

ANNUAL REPORT ON GEOTRACES ACTIVITIES IN BRAZIL

May 1st, 2017 to March 30th, 2018

Activities

- A GEOTRACES section (Trace elements cycling, processes and fluxes across interfaces) was held during the 46th World Chemistry Congress (IUPAC-2017) in São Paulo, Brazil between July 9th to July 14th. We had two plenary talks and four invited speakers on GEOTRACES research topics (listed below) and 6 oral presentations.
- **Antonio Cobelo García** Advances in the Assessment of The Environmental Impact And Cycling of Platinum Group Elements (Pges)
- **Catherine Jeandel** Which Oceanic Tracers are the Rare Earths and the Nd Isotopes?
- **Michael Bau** Rare Earth Elements: Critical Resources and Emerging (Micro)Contaminants of The Environment
- **Peter Croot** The Importance of Kinetics and Redox Reactions on the Speciation of Trace Elements in Marine Biogeochemical Cycles
- **Gideon Henderson** Chemical Rate-Meters for the Inputs and Cycling of Nutrient Metals in the Ocean
- **Luis Felipe Niencheski** Advances in the Studies of the Sgd in South Atlantic Ocean
- The GEOTRACES Scientific Steering Committee and Data Management Committee annual meetings were held in Salvador, Bahia, Brazil (16-20 September 2017).
- V. Hatje, a Full Member of SCOR Working Group 145: Modelling Chemical Speciation in Seawater to Meet 21st Century Needs (MARCHEMSPEC), participated in the MARCHEMSPEC workshop in February 2018 in Portland.

Capacity Building

- The Scientific Committee on Oceanic Research (SCOR) awarded US\$2500 towards sponsoring a visit by C. Jeandel to Salvador, Brazil in June 2017. C. Jeandel gave a 3 weeks course on “Tracers in the Oceans: applications of isotopes to unveil processes controlling trace element distributions”, and also provided training on isotope dilution techniques for the determination of REE at the laboratories of CIEnAm at Universidade Federal da Bahia. Sixteen graduate students from various universities of Brazil attended the course and had the opportunity to discuss their work with C. Jeandel. As a continuation of this activity one student will visit C. Jeandel for few weeks to deepen her knowledge and practical skills in Nd chemistry.

Projects/grants

- A proposal to fund the project “Ecosystem services and environmental impacts in Todos os Santos Bay and its adjacent seas” was approved by CNPq (441264/2017-4) in December 2017.
- A proposal has been submitted to the MCTIC to repeat the PIRATA-BR XVII/ GEOTRACES GApr10 transect (Figure 1) and also to include two additional transects perpendicular to the Northeastern Coast of Brazil at 5S and 11S to study boundary exchange process along the continental shelf.

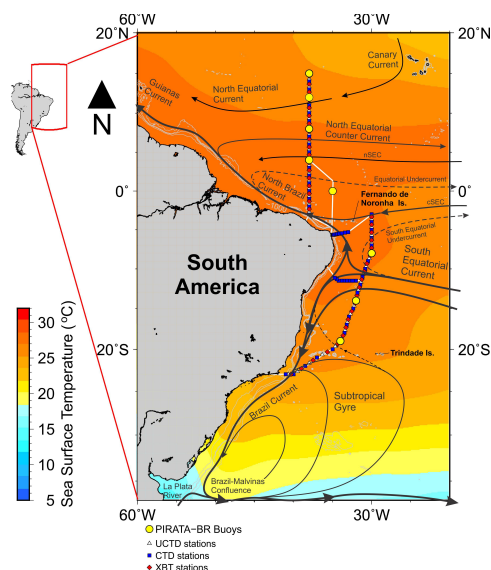


Figure 1. PIRATA-Br XVIII ship plan, showing the 5S and 11S transects.

Cruises

- An opportunity cruise with the Brazilian Navy was carried out between Monaco and Rio de Janeiro on the *R/V Vital de Oliveira*. Aerosol samples were collected using two high volume samplers equipped with PM2.5 and PM10 inlets (Thermo Andersen, USA). Trace metals and PHAs are to be determined by Jailson B de Andrade and Gisele O. da Rocha.
- The PIRATA-BR XVII/GEOTRACES GApr10 cruise was performed in four legs between October 2017 and January 2018. Water samples were collected from 16 full depth profiles between 15N and 21S (Fig. 2). The ship does not have a trace metal sampling rosette, hence water samples were collected only for the determination of REE and Nd isotopes. At selected stations, surficial samples were also collected for Ra and trace elements determination using a clean fish system.

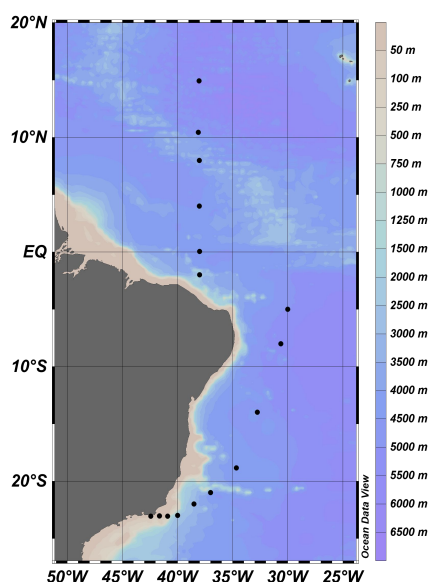


Figure 2. Location of the 16 full depth profiles performed during the PIRATA-Br XVII/GApr10.

GEOTRACES-related articles

- Hatje, V., Attisano, K.K., de Souza, M.F.L., Mazzili, B., de Oliveira, J. de Arauó, T., Burnett, W.C. Applications of radon and radium isotopes to determine submarine groundwater discharge and flushing times in Todos os Santos Bay, Brazil. *Journal of Environmental Radioactivity* v. 178-179, p. 136-146, 2017.
- Hatje, V., Pedreira, R.M.A., de Rezende, C.E., Schettini, C.A.F., de Souza, G.C., Marin, D.C., Hackspacher, P.C. The environmental impacts of one of the largest tailing dam failures worldwide. *Scientific Reports*, v. 7, p. 10706, 2017.
- Andrade, R.L.B., Hatje, V., Masque, P., Zurbrick, C.M., Boyle, E.A., Santos, W.P.C.. Chronology of anthropogenic impacts reconstructed from sediment records of trace metals and Pb isotopes in Todos os Santos Bay (NE Brazil). *Marine Pollution Bulletin*, v. 1, p. 1-14, 2017.

Contributions to conferences

GEOTRACES presentations and co-authorships by Brazilian Scientists at the following meetings: OSM (Portland, USA, Fe), and 46th World Chemistry Congress (IUPAC-2017).

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