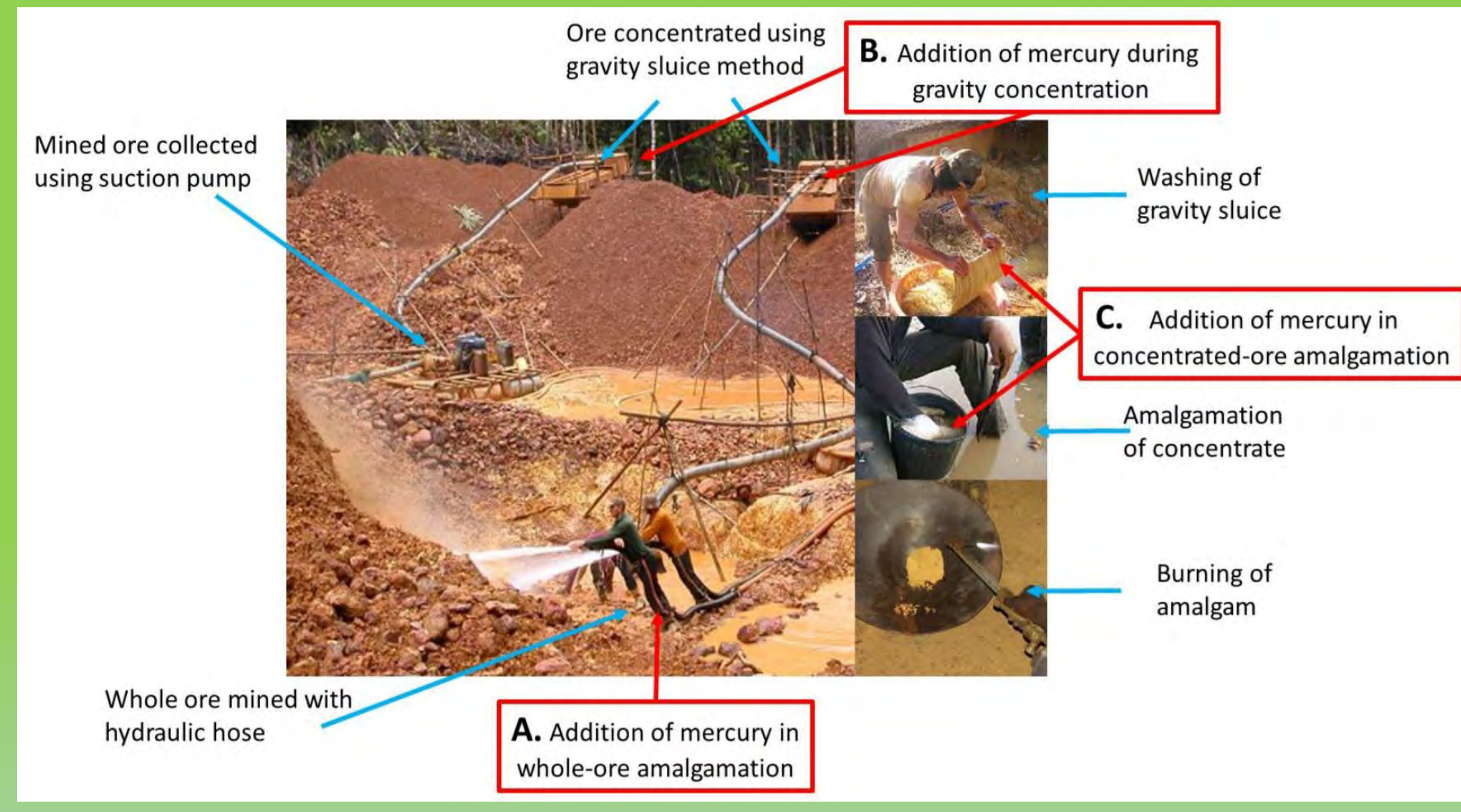
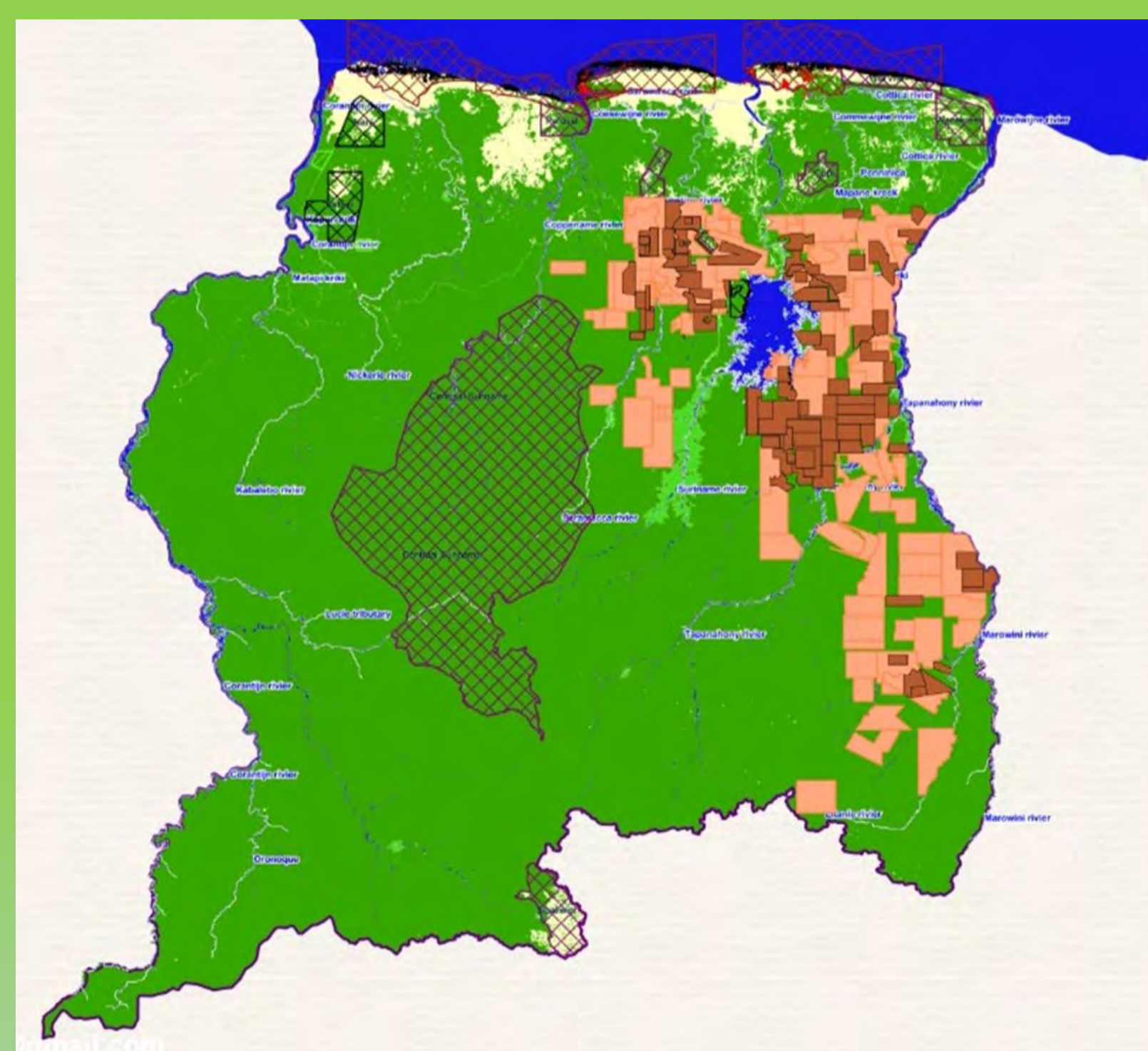
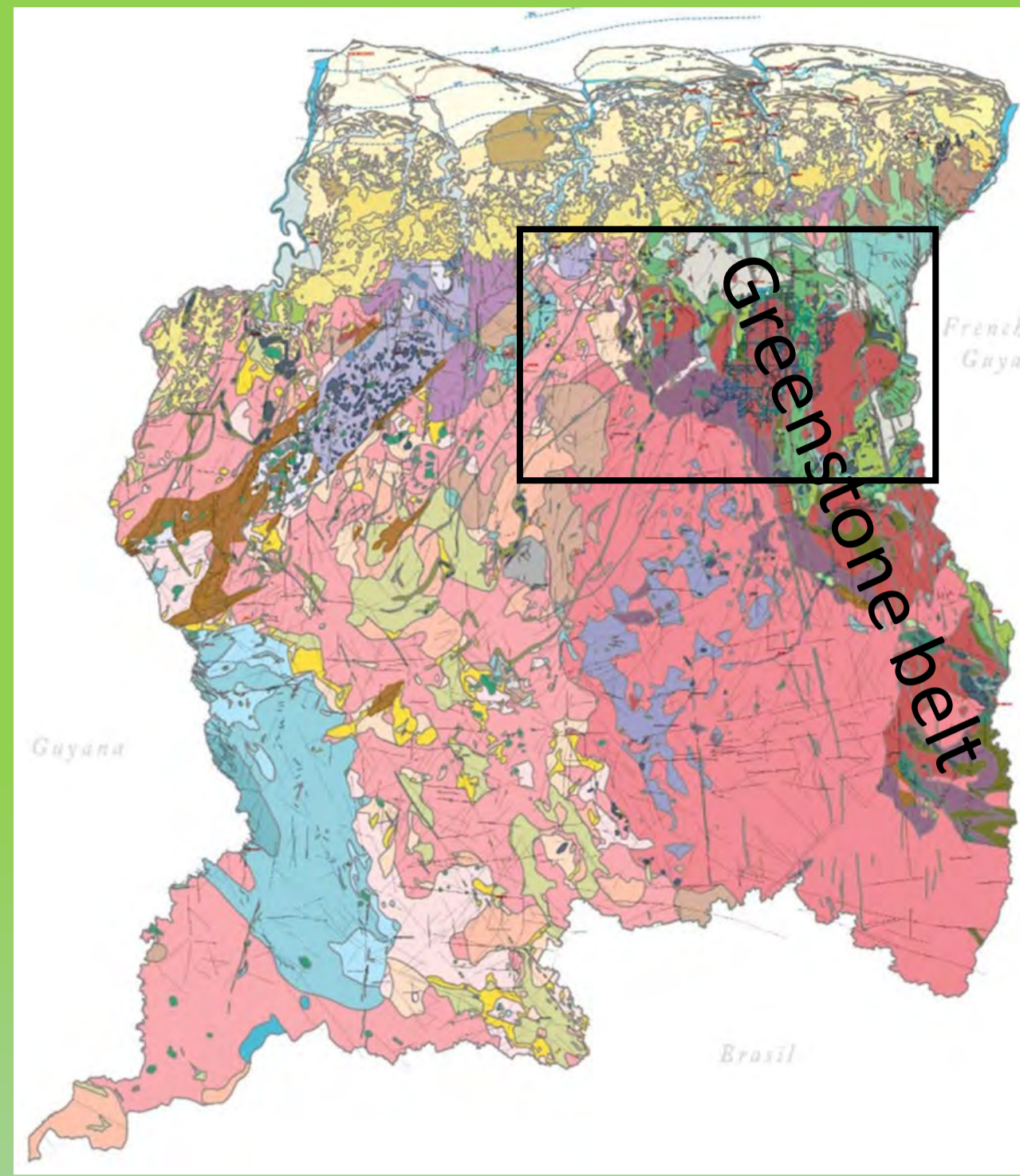


MERCURY BACKGROUND VALUES IN SOILS AND SAPROLITES IN THE GOLD-RICH GREENSTONE BELT OF SURINAME, GUIANA SHIELD: THE ROLE OF PARENT ROCK AND RESIDUAL ENRICHMENT

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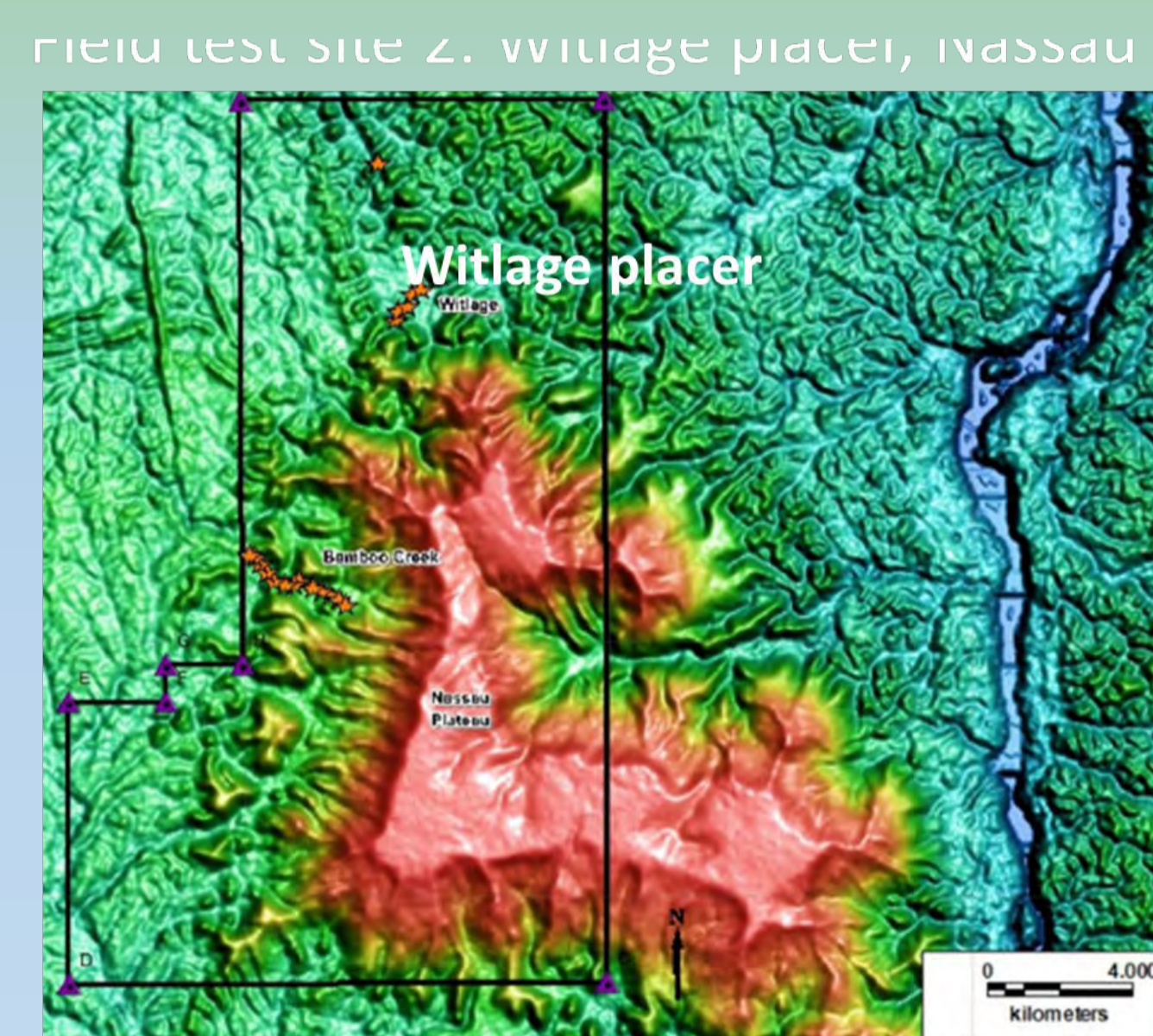
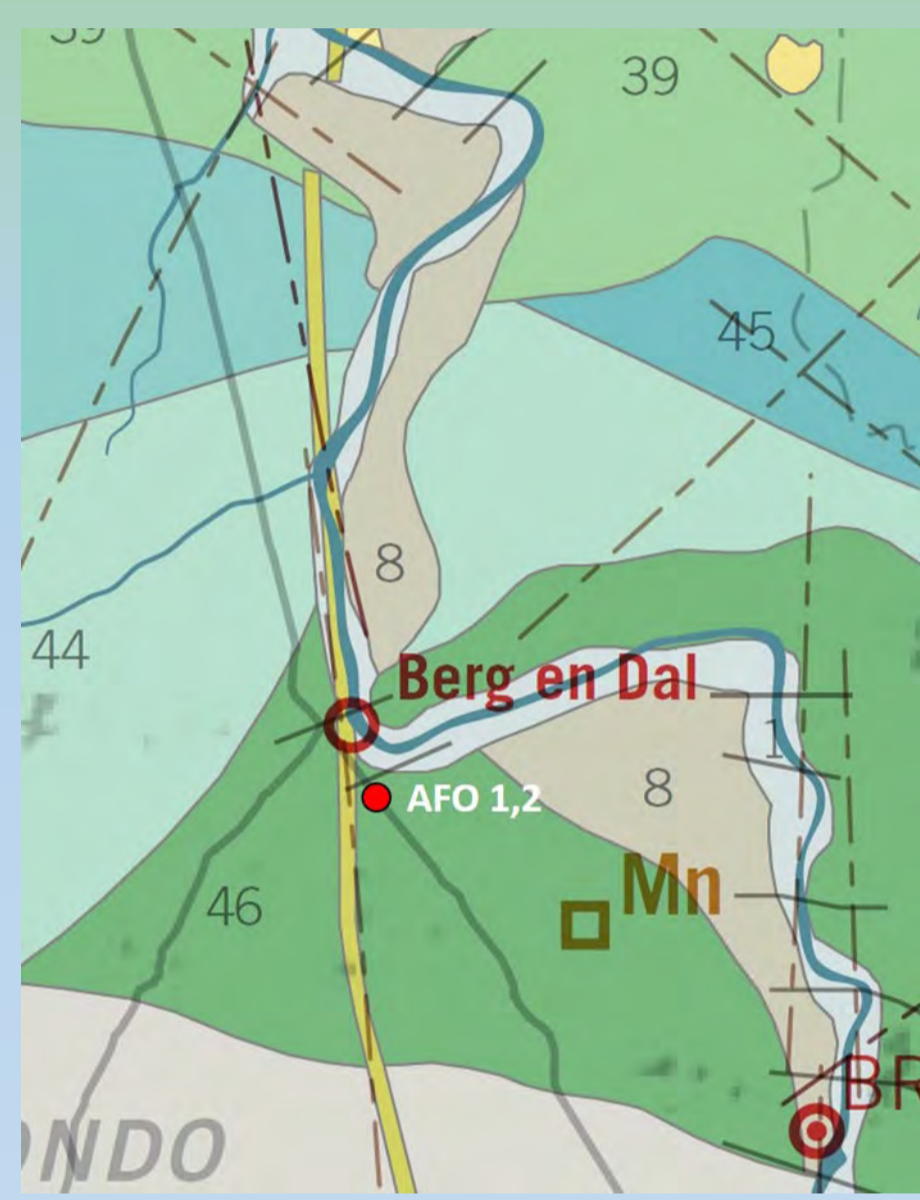
Objective: establish regional mercury background values to be able to distinguish polluted from unpolluted materials



Geological map of Suriname and study area, GMD, 2018

Gold concessions in Suriname Gonini.org

Mercury use in artisanal gold mining, Legg et al., 2015, WWF



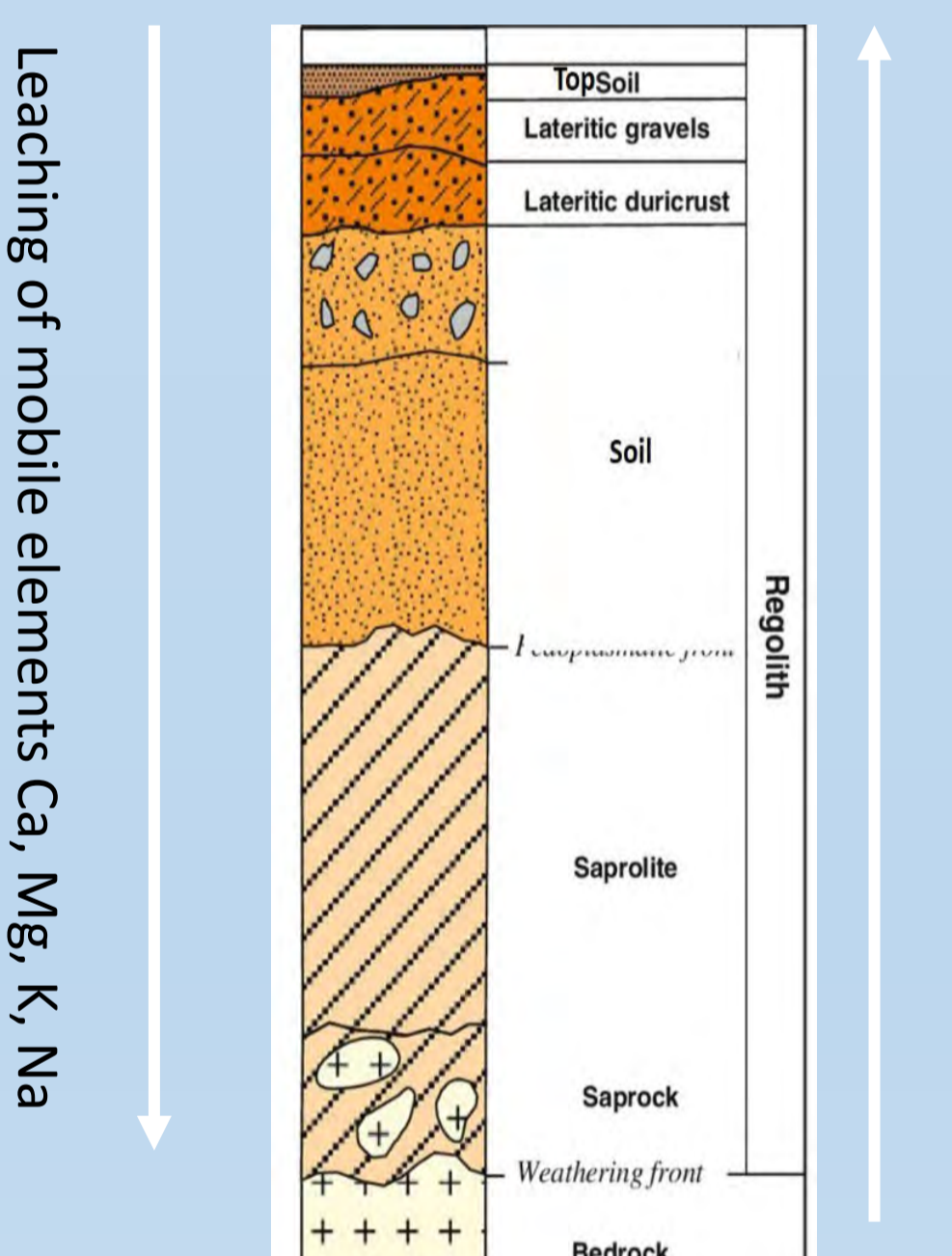
Location pilot sites

AFO 1: regular oxisol, AFO 2: indurated horizons

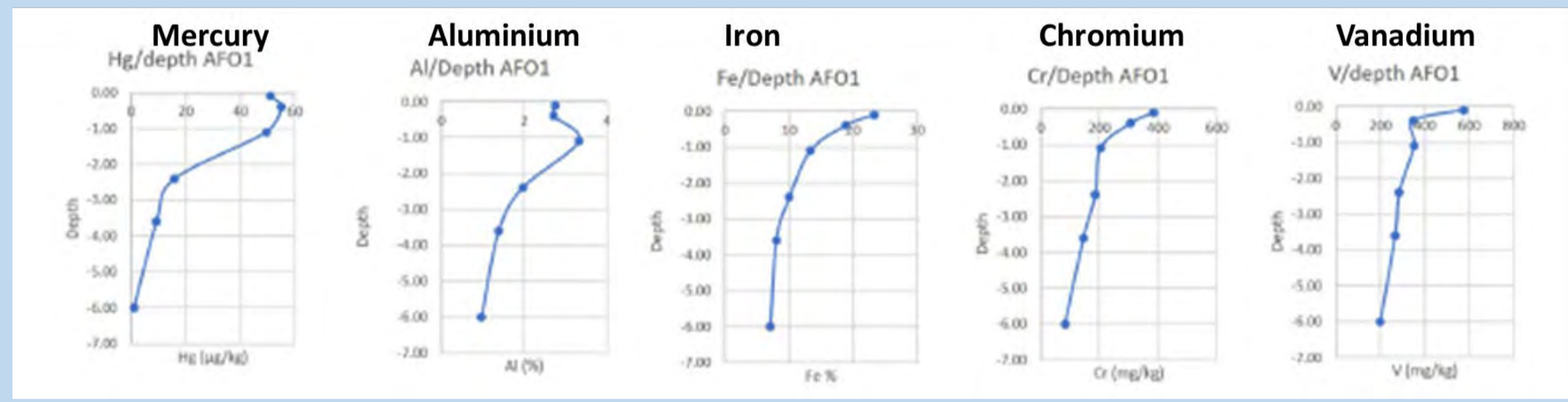
Location Pilot Witlage Placer. MNA31 24 m hole

MNA31 24 m hole

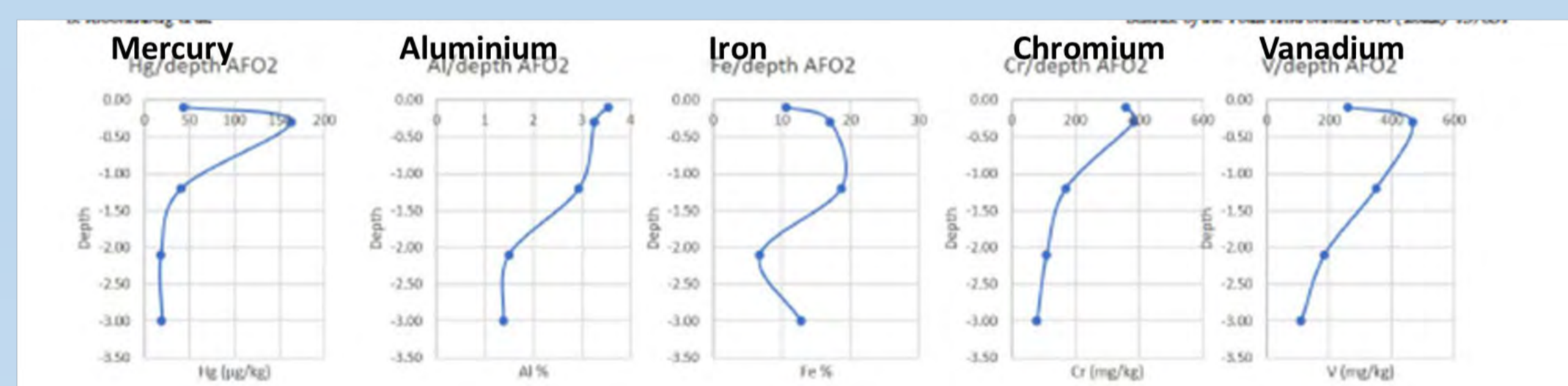
Classic laterite profile



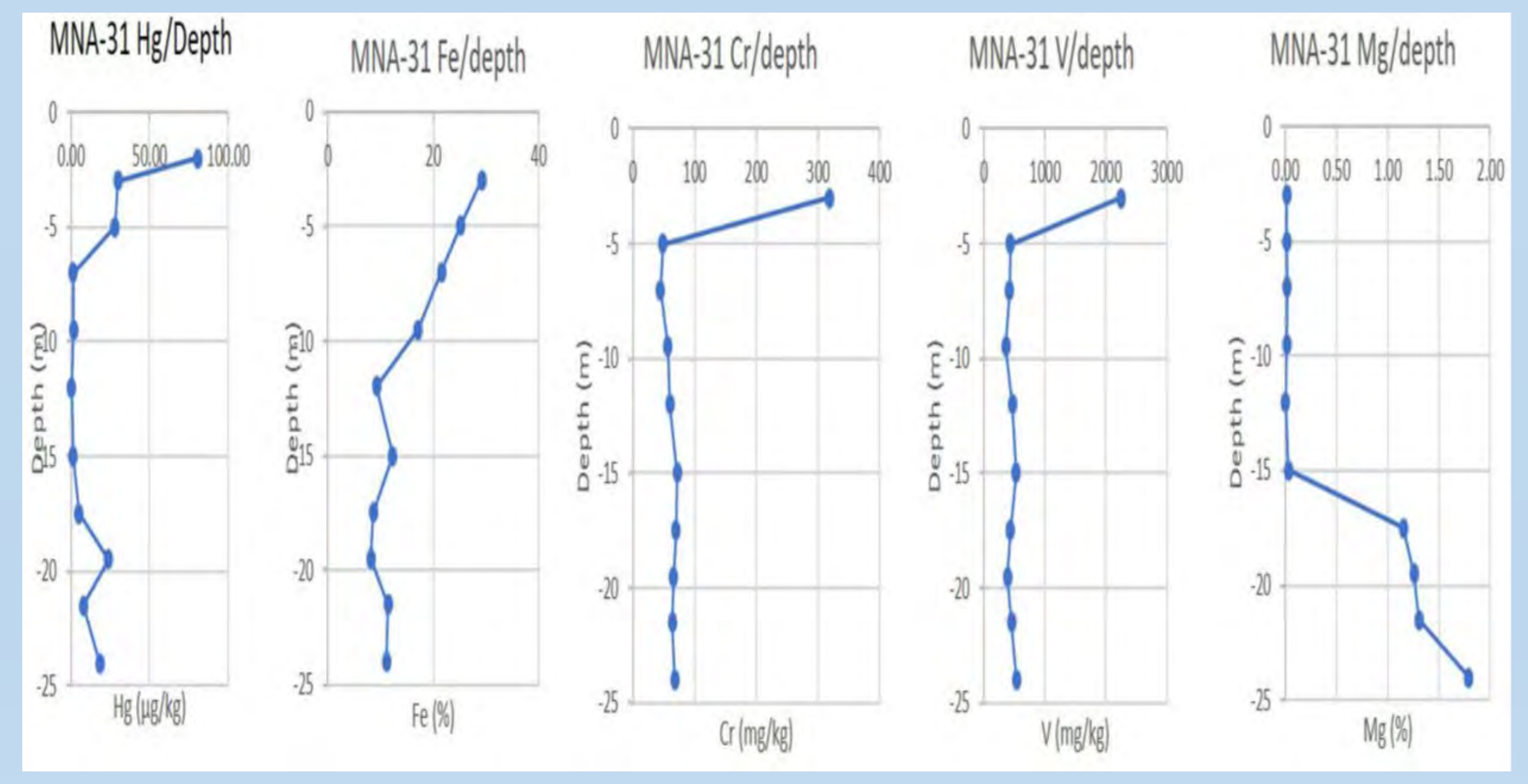
Residual enrichment immobile elements, Fe, Al, Si



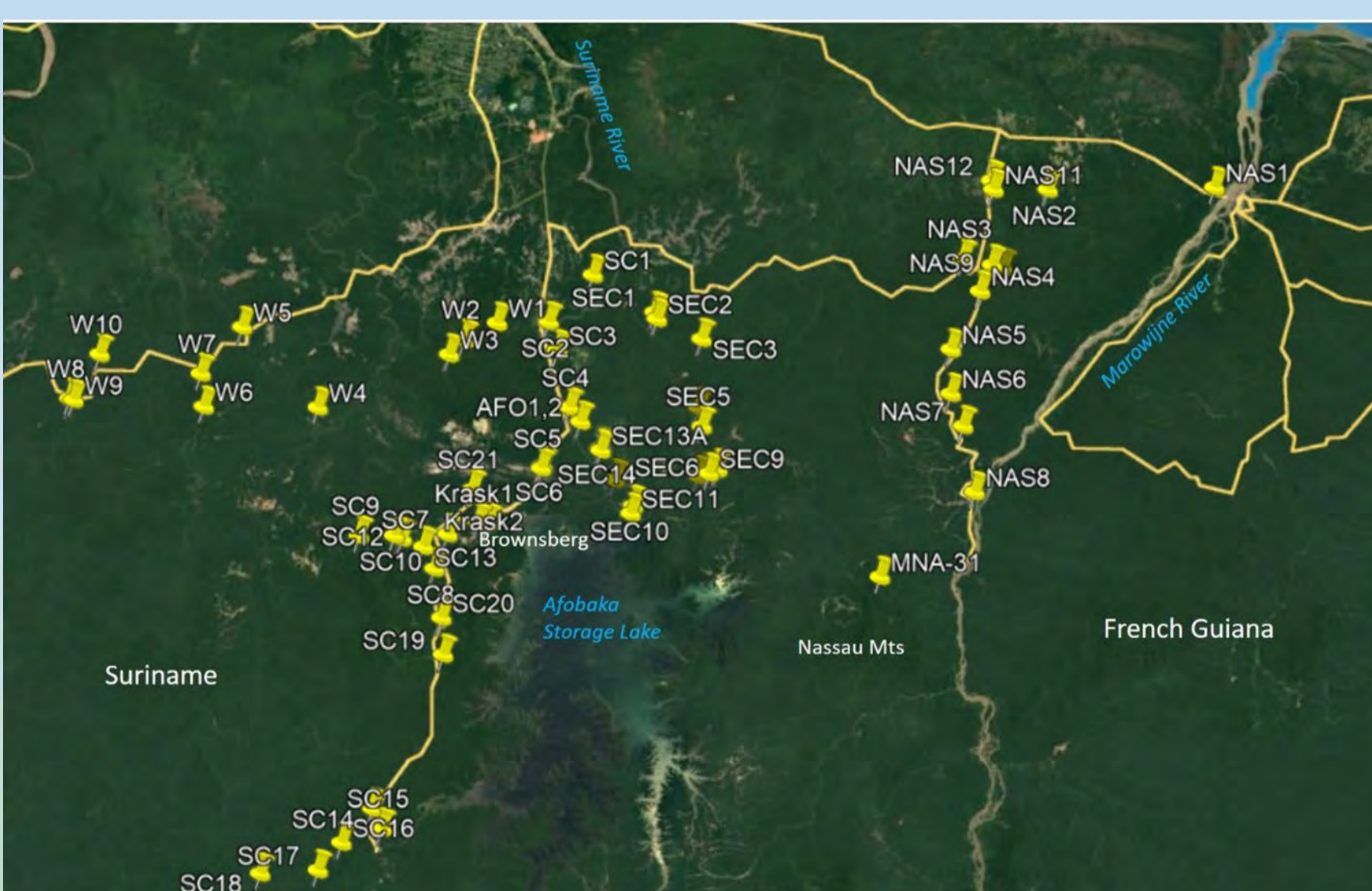
AFO 1: Hg residually enriched together with Fe, Cr, V, Cd, Nb, Pb, Sr, Zr



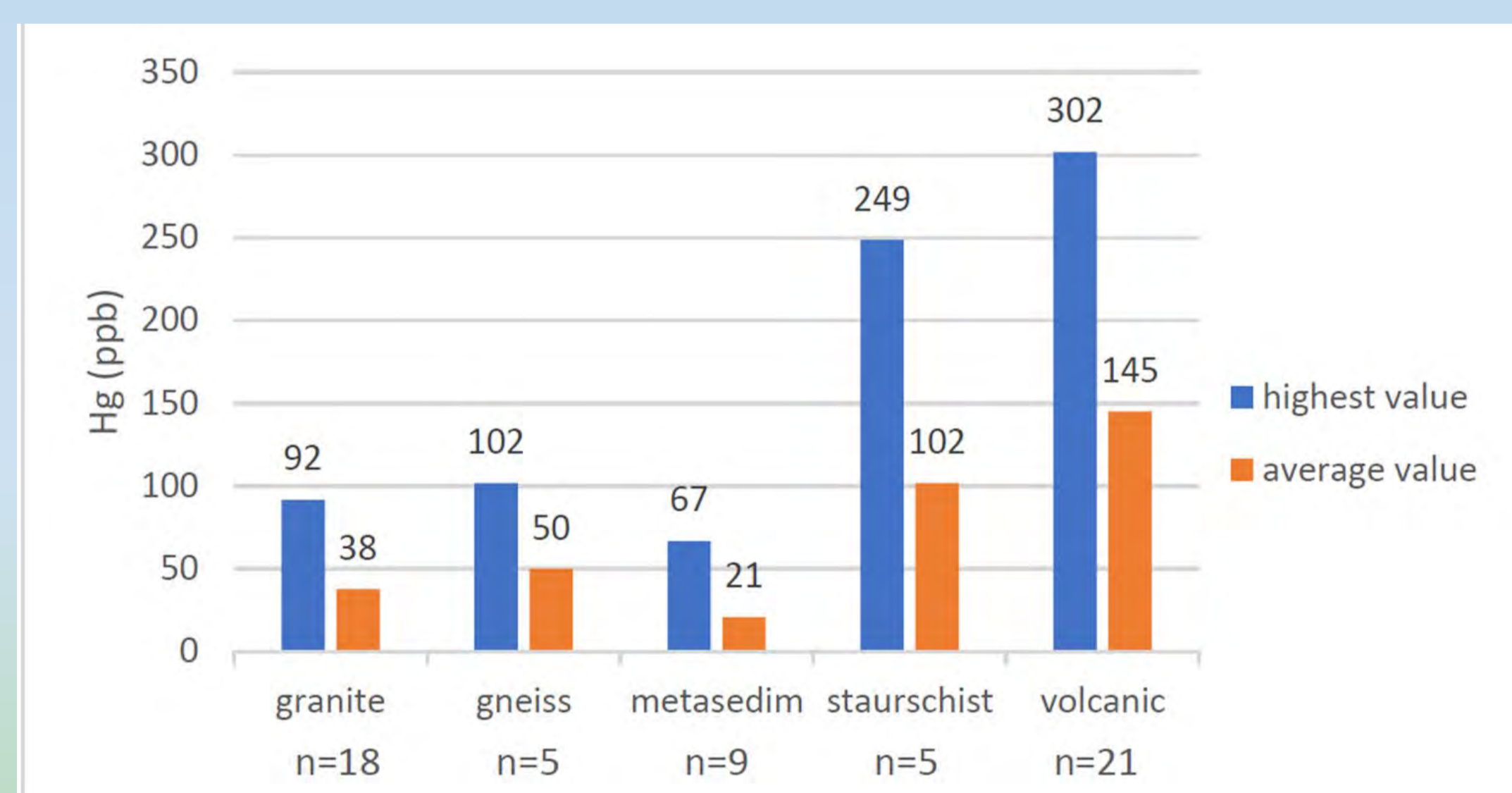
AFO 2: Hg enriched in indurated horizon together with Fe, Cr, V, Cd, Nb, Pb, Sr, Zr



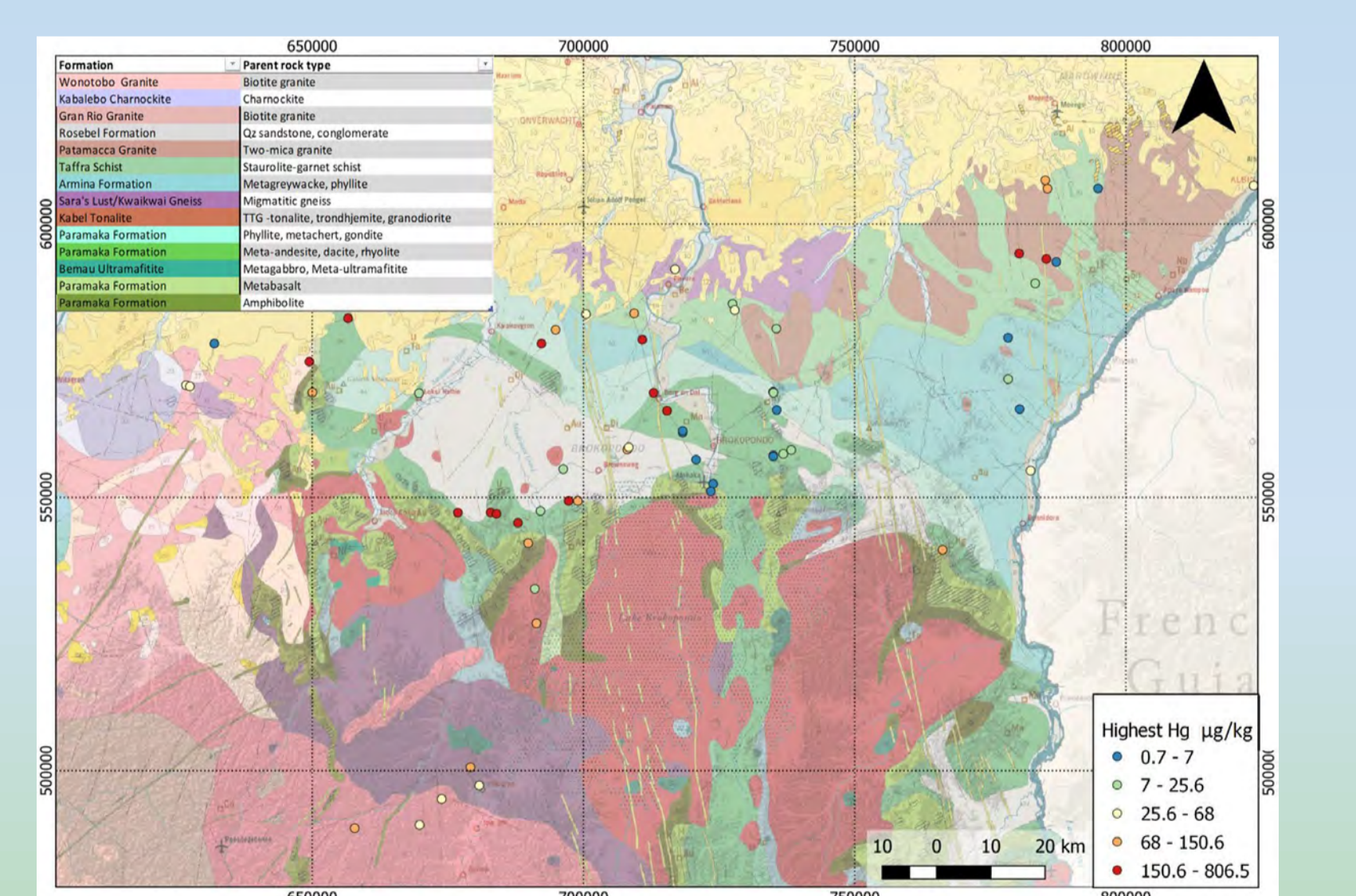
MNA-31: Hg residually enriched with Fe, Cr, V etc., Mg still present in saprock



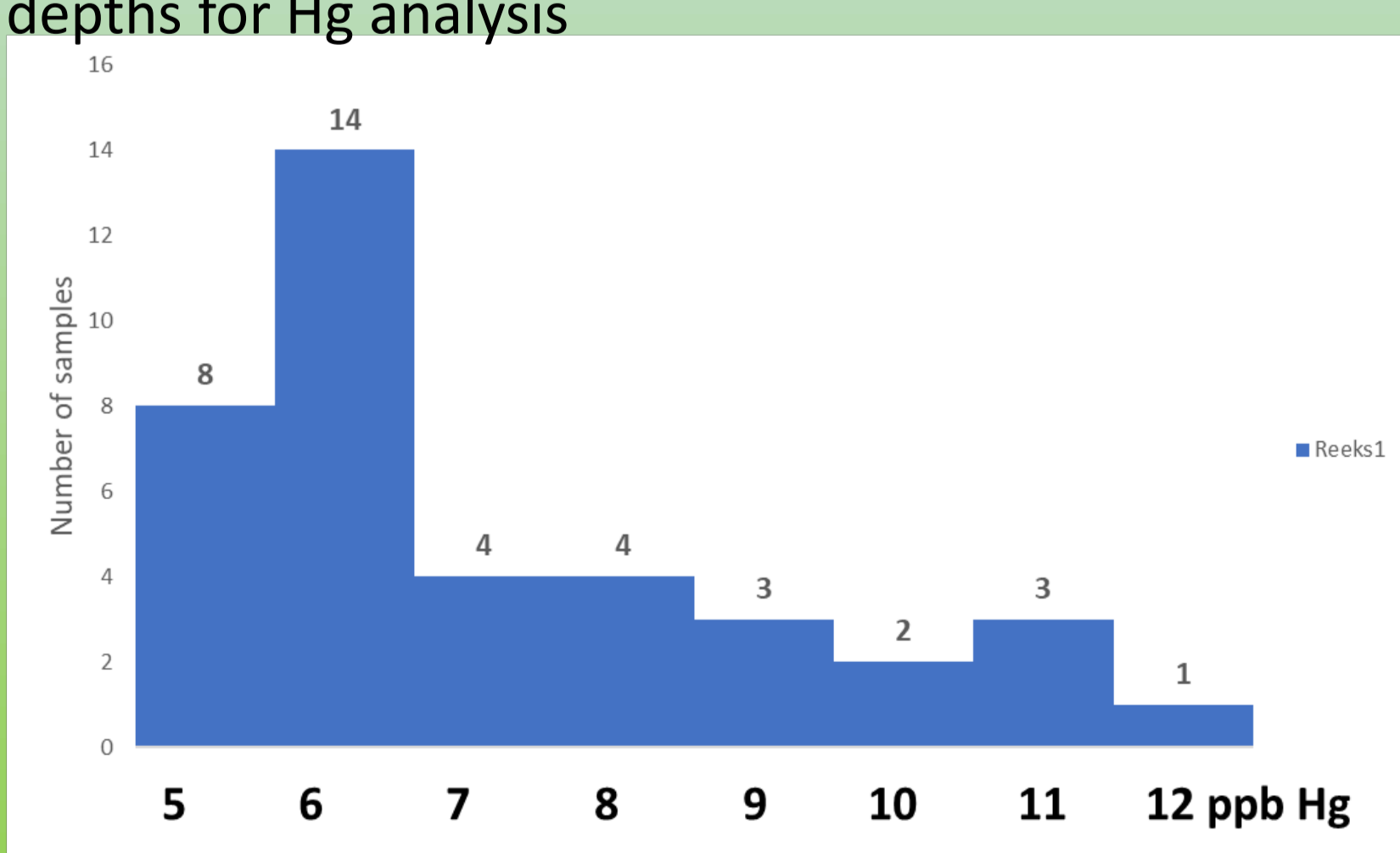
Along 62 road cuts 196 samples were taken at different depths for Hg analysis



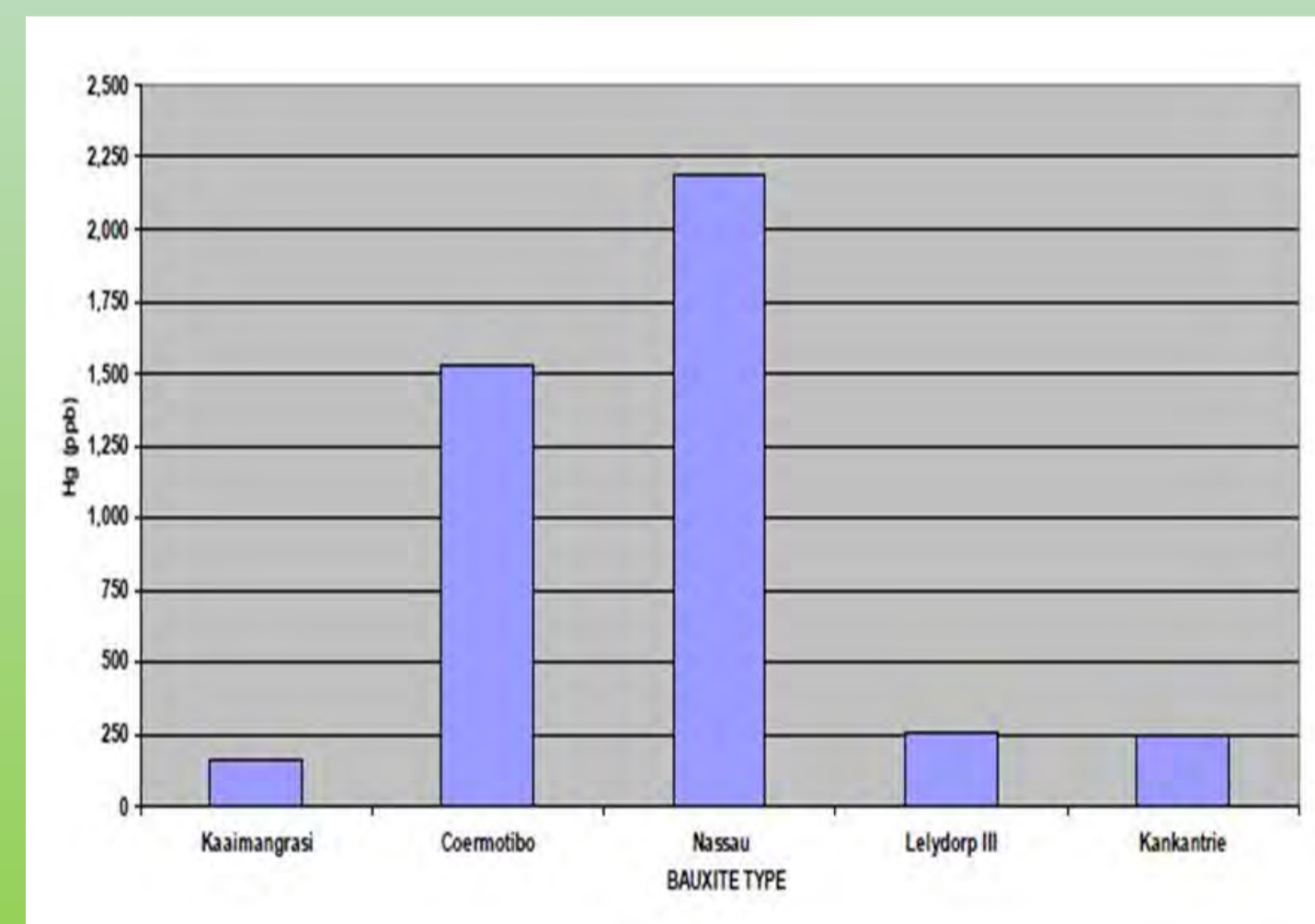
Soils from felsic rocks show lower Hg values than from mafic rocks



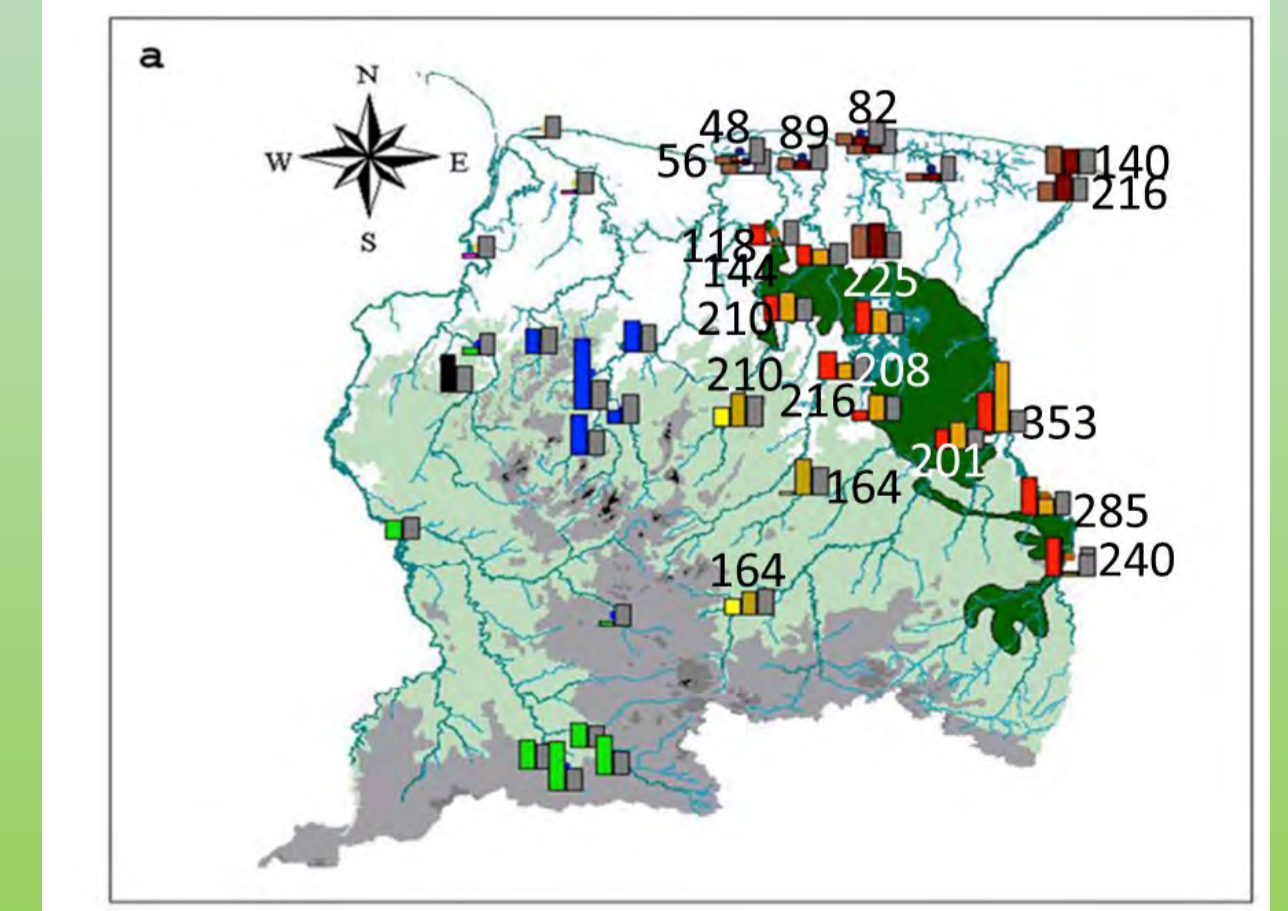
Highest values: Paramaka metavolcanics, Fe-rich staur schists



Pristine hard rock: only 39 out of 113 have Hg >5, highest 12 ppb (IAMGOLD)



Hg values in Sur. Bauxites (BIS). Highest value 12000 (Nassau)



Hg values in stream sediments in the greenstone belt (Ouboter 2015)

Conclusions

- Primary hardrock: low values, Hg < 12 ppb
- Topsoils and iron-cemented horizons residually concentrate Hg up to 100-200 ppb, together with Fe, Cr, V. Extreme residual values in bauxite (commonly 2000 ppb, highest 12000 ppb); Deeper horizons (mottled, pallid zones) are depleted to low levels (Hg < 1 ppb)
- Range of values within individual profiles is higher than between profiles
- Fe-rich parent rocks have higher Hg in topsoils than quartz-feldspar-rich rocks
- Unpolluted (top)soils and saprolites have Hg values in same range as polluted stream sediments and mine tailings.