



## **Effect of gold mining activities on water turbidity and river sediment discharge: comparison of two nearby river basin in French Guiana, using remote sensing and field measurements data**

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The Maroni and Oyapock rivers are two nearby basin in French Guiana, South America. The Maroni river drains a basin of 66 000 km<sup>2</sup> between French Guiana and Surinam. The Oyapock river basin covers 28 000 km<sup>2</sup> over French Guiana and Brazil. The Both over the Guyana shield presenting very lowest erosion rates.

For both rivers, Suspended Sediment Concentration and remote sensing reflectance have been determined, during 3 fields sampling campaigns, using TriOs RAMSES radiometers operating in the 350-900 nm spectral range. Field data are compared with MODIS spaceborne sensors onboard calibration Terra and Aqua satellites.

For the first time over the Maroni river, we show that it is possible to monitored from space both Surface Suspended Sediment Concentration (SSSC) and the Turbidity ( $R^2=0,81$ ), making possible to evaluate water quality long term. Combining fields and satellite derived SSSC measurements, we detected an increase of median SSSC (20 to 30 mg/l) and sediment budget in the Maroni river and a stability for the Oyapock river (10 mg/l), since 2000.

Almost, relationship between SSSC and river water discharge was investigated for both rivers and for the 2000-2015 period. We show that SSSC and Maroni river discharge present decreasing correlation over the period of study. For the Oyapock River, SSSC and river discharge show good relationship over the period of study.

Analysis of land-use change in the Maroni catchment showed an important increase of areas affected by gold mining which explain the observed modification of the Maroni River Suspended Sediment budget.