

Linking Minamata Convention effectiveness evaluation and biota monitoring to GBF targets: insights from the Open-Ended Scientific Group

6 October 2026

Olha Furman on behalf of the Minamata Open-Ended Scientific Group – Biota

A/g Assistant Director

Australian Government Department of Climate Change, Energy, the Environment and Water

Open-ended Scientific Group Composition

Co-chairs: Terry Keating (US) (until July 2025), Sandy Steffen (Canada) (from Sep 2025) and Dominique Bally Kpokro (Ivory Coast)

Global experts: 42 OESG members and 112 experts on roster

Subgroups: Air, Other matrices, **Biota**, Human biomonitoring, Emission/release, Integrated Analyses (case studies and global modelling)

Biota Group members and experts contributing to the OESG report

Lead	Karina Miglioranza	Argentina
Co-lead	Olha Furman	Australia
	Josh Ackerman	USA
	Jess Brandt	USA
	Paco Bustamante	France
	Mark Burton	USA
	Celia Chen	USA
	John Chetelat	Canada
	Marlene Evans	Canada
	David Evers	USA
	Nadia Facciola	Canada
	Tatsuya Hattori	Japan
	Magali Houde	Canada
	Kimmo Kahilainen	Finland
	Eva Kruemmel	Inuit Circumpolar Council
	Yanju Ma	China
	Aourell Mauffret	France
	Marianna Pinzone	Norway
	Heli Routti	Norway
	Claudia Vega	Peru
	Simon Wilson	AMAP
	Pianpian Wu	USA



Open-ended Scientific Group (OESG) Scientific Report

Minamata actions



Changes in Hg emissions/releases



Changes in environmental Hg



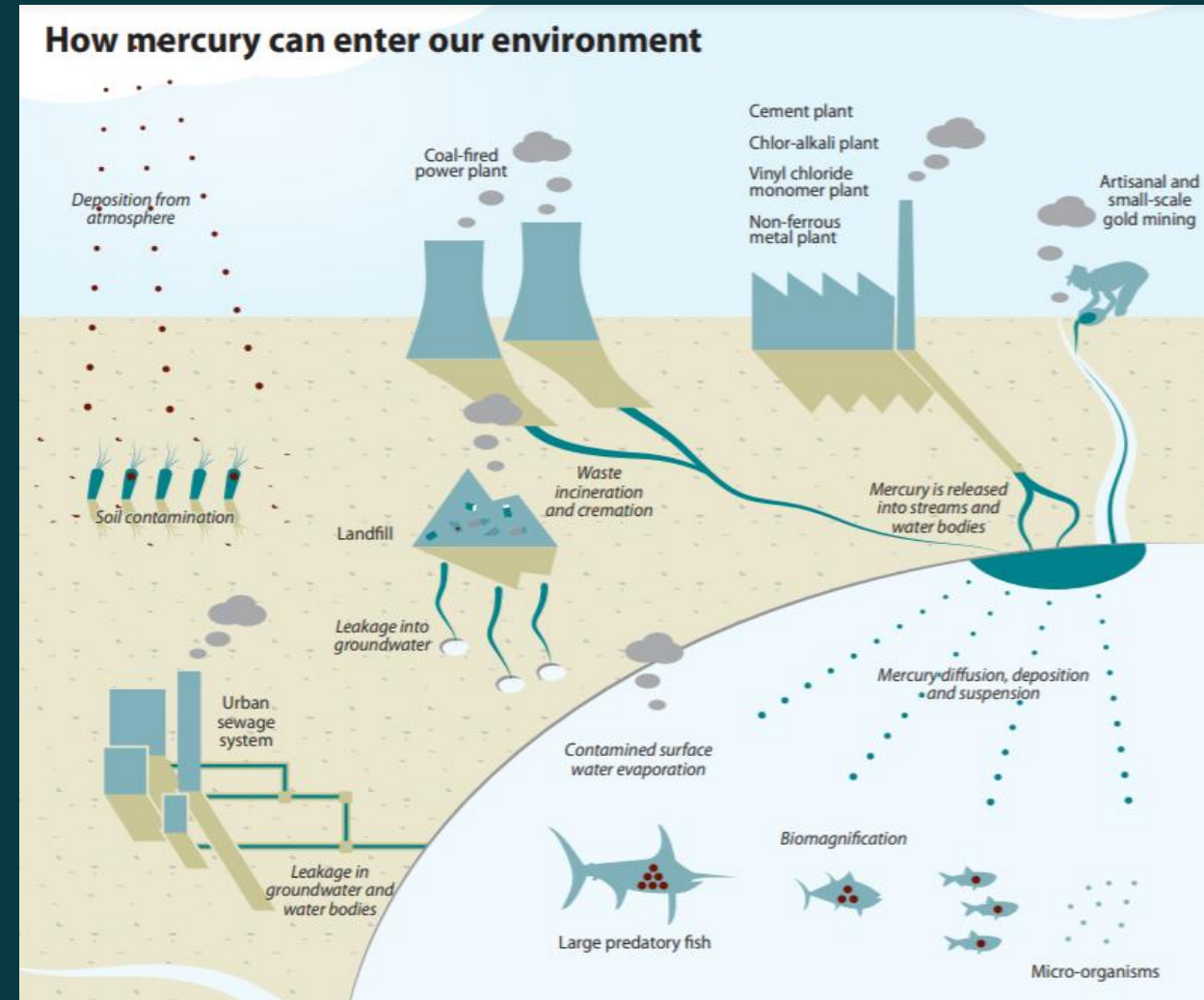
Changes in Hg exposure in biota



Changes in potential ecological risk



Evidence relevant to GBF Target 7



How Minamata mercury monitoring can contribute to GBF Target 7

1 | EXPOSURE

Are mercury concentrations in biota changing over time?



2 | POTENTIAL ECOLOGICAL RISK

What proportion of monitored biota exceed appropriate toxicity-relevant benchmarks?



3 | CHANGE OVER TIME

Is the extent of exceedance changing?

These measures provide evidence relevant to CBD Target 7's objective of reducing pollution to levels not harmful to biodiversity.

Toxicity reference value exceedance indicates potential ecological risk or potential adverse effects. It is not direct evidence of biodiversity loss.

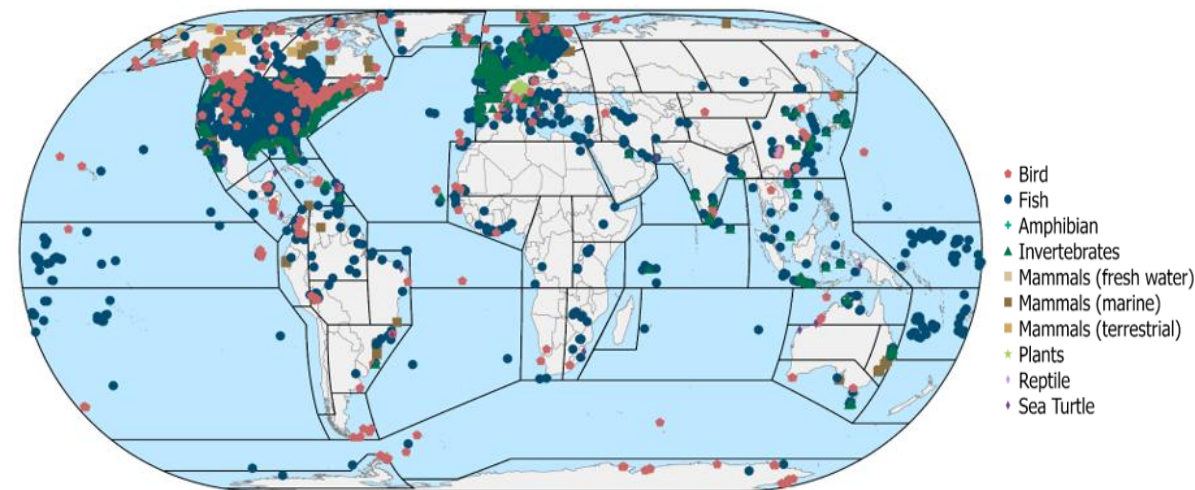
Global mercury monitoring is substantial, but geographically uneven



- Most mercury data come from **North America, Europe, and East Asia**
- Most frequently sampled matrices: **fish** (muscle), **birds** (feathers, blood and eggs), **invertebrates** (soft tissues), and **mammals** (liver and muscle)

Key Findings

- ❖ Data have **limited geographic coverage** and **broad variability in species and trophic position**
- ❖ Existing biota **data support regional analyses**.
- ❖ While mercury emission reductions provide benefits, **biotic responses are often slow, uneven**, and influenced by legacy stores and ecological factors.
- ❖ Artisanal and small-scale gold mining (**ASGM**) regions require **urgent monitoring** due to their high mercury emissions.
- ❖ Community-led monitoring and ethical utilization of **Indigenous Knowledge** can greatly improve understanding and relevance of mercury monitoring programs.



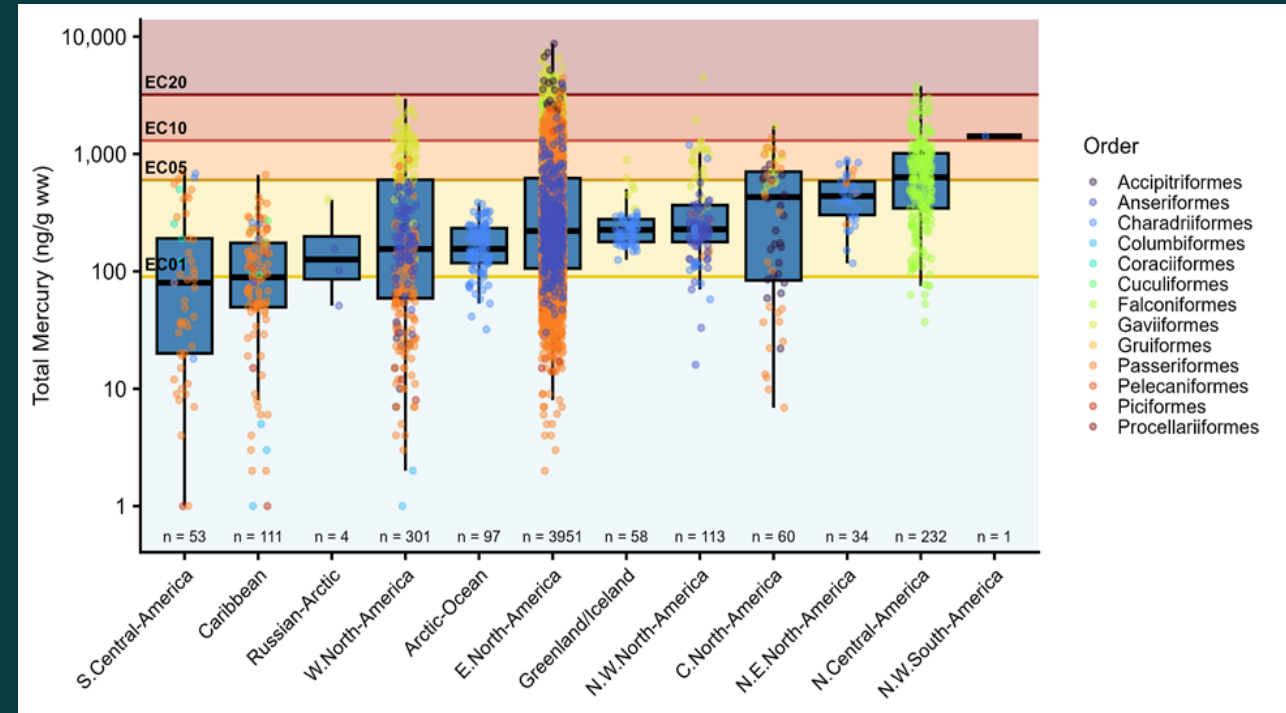
Geographic distribution of sampling locations in current period (2014-2024) by taxa, overlaid on IPCC regional boundaries (black lines). A subset of suitable samples were identified for use in each analysis.

How do current levels of mercury observed in birds compare to toxicity reference values associated with adverse effects on wildlife?

We compared mercury concentrations in bird tissues to toxicity reference values for the adverse effects of mercury on survival and reproduction (*Env Toxicology and Chemistry – Vol 43, pp.1195-1241, 2024*).

- 14.6% of samples exceeded concentrations associated with 5% reduction in survival or reproductive success in birds (moderate injury);
- 9.6% exceeded concentrations associated with 10% reduction in survival or reproductive success in birds (high injury);
- 1.2% exceeded concentrations associated with 20% reduction in survival or reproductive success in birds (severe injury).

Results reflect conditions in the sampled animals only and should not be interpreted as representing the prevalence of impacts across the wider region.



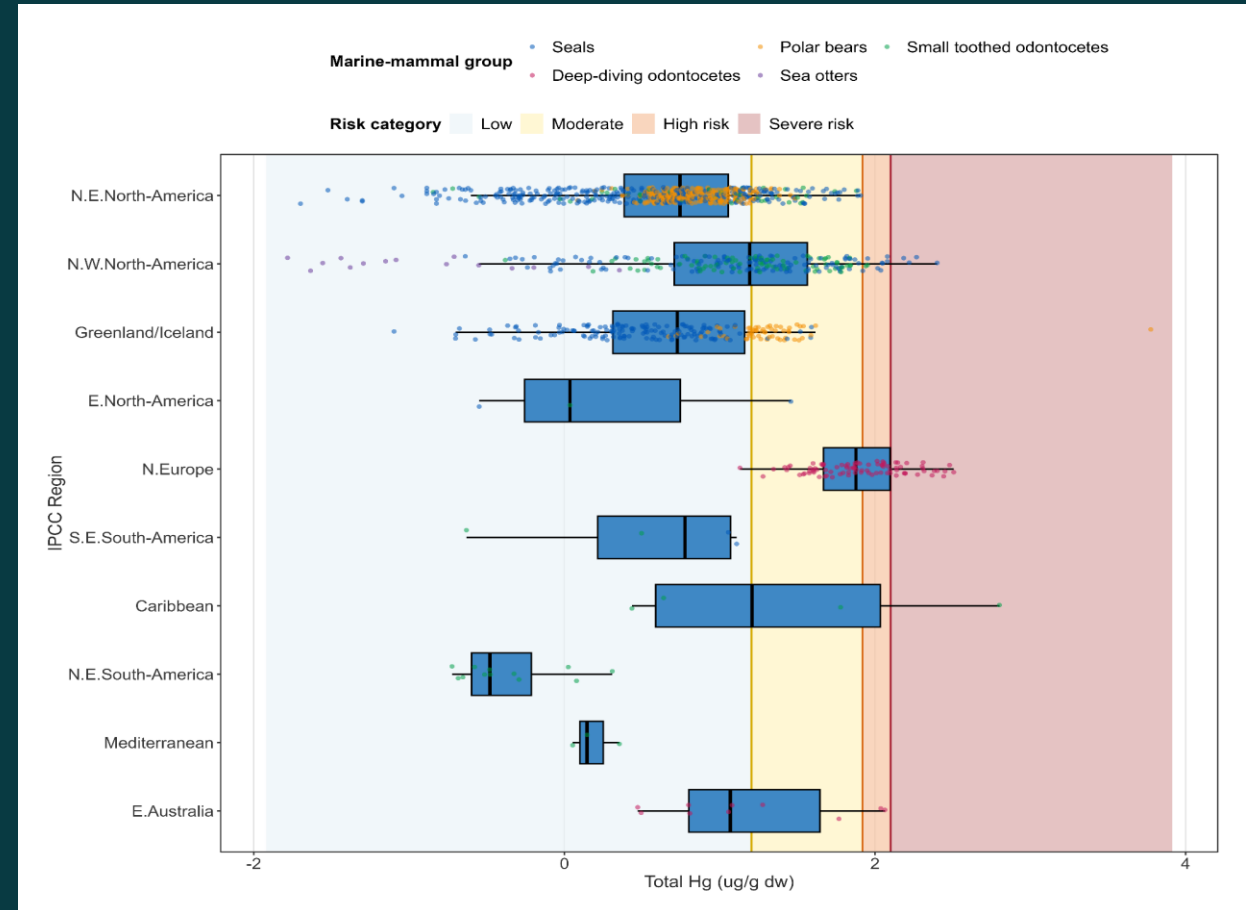
Bird blood concentrations (2014-2024) vs Toxicity Reference Values for the effects of methylmercury. Data points are shown for individual records (colors by Order). Horizontal colored lines indicate toxicity reference values (TRVs): 90 ng/g (EC01, yellow), 600 ng/g (EC05, orange), 1300 ng/g (EC10, orangered), 3200 ng/g (EC20, dark red). The y-axis is a log₁₀ scale.

How do current levels of mercury observed in marine mammals compare to toxicity reference values associated with adverse effects on wildlife?

We compared total mercury concentrations in liver to the four risk categories of adverse effects of mercury on the reproduction, physiology, condition, and behaviour of mammals according to the categorization made by Dietz et al. 2022 (*Science of the Total Environment* 829 (2022) 154445).

- $\leq 16 \mu\text{g g}^{-1} \text{ ww}$ (No risk)
- $16\text{--}83 \mu\text{g g}^{-1} \text{ ww}$ (Low risk),
- $83\text{--}126 \mu\text{g g}^{-1} \text{ ww}$ (High risk),
- $\geq 126 \mu\text{g g}^{-1} \text{ ww}$ (Severe risk)

Almost the totality of deep-diving odontocetes (93%) presented individuals in the risk range, followed by small toothed odontocetes (42%) and seals, polar bears and sea otters (< 20% in all groups).



Individual total mercury concentrations in marine mammal liver ($\mu\text{g/g ww}$ in log₁₀ scale) for the period 2014-2024 by IPCC region. Concentrations are reported as median and by region. X-axis is log₁₀ scale.

Mercury monitoring can contribute to GBF Target 7

- Mercury contamination in wildlife is widespread, with evidence of survival and reproductive risks across multiple regions, providing an important baseline for consideration in relation to global biodiversity conservation.
- Long-term monitoring and datasets are essential for tracking changes in potential ecological risk. Combining temporal trends with the proportion of sampled biota exceeding appropriate toxicity reference values can provide information on changes in potential ecological risk.
- From pollutant monitoring to biodiversity outcomes:
Minamata monitoring demonstrates how existing pollution data can help track progress towards a world where pollution is no longer harmful to biodiversity.