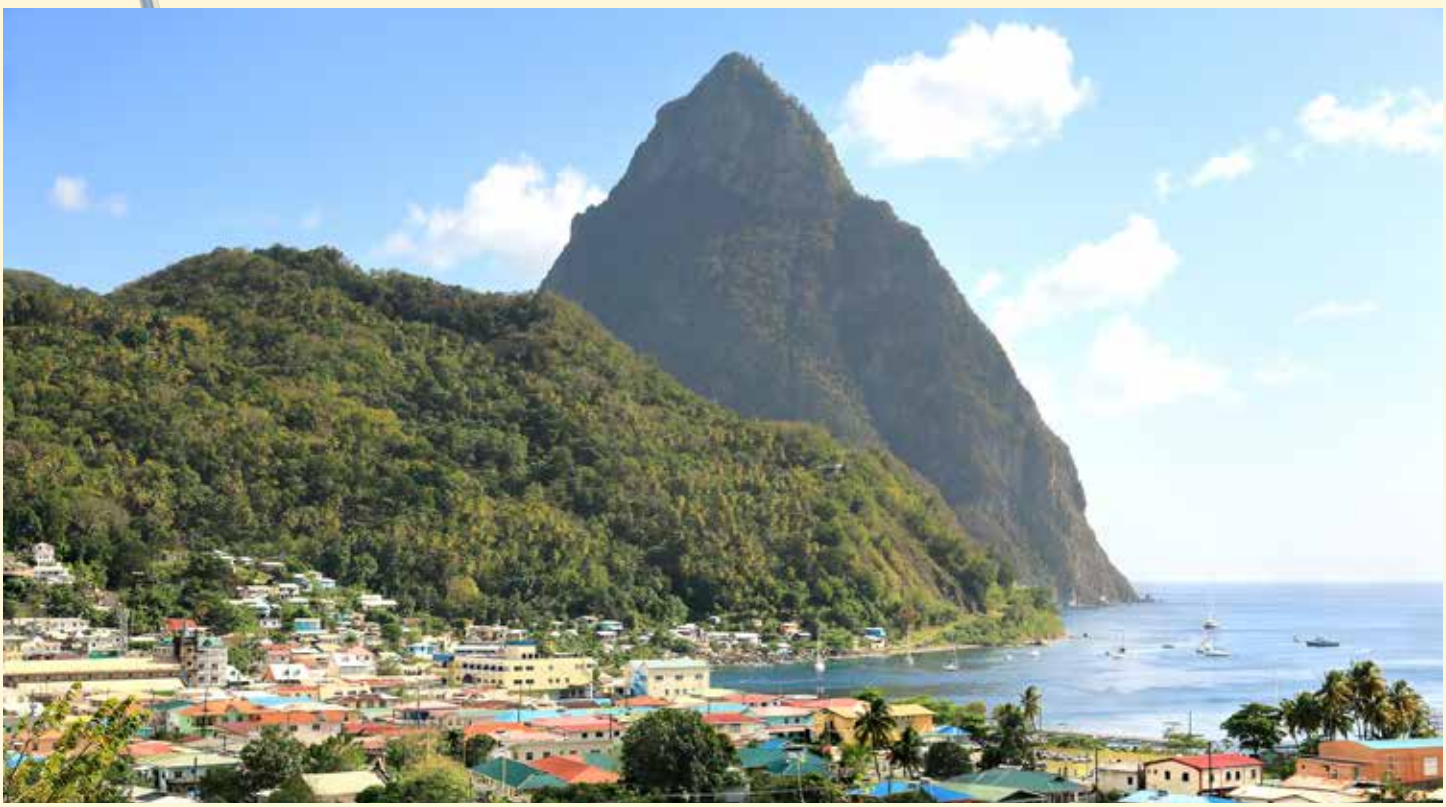
The State of Mercury in Saint Lucia



The Minamata Convention on Mercury is the first global agreement specifically designed to address contamination from a heavy metal. Opened for signature on October 10, 2013 and entered into force on August 16, 2017, the Convention seeks to address issues related to the use and release of mercury in trade and in industrial processes. The treaty also addresses major sources of atmospheric emissions and releases of mercury into the environment, as well as long-term storage and disposal of mercury and mercury compounds.

Under the Minamata Convention, individual countries are charged with protecting human health and the environment from the risks of mercury exposure by systematically controlling mercury emissions and releases, including phasing out the use of mercury in certain products and processes.

In order to assist with preparations for the ratification and implementation of the Convention, the Government of Saint Lucia conducted a Minamata Initial Assessment (MIA). The primary activities of the MIA in Saint Lucia included:

- A review of institutional and capacity needs for implementation of the Convention;
- An assessment of national regulations, policies, and legislation to assist with preparations for compliance with the obligations of the Convention; and
- An identification of the primary sources of mercury emissions and releases as part of a detailed National Mercury Profile.

The MIA was conducted with financial assistance from the Global Environment Facility and was implemented in collaboration with UN Environment and the Basel Convention Regional Centre for the Caribbean, based in Saint Lucia. This brochure summarizes the major findings of the MIA in Saint Lucia.

BASEL CONVENTION

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Findings from the Minamata Initial Assessment

What are the Sources of Mercury?

The origin of mercury can be natural (e.g. volcanoes) or anthropogenic (human-caused releases). The major anthropogenic sources of mercury in Saint Lucia, based on the mercury inventory conducted for the MIA using primarily 2016 data, include the following:

- Use and disposal of other products/process uses such as dental amalgam fillings, laboratory chemicals and equipment and other medical devices (≈28 kg Hg/yr)
- Use and disposal of mercury-added products such as thermometers, electrical switches and relays, batteries and lighting devices (≈25 kg Hg/yr)
- Waste deposition/landfilling and wastewater treatment (≈36 kg Hg/yr)

As a result of the MIA process, the approximate magnitude and distribution of these anthropogenic releases into air, water, and land are now quantified for Saint Lucia. Based on the MIA findings, the use and disposal of mercury-containing products/process uses such as dental amalgam fillings, laboratory chemicals and equipment, and manometers and gauges is a major source of mercury releases to the environment, representing approximately 37% of total mercury releases. Additionally, the use and disposal of mercury-added products accounted for 33% of mercury input within the country. The total calculated mercury input to society in Saint Lucia is ≈75 kg Hg/yr.

To avoid double counting of mercury-added product use and then waste, only 10% of mercury-added products are counted toward the total calculated mercury input to society from waste.

How are People Exposed to Mercury?

Elemental mercury, which is found in some manufactured products, is not necessarily toxic to humans. Exceptions may include dental amalgam and cosmetics, but these products are still under scientific investigation, so their potential harm is not yet fully characterized.

Methylmercury, the organic form of mercury, is toxic to humans because it can biomagnify in food webs and bioaccumulate over time in organisms that may be frequently consumed. A neurotoxin, methylmercury can cause physiological harm and behavioral disorders in people.

Fish from the sea or freshwater systems can be a major source of methylmercury exposure to humans. In general, fish species that are small, short-lived, and forage low in the food web contain less methylmercury, while predatory species that are long-lived and grow larger can contain higher levels of methylmercury.

Published mercury concentrations (measured in methylmercury) from tissues in fish and marine mammals in the Caribbean Sea indicate regular exceedance of various thresholds used by American and International entities (e.g., 0.22 parts per million (ppm), wet weight (ww) by the Great Lakes Consortium for the U.S. and Canada; 0.30 ppm, ww by the U.S. Environmental Protection Agency; 0.50 ppm, ww by the European Commission and World Health Organization which includes an exemption for large predatory fish species of 1.0 ppm, ww). See the list of healthier and riskier seafood choices below:

Seafood with lower mercury levels (<0.22 ppm, ww; *healthier choices*):

- Small grouper, snapper, shrimp, tilapia, oysters, mahi mahi, salmon

Seafood with higher mercury levels (>0.22 ppm, ww; *riskier choices*):

- Atlantic blue marlin, barracuda, large grouper, king mackerel, swordfish, many tuna species, wahoo (peto)

Red Snapper

How Does Mercury Affect Ecological Health?

Studies have shown that high mercury concentrations in fish (measured in methylmercury) can have negative impacts on fish growth, behavior, and reproduction. Consequently, fish-eating wildlife are shown to have decreased reproductive success when methylmercury concentrations in fish are high. As a neurotoxin, methylmercury can also have negative affects on behavior such as foraging or nest protection.

The process of methylation, the conversion of mercury to methylmercury, varies widely on the landscape and within the waterscape. Areas that are particularly sensitive to mercury deposition—where methylation rates are highest and biomagnification in the food web is greatest, and where animals experience significant reproductive harm—are called biological mercury hotspots. These areas generally represent aquatic ecosystems or have an aquatic connection within the food web.

Generally, aquatic ecosystems connected to wetlands, either marine (e.g. beaches) or freshwater (e.g. rivers), are prime areas for high methylation rates. Fish and wildlife predators that live in estuaries and lakes, or that forage in a food web associated with these habitats (e.g. mangroves), often contain elevated mercury levels. The combination of high methylation rates and longer-lived animals higher in the food web creates the greatest risk.

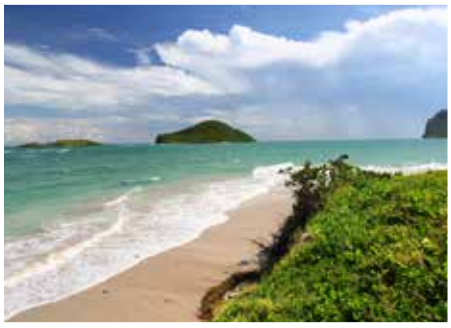
Habitats at Greatest Risk:

- Wetlands, mangroves, aquatic habitats near contaminated sites

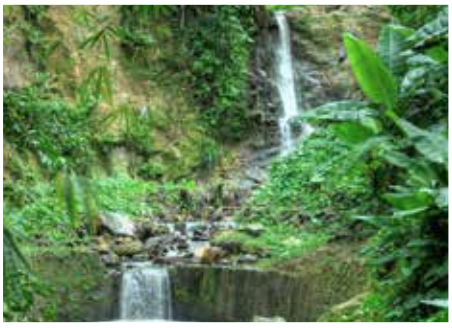
Brown Pelican

Wildlife at Greatest Risk:

- Brown Pelican, Magnificent Frigatebird, Masked and Red-footed Booby, White-tailed Tropicbird, Black-capped Petrel, Audubon's Shearwater, Bridled Tern, Sooty Tern



Beaches and Coral Reefs



Rivers and Streams

Wetlands and Mangroves

What is the State of Mercury in Saint Lucia?

The impacts of mercury pollution can be challenging to identify and reverse. However, strategies to reduce mercury contamination are important because mercury can cause significant adverse effects to human and ecological health.

Findings from the MIA in Saint Lucia indicate that the input of mercury into ecosystems may be elevated in some areas but with effort by the government, key stakeholders and the general public, those inputs can be further identified and reduced.

Lifecycle management of mercury-added products also presents a challenge for Saint Lucia. The adoption of legislation that limits and restricts the importation of such products will be an important first step towards the successful implementation of the Minamata Convention, and will help to reduce overall mercury releases on the island.

Like many SIDS, regional atmospheric mercury loads may be impacting local marine fisheries. However, with greater collaboration and cooperation across the region, the potential risks associated with mercury in the environment can be reduced.

Steps Consumers Can Take to Protect Against Mercury Contamination

- Choose healthier fish options (those with lower mercury levels) as part of your diet.
- Use your buying power—purchase no- or low-mercury product replacements when possible (See Useful Links on back page for more information).
- Support legislation that helps reduce the impacts of mercury on the environment.

Recommendations from the Saint Lucia Mercury Team

- Create legislation that can help facilitate a framework to comply with the Minamata Convention.
- Reduce the import and use of products that contain mercury by selecting no- or low-mercury product replacements:
  - Replace compact and linear fluorescent lights with LED bulbs;
  - Check the ingredients in skin lightening creams and lotions to avoid products that contain mercury (see*);
  - Choose brands of batteries that do not contain mercury; and
  - Replace outdated medical/measuring devices containing mercury with digital alternatives.
- Properly store waste products with mercury and avoid using landfills by creating proper storage facilities for hazardous wastes.
- Generate greater awareness and education through existing outreach programs; oversee the development and distribution of information on mercury to the public, including importers of manufactured products.
- Participate in global mercury database and monitoring programs and coordinate existing data with global and regional sampling efforts organized by UN agencies, including:
  - Hair samples for people;
  - Muscle samples for fish;
  - Blood, feather, and egg samples for birds;
  - Sampling of cosmetic skin lightening creams; and
  - Air sampling with passive devices.

BRI's Mercury Work in Saint Lucia

Biodiversity Research Institute (BRI) has collaborated with its partners in Saint Lucia to help identify and estimate major mercury sources in the region. As an International Technical Expert, BRI provided training on the UN Environment's *Toolkit for Identification and Quantification of Mercury Releases* and assisted with the review of primary reports and products developed as part of the MIA.

Basel Convention Regional Centre – Caribbean

The primary mechanism for assisting in the implementation of the Basel Convention and its obligations is a series of Basel Convention Regional Centres for Training and Technology Transfer (BCRC). Established across the world under Article 14 of the Convention, these Centres are meant to provide for the effective implementation of the Convention at the national to regional levels. The Basel Convention Regional Centre for Training and Technology for the Caribbean (BCRC-Caribbean) serves the Contracting Parties to the Basel, Rotterdam, Stockholm and Minamata Conventions within the Caribbean region and any other country consenting to be served by the Centre.

Useful Links

BCRC–Caribbean: www.bcrc-caribbean.org

Minamata Convention: www.mercuryconvention.org

*World Health Organization: http://www.who.int/ipcs/assessment/public_health/mercury/en/

BRI publications on mercury: www.briloon.org/hgpubs

Global Health Trade-Off for Mercury and Omega-3 in Seafood

Milligrams of Omega-3 Fatty Acids/4 Ounces of Cooked Fish →

Total Mercury in Muscle Tissue µg/g (ww) ↓

Meal Frequency Recommendations	<500 mg	500-1,000 mg	1,000-2,000 mg	> 2,000 mg
Unrestricted meals (< 0.05 µg/g)	Catfish, Clams, Crab* (most species), Croaker, Haddock, Scallops, **Shrimp**, **Tilapia***	Blue Mussels,* Pink Salmon, Sockeye Salmon	Chinook Salmon,* Coho Salmon, **Oysters**	**Healthier Choices** Atlantic Salmon, Sardines, Shad
1-2 meals per week (0.05–0.22 µg/g)	Atlantic and Pacific Cod, Flounder, Grenadier, Hake, Lobster,* Sole	Atlantic Pollock, **Mahi Mahi**, Mullet, Scad, Squid, Skipjack Tuna, any canned tuna	Atlantic Horse Mackerel, European Sea Bass, Rays, Skates, Trout	Anchovies,* Herring
1 meal per month (0.22–0.95 µg/g)	**Grouper**, Orange Roughy, **Snapper**	Amberjack, **Barracuda**, **Bigeye Tuna**, **Bluefish**, Halibut, **Jack**, Trevally, **Wahoo** (**Peto**), **Yellowfin Tuna**	Atlantic and Pacific Mackerel, **Albacore Tuna**,* **Atlantic Bluefin Tuna**, Chilean Sea Bass	Mercury concentrations vary widely across shark species. To learn more, visit: www.briloon.org/hgcenter
No consumption (> 0.95 µg/g)	**King Mackerel** **Riskier Choices**	**Atlantic Blue Marlin**, **Atlantic Sailfish**, Tilefish	**Dogfish**, **Ground**, and **Mackerel Sharks**; Pacific Bluefin Tuna, **Swordfish***	

Data Sources: BRI's Global Biotic Mercury Synthesis (GBMS) Database; U.S. Environmental Protection Agency; U.S. Food and Drug Administration; Great Lakes Consortium for the U.S. and Canada

Pictured species*; **in bold–*species found in the Caribbean Sea*

For More Information:

Basel Convention Regional Centre for Training and Technology Transfer for the Caribbean (BCRC-Caribbean)
info@bcrc-caribbean.org

National Executing Agency

- Sustainable Development and Environment Division, Department of Sustainable Development, Ministry of Education, Innovation, Gender Relations, and Sustainable Development

MIA Stakeholders

- Ministry of Agriculture, Fisheries, Physical Planning, Natural Resources and Co-operatives
- Ministry of Commerce, Industry, Enterprise Development and Consumer Affairs
- Ministry of Finance, Economic Growth, Job Creation, External Affairs and the Public Service
- Ministry of Health and Wellness
- Ministry of Infrastructure, Ports, Energy and Labour
- Customs and Excise Department
- Attorney General's Chambers
- Saint Lucia Bureau of Standards
- Saint Lucia Solid Waste Management Authority
- Saint Lucia Chamber of Commerce, Industry and Agriculture
- Pharmacy Council
- Saint Lucia Manufacturing Association
- Saint Lucia Medical and Dental Association
- Funeral Homes and Crematoria
- Other Public and Private Entities, NGOs, CSOs
- UN Environment
- Biodiversity Research Institute

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