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Record 1 of 24**Title:** A 3D analysis of spatial habitat metrics about the confluence of Negro and Solimoes rivers, Brazil**Author(s):** Gualtieri, C (Gualtieri, Carlo); Abdi, R (Abdi, Reza); Ianniruberto, M (Ianniruberto, Marco); Filizola, N (Filizola, Naziano); Endreny, TA (Endreny, Theodore A.)**Source:** ECOHYDROLOGY **Article Number:** UNSP e2166 **DOI:** 10.1002/eco.2166 **Early Access Date:** DEC 2019**Times Cited in Web of Science Core Collection:** 0**Total Times Cited:** 0**Usage Count (Last 180 days):** 0**Usage Count (Since 2013):** 0**Cited Reference Count:** 63

Abstract: Confluences are integral features in rivers characterized by complex 3D changes in flow hydrodynamics and bed morphology and provide important ecological functions. This paper presents the first known analysis of 3D spatial habitat metrics, based on hydraulic complexity, using data from the Negro and Solimoes rivers confluence in the Amazon Basin, during high- and low-flow conditions. The analysis was conducted using two bioenergetics metrics M-2 and M-3 computed for 1-m(2) cells within each cross section. M-2 is related to the drag force on a fish moving between two locations in the river, whereas M-3 is related to the energy needed by a fish to remain in a location without spinning. M-2 provides useful spatial analysis of the confluence, and its longitudinal distribution as well as its uniformity parameters in the river cross sections showed a peak downstream the junction and a rapid decay in the central confluence hydrodynamic zone. This trend corresponded with the classic hydrodynamic features as well as with literature observed patterns of biotic assemblages downstream of river confluences. At the entrance of the Amazon channel, M-2 peaks corresponded to the largest concentration of fish larvae demonstrating that the metric could be used to identify hot spots for aquatic species richness. The 3D derived M-2 values were larger in magnitude than M-2 values derived from depth-averaged velocity data. The longitudinal distribution of M-3 metric peaked immediately downstream of the confluence, and the M-3 helical flow cells corresponded with areas where dolphins congregate to feed and could exert less energy to remain in this zone. The study demonstrated that a 3D analysis of velocity gradients is able to reveal and explain observed patterns of species abundance and richness beyond those captured by a 2D analysis.

Accession Number: WOS:000499681300001**Language:** English**Document Type:** Article; Early Access**Author Keywords:** ADCP measurements; Amazon Basin; ecohydraulics; river confluence; spatial habitat metrics**KeyWords Plus:** FLOW STRUCTURE; PHYSICAL HABITAT; SALMO-TRUTTA; BROWN TROUT; HOT-SPOTS; AMAZON; DIVERSITY; HYDRODYNAMICS; COMPLEXITY; MORPHOLOGY**Addresses:** [Gualtieri, Carlo] Univ Napoli Federico II, Dept Civil Architectural & Environm Engr, Naples, Italy.

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Reprint Address: Gualtieri, C (reprint author), Univ Napoli Federico II, Dept Civil Architectural & Environm Engr, Naples, Italy.**E-mail Addresses:** carlo.gualtieri@unina.it**Publisher:** WILEY**Publisher Address:** 111 RIVER ST, HOBOKEN 07030-5774, NJ USA**Web of Science Categories:** Ecology; Environmental Sciences; Water Resources**Research Areas:** Environmental Sciences & Ecology; Water Resources**IDS Number:** JR5RF**ISSN:** 1936-0584**eISSN:** 1936-0592**29-char Source Abbrev.:** ECOHYDROLOGY**ISO Source Abbrev.:** Ecohydrology**Source Item Page Count:** 16**Funding:**

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Seventh Framework Programme, Grant/Award Number: n.295091 295091

Output Date: 2019-12-17**Record 2 of 24****Title:** On the mixing of rivers with a difference in density: The case of the Negro/Solimoes confluence, Brazil**Author(s):** Gualtieri, C (Gualtieri, C.); Ianniruberto, M (Ianniruberto, M.); Filizola, N (Filizola, N.)**Source:** JOURNAL OF HYDROLOGY **Volume:** 578 **Article Number:** UNSP 124029 **DOI:** 10.1016/j.jhydrol.2019.124029 **Published:** NOV 2019**Times Cited in Web of Science Core Collection:** 1**Total Times Cited:** 1**Usage Count (Last 180 days):** 0**Usage Count (Since 2013):** 0

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Abstract: Confluences are common components of all riverine systems, and characterized by converging streamlines and potential mixing of separate flows. The fluid dynamics of confluences possess a highly complex structure with several common types of flow features observed.

An investigation was carried out in both low and relatively high flow conditions at the confluence of the Negro and Solimoes Rivers, Brazil, which ranks among the largest river junctions on Earth. During this field research, acoustic Doppler velocity profiling (ADCP) and water quality sampling were applied to investigate hydrodynamics, sediment transport and mixing characteristics at this confluence. It was found that the location and the width of the mixing interface were closely related to changes of the discharge ratio between the tributaries due to both seasonal and annual variations. Second, a timescales analysis was applied to comparatively identify the contribution to mixing at the Negro/Solimoes confluence of four processes: difference in (1) velocity and (2) density between the rivers, (3) bed friction, including form drag, and (4) change in channel width. The analysis demonstrated that adjustments of confluence hydrodynamics and morphodynamics can modify the relative importance of each contribution. Immediately downstream of the junction the effects of differences in velocity and density were comparable, while farther downstream the latter was predominant and the role of bed friction was significant. At the end, this study suggests that mixing at the Negro/Solimoes confluence can be explained as a combination of the four hydrologic and morphologic processes.

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Author Keywords: Environmental hydraulics; Field study; ADCP; River confluence; Lateral stratification; Upwelling/downwelling

KeyWords Plus: FLOW STRUCTURE; STREAM CONFLUENCE; PLANFORM GEOMETRY; SHEAR-STRESS; AMAZON RIVER; VELOCITY; CURRENTS; BED; ADJUSTMENT; CHANNELS

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Record 3 of 24

Title: Provenance of the Neogene sediments from the Solimoes Formation (Solimoes and Acre Basins), Brazil

Author(s): Horbe, AMC (Coimbra Horbe, Adriana Maria); Roddaz, M (Roddaz, Martin); Gomes, LB (Gomes, Luciane Batista); Castro, RT (Castro, Rodrigo Tokuta); Dantas, EL (Dantas, Elton Luiz); do Carmo, DA (do Carmo, Dermeval A.)

Source: JOURNAL OF SOUTH AMERICAN EARTH SCIENCES **Volume:** 93 **Pages:** 232-241 **DOI:** 10.1016/j.jsames.2019.05.004 **Published:** AUG 2019

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Abstract: This study investigates the provenance of middle-late Miocene to Pliocene sediments of the Solimoes Formation, in western Brazilian Amazonia, to complement the geological history and fill the gap left by similar studies on other foreland basin deposits and in the Amazonian fan. The major and trace element concentrations and Sr Nd isotopic compositions of sixteen samples from the 1AS 33AM borehole and fifteen samples from two sections outcropping in the Acre and Yaco rivers were measured for determining their provenance. Additionally, the heavy mineral assemblages of the sixteen borehole samples

were determined to complement the geochemical provenance interpretation of the borehole sediments. The Nd isotopic compositions of the Solimoes Formation indicate that the Andes was the principal source of these Neogene sediments. While the middle-late Miocene borehole sediments are dominated by stable assemblage (zircon, tourmaline, and rutile) and less radiogenic Nd isotopic values, the Pliocene borehole sediments have a larger amount of more unstable mineral assemblages (epidote, pyroxene, and amphibole) and more radiogenic Nd isotopic values. These mineral and isotopic differences between the middle-late Miocene and Pliocene sediments are interpreted to reflect a change in provenance with increasing contribution of metamorphic and young Nd radiogenic source in the Pliocene most probably related to the late Miocene uplift of the Peruvian Eastern Cordillera. These changes that precede the paleoenvironmental changes highlighted by the palynological study of Leite et al. (2017) suggest that the Andean tectonics drove the middle to late Miocene paleoenvironmental changes of the Amazon basin from the Pebas mega-wetland to the more fluvial Acre phase.

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Language: English

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Author Keywords: Sr-Nd isotopes; Heavy minerals; Solimoes Formation; Andes; Amazonian retroarc foreland basins

KeyWords Plus: TRACE-ELEMENT GEOCHEMISTRY; AMAZONIAN FORELAND BASIN; MADRE-DE-DIOS; LATE MIOCENE; U-PB; SOUTHWESTERN AMAZONIA; ANDEAN UPLIFT; ND; EVOLUTION; RIVER

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Institute of Geosciences of the Universidade de Brasilia, Brazil	
CAPES-COFECUB program	Te 924/18

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Record 4 of 24

Title: Are seasonal variations in river-floodplain sediment exchange in the lower Amazon River basin resolvable through meteoric cosmogenic Be-10 to stable Be-9 ratios?

Author(s): Wittmann, H (Wittmann, H.); Oelze, M (Oelze, M.); Roig, H (Roig, H.); von Blanckenburg, F (von Blanckenburg, F.)

Source: GEOMORPHOLOGY **Volume:** 322 **Pages:** 148-158 **DOI:** 10.1016/j.geomorph.2018.08.045 **Published:** DEC 1 2018

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Abstract: The lower Amazon basin contains vast floodplains that exchange sediment with the main river. The exchange of sediment between the floodplain and the channel follows a seasonal cycle that is anticorrelated with the hydrological cycle. At low water stages, sediment that has been stored in the floodplain for potentially several thousands of years is eroded and transferred from the floodplain to the mainstem. During high water stages, most sediment transported in the main channel stems directly from the eroding source with little intermittent storage. We apply the meteoric cosmogenic Be-10 to stable Be-9 ratio (Be-10/Be-9) as a denudation and weathering proxy to investigate this seasonality in sediment transport. Single meteoric Be-10 concentrations (Mel) have previously been shown to record floodplain storage; whereas fractions of mobilized Be-9, a trace metal released during weathering, provide degrees of weathering. The resulting Be-10/Be-9 ratio provides denudation rates of the sediment sources. We compare Be-10/Be-9 measured on suspended sediment from river depth profiles at two sites (Obidos/Macapa) and during two hydrological seasons (high/low water stage in 2013). We show that careful construction of river depth profiles in combination with Rouse modeling is necessary to exclude the grain size dependence that together with hydrodynamic

sorting introduces a bias into single [Be-10] and [Be-9]. In contrast, the Be-10/Be-9 is largely uniform across grain sizes and is thus unaffected by sorting. Our Be-10/Be-9 ratios, the denudation rates derived from them, and mobilized Be-9 fractions do not show variations outside their uncertainties across seasons or sites. Thus, Be-10/Be-9 show that upstream sediment sources were well mixed by multiple cycles of storage and remobilization in the floodplain. (C) 2018 Elsevier B.V. All rights reserved.

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Language: English

Document Type: Article

Author Keywords: Amazon basin; Cosmogenic nuclides; Sediment transport; Erosion; Floodplain; Weathering

KeyWords Plus: IN-SITU BE-10; SUSPENDED SEDIMENT; DENUDATION RATES; EROSION RATES; GRAIN-SIZE; BERYLLIUM; GEOCHEMISTRY; EXTRACTION; ISOTOPES; MINERALS

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Record 5 of 24

Title: Primary productivity in the western tropical Atlantic follows Neogene Amazon River evolution

Author(s): Lammertsma, El (Lammertsma, E. I.); Troelstra, SR (Troelstra, S. R.); Flores, JA (Flores, J. -A.); Sangiorgi, F (Sangiorgi, F.); Chemale, F (Chemale, F., Jr.); do Carmo, DA (do Carmo, D. A.); Hoorn, C (Hoorn, C.)

Source: PALAEOGEOGRAPHY PALAEOCLIMATOLOGY PALAEOECOLOGY **Volume:** 506 **Pages:** 12-21 **DOI:** 10.1016/j.palaeo.2018.05.048 **Published:** OCT 1 2018

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Abstract: The Amazon River nutrient-rich plume currently triggers large-scale phytoplankton blooms in the otherwise oligotrophic western tropical Atlantic Ocean. Little is known about the onset and development of this high productivity system, although a direct link to the transcontinental Amazon River evolution can be expected. The Amazon submarine fan, located on the Brazilian Equatorial Margin (BEM), contains a unique sediment archive of the river's history and associated environmental changes in the marine realm. This study represents the first marine microfossil multi-proxy approach applied to any sedimentary record in the submarine fan area for the time interval encompassing the onset and development of the transcontinental Amazon River system. To reconstruct Miocene to Pleistocene changes in surface- and bottom water conditions we analyzed organic-walled dinoflagellate cyst- and benthic foraminiferal assemblages, respectively. Moreover, terrestrial- and freshwater palynomorph abundances were studied to provide a link between fluvial input and marine environmental changes. In addition, a planktonic foraminiferal biostratigraphy is constructed to verify the available calcareous nannofossil-based age model. Our data show that in the early- mid Miocene up to similar to 13 Ma limited fluvial input reached the BEM and primary productivity was elevated, after which distinctly low productivity conditions prevailed. After the birth of the transcontinental Amazon at 9 Ma surface water productivity initially increased slightly. Consistently high surface water productivity and decreased bottom water oxygenation followed increasing terrestrial input after the (early) Pliocene. The temporal consistency between records from the Amazon Fan and the more distant Ceara Rise reflects large-scale marine environmental changes followed the development of the Amazon River, likely related to increased climatic variability in the Amazon Basin during the Plio-

Pleistocene.

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Author Keywords: Amazon Fan; Brazilian Equatorial Margin; Neogene; Foraminifera; Organic-walled dinoflagellate cysts

KeyWords Plus: WALLED DINOFLAGELLATE CYSTS; LATE MIOCENE ONSET; SEA FAN EVIDENCE; MARINE-SEDIMENTS; NORTH; DISPERSAL; PLUME; FOZ; DISCHARGE; HISTORY

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Record 6 of 24

Title: Provenance record of late Maastrichtian-late Palaeocene Andean Mountain building in the Amazonian retroarc foreland basin (Madre de Dios basin, Peru)

Author(s): Louterbach, M (Louterbach, Melanie); Roddaz, M (Roddaz, Martin); Antoine, PO (Antoine, Pierre-Olivier); Marivaux, L (Marivaux, Laurent); Adnet, S (Adnet, Sylvain); Bailleul, J (Bailleul, Julien); Dantas, E (Dantas, Elton); Santos, RV (Santos, Roberto Ventura); Chemale, F (Chemale, Farid, Jr.); Baby, P (Baby, Patrice); Sanchez, C (Sanchez, Caroline); Calderon, Y (Calderon, Ysabel)

Source: TERRA NOVA **Volume:** 30 **Issue:** 1 **Pages:** 17-23 **DOI:** 10.1111/ter.12303 **Published:** FEB 2018

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Abstract: Biostratigraphic, sedimentological and provenance analyses suggest that a proto-Andean Cordillera already existed in southern Peru by late Maastrichtian-late Palaeocene times. A 270-m-thick stratigraphic section shows changes in depositional environments from shallow marine (early Maastrichtian) to non-marine (late Maastrichtian) then back to estuarine (late Palaeocene) conditions. An erosional surface separates lower Maastrichtian from upper Maastrichtian deposits. Above this surface, the late Maastrichtian unit exhibits moderately developed palaeosols and syn-sedimentary normal faults. The sedimentary evolution is accompanied by a decrease in sedimentation rate and by changes in provenance. Shallow marine lower Maastrichtian deposits have a cratonic provenance as shown by their low epsilon Nd(0) values (-15 to -16) and the presence of Precambrian inherited zircon grains. The upper Maastrichtian deposits have a mixed Andean and cratonic origin with epsilon Nd(0) values of similar to 12.6 and yield the first Cretaceous and Permian-Triassic zircon grains. Estuarine to shallow marine upper Palaeocene deposits have an Andean dominant source as attested by higher epsilon Nd(0) values (-6 to -10) and by the presence of Palaeozoic and Late Cretaceous zircon grains. The changes in depositional environments and sedimentation rates, as well as

the shift in detrital provenance, are consistent with a late Maastrichtian-late Palaeocene period of Andean mountain building. In agreement with recently published studies, our data suggest that an Andean retroarc foreland basin was active by late Maastrichtian-late Palaeocene times.

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Keywords Plus: MAGDALENA VALLEY BASIN; U-PB AGES; SOUTHERN PERU; ALTIPLANO PLATEAU; NORTHERN BOLIVIA; EVOLUTION; COLOMBIA; MARGIN; INDIA; CONFIGURATION

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Record 7 of 24

Title: New constraints on elemental and Pb and Nd isotope compositions of South American and Southern African aerosol sources to the South Atlantic Ocean

Author(s): Khondoker, R (Khondoker, R.); Weiss, D (Weiss, D.); van de Flierdt, T (van de Flierdt, T.); Rehkamper, M (Rehkamper, M.); Kreissig, K (Kreissig, K.); Coles, BJ (Coles, B. J.); Strekopytov, S (Strekopytov, S.); Humphreys-Williams, E (Humphreys-Williams, E.); Dong, S (Dong, S.); Bory, A (Bory, A.); Bout-Roumazeilles, V (Bout-Roumazeilles, V.); Smichowski, P (Smichowski, P.); Cid-Aguero, P (Cid-Aguero, P.); Babinski, M (Babinski, M.); Losno, R (Losno, R.); Monna, F (Monna, F.)

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Abstract: Improving the geochemical database available for characterising potential natural and anthropogenic aerosol sources from South America and Southern Africa is a critical precondition for studies aimed at understanding trace metal controls on the marine biogeochemical cycles of the South Atlantic

Ocean. We here present new elemental and isotopic data for a wide range of sample types from South America and Southern Africa that are potentially important aerosol sources. This includes road dust from Buenos Aires and lichen samples from Johannesburg, soil dust from Patagonia, volcanic ash from the Andean volcanic belt, and aerosol samples from Sao Paulo. All samples were investigated for major (Al, Ca, Fe, Mg, Na, K, Mn) and trace element (Cd, Co, Cr, Cu, Ni, Pb, REE, Sc, Th, Y, V, Zn) concentrations and Nd and Pb isotopic compositions. We show that diagrams of $(208\text{Pb})/(207\text{Pb})$ vs. $\epsilon(\text{Nd})$, $\text{Pb}-208/\text{Pb}-207$ vs. Pb/Al , $1/[\text{Pb}]$, Zn/Al , Cd/Al , Cu/Al , and $\epsilon(\text{Nd})$ vs. Pb/Al , and $1/[\text{Nd}]$ are best suited to separate South American and South African source regions as well as natural and anthropogenic sources. A subset of samples from Patagonia and the Andes was additionally subjected to separation of a fine ($< 5 \mu\text{m}$) fraction and compared to the composition of the bulk sample. We show that differences in the geochemical signature of bulk samples between individual regions and source types are significantly larger than between grain sizes. Jointly, these findings present an important step forward towards a quantitative assessment of aeolian trace metal inputs to the South Atlantic Ocean.

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Language: English

Document Type: Article

Author Keywords: Isotopic and elemental composition; Source characterisation; Geochemical assessment; Aerosol; South America; Southern Africa; South Atlantic Ocean

KeyWords Plus: ATMOSPHERIC LEAD; SAO-PAULO; TRACE-METALS; GRAIN-SIZE; GEOCHEMISTRY; ORIGIN; SIGNATURES; PATAGONIA; EVOLUTION; PETROLOGY

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Open Access: Other Gold

Output Date: 2019-12-17

Record 8 of 24

Title: A field study of the confluence between Negro and Solimoes Rivers. Part 1: Hydrodynamics and sediment transport

Author(s): Gualtieri, C (Gualtieri, Carlo); Filizola, N (Filizola, Naziano); de Oliveira, M (de Oliveira, Marco); Santos, AM (Santos, Andre Martinelli); Ianniruberto, M (Ianniruberto, Marco)

Source: COMPTES RENDUS GEOSCIENCE **Volume:** 350 **Issue:** 1-2 **Pages:** 31-42 **DOI:** 10.1016/j.crte.2017.09.015 **Published:** JAN-FEB 2018

Times Cited in Web of Science Core Collection: 16

Total Times Cited: 16

Usage Count (Last 180 days): 0

Usage Count (Since 2013): 5**Cited Reference Count:** 28

Abstract: Confluences are a common feature of riverine systems, where are located converging flow streamlines and potential mixing of separate flows. The confluence of the Negro and Solimoes Rivers ranks among the largest on Earth and its study may provide some general insights into large confluence dynamics and processes. An investigation was recently conducted about that confluence in both low and high-flow conditions using acoustic Doppler velocity profiling (ADCP), water quality sampling and high-resolution seismic data. First, the study gained insights into the characterization of the basic hydrodynamics parameters about the confluence as well as of those affecting sediments transport. Second, the analysis of the results showed that common hydrodynamic features noted in previous confluence studies were herein observed. Finally, some differences between low-flow and relatively high-flow conditions about the transfer of momentum from the Solimoes to the Negro side of the Amazon Channel were identified. (C) 2017 Academie des sciences. Published by Elsevier Masson SAS. All rights reserved.

Accession Number: WOS:000427076100005**Language:** English**Document Type:** Article; Proceedings Paper**Conference Title:** 6th HYBAM Scientific Meeting**Conference Date:** 2015**Conference Location:** Cuzco, PERU**Conference Sponsors:** HYBAM**Author Keywords:** Environmental hydraulics; River confluences; Hydrodynamics; Sediment transport; Amazon basin**KeyWords Plus:** BED MORPHOLOGY**Addresses:** [Gualtieri, Carlo] Univ Naples Federico II, Dept Civil Architectural & Environm Engrn DICEA, Via Claudio 21, I-80125 Naples, Italy.

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Ianniruberto, Marco	W-9704-2018	0000-0002-9056-9668

Publisher: ELSEVIER FRANCE-EDITIONS SCIENTIFIQUES MEDICALES ELSEVIER**Publisher Address:** 65 RUE CAMILLE DESMOULINS, CS50083, 92442 ISSY-LES-MOULINEAUX, FRANCE**Web of Science Categories:** Geosciences, Multidisciplinary**Research Areas:** Geology**IDS Number:** FY7XD**ISSN:** 1631-0713**eISSN:** 1778-7025**29-char Source Abbrev.:** CR GEOSCI**ISO Source Abbrev.:** C. R. Geosci.**Source Item Page Count:** 12**Funding:**

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MIUR PRIN Research Project HYDROCAR	E61J12000210001

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Output Date: 2019-12-17**Record 9 of 24****Title:** A field study of the confluence between Negro and Solimoes Rivers. Part 2: Bed morphology and stratigraphy**Author(s):** Ianniruberto, M (Ianniruberto, Marco); Trevethan, M (Trevethan, Mark); Pinheiro, A (Pinheiro, Arthur); Andrade, JF (Andrade, Joao Fernando); Dantas, E (Dantas, Elton); Filizola, N (Filizola, Naziano); Santos, A (Santos, Andre); Gualtieri, C (Gualtieri, Carlo)**Source:** COMPTES RENDUS GEOSCIENCE **Volume:** 350 **Issue:** 1-2 **Pages:** 43-54 **DOI:** 10.1016/j.crte.2017.10.005 **Published:** JAN-FEB 2018**Times Cited in Web of Science Core Collection:** 5**Total Times Cited:** 5**Usage Count (Last 180 days):** 1**Usage Count (Since 2013):** 8**Cited Reference Count:** 46

Abstract: The confluence of the Negro and Solimoes Rivers is an interesting study area under several points of view: it represents the second largest river confluence of the Amazon Basin; the rivers are characterized by very distinct hydrologic behaviour; and it is situated in a peculiar tectonic setting. A field

investigation was undertaken to study the characteristics of this confluence, aiming to better understand the bed morphology and stratigraphy resulting from the complex interaction of geological setting, hydrodynamics, and sediment load. Two field campaigns were carried out, during low- and high-flow conditions, using high-resolution seismic, echosounding, and acoustic Doppler current profiling. A third campaign was carried out just in a limited area of the confluence, with a multi-beam echosounder. The results of these surveys provided a more detailed view of the geology, morphology and sediment distribution about the confluence. (C) 2017 Academie des sciences. Published by Elsevier Masson SAS. All rights reserved.

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Language: English

Document Type: Article; Proceedings Paper

Conference Title: 6th HYBAM Scientific Meeting

Conference Date: 2015

Conference Location: Cuzco, PERU

Conference Sponsors: HYBAM

Author Keywords: Amazon River; River confluences; Riverbed morphology; Sedimentology; Neo-tectonics

KeyWords Plus: AMAZON RIVER; WESTERN AMAZON; CHANNEL; TRIBUTARIES; SYSTEM; BRAZIL

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Output Date: 2019-12-17

Record 10 of 24

Title: Hydraulic complexity at a large river confluence in the Amazon basin

Author(s): Gualtieri, C (Gualtieri, C.); Ianniruberto, M (Ianniruberto, M.); Filizola, N (Filizola, N.); Santos, R (Santos, R.); Endreny, T (Endreny, T.)

Source: ECOHYDROLOGY **Volume:** 10 **Issue:** 7 **Article Number:** UNSP e1863 **DOI:** 10.1002/eco.1863 **Published:** OCT 2017

Times Cited in Web of Science Core Collection: 13

Total Times Cited: 13

Usage Count (Last 180 days): 1

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Cited Reference Count: 31

Abstract: Confluences are a classic feature in riverine networks with important ecological and morphological functions. A method to characterize the hydraulic complexity of a river based on velocity gradients was applied, for high and low flow conditions, to the Negro and Solimoes Rivers confluence in the Amazon basin. The applied metrics M-1 and M-2 approximate the drag forces imposed on aquatic organisms moving between 2 locations and may identify potential habitat zones and edges. Metric M-2 corresponded best with the hydraulic and morphological patterns in the confluence hydrodynamic zone, with

the largest M-2 values in the entrance of the confluence, centered at the mixing interface, and M-2 values generally decaying laterally toward the banks and longitudinally with downstream distance. Seasonal decreases in discharge magnitude in the Amazon, and decreases in discharge between other river basins analyzed in this study, led to increases in hydraulic complexity metric M-2. The hydraulic complexity metrics can characterize some aspects of habitat heterogeneity and contribute to an explanation for observations of increased species richness at Amazon basin confluences and the larger ecological patterns of diversity increasing at nodes in riverine networks.

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Language: English

Document Type: Article

Author Keywords: ADCP; Amazon basin; ecohydrology; field study; hydraulic complexity; river confluence

KeyWords Plus: HABITAT; DIVERSITY; ECOLOGY; METRICS; POPULATION; DYNAMICS; SOTALIA; UNITS; INIA

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Research Areas: Environmental Sciences & Ecology; Water Resources

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Clim-Amazon Research Project, Grant/Award Number: FP7 INCO-LAB 295091; National Science Foundation, Grant/Award Number: EAR 09-11547

Output Date: 2019-12-17

Record 11 of 24

Title: A 30 Ma history of the Amazon River inferred from terrigenous sediments and organic matter on the Ceara Rise

Author(s): van Soelen, EE (van Soelen, Elsbeth E.); Kim, JH (Kim, Jung-Hyun); Santos, RV (Santos, Roberto Ventura); Dantas, EL (Dantas, Elton Luiz); de Almeida, FV (de Almeida, Fernanda Vasconcelos); Pires, JP (Pires, Juliana Pinheiro); Roddaz, M (Roddaz, Martin); Damste, JS (Damste, Jaap S. Sinninghe)

Source: EARTH AND PLANETARY SCIENCE LETTERS **Volume:** 474 **Pages:** 40-48 **DOI:** 10.1016/j.epsl.2017.06.025 **Published:** SEP 15 2017

Times Cited in Web of Science Core Collection: 13

Total Times Cited: 13

Usage Count (Last 180 days): 4

Usage Count (Since 2013): 20

Cited Reference Count: 50

Abstract: The history of the Amazon River is a much-discussed subject, and the timing of the development of a transcontinental system in particular is a matter of some controversy, with estimations varying between the Early Miocene and the Pliocene or even the Pleistocene. To shed further light on this, we studied the sediment provenance of an Oligocene to Late Pleistocene marine sedimentary section from the Ceara Rise (ODP Site 925), a topographic high in the central Atlantic Ocean, using major element concentrations and Nd isotopic composition in 85 samples. In addition, the carbon isotopic composition of bulk organic matter and changes in the distribution of glycerol dialkyl glycerol tetraethers (GDGTs) were used to identify periods of increased river outflow. On the basis of these results, we suggest that the history of the development of the Amazon River is characterized by specific steps. During the late Oligocene/Early Miocene (30-18.3 Ma), the terrigenous mass accumulation rates (TARs) were high, and sediment and GDGT compositions suggest that a large river system existed, which at times received weathering products from a younger and probably Andean sediment source. A shift to a younger Andean sediment provenance after 8.7 Ma indicates that the Amazon River became permanently connected with the Andes. Between 18.3 and 4.5 Ma, TARs were generally low, and GDGTs were derived for the most part from in situ production in marine waters. Around 4.5 Ma, the river expanded, probably due to ongoing tectonic activity, and uplift in the Andes increased Andean rock erosion. This led to a strong increase in terrigenous sediment deposition and enhanced organic matter preservation on the Ceara Rise, and the delivery of terrestrial (both soil and riverine) branched GDGTs to the Ceara Rise. (C) 2017 Elsevier B.V. All rights reserved.

Accession Number: WOS:000409150600006**Language:** English**Document Type:** Article**Author Keywords:** Ceara Rise; Amazon; Nd isotopes; GDGT**KeyWords Plus:** LATE MIOCENE ONSET; SEA FAN EVIDENCE; CENTRAL-AMERICAN SEAWAY; ENVIRONMENTAL CONTROLS; SUSPENDED SEDIMENTS; TETRAETHER LIPIDS; WESTERN AMAZONIA; ND ISOTOPES; DEEP-WATER; BASIN**Addresses:** [van Soelen, Elsbeth E.; Kim, Jung-Hyun; Damste, Jaap S. Sinninghe] NIOZ Royal Netherlands Inst Sea Res, Dept Marine Microbiol & Biogeochem, POB 59, NL-1790 AB Den Burg, Texel, Netherlands.

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Dantas, Elton Luiz		0000-0002-7954-5059

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Open Access: Green Published**Output Date:** 2019-12-17**Record 12 of 24****Title:** Hafnium and neodymium isotopes and REY distribution in the truly dissolved, nanoparticulate/colloidal and suspended loads of rivers in the Amazon Basin, Brazil**Author(s):** Merschel, G (Merschel, Gila); Bau, M (Bau, Michael); Schmidt, K (Schmidt, Katja); Munker, C (Muenker, Carsten); Dantas, EL (Dantas, Elton L.)**Source:** GEOCHIMICA ET COSMOCHIMICA ACTA **Volume:** 213 **Pages:** 383-399 **DOI:** 10.1016/j.gca.2017.07.006 **Published:** SEP 15 2017**Times Cited in Web of Science Core Collection:** 9**Total Times Cited:** 9**Usage Count (Last 180 days):** 1**Usage Count (Since 2013):** 12**Cited Reference Count:** 88**Abstract:** Radiogenic isotopes in river sediments and river waters have been widely used in provenance studies, as these samples naturally integrate the geology/chemistry of the entire catchment. While the Hf and Nd isotope systems are coupled during igneous processes, they are decoupled during

supergene processes at the Earth's surface, which is reflected by the isotope composition of riverine sediments. We present the first data for both Hf and Nd isotope compositions of the dissolved (0.2 μm -filtrates rich in nanoparticles and colloids, NPCs) and the truly dissolved (1 kDa-ultrafiltrates) load of rivers. Hafnium and Nd isotope compositions and concentrations of the Rare Earths and Yttrium (REY) and Hf were determined for suspended particles ($>0.2 \mu\text{m}$) as well as for the dissolved and the truly dissolved load of the Rio Solimoes, the Amazon's largest tributary draining the Andes, and of the Rio Negro, an organic NPC- and particle-rich river draining the rainforest of northern Amazonia. We also analyzed the Nd isotope compositions of suspended sediments and 0.2 μm -filtered water samples from the Amazon River and its tributaries Rio Tapajos, Rio Xingu and Rio Jari.

Our novel results clearly show that the decoupling of the Hf and Nd isotope systems is related to incongruent weathering processes on the continent, as this decoupling can already be observed in the different Hf and Nd pools, i.e. in the particulate, the NPC-dominated dissolved and the truly dissolved load of rivers. In the Rio Negro and Rio Solimoes, a strong particle size-dependent difference in Hf isotope composition is observed. Values of $\epsilon(\text{Hf})$ become more radiogenic as filter pore size decreases, which can be related to the density- and size-dependent distribution of Hf-rich minerals, e.g. zircons, and their absence from the truly dissolved pool. In contrast, the Nd isotope composition of Amazonian river waters reflects that of their catchment geology. Tributaries draining the Precambrian Brazilian and Guyana shields show very unradiogenic $\epsilon(\text{Nd})$ values of -19 to -25 in their dissolved load, whereas the Rio Solimoes draining the Andes yields a more radiogenic $\epsilon(\text{Nd})$ signal of only -7. The dissolved Nd isotope composition of the Amazon is dominated by its Andean tributaries and averages at -8. Although Nd isotope compositions are thought to not being fractionated by Earth surface processes, significant differences of 1.3-1.9 ϵ -units can be observed between the dissolved and suspended loads in the Amazon River and its main tributary, the Rio Solimoes. In these rivers, the dissolved load is more radiogenic than the suspended sediment, which is likely due to incongruent weathering and related mineral sorting in the Andean headwaters. In contrast, the organic-rich and mineral-poor shield rivers do not show a difference between the truly dissolved, dissolved and suspended load, as the Nd in all these pools is controlled by surface- and solution-complexation and hence isotopically homogenized by continuous exchange and reequilibration. (C) 2017 Elsevier Ltd. All rights reserved.

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Record 13 of 24

Title: A critical examination of the possible application of zinc stable isotope ratios in bivalve mollusks and suspended particulate matter to trace zinc pollution in a tropical estuary

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Source: ENVIRONMENTAL POLLUTION **Volume:** 226 **Pages:** 41-47 **DOI:** 10.1016/j.envpol.2017.04.011 **Published:** JUL 2017

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Abstract: The application of zinc (Zn) isotopes in bivalve tissues to identify zinc sources in estuaries was critically assessed. We determined the zinc isotope composition of mollusks (*Crassostrea brasiliana* and *Perna perna*) and suspended particulate matter (SPM) in a tropical estuary (Sepetiba Bay, Brazil) historically impacted by metallurgical activities. The zinc isotope systematics of the SPM was in line with mixing of zinc derived from fluvial material and from metallurgical activities. In contrast, source mixing alone cannot account for the isotope ratios observed in the bivalves, which are significantly lighter in the contaminated metallurgical zone ($\delta\text{Zn-66(jmc)} = +0.49 \pm 0.06$ parts per thousand, 2 sigma, n = 3) compared to sampling locations outside ($\delta\text{(66)Zn}_{\text{imc}} = +0.83 \pm 0.10$ parts per thousand, 2 sigma, n = 22). This observation suggests that additional factors such as speciation, bioavailability and bioaccumulation pathways (via solution or particulate matter) influence the zinc isotope composition of bivalves. (C) 2017 Elsevier Ltd. All rights reserved.

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Record 14 of 24

Title: The Amazon at sea: Onset and stages of the Amazon River from a marine record, with special reference to Neogene plant turnover in the drainage basin

Author(s): Hoorn, C (Hoorn, Carina); Bogota, GR (Bogota-A, Giovanni R.); Romero-Baez, M (Romero-Baez, Millerlandy); Lammertsma, EI (Lammertsma, Emmy I.); Flantua, SGA (Flantua, Suzette G. A.); Dantas, EL (Dantas, Elton L.); Dino, R (Dino, Rodolfo); do Carmo, DA (do Carmo, Dermeval A.); Chemale, F (Chemale, Farid, Jr.)

Source: GLOBAL AND PLANETARY CHANGE **Volume:** 153 **Pages:** 51-65 **DOI:** 10.1016/j.gloplacha.2017.02.005 **Published:** JUN 2017

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Abstract: The Amazon submarine fan is a large sediment apron situated offshore Para (Brazil) and represents the most distal extent of the Amazon River. The age of onset of this transcontinental river remains debated, yet is of great importance for understanding biotic evolutionary processes on land and at sea. Here we present new geochemical and palynological data from a borehole drilled at the continental slope and dated based on nannofossil biostratigraphy. We found that sediments of mixed source (craton and adjacent) occur at least from the late Oligocene (NP25) to late Miocene (NN9), and that the earliest Andes-derived sediments occur in NN10 (late Miocene). Our geochemical record indicates an onset of the transcontinental Amazon River between 9.4 and 9 Ma, which post-dates the regional unconformity by 1 to 1.5 My. The shift in sediment geochemistry is more gradually replicated in the palynological record by a change from coastal plain and tropical lowland taxa to a mixture of tropical lowland, and montane forest to open Andean taxa. In particular, the appearance of taxa such as Jamesonia and Huperzia, followed by Valeriana, Polylepis-Acaena, Lysipomia and Plantago (with a current altitudinal range from 3200 to 4000 m) suggests the development of open, treeless, vegetation between 9.5 and 5.4 Ma, and highlight the presence of a high Andes in the late Miocene hinterland. Poaceae progressively increased from 9 Ma, with a notable rise from 4 Ma onwards, and percentages well above post-glacial and modern values, particularly between 2.6 and 0.8 Ma. We hypothesize that the rise of the grasses is a basin-wide phenomenon, but that the Plio-Pleistocene expansion of open, treeless vegetation on the Andean slopes and foothills are the main contributor. This rise in grasses was likely caused by climatic fluctuations, and subsequent changes in relief and erosion rates. We conclude that the onset of the Amazon River is coupled with Neogene Andean tectonism and that subsequent developments, both of river and biota, are closely linked to the Plio-Pleistocene climatic fluctuations. From latest Neogene onwards these major landscape changes determined the composition of the montane and lowland forest in the Andes-Amazonian system. (C) 2017 Elsevier B.V. All rights reserved.

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Author Keywords: Miocene; Palynology; Geochemistry; Grasses; Western Atlantic; Amazon submarine fan

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Record 15 of 24

Title: Contrasting impact of organic and inorganic nanoparticles and colloids on the behavior of particle-reactive elements in tropical estuaries: An experimental study

Author(s): Merschel, G (Merschel, Gila); Bau, M (Bau, Michael); Dantas, EL (Dantas, Elton Luiz)

Source: GEOCHIMICA ET COSMOCHIMICA ACTA **Volume:** 197 **Pages:** 1-13 **DOI:** 10.1016/j.gca.2016.09.041 **Published:** JAN 15 2017

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Abstract: Estuarine processes may affect the flux of dissolved organic carbon (DOC), iron and other particle-reactive elements such as the rare earth elements and yttrium (REY), into the ocean via salt-induced coagulation and subsequent removal of river-borne (nano-)particles and colloids. We experimentally assessed the impact of the admixture of seawater on DOC, Fe and REY associated with inorganic and organic nanoparticles and colloids (NPCs) present in tropical rivers, using Rio Solimoes and Rio Negro, which are particularly rich in inorganic and organic NPCs, respectively, as river water endmembers. Similar to the conservative elements Sr, Rb and U, DOC behaves conservatively in all mixing experiments, whereas strong removal of Fe and REY (and preferential removal of light over heavy REY and of Ce relative to La and Pr) is confined to experiments with inorganic NPC-rich Rio Solimoes water. This removal already occurs at very low salinity and is due to the aggregation of the inorganic NPCs. However, REY removal efficiency increases gradually with increasing salinity, which is in marked contrast to DOC-poor Arctic river waters from which REY removal at lowest salinity is significantly stronger. This suggests that the DOC concentrations in the water have a profound impact on the estuarine mixing behavior of particle-reactive elements. In marked contrast to the Rio Solimoes mixing experiment, Fe and the REY in experiments with Rio Negro water behave similarly to DOC and mix conservatively with seawater, indicating that the organic NPCs, most of which are humic and fulvic acids, and their associated trace elements are much less susceptible to coagulation and estuarine removal than inorganic ones. Even at higher salinities, estuarine REY removal from inorganic NPC-rich Rio Solimoes water significantly exceeds REY removal from organic NPC-rich Rio Negro water. Hence, the combination of higher element concentrations in and of less estuarine removal from organic NPC-rich rivers compared to inorganic NPC-rich rivers indicates that the former are a more important source of particle-reactive elements to the oceans than previously thought. This suggests that chemical complexation with organic ligands, such as humic and fulvic acids, may have a strong impact on the riverine flux and on the marine inventory of particle-reactive elements, and hence may play an important role for the isotopic composition of such elements in seawater. (C) 2016 Elsevier Ltd. All rights reserved.

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Record 16 of 24**Title:** Iron isotope fingerprints of redox and biogeochemical cycling in the soil-water-rice plant system of a paddy field**Author(s):** Garnier, J (Garnier, J.); Garnier, JM (Garnier, J.-M.); Vieira, CL (Vieira, C. L.); Akerman, A (Akerman, A.); Chmeleff, J (Chmeleff, J.); Ruiz, RI (Ruiz, R. I.); Poitrasson, F (Poitrasson, F.)**Source:** SCIENCE OF THE TOTAL ENVIRONMENT **Volume:** 574 **Pages:** 1622-1632 **DOI:** 10.1016/j.scitotenv.2016.08.202 **Published:** JAN 1 2017**Times Cited in Web of Science Core Collection:** 10**Total Times Cited:** 12**Usage Count (Last 180 days):** 3**Usage Count (Since 2013):** 78**Cited Reference Count:** 55

Abstract: The iron isotope composition was used to investigate dissimilatory iron reduction (DIR) processes in an iron-rich waterlogged paddy soil, the iron uptake strategies of plants and its translocation in the different parts of the rice plant along its growth. Fe concentration and isotope composition ($\delta\text{Fe-56}$) in irrigation water, precipitates from irrigation water, soil, pore water solution at different depths under the surface water, iron plaque on rice roots, rice roots, stems, leaves and grains were measured. Over the 8.5-10 cm of the vertical profiles investigated, the iron pore water concentration (0.01 to 243 mg center dot 1(-1)) and $\delta\text{Fe-56}$ (-0.80 to -3.40‰) varied over a large range. The significant linear co-variation between $\text{Ln}[\text{Fe}]$ and $\delta\text{Fe-56}$ suggests an apparent Rayleigh-type behavior of the DIR processes. An average net fractionation factor between the pore water and the soil substrate of $\Delta\text{Fe-56}$ approximate to -1.15 parts per thousand was obtained, taking the average of all the $\delta\text{Fe-56}$ values weighted by the amount of Fe for each sample. These results provide a robust field study confirmation of the conceptual model of Crosby et al. (2005, 2007) for interpreting the iron isotope fractionation observed during DIR, established from a series of laboratories experiments. In addition, the strong enrichment of heavy Fe isotope measured in the root relative to the soil solution suggest that the iron uptake by roots is more likely supplied by iron from plaque and not from the plant-available iron in the pore water. Opposite to what was previously observed for plants following strategy II for iron uptake from soils, an iron isotope fractionation factor of -0.9‰ was found from the roots to the rice grains, pointing to isotope fractionation during rice plant growth. All these features highlight the insights iron isotope composition provides into the biogeochemical Fe cycling in the soil-water-rice plant systems studied in nature. (C) 2016 Elsevier B.V. All rights reserved.

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Record 17 of 24

Title: Amazon forest dynamics under changing abiotic conditions in the early Miocene (Colombian Amazonia)

Author(s): Villegas, SS (Villegas, Sonia Salamanca); van Soelen, EE (van Soelen, Els E.); van Manen, MLT (van Manen, Milan L. Teunissen); Flantua, SGA (Flantua, Suzette G. A.); Santos, RV (Santos, Roberto Ventura); Roddaz, M (Roddaz, Martin); Dantas, EL (Dantas, Elton Luiz); van Loon, E (van Loon, Emiel); Damste, JSS (Damste, Jaap S. Sinninghe); Kim, JH (Kim, Jung-Hyun); Hoorn, C (Hoorn, Carina)

Source: JOURNAL OF BIOGEOGRAPHY **Volume:** 43 **Issue:** 12 **Pages:** 2424-2437 **DOI:** 10.1111/jbi.12769 **Published:** DEC 2016

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Abstract: Aim We analysed in detail a past marine incursion event in north-western Amazonia and measured its effect on the forest composition. We also determined the sediment provenance in the fluvio-estuarine system and reconstructed the overall floral composition of the Amazon lowland forest during the Miocene climatic optimum.

Location A 60-m-thick sedimentary succession situated along the Caqueta River in Colombian Amazonia (0.77 degrees S; 71.97 degrees W).

Methods Palynological, geochemical and statistical analyses were performed on samples from organic-rich sediments.

Results The lower section was formed by fluvial floodplain deposits of Andean provenance rich in pollen of *Malvacipolloides maristellae* (aff. *Abutilon*) and *Rhoipites guianensis* (aff. *Vasivaea*). The middle section was formed by fluvial channel and estuarine swamp deposits of central Venezuelan provenance dominated by pollen of *Mauritiidites franciscoi* (*Mauritia*). Towards the top, the swamp deposits represent an estuarine floodplain with aquatic biomarkers, marine palynomorphs and mangrove pollen. The succession ended with fluvial floodplain deposits of central to southern Venezuelan origin with *R. guianensis* as dominant pollen type. Palynological diversity was high throughout the section with Andean- and Venezuelan-derived sediments each with their characteristic taxa. Tropical rain forest taxa, such as *Arecaceae*, *Fabaceae*, *Sapotaceae*, *Malpighiaceae* and *Bombacoideae*, were common in these sediments, although taxa adapted to drier conditions also occurred. We provide a 'figshare' link to an image library of selected taxa, as well as the raw counts and processed data.

Main conclusions The fluvio-estuarine system was of mixed origin with sediments and palynomorphs from the emerging Andes, but also from an area situated in the modern Orinoco Basin. Marine influence was linked to the Venezuelan source area and thus of indisputable Caribbean origin. Overall, a mixed forest with drought-resistant components existed in the drainage system during the Miocene climatic optimum. Our data provide a novel insight into the composition of the tropical lowland forest and the environments in northwestern Amazonia prior to the main uplift of the central and northern Andes.

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Output Date: 2019-12-17**Record 18 of 24****Title:** INFLUENCE OF TRIBUTARY WATER CHEMISTRY ON HYDRODYNAMICS AND FISH BIOGEOGRAPHY ABOUT THE CONFLUENCE OF NEGRO AND SOLIMÕES RIVERS, BRAZIL**Author(s):** Trevethan, M (Trevethan, Mark); Santos, RV (Santos, Roberto Ventura); Ianniruberto, M (Ianniruberto, Marco); Oliveira, M (Oliveira, Marco); Martinelli, A (Martinelli, Andre); Gualtieri, C (Gualtieri, Carlo)**Book Author(s):** Webb, JA (Webb, JA); Costelloe, JF (Costelloe, JF); CasasMulet, R (CasasMulet, R); Lyon, JP (Lyon, JP); Stewardson, MJ (Stewardson, MJ)**Source:** 11TH INTERNATIONAL SYMPOSIUM ON ECOHYDRAULICS **Published:** 2016**Times Cited in Web of Science Core Collection:** 4**Total Times Cited:** 4**Usage Count (Last 180 days):** 0**Usage Count (Since 2013):** 0**Cited Reference Count:** 15

Abstract: As part of a project to investigate the hydrodynamic, sediment transport and mixing processes about the large confluences of the Amazon Basin, two field studies were conducted under high and low flow conditions about the confluence of the Negro and Solimoes Rivers. To date, little is understood about how differences in tributary water physico-chemistry (e.g. temperature, pH) are related to local hydrodynamic and mixing processes about confluences, especially large confluences and further how these differences could influence fish biogeography about such confluences. Presented herein are some key findings from the field study conducted about this confluence under high flow conditions as well as a conceptual model that helps to explain how tributary water characteristic differences influence local hydrodynamic and mixing processes. These findings are then used to briefly discuss how local confluence dynamics may influence fish biogeography with the Amazon Basin.

Accession Number: WOS:000401732900011**Language:** English**Document Type:** Proceedings Paper**Conference Title:** 11th International Symposium on Ecohydraulics**Conference Date:** FEB 07-12, 2016**Conference Location:** Melbourne, AUSTRALIA**Addresses:** [Trevethan, Mark; Gualtieri, Carlo] Univ Napoli Federico II, Civil Construct & Environm Engr Dept, Via Claudio 21, I-80125 Naples, Italy.

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Publisher: UNIV MELBOURNE, MELBOURNE SCH ENGINEERING**Publisher Address:** ENGINEERING BLOCKS B, C & D, PARKVILLE, 3010 VIC, AUSTRALIA**Web of Science Categories:** Environmental Sciences; Water Resources**Research Areas:** Environmental Sciences & Ecology; Water Resources**IDS Number:** BH6EH**ISBN:** 978-0-7340-5339-8**Source Item Page Count:** 8**Funding:**

Funding Agency	Grant Number
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The authors acknowledge this research was carried out within the CLIM-AMAZON European Laboratory in Brazil funded by grant FP7 INCO-LAB no 295091 from the European Commission; the CPRM (Geological Survey of Brasil) for supplying research vessel, instrumentation, technical assistance with sampling; as well as Federal University of Amazonas and University of Brasilia for supplying additional sampling equipment.

Output Date: 2019-12-17

Record 19 of 24

Title: A test of the cosmogenic Be-10(meteoric)/Be-9 proxy for simultaneously determining basin- wide erosion rates, denudation rates, and the degree of weathering in the Amazon basin

Author(s): Wittmann, H (Wittmann, H.); von Blanckenburg, F (von Blanckenburg, F.); Dannhaus, N (Dannhaus, N.); Bouchez, J (Bouchez, J.); Gaillardet, J (Gaillardet, J.); Guyot, JL (Guyot, J. L.); Maurice, L (Maurice, L.); Roig, H (Roig, H.); Filizola, N (Filizola, N.); Christl, M (Christl, M.)

Source: JOURNAL OF GEOPHYSICAL RESEARCH-EARTH SURFACE **Volume:** 120 **Issue:** 12 **Pages:** 2498-2528 **DOI:** 10.1002/2015JF003581 **Published:** DEC 2015

Times Cited in Web of Science Core Collection: 15

Total Times Cited: 15

Usage Count (Last 180 days): 3

Usage Count (Since 2013): 35

Cited Reference Count: 72

Abstract: We present an extensive investigation of a new erosion and weathering proxy derived from the Be-10(meteoric)/Be-9(stable) ratio in the Amazon River basin. This new proxy combines a radioactive atmospheric flux tracer, meteoric cosmogenic Be-10, with Be-9, a trace metal released by weathering. Results show that meteoric Be-10 concentrations ([Be-10]) and Be-10/Be-9 ratios increase by >30% from the Andes to the lowlands. We can calculate floodplain transfer times of 2-30 kyr from this increase. Intriguingly however, the riverine exported flux of meteoric Be-10 shows a deficit with respect to the atmospheric depositional Be-10 flux. Most likely, the actual area from which the Be-10 flux is being delivered into the mainstream is smaller than the basin-wide one. Despite this imbalance, denudation rates calculated from Be-10/Be-9 ratios from bed load, suspended sediment, and water samples from Amazon Rivers agree within a factor of 2 with published in situ Be-10 denudation rates. Erosion rates calculated from meteoric [Be-10], measured from depth-integrated suspended sediment samples, agree with denudation rates, suggesting that grain size-induced variations in [Be-10] are minimized when using such sampling material instead of bed load. In addition, the agreement between erosion and denudation rates implies minor chemical weathering intensity in most Amazon tributaries. Indeed, the Be-specific weathering intensity, calculated from mobilized Be-9 comprising reactive and dissolved fractions that are released during weathering, is constant at approximately 40% of the total denudation from the Andes across the lowlands to the Amazon mouth. Therefore, weathering in the Amazon floodplain is not detected.

Accession Number: WOS:000369944900004

Language: English

Document Type: Article

KeyWords Plus: LARGE RIVERS; SUSPENDED SEDIMENT; METEORIC BE-10; HALF-LIFE; CLIMATE; GEOCHEMISTRY; BERYLLIUM; NUCLIDES; FLUXES; EXTRACTION

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Publisher: AMER GEOPHYSICAL UNION

Publisher Address: 2000 FLORIDA AVE NW, WASHINGTON, DC 20009 USA

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Open Access: Green Published

Output Date: 2019-12-17

Record 20 of 24

Title: Tracing and tracking wastewater-derived substances in freshwater lakes and reservoirs: Anthropogenic gadolinium and geogenic REEs in Lake Paranoa, Brasilia

Author(s): Merschel, G (Merschel, Gila); Bau, M (Bau, Michael); Baldewein, L (Baldewein, Linda); Dantas, EL (Dantas, Elton Luiz); Walde, D (Walde, Detlef); Buhn, B (Buehn, Bernhard)

Source: COMPTES RENDUS GEOSCIENCE **Volume:** 347 **Issue:** 5-6 **Pages:** 284-293 **DOI:** 10.1016/j.crte.2015.01.004 **Published:** SEP-OCT 2015

Times Cited in Web of Science Core Collection: 24

Total Times Cited: 24

Usage Count (Last 180 days): 2

Usage Count (Since 2013): 27

Cited Reference Count: 65

Abstract: Total and dissolved rare earth element (REEs) and U concentrations were determined for waters from Lake Paranod (Brasilia, Brazil) sampled in the dry (November 2012) and wet seasons (July 2013). Shale-normalized REE patterns of all samples display the M-type lanthanide tetrad effect and large positive Gd anomalies, but only the total REE pool shows a positive Ce anomaly, possibly reflecting aeolian and/or fluvial input from surrounding laterites. The positive Gd anomaly increased strongly between 2012 and 2013. It reveals an anthropogenic dissolved Gd source that enters the lake with effluents from wastewater treatment plants, originating from the use of Gd-based contrast agents in magnetic resonance imaging. Because anthropogenic Gd is a tracer for other wastewater-derived substances, such as pharmaceuticals, REE geochemistry offers an inexpensive way to monitor the presence of wastewater-derived substances in the lake, which may be utilized as a drinking water reservoir in the near future. (C) 2015 Academie des sciences. Published by Elsevier Masson SAS. All rights reserved.

Accession Number: WOS:000368867200009

Language: English

Document Type: Article

Author Keywords: Anthropogenic gadolinium; Cerium anomaly; Rare earth elements; Lake Paranoa; Lanthanide tetrad effect

Keywords Plus: RARE-EARTH-ELEMENTS; SURFACE-WATER; RHINE RIVER; TAP WATER; FRACTIONATION; COMPLEXATION; FE; SEAWATER; YTTRIUM; MN

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Publisher: ELSEVIER FRANCE-EDITIONS SCIENTIFIQUES MEDICALES ELSEVIER

Publisher Address: 65 RUE CAMILLE DESMOULINS, CS50083, 92442 ISSY-LES-MOULINEAUX, FRANCE

Web of Science Categories: Geosciences, Multidisciplinary

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Output Date: 2019-12-17

Record 21 of 24

Title: Marine connections of Amazonia: Evidence from foraminifera and dinoflagellate cysts (early to middle Miocene, Colombia/Peru)

Author(s): Boonstra, M (Boonstra, M.); Ramos, MIF (Ramos, M. I. F.); Lammertsma, EI (Lammertsma, E. I.); Antoine, PO (Antoine, P. -O.); Hoorn, C (Hoorn, C.)

Source: PALAEOGEOGRAPHY PALAEOCLIMATOLOGY PALAEOECOLOGY **Volume:** 417 **Pages:** 176-194 **DOI:** 10.1016/j.palaeo.2014.10.032 **Published:** JAN 1 2015

Times Cited in Web of Science Core Collection: 29

Total Times Cited: 29

Usage Count (Last 180 days): 1

Usage Count (Since 2013): 23

Cited Reference Count: 137

Abstract: Species composition in the present-day Amazonian heartland has an imprint of past marine influence. The exact nature, timing and extent of this marine influence, however, are largely unresolved. Here we use calcareous tests of foraminifera and marine palynomorphs from Miocene sediments in northwestern Amazonia to extend on current estimates for salinity ranges, paleoenvironments and paleogeography. Our samples mostly contain tests and/or organic linings of euryhaline (tolerant to a wide range of salinity) foraminifera of the genera *Ammonia*, *Trochammina* and *Elphidium*, with *Ammonia* being by far the dominant genus at all locations. Organic-walled dinoflagellate cysts (dinocysts), such as *Spiniferites*, *Brigantedinium* and *Tuberculodinium vancampoae*, are also common at a number of sites. This association of foraminifera and dinocyst taxa points at varying salinities, with aberrant forms of *Ammonia* indicating lower limits of 0-10 psu (practical salinity units) whereas dinocyst associations suggest more marine conditions. Such regional heterogeneity is common at the interface of shallow marine to freshwater environments, like estuaries. We conclude that during the early and middle Miocene marginal marine conditions reached at least 2000 km inland from the Caribbean portal. Global high sea level and fast subsidence in the sub-Andean zone are thought to be the controlling mechanisms of the marine incursions. Lowering of global sea level and a change in tectonic regime terminated the incursions in the course of the Plio-Pleistocene. (C) 2014 Elsevier B.V. All rights reserved.

Accession Number: WOS:000347862400017

Language: English

Document Type: Article

Author Keywords: Pebas; Marginal marine; Neogene; Micropaleontology; Marine palynomorphs

KeyWords Plus: CHACO FORELAND BASIN; MADRE-DE-DIOS; PALEOENVIRONMENTAL RECONSTRUCTION; MORPHOLOGICAL ABNORMALITIES; NORTHWESTERN AMAZONIA; PERUVIAN AMAZONIA; YECUA FORMATION; CLIMATE-CHANGE; ADRIATIC SEA; RIVER

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Publisher: ELSEVIER

Publisher Address: RADARWEG 29, 1043 NX AMSTERDAM, NETHERLANDS

Web of Science Categories: Geography, Physical; Geosciences, Multidisciplinary; Paleontology

Research Areas: Physical Geography; Geology; Paleontology

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Output Date: 2019-12-17

Record 22 of 24**Title:** FLUID MECHANICS, SEDIMENT TRANSPORT AND MIXING ABOUT THE CONFLUENCE OF NEGRO AND SOLIMÕES RIVERS, MANAUS, BRAZIL**Author(s):** Trevethan, M (Trevethan, Mark); Martinelli, A (Martinelli, Andre); Oliveira, M (Oliveira, Marco); Ianniruberto, M (Ianniruberto, Marco); Gualtieri, C (Gualtieri, Carlo)**Edited by:** Mynett A**Source:** PROCEEDINGS OF THE 36TH IAHR WORLD CONGRESS: DELTAS OF THE FUTURE AND WHAT HAPPENS UPSTREAM **Pages:** 302-313 **Published:** 2015**Times Cited in Web of Science Core Collection:** 3**Total Times Cited:** 3**Usage Count (Last 180 days):** 0**Usage Count (Since 2013):** 2**Cited Reference Count:** 28

Abstract: As part of a project to investigate the hydrodynamic, sediment transport and mixing processes about the large confluences of the Amazon River, a field study was conducted about the confluence of the Negro and Solimões Rivers. This confluence ranks among the largest confluences on Earth the outcomes of this study may also provide some general insights into large confluence dynamics. A detailed series of ADCP, water quality and seismic profile measurements were collected to investigate key hydrodynamic and morphodynamic features about this confluence. Presented here are the key hydrodynamic features observed about this large confluence and how these relate to findings in previous studies conducted in flumes and small confluences. Finally some insights into how the differences in water characteristics and the hydrodynamics of these two rivers may influence the rate of mixing downstream are presented.

Accession Number: WOS:000398996200037**Language:** English**Document Type:** Proceedings Paper**Conference Title:** 36th IAHR World Congress**Conference Date:** JUN 28-JUL 03, 2015**Conference Location:** Delft, NETHERLANDS**Conference Sponsors:** Int Assoc Hydro Environm Engr & Res, Boskalis, Van Oord, UNESCO IHE, Delft Univ Technol, Deltares, Minist Infrastructure & Environm, Rijkswaterstaat, Royal HaskoningDHV, ARCADIS, Witteveen Bos, AANDERAA, Prince Sultan Bin Abulaziz Int Prize Water**Author Keywords:** Amazon River; Confluence; Hydrodynamics; Mixing; Sediment transport**KeyWords Plus:** BED MORPHOLOGY; FLOW STRUCTURE; AMAZON RIVER**Addresses:** [Trevethan, Mark; Gualtieri, Carlo] Univ Napoli Federico II, Dept Civil Construct & Environm Engr, Naples, Italy.

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Publisher: IAHR-INT ASSOC HYDRO-ENVIRONMENT ENGINEERING RESEARCH**Publisher Address:** PASEO BAJO VIRGEN DEL PUERTO 3, MADRID, 28005, SPAIN**Web of Science Categories:** Water Resources**Research Areas:** Water Resources**IDS Number:** BH2JW**ISBN:** 978-90-824846-0-1**Source Item Page Count:** 12**Funding:**

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CPRM (Geological Survey of Brasil)	

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Output Date: 2019-12-17**Record 23 of 24****Title:** Provenance of quaternary and modern alluvial deposits of the Amazonian floodplain (Brazil) inferred from major and trace elements and Pb-Nd-Sr isotopes**Author(s):** Horbe, AMC (Coimbra Horbe, Adriana Maria); da Trindade, IR (da Trindade, Ivaldo Rodrigues); Dantas, EL (Dantas, Elton Luiz); Santos, RV (Santos, Roberto Ventura); Roddaz, M (Roddaz, Martin)**Source:** PALAEOGEOGRAPHY PALAEOCLIMATOLOGY PALAEOECOLOGY **Volume:** 411 **Pages:** 144-154 **DOI:** 10.1016/j.palaeo.2014.06.019 **Published:** OCT 1 2014**Times Cited in Web of Science Core Collection:** 7

Total Times Cited: 7**Usage Count (Last 180 days):** 3**Usage Count (Since 2013):** 25**Cited Reference Count:** 69

Abstract: Chemical and Pb, Nd and Sr isotope data from floodplain sedimentary deposits in the Solimbes River, northwest Brazil, constrain the variability of the deposits through the Quaternary and help reconstruct the paleogeography of Amazonia since the uplift of the Andes. Compared to the modern alluvial deposits in the active channel, the Quaternary terrace deposits in the Solimaes River have a higher chemical index of alteration (CIA), higher SiO₂/Al₂O₃ ratios, higher concentrations of immobile elements, higher radiogenic Sr isotopic compositions, more negative epsilon(Nd)(t = 0) values, and older Nd T-DM ages. These geochemical characteristics indicate that the Quaternary sediment sources were composed by more felsic and/or recycled old continental crust derived rock materials than the younger source areas, which contributed major arc volcanic materials to the flood plain deposits. This shift in the composition of the sediment source areas indicates that a significant reorganization of the architecture of the Solimoies River has occurred since the uplift of the Andes. (c) 2014 Elsevier B.V. All rights reserved.

Accession Number: WOS:000342269200013**Language:** English**Document Type:** Article**Author Keywords:** Major and trace elements; Quaternary terrace deposits; Active channel deposits; Amazonas River**KeyWords Plus:** FORELAND BASIN; U-PB; ENVIRONMENTAL-CHANGES; SUSPENDED SEDIMENTS; WESTERN AMAZONIA; RIVER; GEOCHEMISTRY; EVOLUTION; NEOGENE; ANDES**Addresses:** [Coimbra Horbe, Adriana Maria; Dantas, Elton Luiz; Santos, Roberto Ventura] Univ Brasilia, Inst Geociencias, BR-70910900 Brasilia, DF, Brazil.

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Roddaz, Martin	L-9748-2019	0000-0001-8562-8582
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Publisher: ELSEVIER SCIENCE BV**Publisher Address:** PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS**Web of Science Categories:** Geography, Physical; Geosciences, Multidisciplinary; Paleontology**Research Areas:** Physical Geography; Geology; Paleontology**IDS Number:** AP7PM**ISSN:** 0031-0182**eISSN:** 1872-616X**29-char Source Abbrev.:** PALAEOGEOGR PALAEOCL**ISO Source Abbrev.:** Paleogeogr. Paleoclimatol. Paleocol.**Source Item Page Count:** 11**Funding:**

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CLIM-AZON	295091

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Output Date: 2019-12-17**Record 24 of 24****Title:** Provenance of Pliocene and recent sedimentary deposits in western Amazonia, Brazil: Consequences for the paleodrainage of the Solimoies-Amazonas River**Author(s):** Horbe, AMC (Coimbra Horbe, Adriana Maria); Motta, MB (Motta, Marcelo Batista); de Almeida, CM (de Almeida, Carolina Michelin); Dantas, EL (Dantas, Elton Luiz); Vieira, LC (Vieira, Lucieth Cruz)**Source:** SEDIMENTARY GEOLOGY **Volume:** 296 **Pages:** 9-20 **DOI:** 10.1016/j.sedgeo.2013.07.007 **Published:** OCT 15 2013**Times Cited in Web of Science Core Collection:** 16**Total Times Cited:** 16**Usage Count (Last 180 days):** 1**Usage Count (Since 2013):** 23**Cited Reference Count:** 33

Abstract: Integrated data on paleocurrents, the morphology of detrital minerals and zircon grains, chemical compositions and U-Pb geochronology, reveal that the flow of the modern Solimoes-Amazonas River has changed from west to east since the Plio-Pleistocene. This finding is supported by several lines of evidence, including paleocurrent directions and detrital mineral assemblages in the Ica Formation and in recent sediments. The Ica Formation, which was most likely deposited during the Pliocene, has NE and SE paleocurrents, a high proportion of stable detrital mineral assemblages and U-Pb zircon ages that we interpreted as being derived from the Amazonian craton (e.g., the Rondonian-San Ignacio and Sunsas-Grenvillian geochronologic provinces) and neighboring provinces, including the Neoproterozoic to Cambrian Brazilian Pampean mobile belts. A small proportion is derived from the Cambrian to Silurian Famatinian continental arch. Another source is the Precambrian and Paleozoic basement from the Andes cordillera, which includes several metamorphic inliers in Colombia, Peru and Bolivia. The overlying recent deposits have different provenances and are characterized by a more variable detrital assemblage with zircon grains that are enriched in trace elements and depleted in Si and have Mesoproterozoic ages. In our interpretation, the erosion of the Iquitos Arch after deposition of the Ica Formation allowed the westward expansion of the Solimoes-Amazonas system in the Plio-Pleistocene. (C) 2013 Elsevier B.V. All rights reserved.

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