Geogenic arsenic and manganese in anoxic riverbank groundwater along the Amazon River

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Reducing subsurface conditions in parts of the Amazon Basin result in groundwater being geogenically enriched with arsenic and manganese (de Meyer et al., 2017). Groundwater is an important source of drinking water in places along the Amazon River where surface water is contaminated by microbes or anthropogenic pollutants. Since As and Mn are of concern for human health, it is important to understand where and under which environmental conditions these elements are mobilized from aquifer sediments and accumulated in groundwater. Here we discuss the results of a field study along the main Amazon River. We sampled water from household wells in riverine communities and collected groundwater from seasonally flooded riverbanks by setting piezometers in active clay-silt deposits. We compare the main hydrochemistry, trace element chemistry, variations in redox sensitive trace elements (e.g. As, Mn, Fe, Mo) in groundwater from various river bank types. Analysis of water isotopes and in-situ measurements of dissolved gases (e.g. to date the groundwater), provide insights on the origin and residence times of the contaminated groundwater.

de Meyer C.M.C, Rodríguez J.M., Carpio E.A., García P.A., Stengel C., Berg M. (2017). Arsenic, manganese and aluminum contamination in groundwater resources of Western Amazonia (Peru). Science of The Total Environment (607-608), 1437-1450.