

## ANNUAL REPORT ON GEOTRACES ACTIVITIES IN NORWAY

April 1st, 2018 to March 31st, 2019

### ***Cruises***

August 2018; first cruise in The Nansen Legacy program to Arctic (the Barents sea); Trace metal (including Fe, Hg and others) sampling. Preliminary data collected from an August 2018 cruise indicate an average total mercury concentration of  $0.86 \pm 0.21$  pM in the upper 500m of the water column in the Northern Barents Sea.

### ***New GEOTRACES-related projects and/or funding***

#### ***Funded projects***

- The nature of particulate iron inputs in high Arctic fjord during the spring season (Svalbard)
- SophyCO<sub>2</sub>: Southern Ocean phytoplankton community characteristics, primary production, CO<sub>2</sub> flux and the effects of climate change (Funded by Research Council Norway and South African National Research Foundation as part of the SANOCEAN bilateral research cooperation between Norway and South Africa on ocean research)
- Coast-LaB : Impact of land-based activities to the coastal environment: Seawater desalination and wastewater discharge.(part of SANOCEAN)
- H<sub>2</sub>O<sub>2</sub> dynamic in the coastal system.

#### ***Submitted applications***

- AtoMS: An Autonomous trace-Metal-clean seawater Sampler to study iron and mercury dynamics in the Arctic (submitted to Research Council Norway, 10 April 2019).

### ***Outreach activities conducted***

[Sailing for Science](#) cruise (10 students and M. Ardelan) to the Dodecanese islands in the southeastern Aegean Sea: Sailing for Science is a citizen science initiative brainchild of Dr Murat Ardelan at the Norwegian University of Science and Technology in Trondheim. The goal of the project is to facilitate interdisciplinary marine research and offer students the opportunity to take part in hands on science cruises on citizen sail boats. Topics of interest include organic contamination, trace metal analysis, impacts of tourism on marine chemistry, phytoplankton studies and the impacts of microplastics.

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

- Christoph Heinze, Tatiana Ilyina, and Marion Gehlen (2018. The potential of <sup>230</sup>Th for detection of ocean acidification impacts on pelagic carbonate production Biogeosciences, 15, 3521-3539. <https://doi.org/10.5194/bg-15-3521-2018>
- Sanchez N, Ardelan MV, Reiss CS, Bizsel C, Holm-Hansen O. 2019. Fe distribution around the South Orkneys Islands Scotia Sea in the Southern Ocean along the 2008 International polar year (IPY) AMLR survey, ready for submission.
- Hopwood M, Santana-González, C, Gallego-Urrea J, Sanchez N, Achterberg E, Ardelan MV, Gledhill M, González-Dávila M, Hoffmann L, Leiknes Ø, Santana-Casiano JM,

- Tsagaraki T, and Turner D. 2019. Trace chemical species in marine incubation experiments, part B. Fe(II) stability in seawater. Submitted to Biogeoscience.
- Szymczak-Żyła M, Krajewska M, Witak M, Ciesielski T, Ardelan MV, Jenssen BM, Goslar T, Winogradow A, Filipkowska A, Lubecki L, Kowalewska G. 2019. Present and Past-Millennial Eutrophication in the Gulf of Gdańsk (Southern Baltic Sea), in print, *Paleoceanography and Paleoclimatology*.
  - Sanchez N, Peterson C, Gonzalez SV, Vadstein O, Olsen Y, Ardelan MV. 2019 Effect of hydroxamate and catecholate siderophores on iron availability in the diatom *Skeletonema costatum*: Implications of siderophore degradation by associated bacteria. in print *Marine Chemistry*.
  - Kleiven W, Johnsen, G, and Ardelan MV, 2019, Elemental composition in phaeo-, chloro- and rhodophytes in winter and spring. In print *Journal of Phycology*.
  - Sanchez N, Ardelan MV, Bizsel N, Iriarte JL, Olsen LM. 2019. Iron cycling in a mesocosm experiment in a north Patagonian fjord: Potential effect of ammonium addition by salmon aquaculture. In print, *Estuarine, Coastal and Shelf Science*.
  - Hopwood M, Sanchez N, Polyviou D, Leiknes Ø, Gallego-Urrea J, Achterberg E, Ardelan MV, Aristegui J, Bach L, Besiktepe S, Heriot Y, Kalantzi I, Kurt T, Santi I, Tsagaraki T, and Turner D. 2018. Trace chemical species in marine incubation experiments, part A. Experiment design and bacterial abundance control extracellular H<sub>2</sub>O<sub>2</sub> concentrations. Accepted for publication in *Biogeoscience*.
  - Filipkowska A, Lubecki L, Szymczak-Żyła M, Ciesielski T, Jenssen BM, Ardelan MV, Mazur-Marzec H, Breedveld GD, Oen AMP, Zamojska A, Kowalewska G. 2018. Multi-proxy investigation of recent sediments in two different European coastal areas (Poland, Norway) – anthropogenic impact on ecosystem health. In print, *Marine Pollution Bulletin*.
  - Sanchez N, Brown EA, Olsen Y, Vadstein O, Iriarte JL, Gonzalez HE and Ardelan MV 2018. Effect of Siderophore on Iron Availability in a Diatom and a Dinoflagellate Species: Contrasting Response in Associated Bacteria. *Front. Mar. Sci.* 5:118. doi: 10.3389/fmars.2018.00118.
  - Bizsel N, Ardelan, M. V, Bizsel K. C, Suzal A, Demirdağ A, Sarica D. Y, and Steinnes E. 2018. Distribution and removal of selenium in the plume of the Gediz River, Izmir Bay, Aegean Sea, *Journal for Marine Research*. 75: 81-98(18).

#### ***Completed GEOTRACES Master theses (at NTNU)***

- Andrea Faltynkova, 2018. Mobility of Elements at the Sediment Water Interface in a Simulated Sub-Seabed CO<sub>2</sub> Seepage Site.
- Ayten Pehlivan, 2018. Iron Acquisition in Cynobacteria *Synechococcus* sp. PCC 7002 Culture.
- Maria Villegas, 2018. Determination of Fe(II) and Fe(III) in *Synechococcus* sp. PCC 7002 culture.
- Dunia Rios Yunes, 2018. The impact of high CO<sub>2</sub> and low pH on the organic carbon characterization.

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