

ANNUAL REPORT ON GEOTRACES ACTIVITIES IN AUSTRALIA
JUNE 2013 – JUNE 2014

Meetings

- GEOTRACES presentations by Australian scientists at the AGU/ASLO/TOS Ocean Sciences meeting (Honolulu, USA, February 2014), the SOLAS Summer School 2013, (Xiamen, China, September 2013), the Australian Meteorological and Oceanographic Society national conference (Hobart, February 2014) and the International Symposium on Sea Ice in a Changing Environment (Hobart, March 2014).

New funding

- Shiptime funding from the Marine National Facility for a 2-month research expedition in austral summer 2014-15 to study hydrothermalism and biospheric impacts around Heard/McDonald Islands in the Southern Ocean. GEOTRACES parameters will be sampled and the project will be proposed as a GEOTRACES Process Study 2014 SSC meeting.
- Several research voyages (including GEOTRACES process studies) proposed to the Marine National Facility and Australian Antarctic Science (results announced in the second half of 2014)
- The Antarctic Climate & Ecosystems Cooperative Research Centre (ACE CRC) has been refunded for 5 more years from 2014-2019, which will include future Australian GEOTRACES process studies.
- Funding for GEOTRACES activities in Australia continues to be tight, with most projects carried out using small University research funds and grants from the Australian Research Council. No dedicated national funds available for GEOTRACES activities, and currently a shortage of ‘GEOTRACES researchers’ nationally to undertake full sections.

New results

- Results of the French-led GEOTRACES Process Study KEOPS-2 (GIpr01; Project PI Stephane Blain), a natural iron fertilisation experiment around the Kerguelen Islands in the Southern Ocean will be submitted to a Biogeosciences special issue (deadline end June 2014).
- GEOTRACES GP13 (a zonal section in Southwest Pacific Ocean along approximately 30oS) data synthesis workshop to be held in July 2014.
- Submission of data from Australian cruises GIPY2 (au0703), GIPY3 (au0701), GIPY6 (au0806) and GPpr02 (SS10_v01 PINTS) to GDAC for the GEOTRACES Intermediate Data Product.
- Continuing analyses from SIPEX-2 (GIpr02), a multidisciplinary biogeochemistry experiment examining the role of Antarctic sea ice as a natural ocean fertilizer during the spring in the sea ice zone near east Antarctica in Sep/Oct 2012.
- Participation in the GEOTRACES intercalibration exercises for marine particulate trace elements (led by Phoebe Lam).

New publications (involving Australian GEOTRACES researchers)

- Tagliabue A., Sallee J.-B., Bowie A.R., Lévy M., Swart S., Boyd P.W., 2014. Surface water iron supplies in the Southern Ocean sustained by deep winter mixing. *Nature Geoscience* 7, 314–320. doi:10.1038/ngeo2101
- Queroue F., Townsend A., van der Merwe P., Lannuzel D., Sarthou G., Bucciarelli E., Bowie A.R., 2014. Advances in the offline trace metal extraction of Mn, Co, Ni, Cu, Cd,

and Pb from open ocean seawater samples with determination by Sector Field ICP-MS analysis. *Analytical Methods* 6, 2837-2847. doi:10.1039/C3AY41312H

- Hassler C.S., Ridgway K., Bowie A.R., Butler E.C.V., Clementson L., Doblin M.A., Davies D.M., Law C.S., Ralph P., van der Merwe P., Watson R., Ellwood M., 2014. Primary productivity induced by iron and nitrogen in the Tasman Sea – An overview of the PINTS expedition. *Marine and Freshwater Research*, in press, doi:10.1071/MF13137
- Ellwood M.J., Nodder S.D., King A., Hutchins D.A., Wilhelm S.W., Boyd P.W., 2014. Pelagic iron cycling during the subtropical spring bloom, east of New Zealand. *Marine Chemistry* 160, 18-33
- Thompson C.M., Ellwood M.J., Wille M., 2013. A solvent extraction technique for the isotopic measurement of dissolved copper in seawater. *Analytica Chimica Acta* 775: 106-113
- Thompson C.M., Ellwood M.J., Sander S.G., 2014. Dissolved copper biogeochemistry in the SW Pacific Ocean (Tasman Sea) Part I: organic copper speciation. *Marine Chemistry*, submitted
- Thompson C.M., Ellwood, M.J., 2014. Dissolved copper biogeochemistry in the SW Pacific Ocean (Tasman Sea) part II: stable copper isotope distributions and trends. *Marine Chemistry*, submitted
- Lannuzel D., van der Merwe P.C., Townsend A.T. and Bowie A.R., 2014. Size fractionation of iron, manganese and aluminium during a spring-summer time series in Antarctic fast ice. *Marine Chemistry*, in press
- Sedwick P.N., Sohst B.M., Ussher S., Bowie A.R., 2014. A zonal picture of the water column distribution of dissolved iron(II) during the U.S. GEOTRACES North Atlantic transect cruises. *Deep-Sea Research II*, submitted

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

- There has been a delay in the delivery of the new Australian oceanographic research vessel Investigator, which will now arrive in Hobart (Australia) in July 2014. The commissioning year will run through until end-2014.
- The ship has improved facilities to undertake GEOTRACES science, including new clean container laboratories, a clean underway supply, aerosol samplers, in situ pumps and a new Seabird trace metal rosette system. Procurement of new equipment is currently underway and should be completed by mid-2014.
- Australian scientists have worked closely with Seabird and Ocean Test Equipment (trace metal rosette), and McLane Research Laboratories (in situ pumps), to design improved sampling facilities for GEOTRACES parameters, including provision of a modified “Lam” intake baffle design for dual – head ISPs (6 ordered).

Submitted by Andrew Bowie (Andrew.Bowie@utas.edu.au).