



# The State of Mercury in Vanuatu



Mount Marum, Ambrym

**T**he Minamata Convention on Mercury is the first global agreement specifically designed to address contamination from a heavy metal. Opened for signature in October 10, 2013 and entering 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 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.

Cook Islands, Kiribati, Palau, Tonga and Vanuatu have made their intentions clear to become Parties to the Minamata Convention by declaring their participation in the Pacific Regional Minamata Initial Assessment.

In order assist with preparations for ratification and

implementation of Convention, the Governments of Vanuatu conducted a Minamata Initial Assessment (MIA). The primary activities of the MIA projects in the South Pacific include:

- 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 MIAs was conducted with financial assistance from the Global Environment Facility and are implemented in collaboration with United Nations Environment and the Secretariat of the Pacific Regional Environment Programme (SPREP). This brochure summarizes the primary mercury sources and risks identified through the MIA project in Vanuatu.





# Findings from the Minamata Initial Assessments

## What are the Sources of Mercury?

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

- Use and disposal of mercury-added products such as batteries, electrical switches, compact fluorescent lamps (CFLs), and thermometers: 346/kg Hg/yr
- Waste management, including waste incineration and landfilling: 28 kg Hg/yr
- Dental amalgams: 7 kg Hg/yr
- Crematoria and cemeteries: 7 kg/yr



*The Vanuatu archipelago contains a number of active volcanoes. Volcanoe eruptions are a source of elemental mercury.*

Small Island Developing States (SIDS), including those in the Pacific, face unique challenges related to the Minamata Convention, as territory size limits options for sound management, storage, and disposal of hazardous waste. As a result of the MIA process, the approximate magnitude and source distribution of the anthropogenic releases of Hg into the air, water, and land are now quantified for Vanuatu. Based on the MIA findings, the total calculated mercury input into society for Vanuatu is 363 kg Hg/year.

## How are People Exposed to Mercury?

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

Humans become exposed to mercury and methylmercury primarily through the consumption of fish. Many national and international health organizations recognize both the benefits and the risks associated with a diet high in fish and international guidelines for the maximum amount of mercury in fish have been established.



### *Mercury Monitoring in Women of Childbearing Age in the Asia and the Pacific Region*

Researchers examined hair samples from women, aged 18–44, from Cook Islands, Marshall Islands, Tuvalu, and Kiribati, and two landlocked Asian countries, Tajikistan and Nepal. The study reveals that women of childbearing age living in these countries have elevated levels of mercury in their bodies.

In a subsequent BRI/IPEN study, *Mercury in Women of Childbearing Years in 25 Countries*, hair samples were collected in the Pacific region from Tonga, Cook Islands, Kiribati, Marshall Islands, Tuvalu, Solomon Islands and Vanuatu. The study revealed elevated levels of mercury in women of childbearing years in the region.

To learn more, visit: [www.briwildlife.org/minamata-convention-on-mercury/monitoring-mercury-in-humans/](http://www.briwildlife.org/minamata-convention-on-mercury/monitoring-mercury-in-humans/)

Fish from the sea or freshwater systems can be a major source of methylmercury. 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.

Many of the fish available in the Pacific are safe to eat, although more information is needed about the mercury concentrations to better characterize how mercury is distributed in different species of fish in the waterscape of Pacific nations. BRI will work with Vanuatu and the Pacific Islands Forum Fisheries Agency to help meet interests related to the South Pacific Tuna Treaty of 2002 and other fisheries-oriented treaties.



*Yellowfin Tuna*



## 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 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.

Aquatic ecosystems, either marine (e.g., beaches and coral reefs) or freshwater (e.g., lakes and 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:

- Albatrosses, Cormorants, Frigatebirds, Petrels, Shearwaters, Terns, Tropicbirds



Wedge-tailed Shearwater

## What is the State of Mercury in the Pacific Region?

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 humans and ecological health.

Lifecycle management of mercury-containing products presents the biggest challenge for SIDS. 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 that will help to reduce the overall mercury releases on the islands.

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

## WHAT CAN YOU DO TO HELP?

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

### Products that May Contain Mercury

skin lightening products and cosmetics



dental amalgam



light bulbs



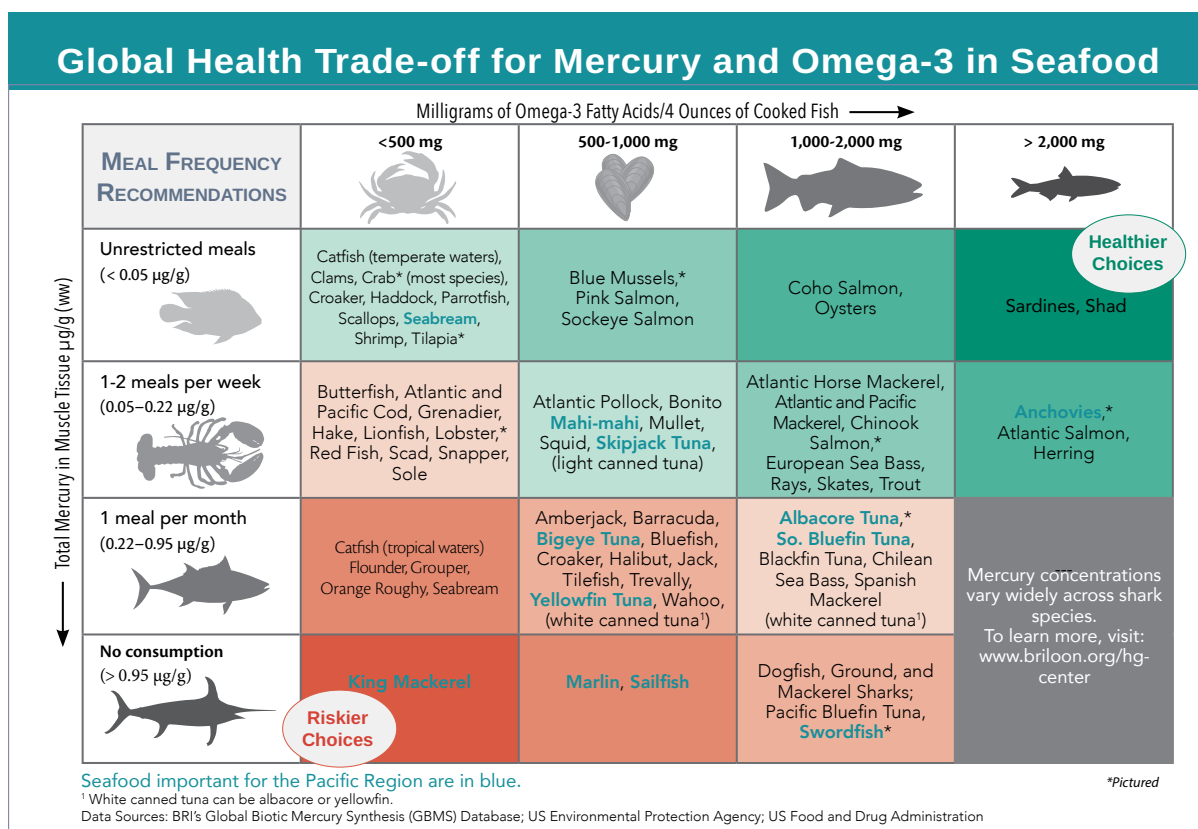
batteries



marine paints

## Recommendations from the Vanuatu 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
- Choose brands of batteries that do not contain mercury
- Properly store waste products with mercury and avoid using landfills by creating proper storage facilities for hazardous waste.
- 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 efforts organized by UN Environment:
  - Use hair samples for people
  - Use muscle samples for fish
  - Use blood, feather, and egg samples for birds



**BRI's Mercury Work in the South Pacific**  
Biodiversity Research Institute has collaborated with its partners in the Pacific region to help identify and estimate major mercury sources through the MIA process in: the Cook Islands, Kiribati, Marshall Islands, Micronesia, Niue, Palau, Tonga, Tuvalu, and Vanuatu. 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 MIAs. [www.brilife.org/hgcenter](http://www.brilife.org/hgcenter)



**Secretariat of the Pacific Regional Environment Programme (SPREP)**

The purposes of SPREP are to promote cooperation in the South Pacific Region and to provide assistance in order to protect and improve the environment and to ensure sustainable development for present and future generations. [www.sprep.org](http://www.sprep.org)

**Minamata Convention on Mercury**  
[www.mercuryconvention.org](http://www.mercuryconvention.org)