

ANNUAL REPORT ON GEOTRACES ACTIVITIES IN THE NETHERLANDS

May 1st, 2023 to April 30th, 2024

New GEOTRACES or GEOTRACES relevant scientific results

- Submitted to GEOTRACES portal: total dissolvable Fe and Mn and dissolved Fe and Mn data from cruises PE401 (Black Sea) and PE411 (Baltic Sea) with associated intercalibration report. The data and calibration report are currently undergoing internal checking within the GEOTRACES DOOR portal. Associated publications:
 - Lenstra et al. 2019. *The shelf-to-basin iron shuttle in the Black Sea revisited*. *Chemical Geology*, 511, 314–341. doi: 10.1016/j.chemgeo.2018.10.024
 - Lenstra et al. 2020 *Controls on the shuttling of manganese over the northwestern Black Sea shelf and its fate in the euxinic deep basin*. *Geochimica et Cosmochimica Acta*, 273, 177–204. doi: <https://doi.org/10.1016/j.gca.2020.01.031>
 - Lenstra et al. 2020 *Coastal hypoxia and eutrophication as key controls on benthic release and water column dynamics of iron and manganese*. *Limnology and Oceanography*, 66, 807–826. doi: 10.1002/lno.11644.

GEOTRACES or GEOTRACES relevant cruises

- EASI-2 (PS140), G1pr12. GEOTRACES process aboard RV Polarstern expedition to the Southern Ocean from Cape Town (South Africa), 28/11/2023, Hobart (Australia), 31/01/2024. Completed.
- CDeepSea Cruise Leg 2 (ship: G.O. Sars (University of Bergen); Longyearbyen – Longyearbyen; 8-7-2024 - 12-7-2024) – Scheduled.

New projects and/or funding

- NWO Veni project (280.000 euro) titled: Continental margin sediments as a source of bio-essential iron and manganese to high-latitude waters

GEOTRACES workshops and meetings organized

- n/a

Outreach activities conducted (please list any outreach/educational material available that could be shared through the GEOTRACES web site) (We are particularly interested in recordings from webinars from GEOTRACES research)

- Presentation about upcoming GEOTRACES fieldwork campaigns at the Radboud University: Dynamics of iron and manganese in polar regions (11-3-2024)

Other GEOTRACES activities

- n/a

New GEOTRACES or GEOTRACES-relevant publications (published or in press) (If possible, please identify those publications acknowledging SCOR funding)

Middag, R., Zitoun, R. and Conway, T.M., 2023. Trace Metals. In: J. Blasco and A. Tovar-Sanchez (Editors), Marine Analytical Chemistry. Springer, Cham, Switzerland. https://doi.org/10.1007/978-3-031-14486-8_3

Tian, H.-A., van Manen, M., Bunnell, Z.B., Jung, J., Lee, S.H., Kim, T.-W., Reichart, G.-J., Conway, T.M. and Middag, R., 2023. Biogeochemistry of iron in coastal Antarctica: isotopic insights for external sources and biological uptake in the Amundsen Sea polynyas. *Geochimica et Cosmochimica Acta*, 363: 51-67, <https://doi.org/10.1016/j.gca.2023.10.029>

Conway, T., Fitzsimmons, J., Middag, R., Noble, T. and Planquette, H., 2024a. Introduction to the special issue on twenty years of GEOTRACES: An international study of the marine biogeochemical cycles of trace elements and isotopes. *Oceanography*, 37(2): 6-7.

Conway, T., Middag, R. and Schlitzer, R., 2024b. GEOTRACES: Ironing out the details of the oceanic iron sources. *Oceanography*, 37(2).

Please indicate if there is any forthcoming or planned GEOTRACES special issue publication

- n/a

Completed GEOTRACES PhD or Master theses (please include the URL link to the pdf file of the thesis, if available)

- Tian, H.-A., 2024. Sources and biogeochemistry of bio-active trace metals in the Southern Ocean and coastal Antarctica; perspectives from their isotopes. PhD completed 15 March 2024.

GEOTRACES presentations in international conferences

- Middag, R., Tian, H.-A., 2024. Trace metals in the Southern Ocean. Invited keynote oral presentation at the NL polar day, 23 April, 2024, The Hague, Netherlands.
- Conway, T.M., Hunt, H.R., Sieber, M., Tian, H.-a., Summers, B.A., Lanning, N.T., Steffen, J.M., Homoky, W.B., Fitzsimmons, J.N. and Middag, R., 2024. The Fe isotope case for sediments as an important marine Fe source, 2024 Goldschmidt Conference. GOLDSCHMIDT.
- Eich, C., van Manen, M., McCain, J.S.P., Jabre, L.J., van de Poll, W.H., Jung, J., Pont, S.B., Tian, H.-A., Ardiningsih, I. and Reichart, G.-J., 2024. Temperature-enhanced effects of iron on Southern Ocean phytoplankton. *EGUsphere*, 2024: 1-45.
- Humphreys, M.P., Adler, M.A., Temmerman, D., Middag, R. and Mienis, F., 2024. Carbon and nutrient exchange between the North Sea and Atlantic Ocean: the NoSE project, 2024 Ocean Sciences Meeting. AGU.
- Jabre, L., van Manen, M., Eich, C.U., van de Poll, W., Rowland, E., Brussaard, C.P., Middag, R. and Bertrand, E.M., 2024. Metaproteomic insights into elemental stoichiometry in a changing Southern Ocean, 2024 Ocean Sciences Meeting. AGU
- Tian, H.-A., van Manen, M., Bunnell, Z., Reichart, G.-J. Conway, T.M., and Middag, R., 2024. Isotopic Composition of Dissolved Fe in the Weddell Sea: Fate of Sedimentary Fe

and Evidence for its Transport. Oral presentation at the Ocean Science Meeting 2024, New Orleans, USA, 18-23 February

- Olivelli, A., Paul, M., Xu, H., Rijkenberg, M.J.A., Middag, R., Henderson, G., Weiss, D.J., van de Flierdt, T. and Rehkämper, M. Lead isotopes as tracers of anthropogenic pollution and oceanographic processes in the South Atlantic Ocean. Oral presentation at the Ocean Science Meeting 2024, New Orleans, USA, 18-23 February
- B. Rabe, M. Janout, Lars-Eric Heimbürger, Rob Middag, Ellen Damm, Sinhue Torres Valde, Kirstin Schulz. Does turbulence matter to vertical mass fluxes in the central Arctic Ocean? A case example from 2015. Poster presentation at the Ocean Science Meeting 2024, New Orleans, USA, 18-23 February.
- Middag, R., Liao, W.-H., Zitoun, R. and Laan, P., 2023. Distribution of dissolved Fe and Mn in the Atlantic-Arctic transition zone. Oral presentation at the Goldschmidt 2023 Conference, Lyon, France, 9-14 July.
- Tian, H.-A., van Manen, M., Bunnell, Z., Jung, J.Y., Kim, T.-W., Conway, T.M., Reichart, G.-J. and Middag, R., 2023. Isotopic insights for external iron sources and biogeochemical cycling in the Amundsen Sea Polynyas. Oral presentation at the Goldschmidt 2023 Conference, Lyon, France, 9-14 July.
- Xu, H., van de Flierdt, T., Rehkämper, M., Weiss, D., Moore, R.E. and Middag, R., 2023. Seawater Pb concentrations and isotope compositions in the western tropical North Atlantic (GEOTRACES cruise GA02,). poster presentation at the Goldschmidt 2023 Conference, Lyon, France, 9-14 July.
- Tissot, F.L., Kipp, M.A., Li, H., Ellwood, M.J., John, S.G., Middag, R. and Adkins, J.F., 2023. Reappraising the U isotope composition of seawater and deep-sea corals: Implications for paleo-environmental reconstructions. Oral presentation at the Goldschmidt 2023 Conference, Lyon, France, 9-14 July.
- Olivelli, A., Murphy, K., Bridgestock, L., Wilson, D.J., Rijkenberg, M., Middag, R., Weiss, D.J., van de Flierdt, T. and Rehkämper, M. Decline of anthropogenic lead in South Atlantic Ocean surface waters from 1990 to 2011: New constraints from concentration and isotope data. Oral presentation at the Goldschmidt 2023 Conference, Lyon, France, 9-14 July.

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