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geofísica UNAM

INSTITUTO DE GEOLOGÍA

UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO

ssagi10@geofisica.unam.mx

L. Díaz

UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO

Instituto de Geofísica

Instituto de Geología

ORGANIZING COMMITTEE 10th SSAGI

Dr. Peter Schaaf
pschaaf@geofisica.unam.mx

Ing. Teodoro Hernández Treviño
tht@geofisica.unam.mx

M. en C. Gabriela Solís Pichardo
gsolis@geofisica.unam.mx

Dr. Raymundo G. Martínez Serrano
rms@geofisica.unam.mx

Ing. Gerardo Arrieta García
arrietagerardo@hotmail.com

M. en C. Lourdes Godínez Calderón
lourdes@igg.unam.mx

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Dirección General de Asuntos del Personal Académico

RADIOGENIC ISOTOPE SIGNATURES OF A SEDIMENT CORE AND SUSPENDED PARTICULATE MATTER OF THE AMAZON RIVER SYSTEM - A PROVENANCE AND PALEOCLIMATE STUDY.

Natalie Höppner ; *Friedrich Lucassen* - MARUM - Center for Marine Environmental Sciences and Faculty of Geosciences, University of Bremen, Germany; *Cristiano Mazur-Chiessi* ; *André Oliveira-Sawakuchi* - Institute of Geosciences of the University of São Paulo, Brazil; *Simone Antonia- Käsemann* - MARUM - Center for Marine Environmental Sciences and Faculty of Geosciences, University of Bremen, Germany.

e-mail: nhoeppner@marum.de

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We report strontium (Sr), neodymium (Nd) and lead (Pb) isotopic compositions of suspended sediment from the Amazon River and its main tributaries (Solimões, Negro, Madeira, Tapajós and Xingu rivers) sampled in 2011 and 2012. The same isotopic systems are presented for the marine sediment core GeoB 16224-1, collected from the continental slope of French Guiana (South America). The sole supply source of terrigenous sediment for the core, covering the last 50,000 years, is the Amazon River. Within the Amazon River system, differences in the composition and age of the continental crust in the draining areas cause characteristic Sr, Nd and Pb isotopic signatures that are preserved through weathering and deposition cycles and can be used to indicate the provenance of the river suspended sediment. The isotopic signature of the material ultimately transported into the ocean is a mixed signal of the isotopic signatures of each tributary. With variations in precipitation, the different tributaries supply varying amounts of sediment to the Amazon River channel, changing the isotopic signature of the suspended sediment and finally the isotopic signature of the sediment in the core that allows identifying shifts in provenance of the deposited material. Most of the suspended sediment of the Solimões River is supplied by the catchment areas draining the Andes. It has the lowest $^{87}Sr/^{86}Sr$ (0.71549 to 0.71582), highest **ε**Nd (-8.7 to -9.3) and the most unradiogenic Pb isotopic composition of ~18.8, ~15.62 and ~38.8 for $^{206}Pb/^{204}Pb$, $^{207}Pb/^{204}Pb$ and $^{208}Pb/^{204}Pb$ respectively, of all tributaries. The Madeira River drains the Andes and parts of the Brazilian Shield. Its Pb isotopic signature is similar to the one from the Solimões River, but its $^{87}Sr/^{86}Sr$ (0.73222 to 0.73574) is more radiogenic, while its εNd (around -12) is less radiogenic. The Xingu and Tapajós rivers (both draining the Brazilian Shield) have the most radiogenic $^{87}Sr/^{86}Sr$ (0.74112 to 0.75846) and Pb isotopic values and the most unradiogenic εNd signatures (-19 to -24). The Negro River drains the Guiana Shield. Its Pb and εNd isotopic signature resemble those of the Xingu and Tapajós rivers, whereas its $^{87}Sr/^{86}Sr$ scatters over a wide range from 0.73 to 0.77. The silicate detritus from the marine core shows small variations in $^{87}Sr/^{86}Sr$ between 0.72189 and 0.72444, in εNd from -11.2 to -12.4, and in Pb isotopic composition from 18.99 to 19.09, from 15.65 to 15.74 and from 38.94 to 39.25 for $^{206}Pb/^{204}Pb$, $^{207}Pb/^{204}Pb$ and $^{208}Pb/^{204}Pb$ respectively. Despite the overall small ranges in isotopic composition, systematic shifts are clear in the core over the last 50,000 years. In combination, the three isotopic systems allow a more detailed determination of changes in the provenance of the sediment and indicate that the supply intensity of the different tributaries changed through time.