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Evaluating The Potential Toxic Metal Aerosol Exposure In The Virunga Volcanic Province Stemming From The Nyiragongo And Nyamuragira Volcanoes, D.R. Of Congo

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The Virunga Volcanic Province, including the city of Goma, lies along the border between the Dem. Rep. of Congo and Rwanda. The area has experienced explosive population growth following the civil war started in 1996 and persisting today related to political unrest in the area. The population growth occurs despite the presence of two very active volcanoes (Mt. Nyiragongo and Mt. Nyamuragira) within ∼18 km of the city center. In January 2002 Mt. Nyiragongo erupted pouring lava into the city of Goma killing ∼180 people and leaving 130,000 homeless, presenting an obvious volcanic hazard to the area's inhabitants.

We evaluate the extent and degree of a less obvious volcanic hazard that may result from the extremely metal-rich aerosol particles emitted periodically eruptive phases (e.g. Mt. Nyiragongo (e.g. Jan 2001) and Mt. Nyamuragira (Jan 2010)) and ambient activity (i.e. the continuous lava lake at Mt. Nyiragongo (June and July 2010) and hydrothermal activity). Because of the unique silica-undersaturated lava composition and highly enriched metal content (e.g. REEs, HFSEs, actinides) of Nyiragongo activity, the aerosol emissions from this area may constitute a metal exposure (specifically metal inhalation) risk to inhabitants of the area.

We present cation and anion (IC), pH (field unit), and major element and trace element (ICP-MS and CLA-ICP-MS) data for a variety of samples associated with the volcanic activity in the area. Samples include: 1) local precipitation collected around the area for a period of approximately two months following the January 2010 eruption of Mt. Nyamuragira within the city of Goma and areas surrounding the volcano and 2); aerosols collected during two separate expeditions within the Mt. Nyiragongo crater and near the lava lake. Initial data demonstrates an exponential decrease in metal content of precipitation following the eruption.