

FOCUS Young Scientists day 2022

Oral presentation: "Surface water pollution in the Lom river basin (East Cameroon): impact of anthropogenic pressures on water quality and mercury transfer"

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Abstract:

Mercury contamination by small-scale mining activities is a major environmental concern. In the East Cameroon region, the Lom River and its tributaries drain the Lom gold watershed (11.100 km²) where gold mining is practiced in an artisanal and semi-mechanized manner. Nearly one hundred open-pit mining sites are listed, with production estimated around 317 kg of gold in 2019. In this type of exploitation, mercury is used to extract gold from the gangue by amalgamation, in equal proportions. About 5-45% of the mercury used is discharged and flows toward rivers. In order to determine the impact of gold mining activities on the quality of the basin's water resources, measurements were carried out on surface water at 15 stations. These measurements included concentrations of physico-chemical parameters (pH, DO, TDS, EC, SS, Na⁺, K⁺, Mg²⁺, Ca²⁺, NH₄⁺, HCO₃⁻, NO₃⁻, SO₄²⁻, Cl⁻, F⁻ and PO₄³⁻) and total mercury (Hg tot). A combined characterization and modelling approach is used in order to represent the pressure-impact relationships and to simulate the water quality of the basin water resource. Seasonal monitoring of physico-chemical parameters during the year 2021 has allowed (i) to identify the processes controlling water geochemistry; (ii) to calculate a water quality index; (iii) to determine the levels of mercury contamination; (iv) and finally, to start modeling processes (the transport of dissolved mercury in the surface water of the basin).