Goldschmidt 2024 Abstract
https://doi.org/10.46427/gold2024.24014

Silicate vs. sedimentary rock weathering in the Amazon Basin over the last 10 Ma and its link to Andean uplift and carbon cycle

GABRIEL RIBEIRO MOIZINHO[1,2,3], GERMAIN BAYON[1], ROBERTO VENTURA SANTOS[3] AND MARTIN RODDAZ[2]

[1]IFREMER

[2]Universite Paul Sabatier - Toulouse III

[3]Universidade de Brasília

Presenting Author: gribeiro@ifremer.fr

Periods of mountain building have been linked to enhanced physical erosion and accelerated dissolution of crystalline silicate rocks, resulting in a net drawdown of atmospheric CO_2 and global climate cooling [1]. However, the alteration of sedimentary rocks may instead act as a net source of CO_2 over geological timescales. Observations in the Amazon Basin have shown that high mountains environments are dominated by the weathering of sedimentary rocks, while silicate weathering prevails in less elevated environments and floodplains [2]. In this ongoing work, we aim to better understand the relative contribution of crystalline silicate rocks versus sedimentary rocks to chemical weathering fluxes and their relationship with the Adean uplift throughout the last 10 Ma in the Amazon Basin, and its impact on regional climate. Our dataset consists of 80 samples retrieved from BP-3 Well, located in the Amazon submarine delta. The delta has been an active sedimentary archive for the denudation of the Andean Cordillera since the onset of the transcontinental Amazon River in the late Miocene (c. 9.5 Ma). Our approach consists of exploring the geochemical differences between the iron oxide and detrital fractions of sediments, especially the difference between corresponding Nd isotope ratios ($\Delta\varepsilon Nd_{Feox\text{-}Det}$; [3]), as a tool for tracing the relative contribution of sedimentary rock inputs with an inherited authigenic Nd isotopic signature versus silicate rock inputs with a composition set by their silicate source.

Raymo and Ruddiman (1992), *Nature* 359

Torres et al. (2016), *EPSL* 450, 681-391

Bayon et al. (2020), *CGEOL* 553