The State of Mercury in Georgia

The Minamata Convention on Mercury is the first global agreement specifically designed to address contamination from a heavy metal. Opened for signature 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 Convention 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.

Georgia became a signatory of the Convention on October 10, 2013. To assist with preparations for the ratification and implementation of the Convention, the government of Georgia 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
- Identification of 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 (GEF) and was implemented in collaboration with the United Nations Development Programme (UNDP) and the Ministry of Environment and Natural Resource Protection of Georgia. This brochure summarizes the major findings of the MIA in Georgia.

gef

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Biodiversity Research Institute
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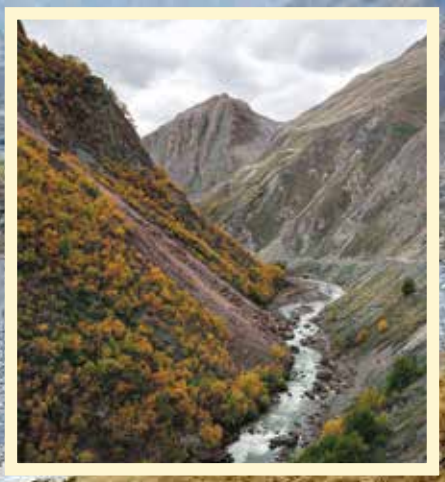
Findings from the Minamata Initial Assessment

What are the Sources of Mercury?

Georgia used the UN Environment Toolkit for Identification and Quantification of Mercury Releases (Level 1) to conduct its national mercury inventory. The total estimated anthropogenic releases of mercury in Georgia in 2014 was estimated to be 4,200 kilograms (kg). The primary sources include the following:

- Primary metal production—industrial gold and pig iron (45%)
- Use and disposal of mercury-added products (28%)
- Waste incineration and open burning (11%)
- Production of cement (5%)

The extraction and production of primary metals is responsible for nearly half of the mercury releases and emissions in Georgia. Lifecycle management, including the importation, use, and proper disposal, of mercury-added products also represents a significant source of mercury.



Rivers

How are People Exposed to Mercury?

Elemental mercury, which is found in 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. 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. 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.

In addition to fish consumption, occupational exposure to mercury can also represent a potential pathway for certain sectors of the population. Examples might include miners, laboratory professionals, and dentists and their hygienists (in the case of dentists where mercury amalgam is still used).

The MIA in Georgia found very little information on fish consumption patterns in the country. The most widely consumed fish in Georgia, the European anchovy, is a low-mercury fish that does not represent a significant risk through human consumption.

Similarly, information on occupational exposure to mercury is not available in Georgia. Occupational sectors that may be at risk include waste management personnel, gold miners, and potentially workers that are processing raw materials used during the production of cement.

How Does Mercury Affect Ecological Health?

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., estuaries) or freshwater (e.g., lakes), 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.

Contaminated sites were not identified as part of the MIA in Georgia. However, areas that could be considered most sensitive to mercury inputs would include wetlands and other aquatic habitats downstream from potential mercury sources (e.g., mining areas or landfills). There is a need for expanded biological monitoring of mercury concentrations (in humans and environmental media) in Georgia to better evaluate the effectiveness of mercury reduction strategies that are implemented as part of the Minamata Convention.

The Black Sea

Mountains

What is the State of Mercury in Georgia?

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

Findings from the MIA in Georgia indicate that mining activities, particularly industrial-scale gold mining and production of pig iron, are primary sources of mercury releases into the environment.

Lifecycle management of mercury-containing products also represents a major challenge for Georgia, particularly the proper disposal of products at the end of their use.The adoption of legislation that limits and restricts the importation of such products will be an important first step towards the successful implementation of Minamata Convention that will help to reduce overall mercury releases.

A significant gap in the National Mercury Inventory for Georgia is the lack of data on releases from the copper mining sector. The Level 1 Toolkit only allows for the calculation of mercury releases from the smelting of copper ore. In Georgia, copper is processed into a concentrate that is then sold on the global market. No copper smelting activities are conducted in the country. However, the mining and processing of copper ore can be a significant source of mercury releases to land and water. The copper mining sector represents a potentially significant source of mercury releases that was not quantified during the MIA in Georgia.

What Can You Do to Help?

- 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 Georgia Mercury Team

Priority Areas for Implementation of the Minamata Convention in Georgia

- Strengthen the legal and institutional framework
- Environmentally sound management of mercury-containing qaste
- Expand education and raise awareness about the Minamata Convention and the general risks of mercury exposure
- Incorporate best available technologies and best environmental practices to promote the reduction of mercury emissions
- Expand research, monitoring, and reporting capabilities related to mercury exposure in humans and the environment

Useful Links

- BRI publications on mercury: www.briloon.org/hgpubs
- Minamata Convention: www.mercuryconvention.org

About Georgia

Located in the South Caucasus region, Georgia is bordered by the Black Sea to its west, the Russian Federation to its north, Azerbaijan from east and southeast, Turkey from south and Armenia from southwest. The country is rich in freshwater and forest resources. Its diverse landscapes include: eternal snow cover and glaciers, high middle to lower mountains and forests, alpine and sub-alpine meadows, plains, marsh-forests, swamps and temperate rainforests, floodplain valleys and forests, light (savannah type) forests, steppes and semi-deserts.

BRI's Mercury Work in Georgia

Biodiversity Research Institute (BRI) has collaborated with its partners in Georgia to help identify and estimate major mercury sources in the country. As an International Technical Expert, BRI provided training on the UN Environment's Toolkit for Identification and Quantification of Mercury Releases (Level 1) and assisted with the review of primary reports and products developed as part of the MIA. BRI is also a co-lead of the UN Environment's Mercury Air Transport and Fate Research partnership area and assists with the design and development of a global mercury monitoring and observation system to assist with the evaluation of the effectiveness of the Minamata Convention in its mercury reduction strategies.

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

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,* Scad, Seabream, 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, Yellowfin Tuna	Atlantic and Pacific Mackerel, Albacore Tuna,* Atlantic Bluefin Tuna, Chilean Sea Bass	
No consumption (> 0.95 µg/g)	King Mackerel — Riskier Choices	Marlin, 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

Pictured

MIA Stakeholders

The MIA in Georgia was directed by the Ministry of Environment and Natural Resources Protection with the assistance from a wide range of stakeholders including (in alphabetical order):

- Center for Strategic Research and Development of Georgia
- Energy Efficiency Center of Georgia
- Environmental Information and Education Center
- Greens Movement of Georgia
- Ministry of Agriculture (National Food Agency)
- Ministry of Economics and Sustainable Development
- Ministry of Finance (Customs Department)
- Ministry of Labor, Health, and Social Affairs
- Ministry of Regional Development and Infrastructure (Solid Waste Management)
- National Environmental Agency
- Tbilisi University

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Credits

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