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# Climate control on silicate weathering and physical erosion rates in young orogenic belts: Case study along a runoff gradient in Pacific and Amazonian Andean basins based on SNO-HYBAM Monitoring Program data

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At the global scale and on geological time scales, mechanical erosion and chemical weathering budgets are linked. Together, these processes contribute to the formation and the degradation of the Earth's critical zone and to the biogeochemical cycles of elements. In young orogenic belts, climate and tectonic subsidence control together the rate of these matter balance budget and their relationships. The climate gradient observed along the Andean basin in both the Pacific and the Atlantic slopes offers the opportunity to explore the role of the climate variability on the erosion and weathering budgets and on their reciprocal relationships.

Based on the SNO-HYBAM Monitoring Program database (Geodynamical, hydrological and Biogeochemical control of erosion/weathering and material transport in the Amazon, Orinoco and Congo basins), we explore the relationship between climate, the lithology, silicate weathering rates and physical erosion rates along a runoff gradient in Andean basins of the Amazon River (13 gauging stations) and Pacific drainage rivers (5 gauging stations).

No homogenous relationship between erosion rates (E) and chemical weathering rate (W) is observed over the monitored basins. Only the volcanic basins respond to a global relationship defined in the literature while the other basins budget may depend on anthropogenic interferences on erosion/sedimentation budget, a lithology dependence of the W-E relationship parameters or/and on the existence of a threshold in this relationship.

The results presented here contribute to better understanding the role of mountains belt formation in the biogeochemical cycles and in particular in the long-term carbon cycle.Your presentation type preference.