

## ANNUAL REPORT ON GEOTRACES ACTIVITIES IN THE NETHERLANDS

April 1st, 2018 to March 31st, 2019

### *New scientific results*

- Progress is being made with the interpretation and publication of results from cruises GA02 and GA04N.
- A process study was done aboard FS Polarstern in collaboration with AWI. In total 26 vertical profiles were collected in the Weddell Sea and Lazarev Sea. Additionally, 4 bio-assay experiments were performed to test the effects of temperature and iron and manganese additions. Samples are currently being transported and will be analysed in the coming years
- Samples are being analysed from cruise ANA08B, a GEOTRACES Process study.
- Samples are being analysed from the RV Pelagia cruise from March 12 – April 4, 2018. St Maarten – Nassau. Benthic flux measurements with landers and pore water sampling was carried out at two stations. Analyses of Fe (flow injection) have been completed, SeaFAST-ICP-MS analyses for other elements are in progress.

### *Cruises*

- PS117 aboard the FS Polarstern to the Weddell and Lazarev Sea (Antarctica) from December 15<sup>th</sup> till February 7 (Cape Town, South Africa to Punta Arenas, Chile).

### *New projects and/or funding*

- ‘Metalgate, Trace metals and the Arctic-Atlantic gateway in a changing world, local processes and global connections’. Vidi grant to Rob Middag.

### *Outreach activities conducted*

- Blog on cruise activities: <https://www.nioz.nl/en/blog/antarctic-expedition-fephyrus-2>

### *New GEOTRACES publications (published or in press)*

- Dulaquais, G., Waeles, M., Gerringa, L. J. A., Middag, R., Rijkenberg, M. J. A., & Riso, R. (2018). The biogeochemistry of electroactive humic substances and its connection to iron chemistry in the North East Atlantic and the Western Mediterranean Sea. *Journal of Geophysical Research: Oceans*, 123. <https://doi.org/10.1029/2018JC014211>
- Sukekava, C. Downes, J., Slagter, H.A., Gerringa, L.J.A., Laglera, L.M., 2018. Determination of the contribution of humic substances to iron complexation in seawater by catalytic cathodic stripping voltammetry. *Talanta* 189, 359-364. <https://doi.org/10.1016/j.talanta.2018.07.021>
- López-Sánchez, D.E., Cobelo-García, A., Rijkenberg, M.J.A., Gerringa, L.J.A., de Baar, H.J.W., 2018. New insights on the dissolved platinum behavior in the western Atlantic Ocean. *Chemical Geology*, special issue GEOTRACES. <https://doi.org/10.1016/j.chemgeo.2019.01.003>

- George, E., Stirling, C.H., Gault-Ringold, M., Ellwood., M.J., Middag, R., (2019). Marine biogeochemical cycling of cadmium and cadmium isotopes in the extreme nutrient-depleted subtropical gyre of the South West Pacific Ocean. *Earth and Planetary Science Letters*, 514, 84-95. <https://doi.org/10.1016/j.epsl.2019.02.031>
- Grand M.M., Laes-Huon A., Fietz S., Resing J.A., Obata H., Luther G.W., Tagliabue A., Achterberg E.P., Middag R., Tovar-Sánchez A., Bowie A.R., (2019) Developing Autonomous Observing Systems for Micronutrient Trace Metals. *Frontiers in Marine Science*, 6.
- Middag R., de Baar H.J.W., Bruland K.W., (2019) The Relationships Between Dissolved Zinc and Major Nutrients Phosphate and Silicate Along the GEOTRACES GA02 Transect in the West Atlantic Ocean. *Global Biogeochemical Cycles*, 33, 63-84.
- Slagter, H.A., Laglera, L.M., Sukekava, C., Gerringa, L.J.A., 2019. Fe-binding organic ligands in the humic-rich TransPolar Drift in the surface Arctic Ocean using multiple voltammetric methods. *Journal of Geophysical Research: Oceans*. DOI: 10.1029/2018JC014576.
- Lenstra, W.K., Hermans, M., Séguret, M.J.M., Witbaard, R., Behrends, T., Dijkstra, N., Van Helmond, N.A.G.M., Kraal, P., Laan, P., Rijkenberg, M.J.A., Severmann, S., Teacă, A. & Slomp, C.P 2018. The shelf-to-basin iron shuttle in the Black Sea revisited. *Chemical Geology*. <https://doi.org/10.1016/j.chemgeo.2018.10.024>.

#### ***Completed GEOTRACES PhD or Master theses***

- H.A. Slagter, PhD University Groningen 10 December, 2018, Promotores (Advisors): Prof. Dr. Ir. H.J.W. de Baar and Prof Dr. C.P.D. Brussaard, co-promotor: Dr. L.J.A. Gerringa. *The Organic Ties of Iron, or the origin and fate of Fe-binding organic ligands*. 220 pages, ISBN 978-94-6375-228-2
- O. Żygadłowska. Msc thesis. 2019. Iron and Manganese dynamics along a water depth transect on the Louisiana Shelf, USA. Advisors: C.P. Slomp, W. Lenstra, M. Seguret. Utrecht University.

#### ***GEOTRACES presentations in international conferences***

- Middag, R., Bertrand, E.M., Brussaard, C.P.D., Eich, C.U.M, Gerringa, L.J.A., Jung, J., Lee, S., Lee, Y., van Manen, M.H., McCain, J.S.P., Pont, S.B.E.H., Reichart, G.J., Tian, H.A. Dissolved Iron in the Amundsen Sea. Poster presentation at the 2018 Goldschmidt conference - Boston 15-08-2018, USA.
- Lenstra, W., Seguret, M.J.M, Hermans, M., Groeneveld, R.K., van Helmond, N.A.G.M., Witbaard, R. Severmann, S., Behrends, T., Slomp, C.P. Transfer of iron from continental shelves to anoxic basins: a comparison of the Black Sea and Baltic Sea. Goldschmidt conference. Oral Presentation, August, 2018. Boston, USA.

Submitted on behalf of all Dutch GEOTRACES participants by Rob Middag (rob.middag@nioz.nl).