

87/2023

Hydrothermal Mercury – the natural story of a contaminant

Human influences are responsible for the majority of mercury pollution in the ocean

18 December 2023/Kiel. **An international team of researchers including the GEOMAR Helmholtz Centre for Ocean Research Kiel has produced the first global estimate of mercury emissions from hydrothermal sources at mid-ocean ridges based on measurements. The researchers were able to show that most of the mercury in the ocean comes from human activities - and can therefore be reduced. Their findings have been published in the journal Nature Geoscience.**

Ten years ago, the United Nations agreed to minimise mercury pollution in the environment to protect human health: the Minamata Convention was adopted in Geneva in 2013. Signatory countries committed to controlling and minimising the release of mercury. One of the main sources of human mercury intake is the consumption of contaminated fish, which accumulate mercury dissolved in seawater. It is estimated that anthropogenic activities have increased the global mercury reservoir in the ocean by 21 per cent. However, this figure is difficult to verify because it was not known exactly how much natural mercury was present in the ocean before anthropogenic emissions began. It is therefore equally difficult to say how much these have influenced mercury levels in fish.

To fill this knowledge gap, an international team of researchers led by the French National Centre for Scientific Research (Centre national de la recherche scientifique, CNRS) has now produced the first global estimate of mercury emissions from hydrothermal sources at mid-ocean ridges, volcanically active areas in the world's oceans, based on measurements.

Dr Sven Petersen, a geoscientist in the "Marine Mineral Resources" working group at the GEOMAR Helmholtz Centre for Ocean Research in Kiel, where metals in the ocean are an important research focus, is a co-author of the study. "Hydrothermal vents are the most important direct source of natural mercury in the ocean," he explains, "but until now, the data on how much mercury they contribute and their distribution in the oceans, while ODP expeditions drill rock samples

"Our combined observations suggest that most of the mercury accumulated in the ocean is diluted in seawater," says the study's lead author, Dr Lars-Eric Heilmann, a geoscientist at the Mediterranean Institute of Oceanography (MIO). Only a small amount of mercury is released locally and remains on the seafloor. Overall, the results show that the global mercury flux from mid-ocean ridges is small compared to anthropogenic mercury emissions. Natalia Torres-Rodriguez, PhD student at the MIO: "This ranges from 1.5 to 2.5 Gg yr⁻¹."

