ELEVATED MERCURY LEVELS IN THE MADEIRA RIVER, BRAZILIAN AMAZON: A FUNCTION OF NATURAL SOURCES AND PROCESSES?

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The use of mercury (Hg) by illegal gold miners (garimpieros) in the Brazilian Amazon, and its release to the world's largest and most biologically diverse rainforest, has become an issue of international concern. In May and June, 1997, a regionally extensive sampling campaign was conducted by Brazilian and American scientists along an 800 km reach of the Madeira River in Brazil to assess regional environmental impacts of Hg released from garimpos near Porto Velho. Channel and floodplain sediments, lateritic soils, ultra-clean water samples, and fish were collected approximately every 50 km. Regionally, Hg concentrations in riverbed and floodplain sediments appear to be related to proximal watershed Hg concentrations and do not appear to be a function of distance from current garimpo Hg releases near Porto Velho. Fish Hg concentrations are closely related to dissolved aqueous Hg concentrations, both of which increase and then decrease in the lower half of the Madeira River basin, far from any known garimpo activities. Extensive zones of Amazon basin soils are enriched in Hg and their erosion may be a primary source of Hg to the river. Geochemical and geomorphic features of the Madeira River basin suggest that much of the elevated Hg in sois and sediments of the area may have come from upstream source areas (Andes Mountains) and has been trasported to this part of the Amazon basin by the Madeira River.