THE AMAZON BIOME IN THE FACE OF MERCURY CONTAMINATION

An overview of mercury trade, science, and policy in the Amazonian countries.

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What is the goal of the report?

The objective of this report is to provide an evaluation on how the countries of the Amazon Biome[2] are addressing the situation of mercury contamination as a result primarily of illegal and informal gold mining (IIGM). This report may be useful for public officials, researchers, journalists, activists, local communities, and in general people who are interested in different angles of the mercury problem in Latin America and specifically in the Amazon Biome. Rather than providing new knowledge, this report complies and organizes information available on mercury in the region from the commercial, scientific, public policy, and regulatory point of views. Particularly, this report attempts to respond to the following three groups of questions:

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1. How are countries in the Amazon Biome involved in the global and regional mercury supply, trade, and demand flows? What are the characteristics of legal and illegal mercury markets and their inclusion in gold mining and other sectors in each country and on a Biome level?

2. What kind of information is available in countries in the Amazon Biome regarding the trends and impacts of mercury emissions and discharges in the eco-region? What are the most significant environmental effects of mercury use in IIGM and its impacts in Amazonian communities?

3. What have countries in the Amazon Biome done to confront these problems? What routes for further action will become available as a result of the presentation of current conditions by this report?

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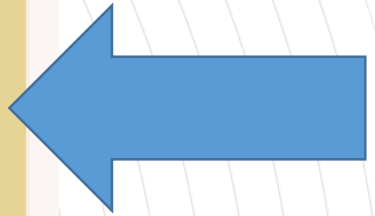

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- Few reports on the illegal mercury trade in Latin America are available in general, and in particular for the Amazon Biome, but instances of confiscation sheds light on its existence.

- Information on imports and exports is partial, because not all the mercury is used in IIGM, even though in some countries like Colombia and Ecuador it is estimated that 90% of imported mercury ends up being used in IIGM. In Brazil and Peru, that figure is closer to 50%.

- There is a risk that the illegal mercury market will grow and become more consolidated as the countries of the Biome continue to reduce their mercury import quotas, if controls and a comprehensive strategy on the use of mercury, or of IIGM in general, does not occur.

- A better understanding of the transnational migration of miners throughout the Biome will allow for a closer look at the workings of the illegal mercury market.

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Aggregate Mercury Imports in the Amazon Biome (mt/year)

Bolivia | Colombia | Perú | Brasil | Venezuela | Guyana | Ecuador | Surinam | French Guiana

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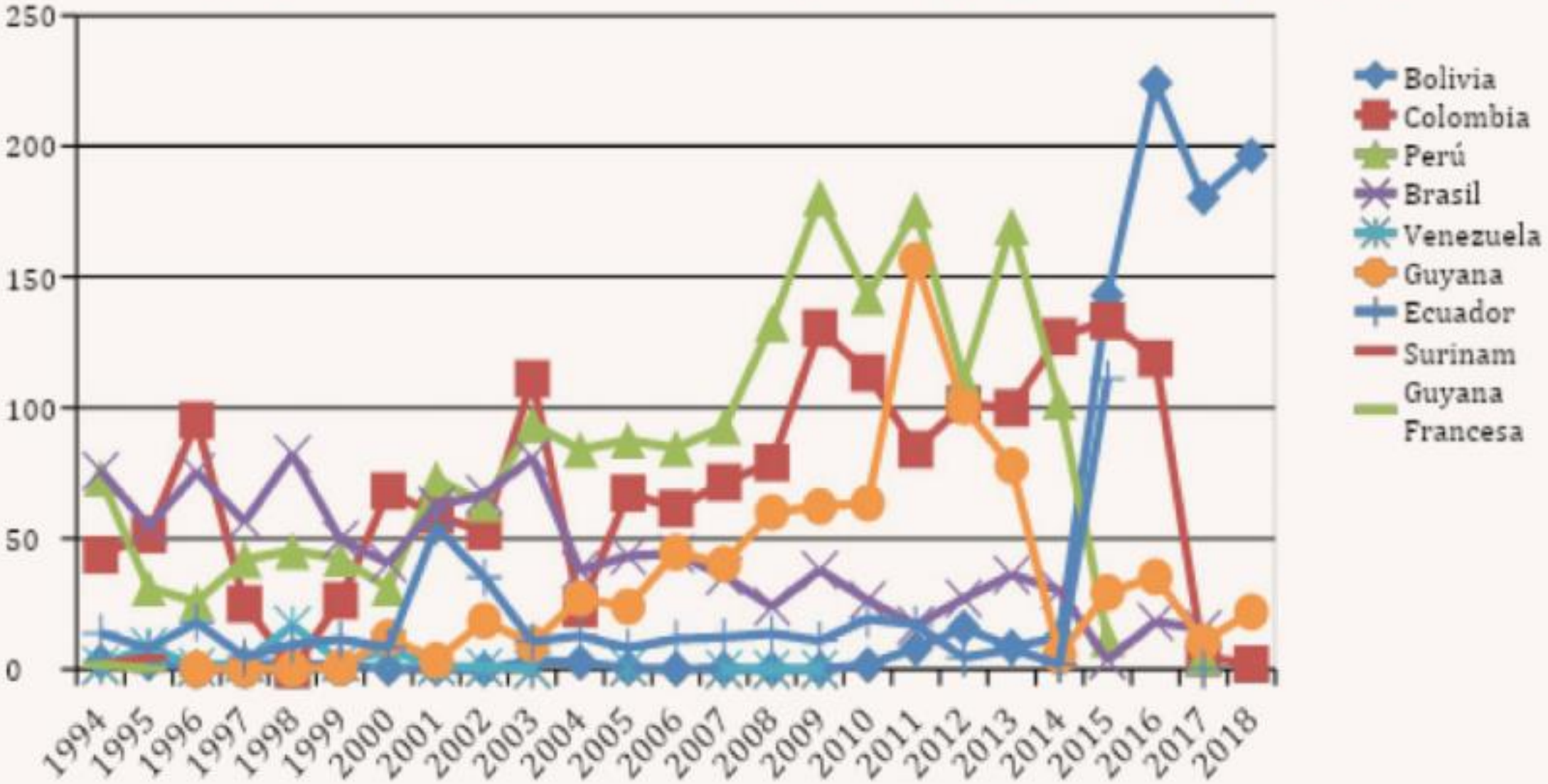
Mercury imports in the Amazon Biome by country (1994 to 2018) (mt/year)



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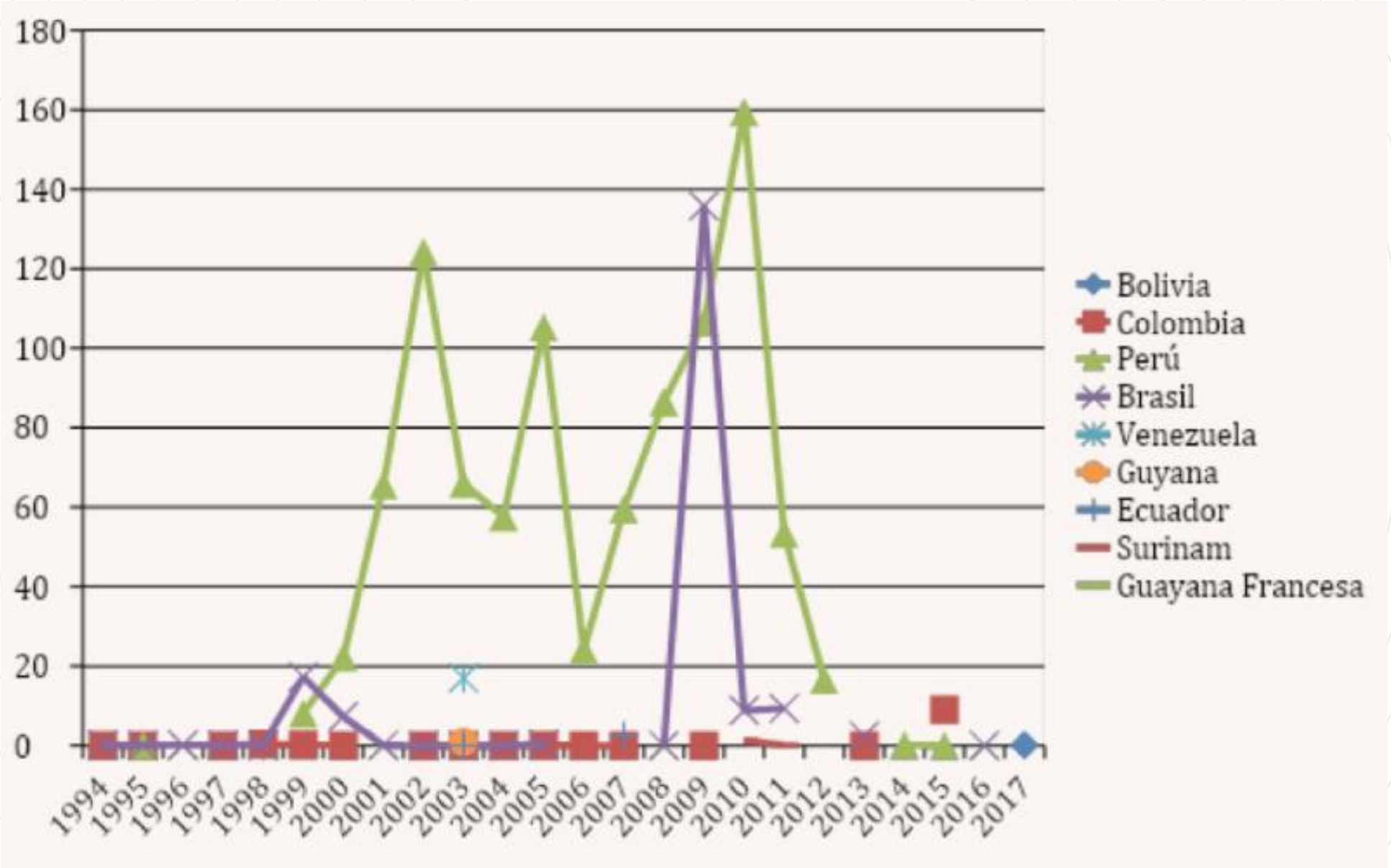
Aggregate mercury exports from Amazonian countries (mt/y)



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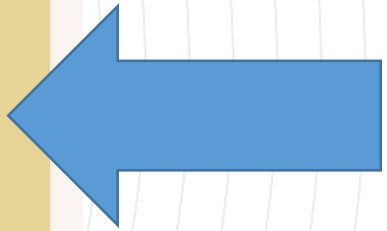

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Table 5. Mercury emissions per capita in the Amazon countries

Country	Annual Hg emissions in metric tons	Total population by country	Kg of Hg emitted per capita
Bolivia	45 (133*)	10.888.000	4,13 (12,21)
Colombia	60 (180*)	45.500.000	1,31 (3,95)
Brazil	23	202.450.649	0,11
Ecuador	18	16.298.217	1,07
Peru	26	31.826.018	0,82
Venezuela	6	31.028.337	0,18
Guyana	11	761.000	14,7
French Guiana	6	187.000	30,5
Surinam	6	524.000	10,7
TOTAL	199	344.327.221	

*All data in the table is from 2010 presented by UNEP (2013). More recent data for Bolivia and Colombia, in parenthesis, is available.

- According to data from 2010, on average 199 of the 727 metric tons of mercury emitted annually into the atmosphere by the illegal and informal gold mining sector is occurs in the nine countries of the Amazon Biome. Emissions from IIGM represent almost 75% of total emissions in all of Latin America.

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- Emissions from IIGM in 2015 increased to 838 metric tons. More updated emission data per country is not available. The contribution of Amazon countries ranges from 24% to 27.5% of global mercury emissions. Data on emissions does not discriminate by subnational areas, making it hard to define the amount of emissions caused directly by activities in the Biome.

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Table 6. Mercury releases into soils and water in metric tons by region

Sub-region	Mercury releases into soils and water (mt)
Australia, New Zealand and Oceania	3.5
Central America and the Caribbean	6.54
CIS and other European states	10.3
East and Southeast Asia	454
European Union (28 countries)	-
Middle East	-
Northern Africa	-
North America	-
South America	313
South Asia	0.37
Sub-Saharan Africa	93.7
TOTAL	881

Source: (AMAP & UNEP, 2013: 72).

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- Mercury emission and releases in the Amazon Biome come from both natural and anthropogenic sources, but evidence shows that mercury concentrations in IIGM zones are higher than standards established for water, fish, and other matrices. This suggests that IIGM activities have increased natural mercury concentrations as a result of deforestation, alluvial sediments removal, as well as from waste dumped from mining and amalgam burning processes.

- Even though bioaccumulation is less dangerous on land than in aquatic environments, it is important to consider the dynamics of flooding in several Amazonian ecosystems that can affect these conditions. There is a significant lack of information on the atmospheric transport of mercury from the Amazon and release trends from Amazonian soils.

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Map 4. Geographic distribution of fixed monitoring stations for long-term measurements of gaseous mercury (greater than ten years)

Source: UNEP (2019: 21)

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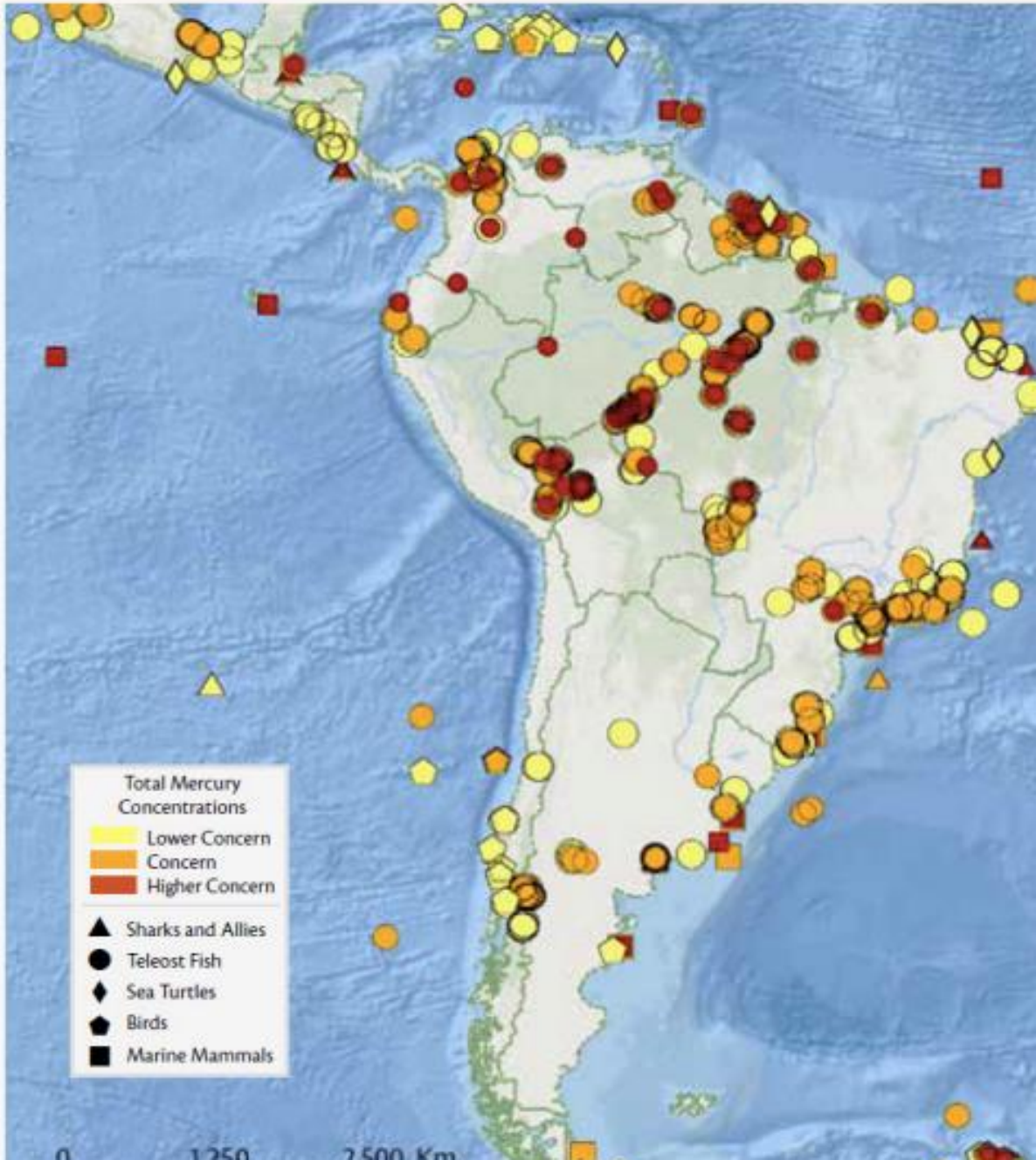
Map 5. Sites of mercury investigations in the Amazon according to publication year

Map 6. Total mercury concentrations in fish, marine turtles, birds, and marine mammals in South America



- In total, in all of South America, 313 metric tons of mercury are released by the IIGM sector, which represents 35% of total mercury releases from IIGM in the world. Unlike the information on emissions, it is not certain how much of this amount occurs in countries in the Amazon Biome.

- The Amazon soil naturally contains mercury. Land use change from expanding grazing and agriculture frontiers, deforestation, and mining have caused an increase in soil erosion which releases the naturally-occurring mercury found there.

- Some studies have shown that biomass burning is also a significant source of emissions, but this was not included in the UNEP's Global Mercury Assessment in 2013. The 2018 UNEP inventory calculated emissions from this source for the first time: 52 metric tons or 2.33% of the global total.

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• Since biomass combustion had not been measured until recently, the topic of mercury has not been incorporated in research agendas or advocacy related to deforestation and land use change to the same extent that it has with the subject of mining. Similarly, the inclusion of mercury in discussions on dams, energy, and climate change in the Amazon is an inevitable and urgent necessity, because evidence suggests that the construction and operation of large dams in the Amazon may accelerate mercury exposure levels in local communities.

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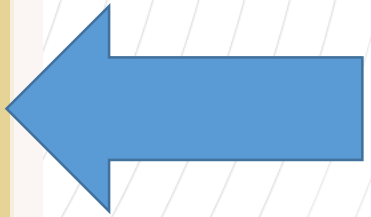

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Table 5. Dates in which countries from the Amazon Biome signed and ratified the Minamata Convention

COUNTRY	SIGNED	RATIFIED
Bolivia	October 10, 2013	January 26, 2016
Brazil	October 10, 2013	August 22, 2018
Colombia	October 10, 2013	August 27, 2019[46]
Ecuador	October 10, 2013	July 29, 2016
Peru	October 10, 2013	January 21, 2016
Venezuela	October 10, 2013	Pending
Guyana	October 10, 2013	September 24, 2014
France (F. Guiana)	October 10, 2013	June 15, 2017
Suriname	August 2, 2018	August 2, 2018

Sources: NIMOS (2017) and UNEP (2018): http://www.mercuryconvention.org/Pa%C3%AD-ses/Partes/tabid/5694/language/es-CO/Default.aspx

- All of the countries in the Biome are currently developing MIA projects. Even though Venezuela has not yet ratified the Convention and Colombia did it very recently, they are also progressing in the elaboration of MIA projects in order to determine the institutional, regulatory, technical, and commercial capacity of the country in order to comply with the treaty's commitments.

- The topic of mercury has been on the ACTO's agenda at least since 2006 and the organization has made progress to position the subject in its work plan and agendas for health, environment, and indigenous peoples for the party countries. However, a lack of resources has hindered the implementation of the programs foreseen in the work agenda. The CAN has focused on promoting cooperation between Andean countries for police control since 2012 and for knowledge management since 2019. Since 2018, several civil society organizations in Colombia, Peru, Bolivia, Ecuador, and Guyana have organized themselves to work collaboratively on the issue.

ACTO
Amazon Cooperation Treaty Organization

- A lack of articulation between the various agencies and ministries responsible for combating the mercury problem in IIGM can be observed across levels and in all countries. Nevertheless, since the signing of the Minamata Convention in 2013, the law making processes, inter-institutional articulation, and pursuit of common goals established by the Convention's obligations have been revitalized.

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- Complaints of mercury contamination in the Yanomami lands in Brazil and Venezuela have been presented to the UN Special Rapporteur on the Rights of Indigenous Peoples and the UN Special Rapporteur on the Right to Health. It is foreseeable if this problem worsens that some organizations will seek to bring the case before the Inter-American Commission on Human Rights regarding the lack of an effective domestic-level response by countries like Brazil, Colombia, Peru, and Venezuela. Precautionary measures have already been employed by the IACHR for the Tres Islas community in Madre de Dios in Peru.

- Countries like Colombia, Guyana, Peru, and Bolivia have begun to develop Fair Trade gold certification programs. However, up until now none of these programs have been implemented in the Amazon regions of these countries, because they have not been able to meet the minimum conditions to do so. It is important that a comprehensive, participatory, and informed discussion occur about the convenience and implications of these types of measures in IIGM in the countries of the Biome.

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- The possibilities for the Minamata Convention to be successful in the Amazon are finely balanced between the interest of several actors to promote mercury-free gold markets on the one hand, and the urgency to reduce emissions, formalize miners, protect communities from exposure, and stop the illegal trade of mercury.

- On its own, the market will not be able to prevent the Amazon from becoming another Minamata. Committed and active collaboration from governments and regional bodies like the ACTO and the CAN, together with support from the Minamata Convention's Secretariat will be needed

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1. More research and cooperation needed on intraregional mercury trade in the Amazon biome.

2. It’s urgent to address knowledge gaps and improve technical and scientific capacity to carry out mercury science. Also, indigenous and local voices, as well as social science perspectives are needed.

3. Regional action and cooperation.

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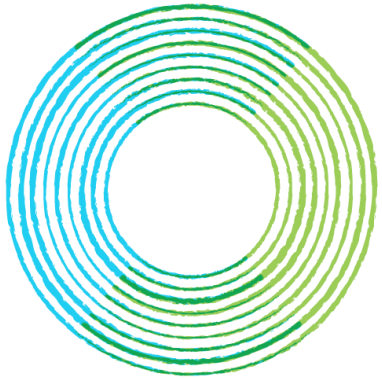

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