



St. Marys River AREA OF CONCERN

Canadian Section

Why are we concerned about St. Marys River?

There are a number of hotspots around the Great Lakes where historical pollution has caused environmental issues. The St. Marys River is one of these environmental hotspots, also known as an 'Area of Concern.'

Past pollution from industrial sources, such as local pulp and paper mill and steel mill effluents, partially treated municipal and private sewage, and untreated stormwater from the surrounding watershed are factors that have contributed to the degradation of the St. Marys River.

Nearly a century ago there were no regulations in place to control what was being dumped into the St. Marys River. As a result, many toxic contaminants made their way directly into the river. In 1987, the St. Marys River was recognized as an Area of Concern because of the cumulative negative impacts that industrial effluents were having on fish and their habitat, sediment quality, and water quality.

In the 1990s, the federal government passed environmental legislation for pulp and paper mill effluents, and the provincial government introduced regulations under the Environmental Protection Act. Today, all industrial effluents must meet strict requirements and cannot be lethal to fish or aquatic insects.

While inputs of pollution into the river are no longer as severe as they used to be, our legacy of environmentally harmful activities has left many environmental challenges that need to be addressed.



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What is an Area of Concern?

Area of Concern (AOC) is the term used to identify hotspots where the environment has been harmed to the point that it affects use and enjoyment of that area or the overall health of the lake or river. Consequences may include beach postings, loss of fish and wildlife habitat, loss of biodiversity, and restrictions on the amount of fish people can eat.



In 1987, the *Canada-U.S. Great Lakes Water Quality Agreement* identified 43 Areas of Concern in the Great Lakes. Currently there are nine Areas of Concern in Canada, 25 Areas of Concern in the United States and five Areas of Concern that are shared by both countries, such as the St. Marys River. Three Canadian Areas of Concern and one American Area of Concern have been fully remediated and officially removed from the list of Areas of Concern. As part of this agreement, Remedial Action Plans have been developed for each area through a collaborative, methodical, and scientific approach.

What is a Remedial Action Plan?

Each Area of Concern has a Remedial Action Plan that defines the nature, extent, and causes of environmental problems and recommends actions to restore and protect the environment. Canada and the United States, along with provincial and state governments, work together with conservation authorities, municipalities, Aboriginal communities, environmental groups, industry, special interest groups, and others to develop and implement the plans. All Remedial Action Plans proceed in three stages.

Stage 1: Identify environmental problems and sources of pollution

Stage 2: Evaluate and carry out actions to restore the area

Stage 3: Confirm that these actions have been effective and that the environment has been restored

Canadian St. Marys River Remedial Action Plan Participants

- Algoma Public Health
- Algoma University
- Bi-National Public Advisory Council
- City of Sault Ste. Marie, ON
- Environment Canada
- Fisheries and Oceans Canada
- Local Aboriginal Communities
- Ontario Ministry of Natural Resources
- Ontario Ministry of the Environment
- Sault Ste. Marie Innovation Centre
- Sault Ste. Marie Region Conservation Authority
- St. Marys River Fisheries Task Group

How is the St. Marys River Affected?

Summary of Environmental Challenges in St. Marys River

There were 14 environmental challenges considered in each Great Lakes Area of Concern

ENVIRONMENTAL ISSUE	Status
Restrictions on Fish and Wildlife Consumption	
➤ Restrictions on fish consumption	I
➤ Consumption of wildlife	NI
Tainting of Fish and Wildlife Flavour	NI
Degradation of Fish and Wildlife Populations	
➤ Health of fish populations	I
➤ Contaminant levels of fish	I
➤ Health of wildlife populations	RFA
➤ Contaminant levels of wildlife	RFA
Fish Tumors and Other Deformities	I
Bird and Animal Deformities or Reproductive Problems	RFA
Degradation of Benthos (worms and insects that live on the bottom of river)	
➤ Health of benthic populations	I
➤ Contaminant levels of benthic organisms	I
Restrictions on Dredging Activities	I
Eutrophication or Undesirable Algae	I
Restrictions on Drinking Water Consumption or Taste and Odour Problems	
➤ Consumption	NI
➤ Taste and odour problems	NI
Beach Closures	I
Degradation of Aesthetics	I
Added Cost to Agriculture and Industry	NI
Degradation of Phytoplankton and Zooplankton	NI
Loss of Fish and Wildlife Habitat	I
I = Impaired; RFA = Requires Further Assessment; NI = Not Impaired	

FACTS ABOUT PAHs

Contaminants of concern in the St. Marys River include PAHs or Polycyclic Aromatic Hydrocarbons. PAHs occur naturally in oil, coal, tar and petroleum, and are released to the environment as byproducts from the burning of these fossil fuels. PAHs mix more easily with oil than water and are often found in sediments where they persist and breakdown very slowly. They are also able to accumulate in bodies of organisms. The toxicity of a given PAH is dependent on its structure and ranges from non-toxic to extremely toxic, with some PAH compounds having been shown to cause cancer, genetic mutations, and disruptions to embryo or fetus development. Industry present along the riverbank accounted for the most significant source of PAHs in the St. Marys River, but with new regulations and equipment upgrades, the amount of PAHs discharged to the river has declined significantly.

Canadian St. Marys River Remedial Action Plan Milestones

- 1987** – St. Marys River was identified as an Area of Concern (AOC) under the *Canada-U.S. Great Lakes Water Quality Agreement*.
- 1988** – The Bi-National Public Advisory Council (BPAC) was formed – a stakeholder group with members from Canada and the United States that represents a variety of interests around the river.
- 1991** – The commissioning of a main filtration plant for wastewater discharged from Algoma Steel Inc.* that led to improved wastewater quality.
- 1992** – The first stage of the RAP for St. Marys River was completed. Federal and provincial government agencies worked with BPAC to identify specific environmental issues in the St. Marys River.
- 1995** – St. Marys Paper Ltd. installed an activated sludge secondary treatment facility that led to improved wastewater quality.
- 1997** – The St. Marys River Fisheries Task Group was established by the Great Lakes Fishery Commission to coordinate fisheries assessment among Canadian and U.S. agencies.
- 1997 – 1999** - Algoma Steel Inc.* invests heavily in new water technology to reduce phenol concentrations in wastewater and optimize water re-use by up to 90% (e.g., new biological treatment facility to treat Cokemaking wastewater, new direct casting facility, toxicity control system on the Bar and Strip process effluent, and water recirculation system on Ironmaking Blast Furnace water facilities).
- 2002** – In partnership with the BPAC, the RAP Team completed the Stage 2 Report which recommended remedial actions to address the environmental challenges within the AOC.
- 2003** – The City of Sault Ste. Marie (ON) constructed a sanitary sewer overflow tank at Bellevue Park to address infiltration and high-flow events.
- 2006** – Sault Ste. Marie's (ON) East End Wastewater Treatment Plant was upgraded to secondary treatment using the first Biological Nutrient Removal system in Ontario, which uses organic material instead of chemicals to reduce contaminants in wastewater.
- 2009** – Sault Ste. Marie (ON) launched an investigative study to identify ways to improve stormwater runoff and minimize the input of contaminants to the river.
- 2010** – The Sugar Island Monitoring Work Group released the last of three reports that confirmed episodes of floating solids and bacteria (*E. coli*) were due to natural causes and stormwater outfalls on both sides of the river.

What's Next?

- Develop an Implementation Annex that includes updated delisting criteria and the actions required to achieve delisting of the AOC.
- As monitoring results become available, update the status of the BUIs designated as *Requiring Further Assessment*.
- Develop a sediment management strategy for priority areas in the St. Marys River as identified in the Stage 2 Report.
- Develop and implement a monitoring plan to track the remaining environmental issues in the St. Marys River.

Is water quality improving?

* Algoma Steel Inc. since renamed to Essar Steel

Due to considerable improvements made by the City of Sault Ste. Marie, Ontario and local industry, the water quality of the river has improved substantially since the onset of the RAP.

Since 1987, Essar Steel (formerly Algoma Steel Inc.) has reduced the amount of oil and grease entering the river via wastewater by more than 96%. They have also reduced suspended solids by over 94%, phenols by more than 99%, and ammonia by over 95%. Also, St. Marys Paper Ltd. has significantly reduced suspended solids by over 91%, biochemical oxygen demand (BOD) by more than 97%, and phenols by over 95%. In addition, the city has improved municipal wastewater quality by reducing BOD by over 96%, suspended solids by over 89%, and phosphorus levels have dropped by more than 91%.

Wastewater effluents entering the river currently meet all provincial and federal regulations for suspended solids, biochemical oxygen demand, phosphorus, phenol, toluene, chloroform and toxicity.

FOR MORE INFORMATION:

For information on the St. Marys River RAP please contact Corrina Barrett at: corrina.barrett@algomau.ca

For information on Areas of Concern please visit: www.ec.gc.ca/raps-pas/