



The State of Mercury in Dominica



The Minamata Convention on Mercury is a 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, which involves 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

Dominica conducted a Minamata Initial Assessment (MIA). The primary activities of the MIA 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. This brochure summarizes the primary mercury sources and risks identified through the MIA project in Dominica.



Findings from the Minamata Initial Assessment

What Are the Sources of Mercury?

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

- Use and disposal of mercury-added products such as thermometers, compact fluorescent lamps, and batteries: 16 kg Hg/yr
- Dental amalgam fillings: 2 kg Hg/yr
- Crematoria and cemeteries: < 1 kg Hg/yr
- Waste management, including waste incineration and landfilling: 6 kg Hg/yr

As a result of the MIA process, the approximate magnitude and source distribution of these anthropogenic releases into the air, water, and land are now quantified for Dominica. Based on the MIA findings, the total calculated mercury input to society in Dominica is 26 kg/year.

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, biomagnifies in food webs and bioaccumulates over time in organisms that may be frequently consumed. Once ingested, this neurotoxin can cause physiological harm and behavioral disorders in humans. Mercury exposure is particularly concerning for children and women of childbearing age as it can damage the nervous system, kidneys, and cardiovascular system.

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 from tissues in fish and marine mammals in the Caribbean region 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, based on the analyses of total Hg of seafood sampled from fish markets in Roseau, below:

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

- Blackfin tuna, Caribbean spiny lobster, flying fish, lionfish, mahi-mahi, octopus, snapper

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

- Blue marlin, wahoo, yellowfin tuna



Blackfin tuna

How Does Mercury Affect Ecological Health?

Studies have shown that high methylmercury concentrations in fish can have negative impacts on 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 effects on behavior such as foraging or nest protection.

The process of methylation, the conversion of elemental mercury to organic 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, either marine (e.g., beaches) or freshwater (e.g., rivers), are often prime areas for high methylation rates. Fish and wildlife predators that live in rivers 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 of adverse effects.

Habitats at Greatest Risk:

- Wetlands, mangroves, aquatic habitats near contaminated sites

Wildlife at Greatest Risk:

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



Brown Pelican



Wetlands



Mangroves



Aquatic Habitats

What Is the Status of Mercury in Dominica?

The Minamata Convention addresses the management of mercury and the risks this toxin poses to human health and the environment. Provisions in the Convention assist countries in developing strategies to reduce mercury contamination.

Findings from the Minamata Initial Assessment in Dominica indicate that the input of mercury into local 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 Dominica. The adoption of national legislation limiting and restricting the import of such products is an important first step in the successful implementation of the Minamata Convention, which will help to reduce overall mercury releases on the islands.

As with many Small Island Developing States, 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 dietary fish options (those with lower mercury levels).
- 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 Dominica Mercury Team

- Ratify the Minamata Convention on Mercury.
- Create legislation that can help facilitate a framework to comply with the Minamata Convention.
- Promote mercury-free alternative products, which are already widespread and on the market:
 - Replace fluorescent lights with Light Emitting Diodes (LED) bulbs;
 - Choose brands of batteries that do not contain mercury;
 - Check the ingredients in skin lightening creams and lotions to avoid products that contain mercury; and
 - Replace outdated medical/measuring devices containing mercury with digital alternatives.
- Develop proper separation methods for the disposal of mercury-added products both at the household consumer level and in the landfill management procedures.
- Improve public access to environmentally sound facilities that could aid in the disposal process, as well as provide information and guidelines on disposing of mercury-added products containing >2,000 mg Hg.
- Implement, monitor, and evaluate best available techniques and environmental practices to maximize reduction of mercury emissions and releases from industrial processes. Locations for development of future sites should be considered with respect to environmentally sensitive areas.
- Participate in global mercury database and monitoring programs involving 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 Dominica

Biodiversity Research Institute (BRI) collaborates with its partners in Saint Vincent and the Grenadines to help identify and estimate major mercury sources in the region. An international advisor on mercury, BRI serves as co-lead of the UN Environment's Mercury Air Transport and Fate Research partnership area. BRI also serves as International Technical Expert with the United Nations Development Programme (UNDP) and UN Environment, and an Executing Agency for the United Nations Industrial Development Organization (UNIDO).



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). The BCRC-Caribbean serves the Contracting Parties to the Basel, Rotterdam, Stockholm and Minamata Conventions within the Caribbean region and any other country in the region consenting to be served by the Centre.

Useful Links

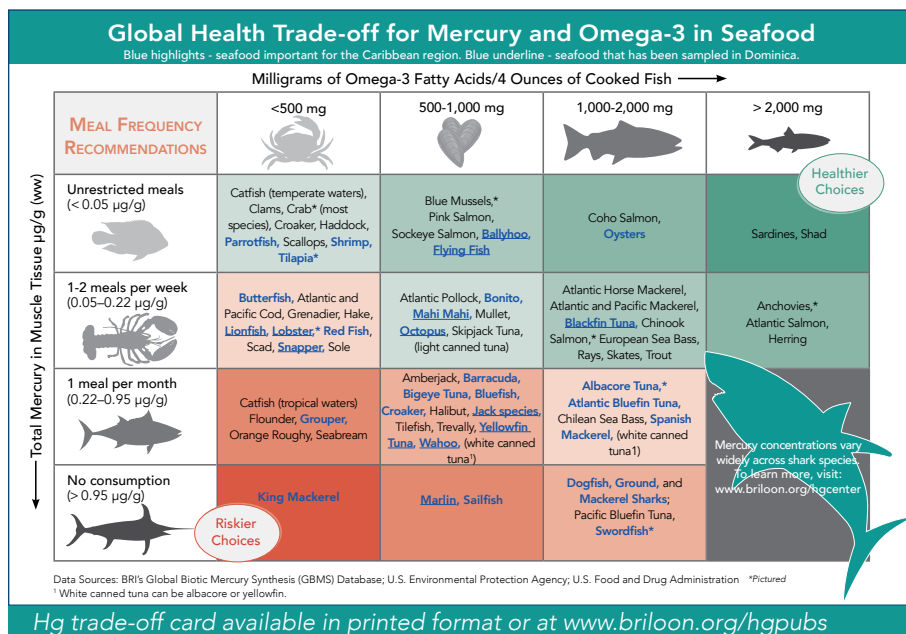
BCRC-Caribbean: www.bcrc-caribbean.org
 Minamata Convention: www.mercuryconvention.org
 World Health Organization: www.who.int
 BRI publications on mercury: www.briloon.org/hgpubs

National Executing Agency:

- Dominica Bureau of Standards

MIA Stakeholders:

- Ministry of Public Works and Ports
- Office of Disaster Management
- Roseau City Council
- Ministry of Foreign Affairs: Energy Unit
- Dominica Youth Environment Organization
- Dominica National Council of Women
- Dominica Electricity Services
- Dominica Air and Sea Ports Authority
- Ministry of Education and Human Resources
- Ministry of Health and Environment
- Customs Excise Division
- All Saints University
- Ministry of Agriculture and Fisheries
- Trade Division
- Ross University
- Environmental Coordinating Unit
- Dominica Solid Waste Management Corporation
- Beauty Wise
- Ministry of Planning, Economic Development and Investment: Physical Planning Division
- Dominica Water and Sewerage Company
- Jolly's Pharmacy
- Dominica Medical Board
- Ministry of Justice, Immigration and National Security: Chambers of the Attorney General
- J. Astaphans and Co. Ltd
- The Pesticides Control Board



Hg trade-off card available in printed format or at www.briloon.org/hgpubs

For More Information:

Basel Convention Regional Center for Training and Technology Transfer for the Caribbean (BCRC-Caribbean)
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