



# LAKE SUPERIOR LAKEWIDE MANAGEMENT PLAN

## Annual Report 2012

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### What is the LaMP?

Under the Great Lakes Water Quality Agreement, the governments of Canada and the United States are obligated to protect the physical, biological and chemical integrity of the Great Lakes Basin Ecosystem.

The Lakewide Management Program (LaMP) is the binational mechanism to establish shared goals, identify threats and priorities, take coordinated action, and monitor results. The Lake Superior Binational Program includes the LaMP and the Zero Discharge Demonstration Program, unique to Lake Superior, with the goal to virtually eliminate the input of nine chemical pollutants. Many actions are implemented through the Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem and the United States Great Lakes Restoration Initiative. The Lake Superior Binational Forum is a volunteer-driven stakeholder involvement and advisory group representing industrial, Tribal/First Nations, business, environmental, recreational, tourism, health, labour, and academic interests. The Forum and the LaMP share a common vision for Lake Superior.

### Overview

For over 20 years, federal, provincial, state and tribal agencies have worked cooperatively with local communities and private stakeholders through the Lake Superior Lakewide Management Plan (LaMP) to restore and protect Lake Superior. As a result, the Lake Superior ecosystem is in relatively good condition. To ensure protection of this beautiful and important resource, continued vigilance and protective actions are necessary.

The Lake Superior ecosystem is in good condition:

- fisheries are in good to excellent condition;
- lower food web is robust and stable;
- persistent toxic contaminants are generally decreasing or remaining stable, with a few exceptions; and
- forest cover has increased since the 1980s, although the composition is changing.

There are, however, ongoing and emerging stressors and threats:

- some contaminants continue to cause fish advisories and exceed water quality guidelines;
- some chemicals of emerging concern (e.g. flame retardants) are increasing;
- impacts from climate change, the spread of invasive species, and some land use practices, including shoreline development, are stressing the ecosystem; and,
- mining activity and hydropower dams are expected to increase in the Lake Superior basin, potentially degrading fish and wildlife habitat and releasing contaminants, such as mercury, to the ecosystem. ♦

### Canada-U.S. Great Lakes Water Quality Agreement (GLWQA) Amendments

Negotiations to amend the 1987 GLWQA were launched in early 2010. The Governments of Canada and the United States held the final negotiation session in early 2012 and the amended GLWQA is now in the process of being finalized and approved. It is anticipated that the amended Agreement will be signed in 2012. ♦



Credit: Lynelle Hanson, University of Wisconsin-Extension. Through the LaMP, representatives from federal, provincial, state and tribal agencies coordinate Lake Superior plans and actions.



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## Accomplishments

### *Lake Superior Year of Monitoring -2011*

In addition to routine monitoring, Lake Superior partners conduct an intensive science and monitoring effort every five years. Research from the 2011 Binational Monitoring Year produced the following preliminary findings:

- lake sturgeon numbers are increasing in response to long-term rehabilitation and protection efforts;
- Lake Superior has the best native to non-native biomass ratio of all the Great Lakes, an important measure of non-native species management and prevention actions;
- no new non-native fish species were found during intensive monitoring of four high-risk harbours; and,
- a basin-wide decrease in precipitation over the last 30 years has led to reduced stream flows into Lake Superior. Reduced stream flows stress fish populations and are a consideration for future water management decisions.

### *Preventing Non-native Invasive Species*

An important accomplishment in Lake Superior was that no new non-native species were detected in 2011. Currently, 89 non-native aquatic species are established in Lake Superior, including the sea lamprey (since 1938), spiny waterflea (since 1987), and Eurasian watermilfoil (since 2006). Many non-native species are invasive, out-competing native species for food and habitat, disrupting the food-web, and negatively impacting ecosystem health and economic interests.

The prevention of new non-native species is tied to actions implemented under the Lake Superior Aquatic Invasive Species Complete Prevention Plan. These actions include working with border officials to educate travellers on how to stop invasive hitchhikers, engaging aquarium and garden store owners about the risks, teaching school children about invasive species identification and prevention, and a renewed commitment to invasive species monitoring. The most recent ballast water regulations have also helped to reduce the risk of new introductions from trans-oceanic ships.

### *Reducing Critical Chemical Pollutants*

All of the 2010 chemical reduction targets were achieved under the Zero Discharge Demonstration Program. Trends continue to show a decline toward the goal of virtually eliminating inputs of nine critical pollutants by 2020. For example, between 1990 and 2010, in-basin mercury emissions were reduced by 80% and dioxin emissions by 86%. Pesticide disposal trends indicate that amounts of DDT and other banned pesticides have significantly dropped since 2001.

Chemical reduction actions implemented under the LaMP include a PCB transformer replacement program, mercury product collections, community hazardous waste collection events and public campaigns to stop household burning of garbage. The LaMP also tracks regulations, national chemical management programs, and energy demands related to critical chemical pollutants.

### *Binational Forum: Citizens Taking Action*

The volunteer-driven Lake Superior Binational Forum mobilizes communities to achieve the LaMP objectives. For example, due to popular demand, two new “Bernie the Burn Barrel” displays have been created for loan to schools, community groups and events. These displays teach people about the environmental and human health effects of burning their garbage. Garbage burning is the largest remaining source of dioxins to the lake.

The Binational Forum, in conjunction with Great Lakes United and with funding from the Canadian Environmental Assessment Agency, is engaged in the environmental assessment of the proposed Stillwater Inc. mine near Marathon, Ontario. The Binational Forum will encourage the incorporation of LaMP objectives throughout the lifecycle of the mining development.

The newly-designed Lake Superior Binational Forum website can be found at [www.superiorforum.org](http://www.superiorforum.org). The website is an excellent resource for information and discussion about Lake Superior issues, including a new mining section. All Lake Superior residents are encouraged to join the “Lake Superior Stewards” program, found on the website.



Credit: Jim Bailey, Eco Superior. Bernie the Burn Barrel spreads the message to stop backyard burning of garbage.





### Making Progress in Areas of Concern

Restoring Lake Superior's eight Areas of Concern (AOCs) is a high priority. AOCs are contamination hotspots where beneficial uses (e.g. drinking water, fish consumption, fish and wildlife habitat) are impaired.

- St. Louis River, MN/WI: After decades of habitat restoration and stocking, lake sturgeon have successfully reproduced for the first time in over a century.
- Thunder Bay, ON: Monitoring since 2009 has confirmed the area once again supports healthy and self-sustaining populations of lake trout and lake whitefish.
- Nipigon Bay, ON: With federal and provincial funding assistance, the town of Nipigon has constructed a new municipal wastewater treatment plant.
- Jackfish Bay, ON: Compliance with federal and provincial environmental regulations has led to improved fish health.
- Peninsula Harbour, ON: Following years of effort and investigation, the federal and provincial governments are working together to clean up contaminated sediment. Completion is expected in 2012.
- St. Marys River, MI/ON: With support of a U.S. federal grant, plans to restore habitat in the Little Rapids have been developed. In Canada, the 2011 sediment assessment showed that contaminants buried below the river bottom in the area of Bellevue Marine Park do not pose a risk to the environment; management actions, therefore, are not required in this location.
- Deer Lake, MI: After years of effort by federal, state and local partners, including upgrades to the Ishpeming wastewater treatment plant, two of the three remaining beneficial use impairments were removed in 2011.
- Torch Lake, MI: Honeywell International is completing an interim response action at the old Calumet and Hecla Power Plant site (located adjacent to the lake) to remove immediate threats to human health posed by heavy metals, asbestos, and PCBs. 💧

### Challenges

#### Vulnerable to Climate Change

The Lake Superior ecosystem is vulnerable to the effects of climate change. By 2050, under high and low greenhouse gas emission scenarios, the summer climate of Michigan's Upper Peninsula is projected to be similar to traditional summers experienced in Iowa or northern Illinois.

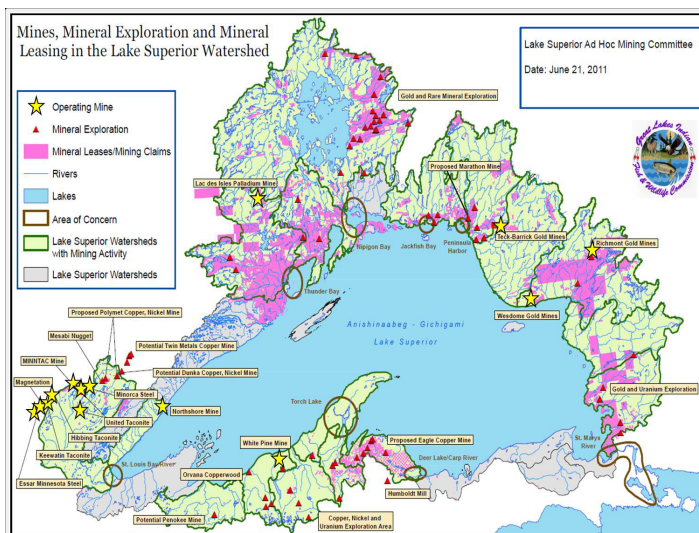
Scientists anticipate that warming waters will benefit warm water fish (e.g. bass, carp, and sunfish) but also invasive species originating from more temperate climates, such as the zebra and quagga mussels.

On the other hand, cold water fish (e.g. trout and salmon) will be stressed by warming waters. Around the lake, most of the present tree species (e.g. spruce-fir, pine, and aspen-birch) will remain, but the mix of species and relative abundances will change. The rate of species migrating from warmer southern forests (e.g. oak-hickory) will depend upon many factors but one study indicates that northward tree migration in the Lake Superior area may currently be occurring at a rate of 100km (62 miles) per century.

#### Chemicals Make Their Home in Lake Superior

Mercury levels in lake trout remain higher than the other Great Lakes, despite significant reductions in the amount of mercury being released from around the lake. Eating contaminated fish is a primary source of mercury exposure for people. A recent study measuring mercury in blood from nearly 1,500 infants born to mothers living on the U.S. side of the Lake Superior basin, found 8% had levels above the safe dose limit set by the U.S. Environmental Protection Agency.

Pollutants which do not degrade easily through natural processes, such as mercury and toxaphene, remain for a very long time in Lake Superior because of the lake's large size and other unique characteristics. This long retention time means that pollution prevention is extremely important for Lake Superior. The largest source of mercury from within the Lake Superior basin is the mining sector, at 63% of total emissions. Since the Lake Superior basin and nearby watersheds are experiencing an increase in mining activity, best mining management practices and emission control technologies will be essential to achieving contaminant discharge and emission reduction targets. 💧



Credit: Great Lakes Indian Fish and Wildlife Commission . Map illustrates existing mines (yellow stars), new mining explorations (red triangles), and mining leases and claims (pink coloured areas).



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## Protecting Lake Superior Habitat

The Lake Superior basin has some of the healthiest remaining habitat in the Great Lakes basin. The bald eagle, wild rice, lake trout and the birch tree – all iconic symbols of Lake Superior – require healthy, sustainable habitats. However, fish, wildlife and plant habitats are being stressed by many factors including mining, climate change and poorly planned shoreline development.

Mining, for example, results in direct habitat loss, changes to hydrological systems, and in some cases, pollution from acid mine drainage. Management attention and financial investments are currently directed at addressing ecosystem impairments from legacy mining, including the restoration of the Torch Lake and Deer Lake Areas of Concern. Actions are also targeted at the effects of elevated levels of pollutants many miles downstream from mining and mineral processing operations. The challenge is to apply lessons learned from past practices to prevent future Areas of Concern, and to restore legacy mining sites so as to achieve ecosystem goals and the long-term vitality of Lake Superior's communities and culture. 💧

## Next Steps

Some future activities for the LaMP agencies include:

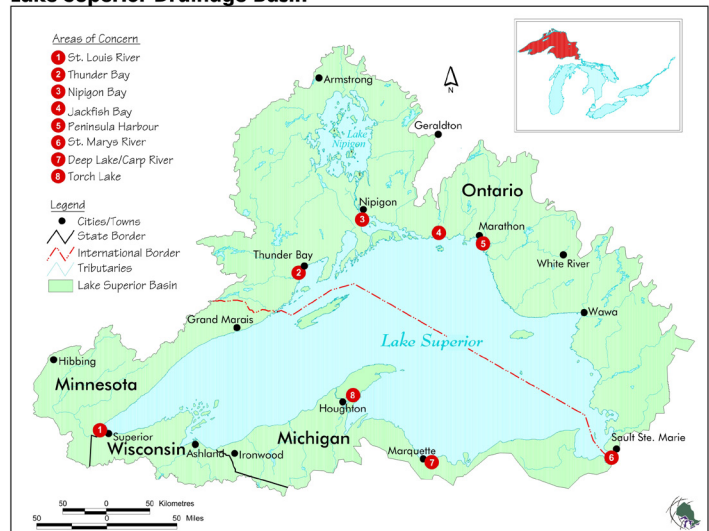
- implementing on-the-ground projects to further reduce critical pollutants;
- preventing new introductions and the spread of aquatic invasive species;
- protecting and restoring critical habitat;

- working with the mining and water power sectors to ensure protection of the Lake Superior ecosystem;
- implementing measures to adapt to climate change;
- sharing Lake Superior science and information:
  - 2010 Critical Chemical Milestone report;
  - watershed fact sheets;
  - results from 2011 intensive year of cooperative science and monitoring.

## Watershed Map

Lake Superior is the world's largest lake by area, and contains 9% of the planet's surface freshwater

### Lake Superior Drainage Basin



## Special Events

Get Ready for Lake Superior Day!



Sunday July 15, 2012 is a day to celebrate the world's largest lake. Food, music and fun activities are organized in many communities. To see what celebrations are planned in your area visit the Lake Superior Binational Forum's website or follow them on Facebook or Twitter.

## For More Information:

Visit one of the Lake Superior Lakewide Management Plan web sites [www.binational.net](http://www.binational.net) or [www.epa.gov/glnpo](http://www.epa.gov/glnpo) or contact:

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