

**THE SOURCE AND DISTRIBUTION OF MERCURY IN THE
WATERS OF THE TAPAJÓS RIVER BASIN - THE
IMPORTANCE OF SUSPENDED SEDIMENTS FROM
ALLUVIAL GOLD MINING, PARÁ, BRAZILIAN AMAZON**

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Dissolved mercury concentrations in waters draining mining operations in the Reserva Garimpeira do Tapajós are elevated when compared to concentrations in pristine rivers. However, essentially all dissolved mercury concentrations fall below 0.1 ppb. Mercury bound to suspended sediment is roughly 600 and 200 times the concentration of dissolved mercury per litre of water in impacted areas and pristine areas, respectively, and thus represents the major pathway of river-borne mercury. Median concentrations of Hg in suspended load are 145ppb regardless of source (impacted or pristine) and 80% of samples are below 300ppb - in the range of surficial materials world-wide. Aqueous Hg fluxes are proportional to the concentration of suspended solids showing that the source of mercury is the sediment itself and not mercury usage from miners. Further, the annual export of mercury from the Creporí River is 4 tonnes - a mass difficult to account for by miner usage alone. These lines of evidence suggests that the regional riverine mercury problem is dominantly caused by physical sediment erosion during sluicing and dredging operations and not by direct mercury usage. This has major implications for remediation and prevention. Simply halting the use of mercury is surely a step in the right direction but regional mercury pollution will only be reduced when the dredging is stopped or contained. Sediment plumes from mining have been contaminating the Tapajós system for 20 years and therefore, in-basin storage of historical mining emissions must be considered in any Hg source apportioning theories.