects how native fish survive.

Economic impacts have already been experienced in commercial fishing, agriculture, tourism, sport fishing, recreation, and utilities. For example, municipal water intake pipes can become clogged with zebra mussels that cling to hard surfaces.

Where are these species?

In 2000, Minnesota Sea Grant observed 28 non-native species in Lake Superior, including 17 fish, five aquatic invertebrates, and six aquatic plants.

Here are some examples of non-native species already living in the Lake Superior basin:

Fish

Some of the non-natives, such as sea lamprey, are found throughout the lake, while others, such as round nose goby, ruffe, and three-spine stickleback, are found in limited areas of the lake. Ship ballast water continues to be the main source of unintentionally introduced non-native fish species in Lake Superior.

Plants

Non-native aquatic plants of concern include purple loosestrife and Eurasian water milfoil. Both are growing in Lake Superior and are spread when boaters accidentally carry small plant parts in their trailers, live well water, or in personal watercraft tanks.

Leafy spurge is a non-native land plant with roots that can extend 35 feet. It can grow through asphalt and flings its seed 15 feet. The deep root system enables it to survive disturbances and sprout even after the foliage is destroyed.

Non-native honeysuckles have been used as ornamentals in gardens for decades, and birds carry their seeds to natural habitats. Once established, honeysuckle can dominate the understorey of woodlands.

Other non-native plants causing problems include exotic buckthorns, garlic mustard, and spotted knapweed.

What is being done to stop the spread of these species?

Binational activities are currently dealing with non-native species in Lake Superior and throughout the Great Lakes. For example, governmental agencies, Native American tribes, and nonprofit organizations from the United States and Canada continue fish surveys to document the range expansion of ruffe and detect other non-native species from Thunder Bay, Ontario, to Sault Ste. Marie, Michigan.

In 2003, round goby and white perch were discovered and confirmed in Thunder Bay harbour, Ontario. Fish surveys are continuing in the St. Louis River in Duluth, Minnesota, and four



Rusty Crayfish, Lake Superior
Photo courtesy of Minnesota Sea Grant,
Jeff Gunderson

other south shore rivers to monitor ruffe and other non-native populations.

Thousands of acres of land are being treated annually to control the spread of non-native plant species by governmental and non-governmental organizations. Educational materials such as pocket guides, signs at boat landings, brochures, and videos are available from Sea Grant, the Lake Superior Binational Program partners, and others. These materials are distributed throughout the Lake Superior basin to prevent the introduction and reduce the spread of non-native species.

What can you do to help stop the invasion?

A few simple actions will help prevent the spread of non-native species to your favorite place:

1. Always inspect your boat and trailer and remove any plants and animals before leaving the water. This is the best way to stop the spread of aquatic plants and fish species to other lakes! Drain water from the motor, live well, bilge, and transom before leaving the water.

2. Never release live baitfish in the water or live earthworms on the land or water.
3. When planting your landscape or garden, use only plants that are native to your region. Consult with professional garden centers and landscape planners on the best native plants for your area.
4. Learn what non-native species look like and additional prevention tips by contacting your local state, provincial, or federal natural resource management agency or university extension service.

For more information about non-native species, visit these web sites:

Environment Canada
<http://www.on.ec.gc.ca/coa/2001/invaders-e.html>
 US Environmental Protection Agency
http://www.epa.gov/owow/invasive_species/

Conserving Energy Reduces Mercury Emissions

What Is Mercury?

There is more to mercury than just the silvery liquid in thermometers. Mercury is a naturally occurring element that is present throughout the environment. Scientists believe that more than half the mercury in the environment today is from human-made sources. Human activity, such as some forms of mining and burning fuel, releases mercury into the environment. These releases increase the amount of mercury cycling through the air, soils, plants, and surface and groundwater.

Living things easily absorb this mercury.

When atmospheric mercury falls to earth, bacteria or chemical interactions can change it into an organic form known as *methylmercury*. Methylmercury is much more toxic than the original form. It also has the ability to pass through cell walls and build up in living tissue. *Bioaccumulation* occurs when a substance absorbed from the air, water, or food builds up in the tissues of a living organism.

Mercury and the Food Chain

When methylmercury accumulates in natural ecosystems, it gets more and more concentrated in living creatures' bodies. For example, small fish may eat aquatic plants that contain mercury. Bigger fish then eat the smaller fish, and bald eagles eat the big fish. This is called *bioaccumulation*.

Mercury poses risks to wildlife that eat contaminated fish including behavioural problems, reduced reproductive success, impaired growth and development, and even death. Species that are at risk for mercury damage from eating fish include eagles, loons, osprey, mink, otter, and humans.

Mercury cannot be removed from fish before people eat them because methylmercury accumulates in



A North Shore stream flows into Lake Superior, Minnesota.
Photograph courtesy of Minnesota Extension Service

the muscle, not the fat. This is why all US states and the province of Ontario in the Great Lakes region have fish advisories that suggest limits on fish consumption.

Mercury and Human Health

Mercury exposure in human beings can lead to damage of the brain, spinal cord, nervous system, kidneys, and liver. Exposure to mercury while in

the womb is now linked to brain development problems in some unborn and growing children. A 2000 National Academy of Sciences report concluded that children of women who consume large amounts of fish are at the highest risk.

A recent public health study based on data from the US Center for Disease Control and Prevention concluded that between 300,000 and 600,000 children born each year in the U.S. have umbilical cord blood levels of mercury associated with loss of IQ. This is equivalent to between 8 and 16% of births in any given year. This startling calculation is a result of exposure to methylmercury while in the womb. It is thought that this loss of IQ is irreversible. The economic costs to the US would be over \$8 billion annually.

Mercury and Coal Combustion

Mercury is naturally present in coal. When coal is burned in power plants, mercury is released into the air as a by-product. This means coal-fired power plants are a main source of mercury emissions. Taconite production, which also burns large amounts of coal, is another major source in the Lake Superior basin.

The good news is that we can reduce our energy use at home, work, and school. The more energy we save, the less coal would be burned and less mercury is released. This makes energy conservation an important part of mercury reduction activities.

Practical Steps For Energy Conservation

What's using energy in the average home?

Heating and cooling	38 %
Major Appliances	21 %
Hot Water	19 %
Other Appliances	15 %
Lighting	7 %

Here's how you can reduce energy use where you live:

- Set the furnace thermostat at 68 degrees F/20 degrees C or lower, and the air conditioner thermostat at 78 degrees F/25 degrees C or higher. This can decrease your energy usage by three to five percent per degree.
- In summer, open windows at night to bring in cool night air, and close windows and drapes during sunny days.
- Plant deciduous shade trees on the west and south sides of your house to block the summer sun.
- Close the fireplace damper, except when you're using the fireplace. This prevents warm air from escaping up the flue.
- Reduce heat to unused rooms in the house by closing doors and heat vents.
- Upgrade ceiling insulation to R-38. Higher R-values mean more effective insulation levels and thus more energy savings.
- Insulate exterior heated basement walls to at least R-11. Insulate floors over unheated areas to R-19.
- Install low-flow showerheads to reduce water-heating bills.
- Dry clothes outside on a line whenever possible.
- Run the dishwasher only when you have a full load of dishes.
- Buy energy-efficient room air conditioners and install them only where needed.
- Turn off electric lights when not in use. This is probably the simplest energy-saving thing you can do!
- Install compact fluorescent bulbs in the fixtures that you use most often.

Paper generously donated by
Bowater, Thunder Bay

Fun Facts About the Lake!

- ◆ The biggest, coldest, and cleanest of the Great Lakes, Lake Superior is the largest freshwater lake, by surface area, on Earth. By volume of water, it's the world's second largest lake. Only Lake Baikal in Siberia has more water.
- ◆ The lake's surface water is over 31,700 square miles/82,103 square kilometres.
- ◆ It's so big it could hold all the water from the other four Great Lakes, PLUS three more lakes the size of Lake Erie!
- ◆ The lake contains 10 percent of the world's fresh surface water, enough to submerge all of North and South America under one foot of water.
- ◆ If you could travel along the entire Lake Superior shoreline, you'd go 1,826 miles/2,922 km, or the distance from Duluth to Miami, or from Thunder Bay to Halifax.
- ◆ Lake Superior's deepest point is 1,332 feet/406 metres.
- ◆ French explorers referred to this tremendous body of water as le lac superieur, or "Upper Lake," or the lake above Lake Huron. The Chippewa Indian translation, Gichigami, signifies Great Water.

- ◆ Length: 350 miles / 563 km.
- ◆ Breadth: 160 miles / 257 km.
- ◆ Average Depth: 483 ft. / 147 m.
- ◆ Maximum Depth: 1,332 ft. / 406 m.
- ◆ Volume: 2,900 cubic miles / 12,100 cubic km.
- ◆ Drainage Basin Area: 49,300 sq. miles / 127,700 sq. km.
- ◆ Shoreline Length (including islands): 2,726 miles / 4,385 km.
- ◆ Average Temperature: 40 degrees F / 4 degrees C
- ◆ Elevation: 600 ft. / 183 m.
- ◆ Outlet: St. Marys River to Lake Huron
- ◆ Retention/Replacement Time: 173 years



Source: Great Lakes Information Network and the University of Wisconsin-Extension's websites.