

UK GEOTRACES 2013-2014 report



GEOTRACES meetings and presentations:

- Ocean Sciences 2014 (Hawaii, USA)
- Goldschmidt 2014 (Sacramento, USA)
- GA10 data synthesis meeting 8-9th Jan 2014 (Oxford, UK)
- Challenger Marine Science Conference, Plymouth 8-11th Sept (UK)

Outputs:

- 16 journal articles reporting GEOTRACES activities published/ accepted 2013-2014
- 3 PhD completions & 3 PhD submitted
- GA10 data in IDP

Cruises:

- Pa and Th samples from GEOVIDE to Oxford
- Shelf sea cruises put back until November

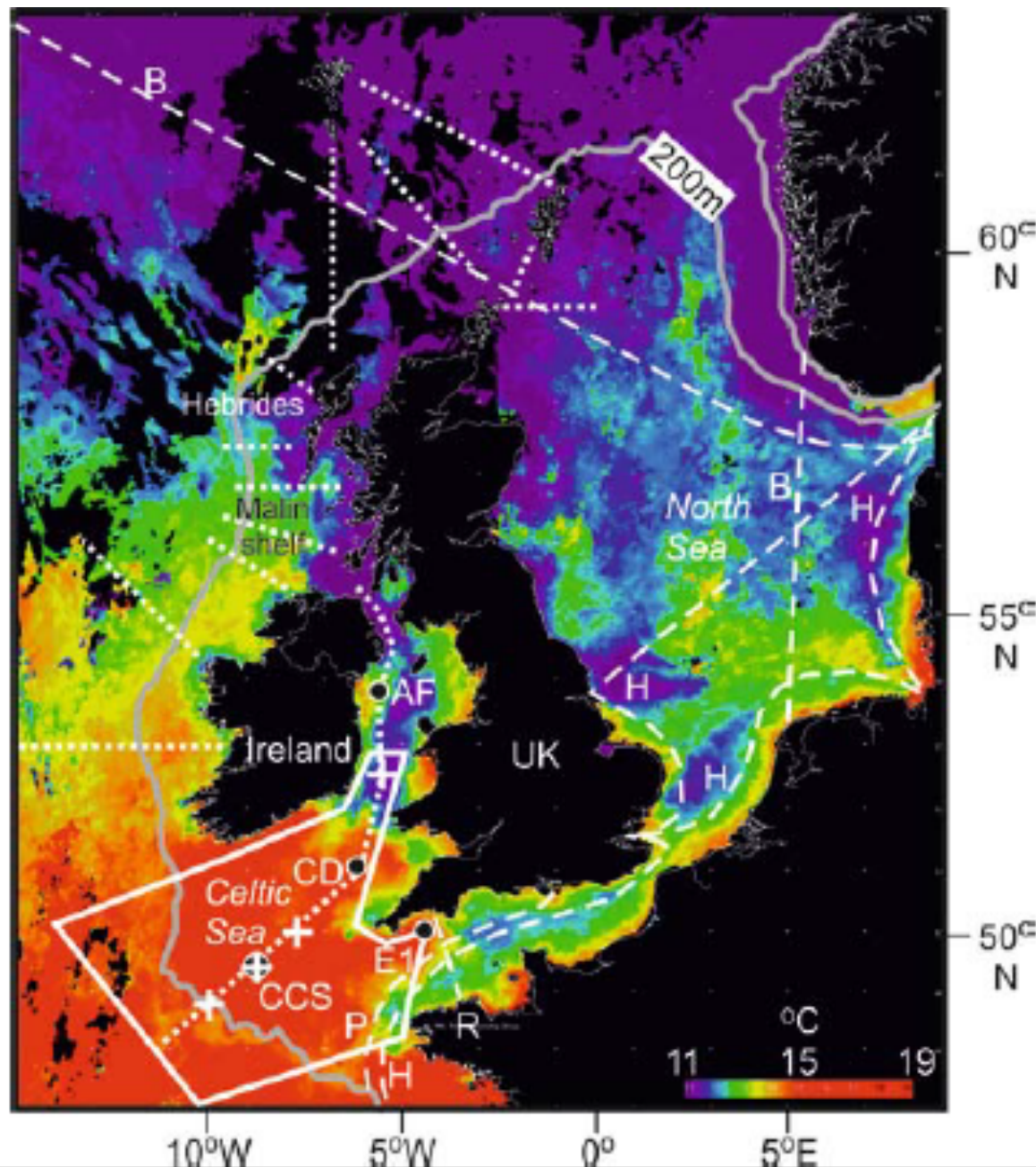
Funding:

- Process Study:-Shelf Sea Iron Biogeochemistry -1 cruises to be held in 2014 & 3 cruises in 2015
- Arctic proposal was not funded
- The impact of Mid-Ocean Ridges on the ocean's iron cycle (Tagliabue & Lohan)
Submitted to NERC July 2014
- Indian Ocean IIEO2 submitted to SPAG outline

Royal Society Science Meeting

- Biological and climatic impacts of ocean trace element chemistry
- 7th to 10th December 2015
- Gideon Henderson

Process Study: Shelf Sea Iron Biogeochemistry



Cruise Timetable:

DY018 -12/11/14-11/12/14

DY009 – 1/05/15-30/05/15

DY012 – 10/07/15-2/08/15



New Equipment and Ship



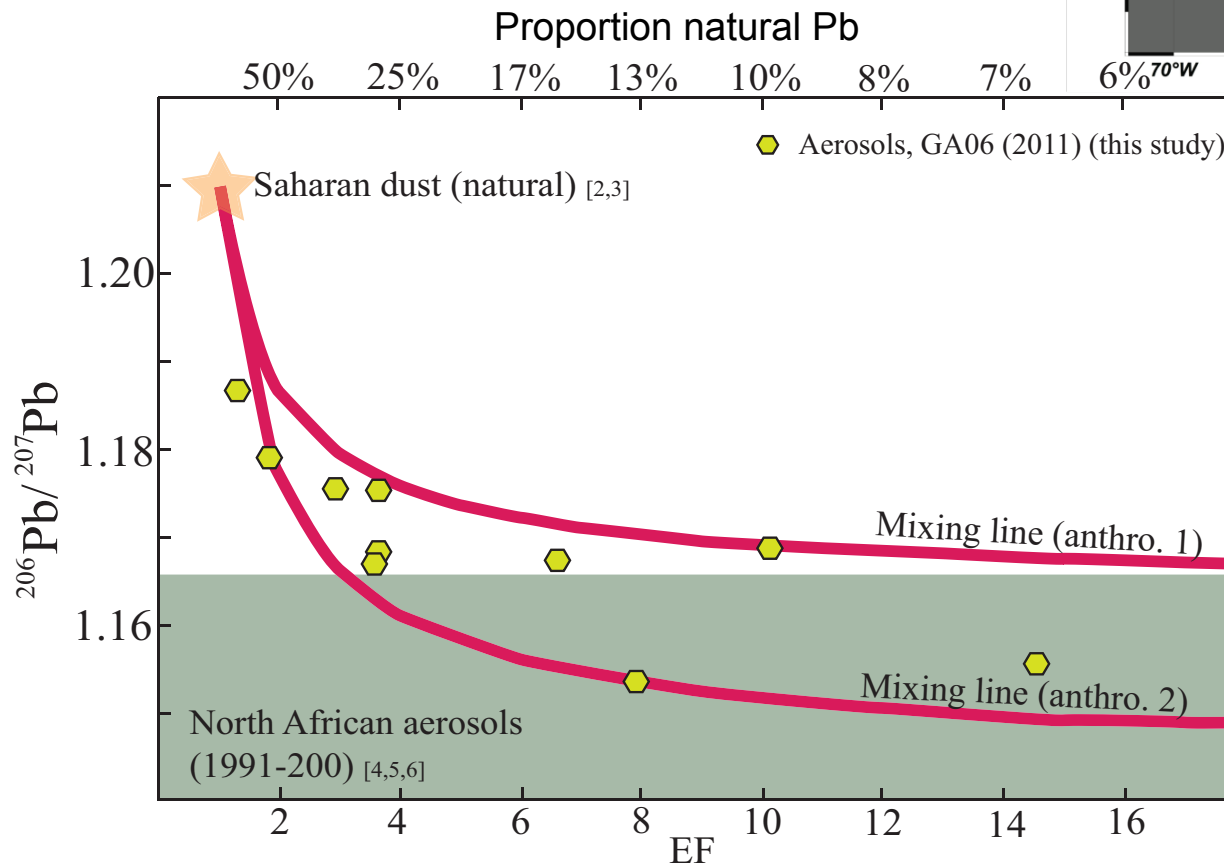
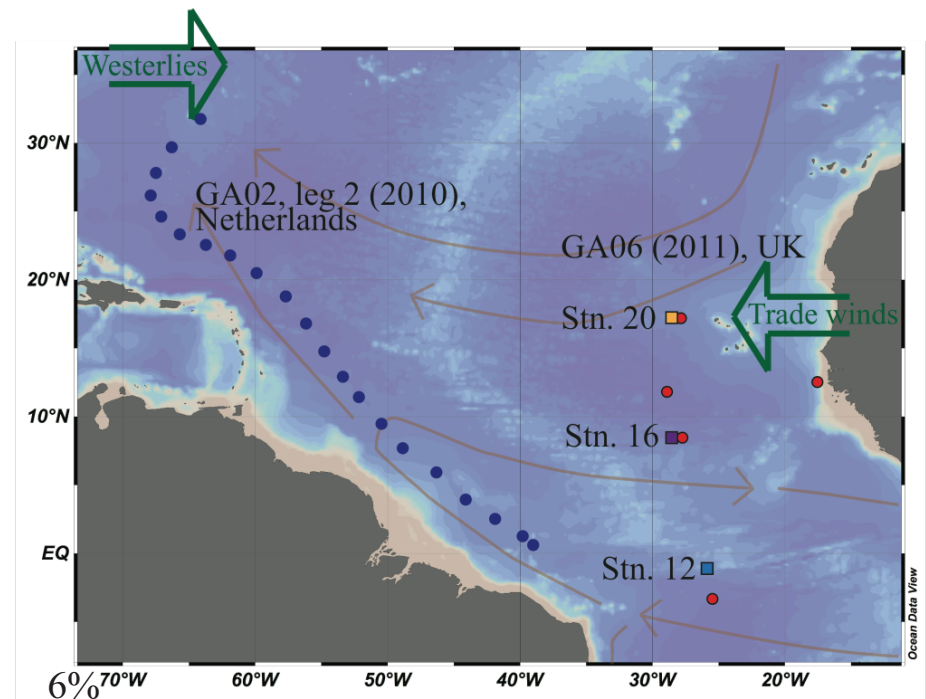
New Polar ice strengthen Ship –operational 2019 –will have trace metal clean operations
Operated by NERC's British Antarctic Survey

New conducting Kevlar winch installed on RSS Discovery and one which will be on the RSS Cook

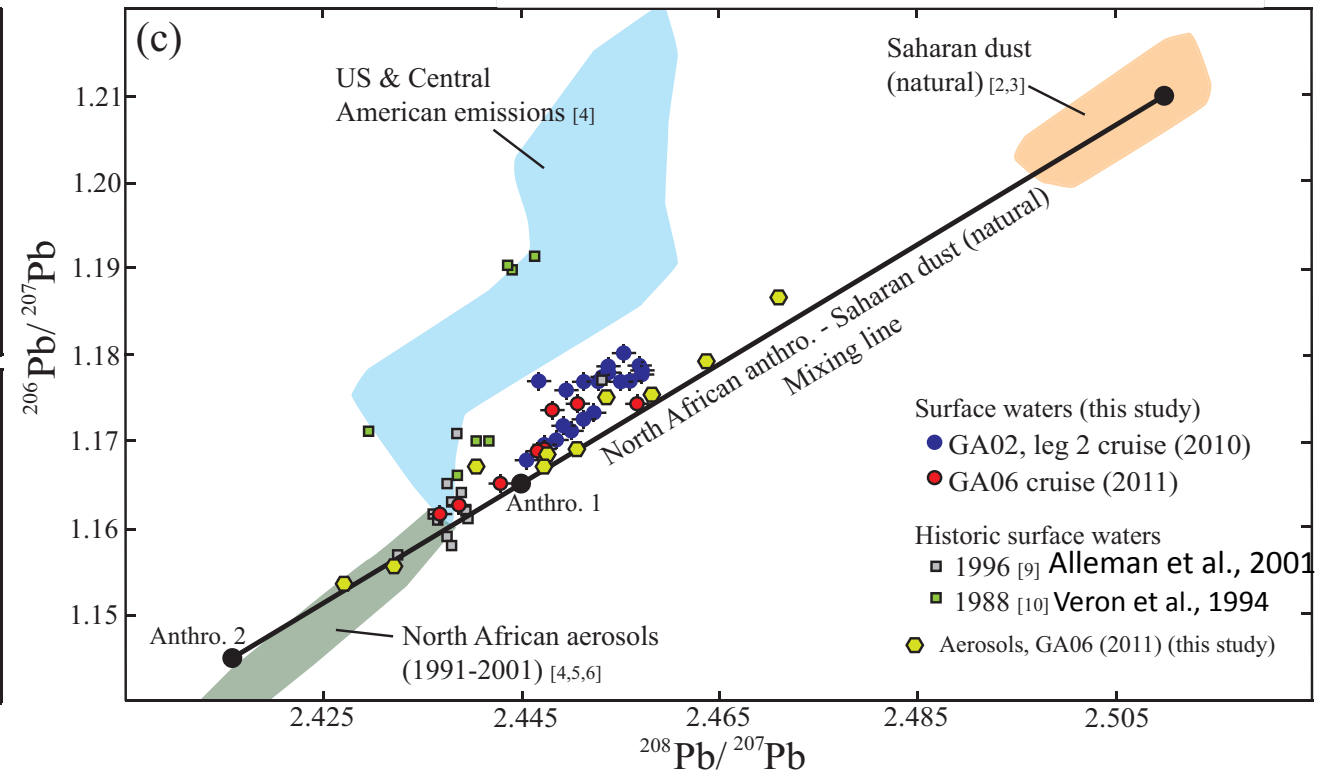
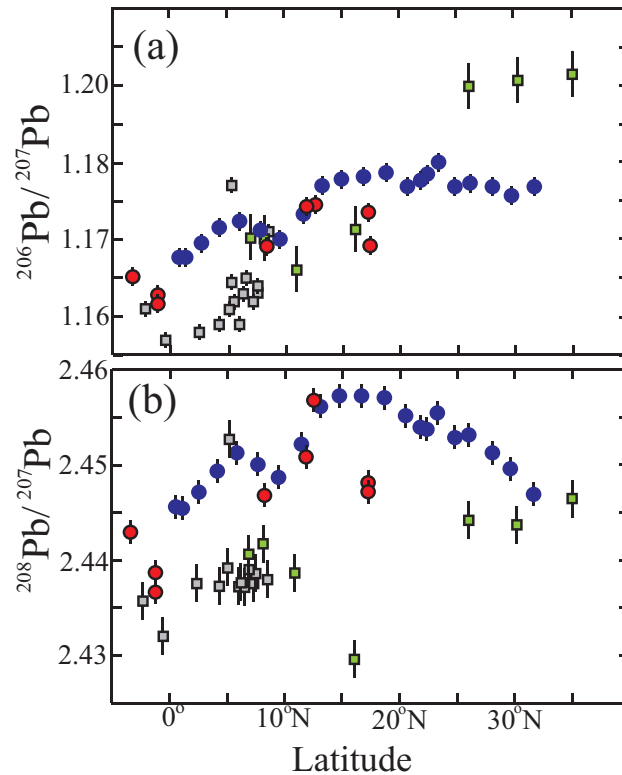
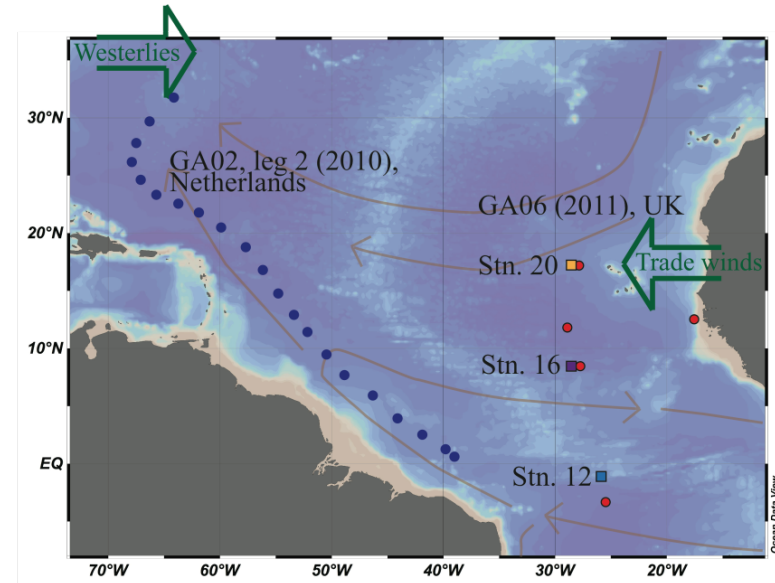
Changes in Pb inputs to the tropical Atlantic

L. Bridgestock, M. Paul, T. van de Flierdt, M. Rehkamper, R. Khondoker, R. Chance, A. Baker, S. Srekopytov, E. Williams, E. Achterberg, M.

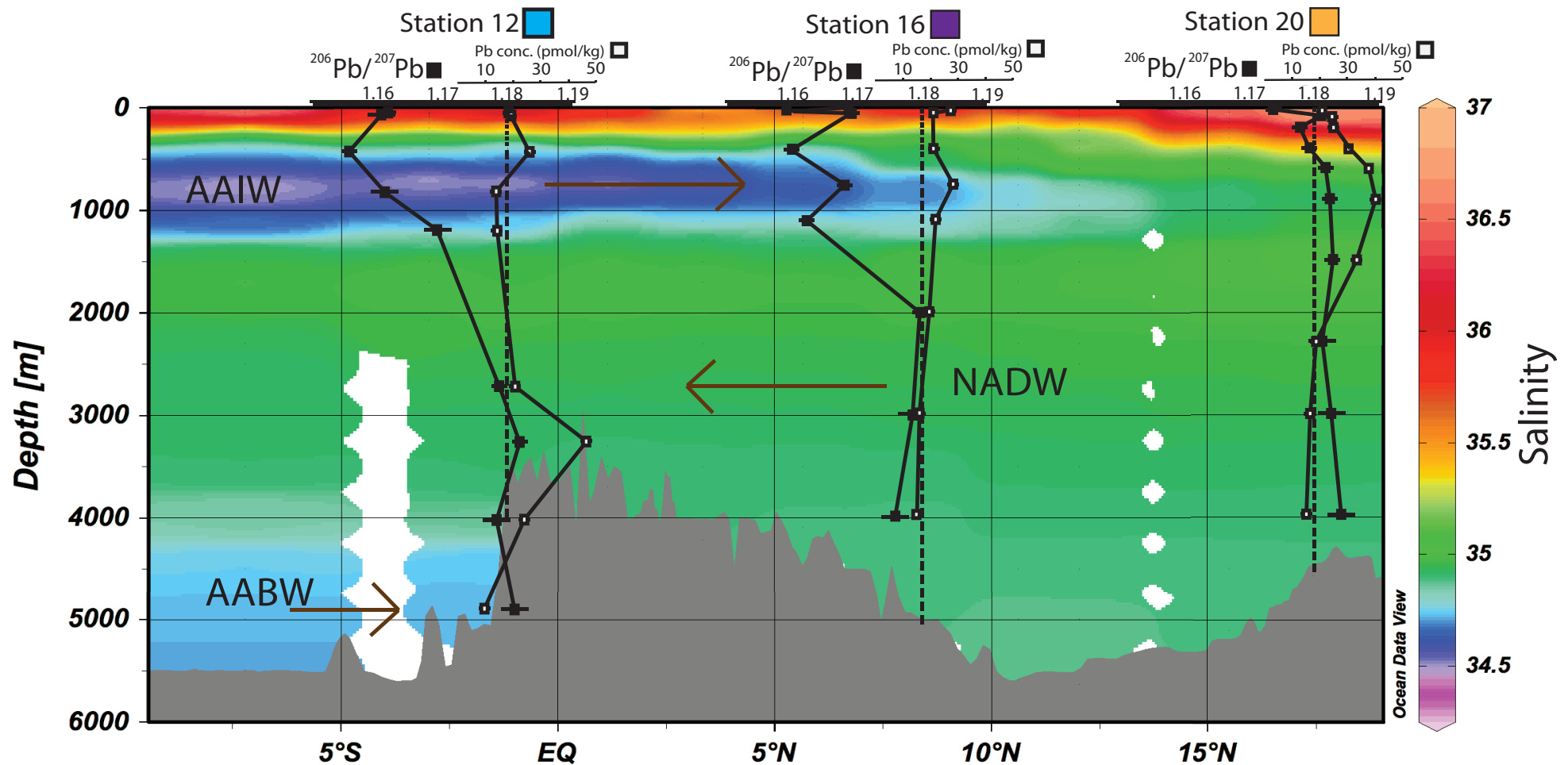
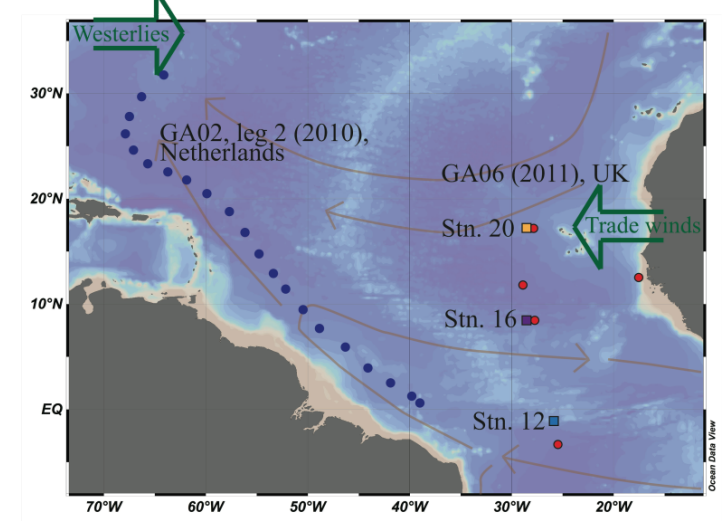
Rijkenberg, M. Lohan, H. de Baar



Changes in Pb inputs to the tropical Atlantic



Depth Profiles



Papers published

1. Hernandez-Sanchez, M. T., Homoky, W. B., Pancost, R. D., 2014. **Occurrence of 1-O-monoalkyl glycerol ether lipids in both oceanic waters and sediments.** *Organic Geochemistry* 63, 1-13.
2. Tagliabue Alessandro, O. Aumont and Laurent Bopp (2014) **The impact of different external sources of iron on the global carbon cycle.** *Geophysical Research Letters*
3. Tagliabue, Alessandro, J-B Sallée, A. R. Bowie, M. Lévy, S. Swart and P. W. Boyd (2014) **Surface water iron supplies in the Southern Ocean sustained by deep winter mixing.** *Nature Geoscience*
4. Hernández-Sánchez, M. T., LaRowe, D. E., Deng, F., Homoky, W. B., Browning, T. J., Pabortsava, K., Henderson, G. M., Mills, R. A., & Pancost, R. D. (2014) **Further insights into how sediment redox status controls the preservation and composition of sedimentary organic biomarkers.** *Organic Geochemistry*, doi:10.1016/j.orggeochem.2014.08.006.
5. Hernandez-Sanchez, M. T., Woodward, E. M. S., Taylor, K. W., Henderson, G., Pancost, R. D., 2014. **Variations in GDGT distributions through the water column in the South East Atlantic Ocean.** *Geochimica et Cosmochimica Acta*, 337-348.
6. Wyatt, N.W., Milne, A., Woodward, E.M.S., Rees, A.P., Browning, T.J., Bouman, H.A., Worsfold, P.J. & Lohan M.C. (2014). **Biogeochemical** cycling of dissolved zinc along the GEOTRACES South Atlantic transect GA10 at 40°S. *GBC*

Papers published

7. Browning, T.J., Bouman, H.A., Moore, C.M., Schlosser, C., Tarran, G.A., Woodward, E.M.S. and Henderson, G.M. (2014). Nutrient regimes control phytoplankton ecophysiology in the South Atlantic. *Biogeosciences* 11, 463-479. [doi:10.5194/bg-11-463-2014](https://doi.org/10.5194/bg-11-463-2014)
8. Browning, T.J., Bouman, H.A., Henderson, G.M., Mather, T., Pyle, D., Schlosser, C., Woodward, E.M. and Moore, (2014). **Nutrient Strong responses of Southern Ocean phytoplankton communities to volcanic ash.** *Geophysical Research Letters*, 41, 2581-2587 [doi:10.1002/2014GL059364](https://doi.org/10.1002/2014GL059364)
9. Deng, F., Thomas, A.L., Rijkenberg, M.J.A. and Henderson, G.M. (2014). **Controls on seawater ^{231}Pa , ^{230}Th and ^{232}Th concentrations along the flow paths of deep waters in the Southwest Atlantic.** *Earth Planet. Sci. Lett.* 390, 93-102.
10. Zhao, Y., Vance, D., Abouchami, W. and deBaar, H.J.W. (2014) **Biogeochemical cycling of zinc and its isotopes in the Southern Ocean.** *Geochemica et Cosmochimica Acta* 125, 653-672 doi: 10.1010/j.cgc.2013.07.045
11. Schlosser, C., Klar, J.K., Wake, B.D., Snow, J., Honey, D.J., Woodward, E.M.S., Lohan, M.C., Achterberg E.P. and Moore, C.M. (2013) **Seasonal ITCZ migration dynamically controls the location of the (sub-) tropical Atlantic biogeochemical divide.** *PNAS* doi: 10.1073/pnas.1318670111
12. Horner, T.J., Lee, R.B.Y., Henderson, G.M., Rickaby, R.E.M. (2013) **Nonspecific uptake and homeostasis drive the oceanic cadmium cycle.** *PNAS* 110, 2500-2505. [10.1073/pnas.1213857110](https://doi.org/10.1073/pnas.1213857110)
13. Painter, S.C., Henson, S.A., Forryan, A., Steigenberger, S., Klar, J., Stinchcombe, M.C., Rogan, N., Baker, A.R., Achterberg, E.P. and Moore, C.M. (2014) **An assessment of the vertical diffusive flux of iron and other nutrients to the surface waters of the subpolar North Atlantic.** *Biogeosciences*, 11, (8),2113-2130. ([doi:10.5194/bg-11-2113-2014](https://doi.org/10.5194/bg-11-2113-2014))

Papers published

14. Worsfold, P.W., Lohan, M.C., Ussher, S.J. & Bowie, A.R. (2014) Determination of dissolved iron; A historical review. Marine Chemistry
15. Van Hulst, M. M. P., Sterl, A., Middag, R., de Baar, H. J. W., Gehlen, M., Dutay, J.-C., and Tagliabue, Alessandro (2014) An improved ocean model of aluminium: the effects of circulation, sediment resuspension and biological incorporation. Biogeosciences
16. Tagliabue, Alessandro, R. G. Williams, N. Rogan, E. P. Achterberg, and P. W. Boyd (2014) A ventilation-based framework to explain the regeneration - scavenging balance of iron in the Ocean, . Geophysical Research Letters

Papers submitted

1. Le Moigne F.A.C., Pabortsava K., Marcinko C.L.J., Martin P., Sanders R. (2014) **Particulate organic carbon and mineral export fluxes: where does the “ballast effect” actually work in the ocean?** GRL
2. Milne, A.M. Schlosser, C., Wyatt, N.W., Chance, R., Baker, A. Klar, J., Achterberg, E.A., Lohan, M.C. **Eastern margin inputs of particulate and dissolved iron to the sub-tropical North Atlantic** Marine Chemistry
3. Maxence, P., Bridgestock, L., Rehkamper, M., van de Flierdt, T. & Weiss, D. **High-precision measurements of seawater Pb isotope compositions by double spike thermal ionization mass spectrometry.** Analytica Chimica Acta
4. Vance, D., Little, S.H., deSouza, G.F., Zhao, Y., Cullne, J.T. & Lohan, M.C. **The oceanic biogeochemical cycle of zinc and its isotopes: the dominance of Southern Ocean export.** Nature
5. Ellwood, M.J., Hutchins, D.F.A., Lohan, M.C., Milne, A.M., Nasemann, P., Nodder, S.D., Sander, S.G., Strezepek, R., Wilhelm, S.W. & Boyd. **Iron stable isotopes track pelagic iron cycling during a subtropical plankton bloom.** PNAS
6. Boyd, P. W., and Alessandro Tagliabue (2014) **Using the L* concept to explore controls on the relationship between paired ligand and dissolved iron concentrations in the ocean.** Marine Chemistry