

ANNUAL REPORT ON GEOTRACES ACTIVITIES IN GERMANY

June 1st, 2015 to April 30th, 2016

Activities

- Walter Geibert (Alfred-Wegener Institute, Bremerhaven) initiated a ⁷Be interlaboratory comparison study for GEOTRACES in January 2016 that is nearing completion.
- Claudia Ehlert (ICBM, Oldenburg) participated in the GEOTRACES dissolved Si isotope intercalibration organized by M. Brzezinski (USA).
- The new trace metal clean rosette and winch of Geomar, Kiel, were used for trace metal sampling on the SE Atlantic GEOTRACES cruise (GA-08).
- Two new GEOTRACES reference samples for surface waters (SAG) and for deep waters near 2200 m (CAB) were collected in the SE Pacific. More than 500 0,5 liter samples were filtered, homogenized, acidified and bottled.

Cruises

- **GEOTRACES Arctic cruise PS94**, ARKXXIX/3 (*R/V Polarstern*, chief scientist U. Schauer, AWI). GEOTRACES PIs: M. Rutgers van der Loeff (AWI, Bremerhaven), K. Pahnke (ICBM, Oldenburg), Micha Rijkenberg (NIOZ, The Netherlands), M. Staubwasser (Univ. of Cologne),
- **GEOTRACES SE Atlantic cruise GA-08**, M121 (*R/V Meteor*, chief scientist: M. Frank). PIs: E. Achterberg (Geomar, Kiel), A. Koschinsky (Jacobs University, Bremen). A total of 51 full water column stations were complemented by continuous towed fish sampling for waters and by aerosol collection.
- **GEOTRACES Process Study**, Oligotrophic South Pacific Gyre (UltraPac), SO245 (*R/V Sonne*, chief scientist: Tim Ferdeman, MPI Bremen). GEOTRACES PIs: P. Croot (Galway), K. Pahnke (ICBM), M. Staubwasser (U. of Cologne).

New projects and/or funding

- Joint DFG proposal (E. Achterberg and A. Koschinsky) for the evaluation phase of the M121 cruise was approved and provides both working groups with a PhD position for 3 years. A third one will be applied for shortly.
- Three PhD studentships were approved as part of the successful GIO6 SONNE proposal.
- GEOTRACES Indian Ocean cruise (GIO6, *R/V Sonne*) was approved. Chief scientists: E. Achterberg/M. Frank (Geomar, Kiel), co-proponent: A. Koschinsky (Jacobs University, Bremen).
- A cruise proposal for *R/V Meteor* (A. Koschinsky, M. Frank, T. Dittmar) to study mixing processes in the Amazon estuary and its impact on trace metal fluxes into the Atlantic, was not approved but will be resubmitted in September 2016 (to be suggested as a GEOTRACES process study).

Other activities

- Melanie Behrens (ICBM, University of Oldenburg) won a student poster award at the AGU Fall Meeting 2015 for her presentation of Nd isotope and REE data from a GEOTRACES Process Study in the West Pacific.

Outreach activities

- Reiner Schlitzer, Presentation during GEOTRACES Townhall at Ocean Sciences Meeting, Feb 2016, in New Orleans

National and international service

- Germany is represented on the International GEOTRACES Standards and Intercalibration Committee by Walter Geibert (AWI), and on the SSC by Reiner Schlitzer (co-chair, AWI) and Katharina Pahnke (MPI/ICBM).

Meetings

- **Workshop on biogeochemical studies in Siberian Shelf Seas**

GEOMAR Kiel 27-28 January 2016. Organized by H. Kassens, M. Rutgers van der Loeff, M. Frank, Andrei Novikhin, Sandra Gdaniec. Sponsored by IASC, TRANSDRIFT (System Laptev Sea) and GEOTRACES.

Objectives:

- 1) Bring together specialists working from widely different perspectives on geochemical studies in the Siberian Shelves Seas.
- 2) Exploring possibilities of cooperation in future studies by exchange of data, samples, cruise participants.

35 attendants, including 10 early career scientists, from 10 countries, represented: NABOS, SWERUS-ISSS08, GEOTRACES, TRANSDRIFT, Arctic-GRO, Shirshov Institute, Japan, RUSALCA, AWI-Lena estuary.

Central in the discussions was the attempt to enhance cooperations between Russian and other scientists and to enhance the possibilities for trace metal analyses in Russian shelf seas. In this respect, two agreements were made:

1. The Shirshov Institute participants announced that 2-3 foreign participants were welcome on their 2017 expedition to the Laptev/Kara/Barents Sea. And
2. It was decided to set up possibilities for Russian students to get training in clean sampling techniques. Both cooperations were announced through the GEOTRACES mail server.

New publications (published or in press)

- Basak, C., Pahnke, K., Frank, M., Lamy, F., Gersonde, R., 2015. Neodymium isotopic characterization of Ross Sea Bottom Water and its advection through the southern South Pacific. *Earth and Planetary Science Letters* 419, 211-221. doi:10.1016/j.epsl.2015.03.011.

- Cao, Z., Frank, M., Dai, M., 2015. Dissolved silicon isotopic compositions in the East China Sea: Water mass mixing versus biological fractionation. *Limnology and Oceanography* 60: pp. 1619-1633.
- Hathorne, E., Stichel, T., Brück, B., and Frank, M., 2015. Rare earth element distribution in the Atlantic sector of the Southern Ocean: The balance between particle scavenging and vertical supply. *Marine Chemistry* 177: pp. 157-171.
- Osborne, A., Haley, B.A., Hathorne, E., Plancherel, Y., Frank, M., 2015. Rare Earth Element distribution in Caribbean seawater: Continental inputs versus lateral transport of distinct REE compositions in subsurface water masses. *Marine Chemistry* 177, 172-183.
- Poehle, S., Schmidt, K., Koschinsky, A., 2015, Determination of Ti, Zr, Nb, V, W and Mo in seawater by a new online-preconcentration method and subsequent ICP-MS analysis. *Deep Sea Research Part I* 98: 83–93.
- Snow J. T., Schlosser C., Woodward E.M.S., Mills M.M., Achterberg E. P., Mahaffey, C.A., Bibby T.S., Moore C.M., 2015. Environmental controls on the biogeography of diazotrophy and Trichodesmium in the Atlantic Ocean. *Global Biogeochemical Cycles*, Global Biogeochemical Cycles. doi:10.1002/2015GB005090.
- Stichel, T., Hartman, A.E., Duggan, B., Goldstein, S.L., Scher, H., Pahnke, K., 2015. Separating biogeochemical cycling of neodymium from water mass mixing in the Eastern North Atlantic. *Earth and Planetary Science Letters* 412, 245-260. doi:10.1016/j.epsl.2014.12.008.
- Xie, R.C., Galer, S.J.G., Abouchami, W., Rijkenberg, M.J.A., De Jong, J., de Baar, H.J.W., Andreae, M.O., 2015. The cadmium-phosphate relationship in the western South Atlantic – the importance of mode and intermediate waters on the global systematics. *Marine Chemistry* 177, 110-123. doi: <http://dx.doi.org/10.1016/j.marchem.2015.06.011>.

Conference abstracts

- Behrens, A., Pahnke, K., Schnetger, B., Brumsack, H.J., Trace element inputs to the upper West Pacific from Nd isotopes and rare earth elements, AGU Fall Meeting, San Francisco, 2015 (poster, won poster award).
- Cao, Z., Siebert C., Hathorne, E., Dai, M., Frank, M.. Do Dissolved Barium Isotopes in Seawater Trace Water Mass Mixing and Nutrient Cycling? 25th Goldschmidt Conference, Prague, Czech Republic, August 15-21, 2015 (talk).
- Geibert, W., Fluxes across the continental shelf. Royal Society Satellite Meeting "Quantifying fluxes and processes in trace-metal cycling at ocean boundaries" Chicheley Hall, UK, Dec. 2015 (keynote lecture).
- Filippova, A., Frank, M., Rickli, J., Hathorne, E., Yashayaev, I.. Water Mass Formation in the Labrador Sea Based on Coupled Hf-Nd Isotope and Rare Earth Element Distributions. 25th Goldschmidt Conference, Prague, Czech Republic, August 15-21, 2015 (talk).
- Koschinsky, A., Schmidt, K., Riedel, T., Poehle, S. and Schneider, A. (2016) The Amazon estuary as an interface for trace metal fluxes from the river into the Atlantic – a study along a salinity gradient in the mixing zone. Ocean Science Meeting, New Orleans, Feb. 2016 (poster).

- Kretschmer, S., Rutgers Van der Loeff, M.M., Masque, P., Geibert, W.: The distribution of ^{231}Pa and ^{230}Th between dissolved and particulate phases in the Western North Atlantic. 25th Goldschmidt Conference, Prague, Czech Republic, August 15-21, 2015 (talk).
- Schlitzer, R., Modelling the transport of trace elements: The mantle He example, GEOTRACES Royal Society Meeting, London, Dec. 2015 (invited talk).

Submitted by Katharina Pahnke (k.pahnke@icbm.de).