Sr and Nd isotopes in Amazon suspended matter as tracers of the role of floodplains in sedimentary transfer

JEAN-SEBASTIEN MOQUET [1], TRISTAN ROUSSEAU [2], MARTIN RODDAZ [3], JULIEN BOUCHEZ [1], WILLIAM SANTINI [3], ELISA ARMIJOS [4], PASCAL FRAIZY [3]

[1] Institut de Physique du Globe de Paris - Centre National de la Recherche Scientifique - Sorbonne Paris Cité, France
[2] Universidade Federal do Ceara, LABOMAR, Fortaleza, Ceará, Brazil
[3] Géosciences Environnement Toulouse – IRD, 14 avenue Edouard Belin, Toulouse, France
[4] LAPA, Av. General Rodrigo Octávio Jordão Ramos, Campus Universitário, Coroado I, Manaus, Brazil

Although the suspended particulate matter (SPM) of large rivers is mainly provided by the erosion of mountain ranges, the role of Amazon floodplains as short- or long-term sediment storage is still poorly constrained. In this study we use the geochemical and isotope signatures of SPM in the Amazon, the largest world river, coupled with hydrological data to better constrain the role of floodplain deposition-remobilisation processes in the transfer of sediment to the ocean.

We analysed the $^{87}Sr/^{86}Sr$, εNd, major/trace elements of monthly sampled SPM along the 02/2012-01/2013 hydrological cycle near the outlet of the Amazon River (Óbidos stations). This new dataset was compared to the daily discharge and suspended matter fluxes from the HYBAM monitoring program (www.ore-hybam.org/) at the outlet of the two main Amazon tributaries (Solimões and Madeira rivers) and the active floodplain area located between their confluence and Obidos station. According to these data, the floodplain acts either as a deposition, a production or a neutral area depending on hydrological conditions.

The time-series of Sr and Nd isotopic signatures follow clearly distinct patterns. When the floodplain is accumulating sediment, the variation in suspended matter εNd traces the relative contribution of the Solimoes *vs*. Madeira. Because of its sensitivity to sediment grain size, the $^{87}Sr/^{86}Sr$ rather traces the floodplain (fine) *vs.* Andean (coarse) sediment inputs,

The combined use of Sr and Nd isotopic signature of SPM shows the varying relative contribution of Northern and Central Andes, Southern Andes and floodplain along the hydrological cycle. We suggest that it might also constitute a powerful tool to constrain the Amazonian paleo-hydro-climatology based on detrital sediment cores.