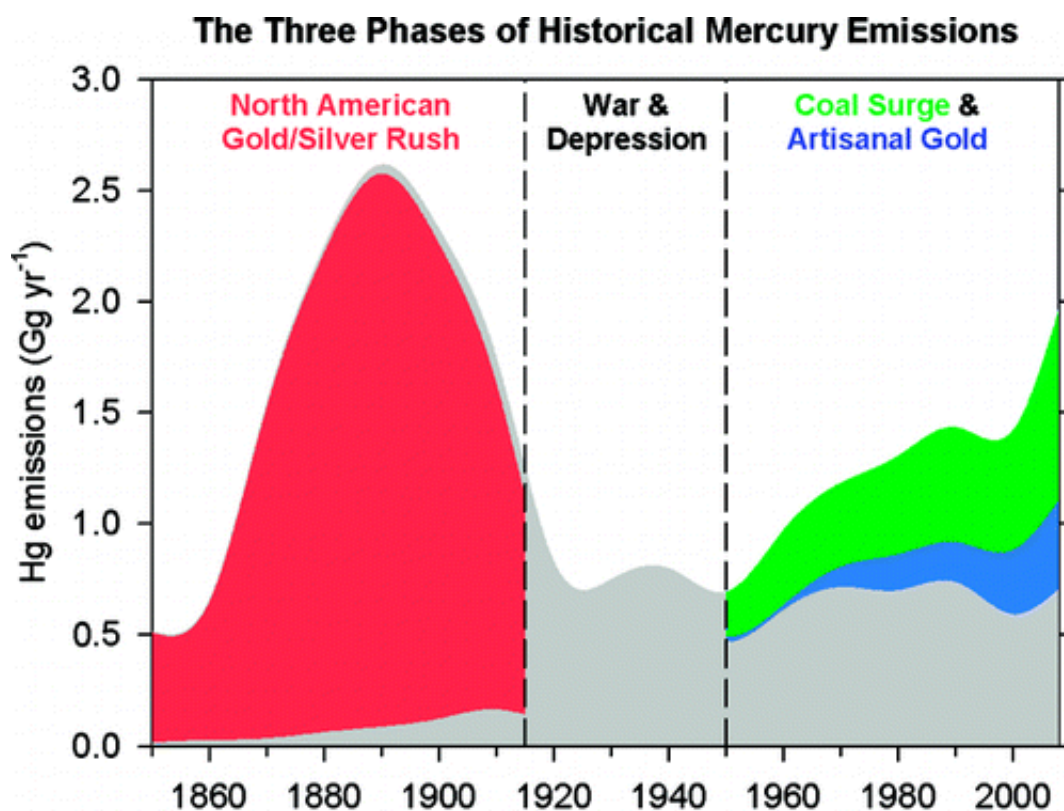


Mercury releases into the atmosphere from ancient to modern times

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In pursuit of riches and energy over the last 5,000 years, humans have released into the environment 385,000 tons of mercury, the source of numerous health concerns, according to a new study that challenges the idea that releases of the metal are on the decline. The report appears in ACS' journal *Environmental Science & Technology*.

David Streets and colleagues explain that humans put [mercury](#) into the [atmosphere](#) by burning fossil fuels and through mining and industrial processes. Mercury is present in coal and the ores used to extract gold and silver. Much information exists about recent releases of mercury, but there is little information on releases in the past. To find out how much impact people have had over the centuries, the scientists reconstructed human additions of mercury to the atmosphere using historical data and computer models.

Their research shows that mercury emissions peaked during the North American gold and silver rushes in the late 1800s, but after a decline in the middle of the 20th century, are quickly rising again thanks mostly to a surge in coal use. They report that Asia has overtaken Europe and America as the largest contributor of mercury. Recent data suggest that mercury concentrations in the atmosphere are declining, and this is not consistent with their conclusion of increasing emissions. Changing atmospheric conditions may be partly responsible, but more work is also needed to understand the fate of large amounts of mercury in discarded products like batteries and thermometers. The researchers predict mercury released from mining and fuel may take as many as 2,000 years to exit the environment and be reincorporated into rocks and minerals in the Earth.

More information: All-Time Releases of Mercury to the Atmosphere from Human Activities, *Environ. Sci. Technol.*, 2011, 45 (24), pp 10485–10491. [DOI: 10.1021/es202765m](https://doi.org/10.1021/es202765m)

Abstract

Understanding the biogeochemical cycling of mercury is critical for explaining the presence of mercury in remote regions of the world, such as the Arctic and the Himalayas, as well as local concentrations. While we have good knowledge of present-day fluxes of mercury to the atmosphere, we have little knowledge of what emission levels were like

in the past. Here we develop a trend of anthropogenic emissions of mercury to the atmosphere from 1850 to 2008—for which relatively complete data are available—and supplement that trend with an estimate of anthropogenic emissions prior to 1850. Global mercury emissions peaked in 1890 at 2600 Mg yr⁻¹, fell to 700–800 Mg yr⁻¹ in the interwar years, then rose steadily after 1950 to present-day levels of 2000 Mg yr⁻¹. Our estimate for total mercury emissions from human activities over all time is 350 Gg, of which 39% was emitted before 1850 and 61% after 1850. Using an eight-compartment global box-model of mercury biogeochemical cycling, we show that these emission trends successfully reproduce present-day atmospheric enrichment in mercury.

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