

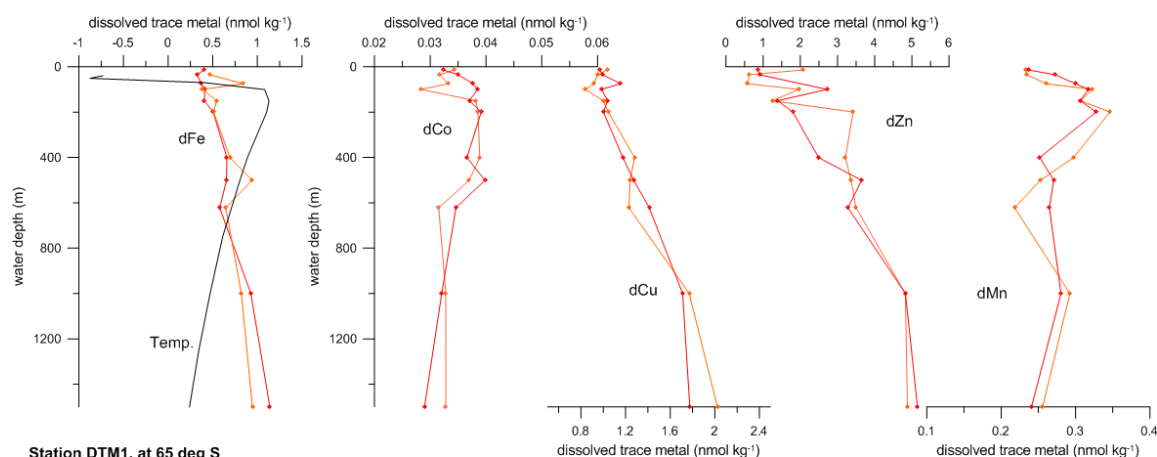
ANNUAL REPORT ON GEOTRACES ACTIVITIES IN SOUTH AFRICA

June 1st, 2015 to April 30th, 2016

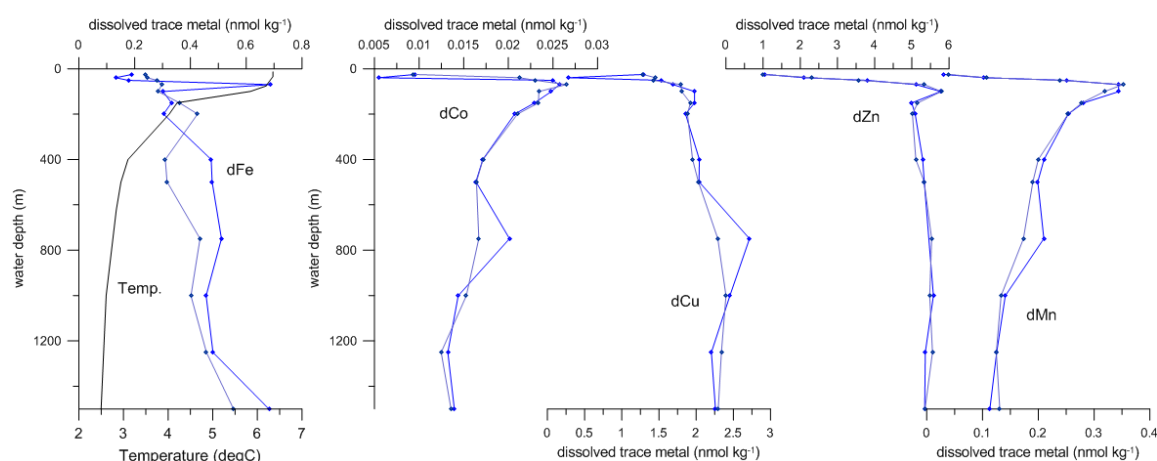
New results

Vertical profiles for Cu, Cd, Co, Fe, Mn and Zn were produced for the Southern Atlantic (Roychoudhury et al. unpublished)

Station DTM2, at 46 deg S



Station DTM1, at 65 deg S



New publications

- Von der Heyden, B. and Roychoudhury A. N. (2015) A review of colloidal iron partitioning and distribution in the open ocean, *Marine Chemistry*, V177(1), pp. 9-19, doi:10.1016/j.marchem.2015.05.010
- Von der Heyden, B. and Roychoudhury A. N. (2015) Application, Chemical Interaction and Fate of Iron Minerals in Polluted Sediment and Soils. *Current Pollution Reports*, V 1, pp. 265-279, doi: 10.1007/s40726-015-0020-2
- von der Heyden, B.; Roychoudhury, A. N., Tyliszczak, T.; Myneni, S. C. (Submitted) Iron L3-edge spectroscopic evaluation of iron oxide and oxy-hydroxide coordination. *American mineralogist*

- Das, S., Roychoudhury, A. N., Routh, J., Veldhuis, M. J. W., Ismail, H. E. (Submitted) Connection of pigment biomarkers and dissolved trace elements to primary production in southern Benguela Upwelling zone (St. Helena Bay). *Journal of Marine Systems*.

Meetings

- S. Fietz, R. Cloete, J. Loock, R. Philibert, A.N. Roychoudhury, N. van Horsten, T. Mtshali, S. Thomalla (2016) Response of Southern Ocean Phytoplankton to iron and light limitation 34th SCAR Biennial Meeting, Kuala Lumpur, Malaysia, August 22 – 26, 2016
- R. Cloete, J. Loock, T. Mtshali, S. Fietz, A.N. Roychoudhury (2016) The distribution and controls of bioactive trace elements (Cu and Zn) in the Atlantic Sector of the Southern Ocean. 34th SCAR Biennial Meeting, Kuala Lumpur, Malaysia, August 22 – 26, 2016
- J. Loock, R. Cloete, T. Mtshali, S. Fietz, A.N. Roychoudhury (2016) The seasonal distribution and controls of bioactive trace elements cadmium and cobalt in the southern ocean, Atlantic sector. 34th SCAR Biennial Meeting, Kuala Lumpur, Malaysia, August 22 – 26, 2016
- S. Fietz, R. Cloete, J. Loock, R. Philibert, A.N. Roychoudhury, N. van Horsten, T. Mtshali, S. Thomalla (2016) Response of Southern Ocean Phytoplankton Communities to Trace Metal and Light Availability. Ocean Sciences Meeting, New Orleans, USA February 21 – 26, 2016

Cruises

- SANAE 55 (Southern Ocean physics and biogeochemistry) cruise was undertaken along the BONUS-GOODHOPE line in the Southern Ocean to support the following projects (Dec 2014 – Feb 2015):
 1. Seasonal Cycle of Carbon in Southern Ocean – SNA2011112600001
 2. Fe and light limitation in Southern Ocean phytoplankton – SNA2011120600005
 3. Bioactive trace elements in Southern Ocean – SNA2011110100001
 4. Stratification dynamics in the Southern Ocean mixed layer: a high resolution approach – YREF 0000005441
 5. Southern Ocean Phytoplankton Adaption to mimicked future changes in light and iron availability - Molecular bases and modelling – SANCOOP 234229
 6. Bio-optics - SNA2011120800004

During this cruise, samples for GEOTRACES process study SOSCEX were also collected. As per SOSCEX III objectives, multiple occupations of the same two stations were carried out in the winter early, mid and late summer that aim to resolve the seasonal evolution of the Fe profile/ferricline in the SAZ.

New funding

- Fietz, S and Roychoudhury AN (2016) Southern Ocean Ecosystem response to dust input, NRF Competitive Rated Researcher Grant R 1,277,000
- Roychoudhury AN (2015) ICP-MS mass spectrometer for ultra-trace metal analysis. National Equipment Program, NRF, R 2,699,000

- Roychoudhury AN (2015-2017) Speciation and interaction of iron nanoparticles in Southern Ocean, SANAP, R 1,353,500
- Roychoudhury AN (2014 – 2016) Iron nanoparticles in environment, NRF Competitive Rated Researcher Grant, R 1,427,220
- Fietz, S and Roychoudhury, AN (2014- 2016) Southern Ocean Phytoplankton adaption to mimicked future changes in light and iron availability – molecular bases and modeling, South Africa – Norway bilateral grant, R 2,421,712 + NOK 1,453,027

Other activities (e.g., acquisition of new sampling systems)



A pico-Fast[®] system acquired last year for pre-concentration of sea-water samples for trace elemental analysis using ICP-MS is functioning successfully. SAFe standard and other internal standards have been analyzed repeatedly and data for Co, Cu, Zn, Cd, Mn and Fe has been sent for comparison of consensus values.

Report submitted by AN Roychoudhury (roy@sun.ac.za).