

# **Forest management practice determines whether the Amazon basin remains a globally important sink for mercury**

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Terrestrial ecosystems are an important sink for atmospheric mercury (Hg), thereby reducing the burden of anthropogenic Hg emissions to global Oceans. Forests in the Amazon basin account for 15% of global photosynthesis and 21% atmospheric Hg deposition to land. The expansion of agriculture has led to deforestation of 18'000 km<sup>2</sup> yr<sup>-1</sup> on average over the past 3 decades and 40% to total forest area is expected to be lost by 2050. Here, we assess the effect of deforestation on the terrestrial-atmosphere net exchange of Hg and on Hg transfer to aquatic ecosystems. Our results show, that in 2020 the Amazon basin accumulated 217 Mg y<sup>-1</sup> Hg from the atmosphere and 70 Mg y<sup>-1</sup> were transferred to surface water. If deforestation continues at current rates, the Amazon basin may turn from a net sink to a net Hg source by 2040. This Hg burden could be reduced by implementing forest conservation strategies, with the “best management practice” scenario continuing to accumulate 94 Mg y<sup>-1</sup> in 2050. This study shows that land-use change can have irreversible effects on global and local mercury dynamics and illustrates the potential of land-use policy to address global mercury pollution.