

ANNUAL REPORT ON GEOTRACES ACTIVITIES IN THE NETHERLANDS

May 1st, 2021 to April 30th, 2022

New GEOTRACES or GEOTRACES relevant scientific results

- Progress is being made with the interpretation and publication of results from cruises ANA08B and PS117
- Sample analysis of the Metalgate cruise samples is ongoing
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GEOTRACES or GEOTRACES relevant cruises

- Metalgate cruise 64PE474 Reykjavik (Iceland) 17-07-2021 to Reykjavik (Iceland) 16-08-2021. GEOTRACES process study GApr16
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New projects and/or funding

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GEOTRACES workshops and meetings organized (Please include the number of early career researchers involved in each event, when possible)

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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)

- Session in the Bètapartnersconferentie for high school teachers ‘Chemie en Natuurkunde in de Oceaan; De basis van het leven. (in Dutch; 17/03/2021)
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Other GEOTRACES activities

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New GEOTRACES or GEOTRACES-relevant publications (published or in press) (Please identify those publications acknowledging SCOR funding and for these publications include the number of PhD or postdoc students involved, if possible)

- Joy-Warren, H.L., Alderkamp, A.-C., van Dijken, G.L., J. Jabre, L., Bertrand, E.M., Baldonado, E.N., Glickman, M.W., Lewis, K.M., Middag, R., Seyitmuhammedov, K., Lowry, K.E., van de Poll, W. and Arrigo, K.R., 2022. Springtime phytoplankton responses to light and iron availability along the western Antarctic Peninsula. *Limnology and Oceanography*, 67(4): 800-815.
- Krusch, S., Hopwood, M.J., Roig, S., Gerringa, L.J.A., Middag, R., Rutgers van der Loeff, M.M., Petrova, M.V., Lodeiro, P., Colombo, M., Cullen, J.T., Jackson, S.L., Heimbürger-Boavida, L.-E. and Achterberg, E.P., 2022. Arctic – Atlantic Exchange of the Dissolved Micronutrients Iron, Manganese, Cobalt, Nickel, Copper and Zinc With a Focus on Fram

Strait. *Global Biogeochemical Cycles*, 36(5): e2021GB007191 Kleint, C., Zitoun, R., Neuholz, R., Walter, M., Schnetger, B., Klose, L., Chiswell, S.M., Middag, R., Laan, P., Sander, S., and Koschinsky, A., in press. Trace metal dynamics in shallow hydrothermal plumes at the Kermadec arc. accepted in *Frontiers in Marine Science*.

- Middag, R., Rolison, J.M., George, E., Gerringa, L.J.A., Rijkenberg, M.J.A. and Stirling, C.H., 2022. Basin scale distributions of dissolved manganese, nickel, zinc and cadmium in the Mediterranean Sea. *Marine Chemistry*, 238: 104063.
- Seyitmuhammedov, K., Stirling, C.H., Reid, M.R., van Hale, R., Laan, P., Arrigo, K.R., van Dijken, G., Alderkamp, A.-C., and Middag, R., 2022. The distribution of Fe across the shelf of the Western Antarctic Peninsula at the start of the phytoplankton growing season. *Marine Chemistry*: 104066.
- Gerringa, L.J.A., Rijkenberg, M.J.A., Slagter, H.A., Laan, P., Paffrath, R., Bauch, D., Rutgers van der Loeff, M. and Middag, R., 2021. Dissolved Cd, Co, Cu, Fe, Mn, Ni, and Zn in the Arctic Ocean. *Journal of Geophysical Research: Oceans*, 126(9): e2021JC017323.
- Baker, A.R., Kanakidou, M., Nenes, A., Myriokefalitakis, S., Croot, P.L., Duce, R.A., Gao, Y., Guieu, C., Ito, A., Jickells, T.D., Mahowald, N.M., Middag, R., Perron, M.M.G., Sarin, M.M., Shelley, R. and Turner, D.R., 2021. Changing atmospheric acidity as a modulator of nutrient deposition and ocean biogeochemistry. *Science Advances*, 7(28): eabd8800
- Zitoun, R., Achterberg, E.P., Browning, T.J., Hoffmann, L.J., Kirsch, S., Sander, S. G., and Koschinsky, A. (2021). The complex provenance of Cu-binding ligands in the South-East Atlantic. *Marine Chemistry*, 237, 104047
- Lenstra, W.K., N.A.G.M van Helmond, O.M. Żygadłowska, R. Van Zummeren, R. Witbaard, C.P. Slomp. 2022. Sediments as a source of iron, manganese, cobalt and nickel to continental shelf waters (Louisiana, Gulf of Mexico). *Frontiers in Marine Science*. *Front. Mar. Sci.* 9:811953. doi: 10.3389/fmars.2022.811953

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

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GEOTRACES presentations in international conferences

- Dale, D., Macrander, A., Ólafsdóttir, S., Middag, R., Casacuberta Arola, N.. Using anthropogenic radionuclides to trace ocean circulation around Iceland. Poster presentation at the 2022 Arctic-Subarctic Ocean Fluxes meeting, 9-11 May, Hafnarfjörður (Iceland).
- Jones, R.L., Annett, A., Jariel, C., Lohan, M., Middag, R.. Investigating the behaviour of iron during sediment resuspension along the Denmark Strait and the Greenland Shelf. *Goldschmidt 2022*.
- Eich, C., Middag, R., and Brussaard, C.P.D. Ecological importance of viral lysis as a loss factor for phytoplankton in the Amundsen Sea. Poster presentation at the 2022 Marine Microbes GRC, 29-05-2022, Switzerland.
- Middag, R., Ardiningsih, I., Bertrand, E.M., Brussaard, C.P.D., Eich, C.U.M, Jung, J., Kim, T., Lee, S., Lee, Y., van Manen, M.H., McCain, J.S.P., Tian, H.A. Effects of Iron and Temperature on Antarctic Phytoplankton. Oral Presentation at the 2022 Ocean Science Meeting, 28-02-2020, online, USA.

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