

# Christopher M. Marsay

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## Education

- Ph.D. Oceanography, University of Southampton, 2009-2012  
Thesis: *Particulate trace metals, carbon and nitrogen in the mesopelagic*  
Advisors: Prof. Eric Achterberg and Dr. Richard Sanders
- M.Sc. Oceanography, University of Southampton, 2001-2002  
Dissertation: *The role of particles in the cycling and fate of phosphorus in estuarine waters*
- M.Chem. Chemistry with Study in Industry, University of Sheffield, 1997-2001

## Professional Experience

- 2020-present Research Professional, Skidaway Institute of Oceanography, University of Georgia.
- 2015-2020 Postdoctoral Research Associate, Skidaway Institute of Oceanography, University of Georgia (with Clifton Buck).
- 2013-2015 Postdoctoral Research Associate, Department of Earth & Ocean Sciences, University of South Carolina (with Seth John).
- 2012-2013 Postdoctoral Research Associate, Department of Ocean, Earth & Atmospheric Sciences, Old Dominion University (with Peter Sedwick).
- 2009-2012 Teaching Assistant, Ocean and Earth Sciences, University of Southampton.
- 2003-2008 Research Technician, Bermuda Institute of Ocean Sciences.

## Current and Pending Funding

- US GEOTRACES GP17-OCE and GP17-ANT: Atmospheric Deposition and Aerosol Fractional Solubility in Remote Ocean Regions, NSF-OCE, OCE-2049305, PI: Buck, Co-PI: Marsay (*submitted to NSF Chemical Oceanography*, August 2020, for \$488,656).
- Hawaii Aerosol Time-Series (HATS): Quantifying marine dust deposition and composition in an oligotrophic gyre, NSF-OCE, OCE-1949660, PI: Buck, Co-PIs: Marsay, Ohnemus, 09/01/2020-08/31/2024, \$1,074,114.

## Peer-reviewed Publications (*h-index 18 – Google Scholar, December 2020*)

29. Achterberg, E.P., S. Steigenberger, J.K. Klar, T.J. Browning, **C.M. Marsay**, S.C. Painter, L. Vieira, A.R. Baker, D.S. Hamilton, T. Tanhua, C. Mark Moore (IN PRESS). Trace element biogeochemistry in the high latitude North Atlantic Ocean: seasonal variations and volcanic inputs. *Global Biogeochemical Cycles*, <https://doi.org/10.1029/2020GB006674>
28. Sedwick, P.N., A.R. Bowie, T.M. Church, J.T. Cullen, R.J. Johnson, M.C. Lohan, **C.M. Marsay**, D.J. McGillicuddy, Jr., B.M. Sohst, A. Tagliabue, S.J. Ussher (2020). Dissolved iron in the Bermuda region of the subtropical North Atlantic Ocean: Seasonal dynamics, mesoscale variability, and physicochemical speciation. *Marine Chemistry*, 219, 103748, <https://doi.org/10.1016/j.marchem.2019.103748>

27. Gao, Y., **C.M. Marsay**, S. Yu, S. Fan, P. Mukherjee, C.S. Buck, W.M. Landing (2019). Particle-size variability of aerosol iron and impact on iron solubility and dry deposition fluxes to the Arctic Ocean. *Scientific Reports*, 9, 16653, <https://doi.org/10.1038/s41598-019-52468-z>
26. Buck, C.S., A. Aguilar-Islas, **C. Marsay**, D. Kadko, W.M. Landing (2019). Trace element concentrations, elemental ratios, and enrichment factors observed in aerosol samples collected during the US GEOTRACES eastern Pacific Ocean transect (GP16). *Chemical Geology*, 511, 212-224, <https://doi.org/10.1016/j.chemgeo.2019.01.002>
25. Kadko, D., A. Aguilar-Islas, C. Bolt, C.S. Buck, J.N. Fitzsimmons, L.T. Jensen, W. Landing, **C.M. Marsay**, R. Rember, A.M. Shiller, L.M. Whitmore, R. Anderson (2019). The residence time of trace elements determined in the surface Arctic Ocean during the 2015 US Arctic GEOTRACES expedition. *Marine Chemistry*, 208, 56-69, <https://doi.org/10.1016/j.marchem.2018.10.011>
24. **Marsay, C.M.**, A. Aguilar-Islas, J.N. Fitzsimmons, M. Hatta, L. Jensen, S. John, D. Kadko, W. Landing, N.T. Lanning, P.L. Morton, A. Pasqualini, S. Rauschenberg, R.M. Sherrell, A.M. Shiller, B.S. Twining, L. Whitmore, R. Zhang, C.S. Buck (2018). Dissolved and particulate trace elements in late summer Arctic melt ponds. *Marine Chemistry*, 204, 70-85, <https://doi.org/10.1016/j.marchem.2018.06.002>
23. **Marsay, C.M.**, D. Kadko, W.M. Landing, P.L. Morton, B.A. Summers, C.S. Buck. Concentration, provenance and flux of aerosol trace elements during US GEOTRACES Western Arctic cruise GN01 (2018). *Chemical Geology*, 502, 1-14, <https://doi.org/10.1016/j.chemgeo.2018.06.007>
22. Achterberg, E.P., S. Steigenberger, **C.M. Marsay**, F.A.C. Le Moigne, S.C. Painter, A.R. Baker, D.P. Connelly, C.M. Moore, A. Tagliabue, T. Tanhua (2018). Iron biogeochemistry in the High Latitude North Atlantic. *Scientific Reports*, 8(1), 1283, <https://doi.org/10.1038/s41598-018-19472-1>
21. Gomez-Saez, G.V., A.M. Pohlabein, A. Stubbins, **C.M. Marsay**, T. Dittmar (2017). Photochemical alteration of dissolved organic sulfur from sulfidic porewater. *Environmental Science & Technology*, 51(24), 14144-14154, <https://doi.org/10.1021/acs.est.7b03713>
20. **Marsay, C.M.**, P.J. Lam, M.I. Heller, J. Lee, S.G. John (2017). Distribution and isotopic signature of ligand-leachable particulate iron along the GEOTRACES GP16 East Pacific Zonal Transect. *Marine Chemistry*, 201, 198-211, <https://doi.org/10.1016/j.marchem.2017.07.003>
19. John, S.G., J. Helgoe, E. Townsend, T. Weber, T. DeVries, A. Tagliabue, K. Moore, P. Lam, **C.M. Marsay**, C. Till (2017). Biogeochemical cycling of Fe and Fe stable isotopes in the Eastern Tropical South Pacific. *Marine Chemistry*, 201, 66-76, <https://doi.org/10.1016/j.marchem.2017.06.003>
18. **Marsay, C.M.**, P.M. Barrett, D.J. McGillicuddy, P.N. Sedwick (2017). Distributions, sources and transformations of dissolved and particulate iron on the Ross Sea continental shelf during summer. *Journal of Geophysical Research – Oceans*, 122, <https://doi.org/10.1002/2017JC013068>
17. Fitzsimmons, J.N., S.G. John, **C.M. Marsay**, C. Hoffman, S. Nicholas, B.M. Toner, C.R. German, R.M. Sherrell (2017). Iron persistence in a distal hydrothermal plume supported by dissolved-particulate exchange. *Nature Geoscience*, 10(3), 195-201, <https://doi.org/10.1038/ngeo2900>
16. Giering, S.L.C., R. Sanders, A.P. Martin, S.A. Henson, J.S. Riley, **C.M. Marsay**, D. Johns (2017). Particle flux in the oceans: challenging the steady state assumption. *Global Biogeochemical Cycles*, 31(1), 159-171, <https://doi.org/10.1002/2016GB005424>
15. Ceballos-Romero, E., M. Villa-Alfageme, F.A.C. Le Moigne, S. Henson, **C.M. Marsay**, R.J. Sanders, R. Garcia-Tenorio (2016). Influence of bloom dynamics on particle export efficiency in the North Atlantic: a comparative study of radioanalytical techniques and sediment traps. *Marine Chemistry*, 186, 198-210, <https://doi.org/10.1016/j.marchem.2016.10.001>

14. Rogan, N., E.P. Achterberg, F.A.C. Le Moigne, **C.M. Marsay**, A. Tagliabue, R.G. Williams (2016). Volcanic ash as an oceanic iron source and sink. *Geophysical Research Letters*, 43, <https://doi.org/10.1002/2016GL067905>
13. **Marsay, C.M.**, R.J. Sanders, S.A. Henson, K. Pabortsava, E.P. Achterberg, R.S. Lampitt (2015). Attenuation of sinking particulate organic carbon flux through the mesopelagic ocean. *PNAS*, 112(4), 1089-1094, <https://doi.org/10.1073/pnas.1415311112>
12. McGillicuddy, D.J., P.N. Sedwick, M.S. Dinniman, K.R. Arrigo, T.S. Bibby, B.J.W. Greenan, E.E. Hofmann, J.M. Klinck, W.O. Smith, S.L. Mack, **C.M. Marsay**, B.M. Sohst, G.L. van Dijken (2015). Iron supply and demand in an Antarctic shelf ecosystem. *Geophysical Research Letters*, 42(19), 8088-8097, <https://doi.org/10.1002/2015GL065727>
11. Zhang, R., S.G. John, J. Zhang, J. Ren, Y. Wu, Z. Zhu, S. Liu, X. Zhu, **C.M. Marsay**, F. Wenger (2015). Transport and reaction of iron and iron stable isotopes in glacial meltwaters on Svalbard near Kongsfjorden: from rivers to estuary to ocean. *Earth and Planetary Science Letters*, 424, 201-211, <https://doi.org/10.1016/j.epsl.2015.05.031>
10. McDonnell, A.M.P., P.J. Lam, C.H. Lamborg, K.O. Buesseler, R. Sanders, J.S. Riley, **C. Marsay**, H.E.K. Smith, E.C. Sargent, R.S. Lampitt, J.K.B. Bishop (2015). The oceanic toolbox for the collection of sinking and suspended marine particles. *Progress in Oceanography*, 133, 17-31, <https://doi.org/10.1016/j.pocean.2015.01.007>
9. **Marsay, C.M.**, P.N. Sedwick, M.S. Dinniman, P.M. Barrett, S.L. Mack, D.J. McGillicuddy (2014). Estimating the benthic efflux of dissolved iron on the Ross Sea continental shelf. *Geophysical Research Letters*, 41(21), 7576-7583, <https://doi.org/10.1002/2014GL061684>
8. Giering, S.L.C., R. Sanders, R.S. Lampitt, T.R. Anderson, C. Tamburini, M. Boutrif, M.V. Zubkov, **C.M. Marsay**, S.A. Henson, K. Saw, K. Cook, D.J. Mayor (2014). Reconciliation of the carbon budget in the ocean's twilight zone. *Nature*, 507, 480-483, <https://doi.org/10.1038/nature13123>
7. Achterberg, E.P., C.M. Moore, S.A. Henson, S. Steigenberger, A. Stohl, S. Eckhardt, L.C. Avendano, M. Cassidy, D. Hembury, J.K. Klar, M.I. Lucas, A.I. Macey, **C.M. Marsay**, T.J. Ryan-Keogh (2013). Natural iron fertilization by the Eyjafjallajökull volcanic eruption. *Geophysical Research Letters*, 40, 921-926, <https://doi.org/10.1002/grl.50221>
6. Le Moigne, F.A.C., M. Villa-Alfageme, R.J. Sanders, **C. Marsay**, S. Henson, R. Garcia-Tenorio (2013). Export of organic carbon and biominerals derived from <sup>234</sup>Th and <sup>210</sup>Po at the Porcupine Abyssal Plain. *Deep-Sea Research Part I*, 72, 88-101, <https://doi.org/10.1016/j.dsr.2012.10.010>
5. Shelley, R.U., P.N. Sedwick, T.S. Bibby, P. Cabedo-Sanz, T.M. Church, R.J. Johnson, A.I. Macey, **C.M. Marsay**, E.R. Sholkovitz, S.J. Ussher, P.J. Worsfold, M.C. Lohan (2012). Controls on dissolved cobalt in surface waters of the Sargasso Sea: comparisons with iron and aluminum. *Global Biogeochemical Cycles*, 26, GB2020, <https://doi.org/10.1029/2011GB004155>
4. Riley, J.S., R. Sanders, **C. Marsay**, F.A.C. Le Moigne, E.P. Achterberg, A.J. Poulton (2012). The relative contribution of fast and slow sinking particles to ocean carbon export. *Global Biogeochemical Cycles*, 26, GB1026, <https://doi.org/10.1029/2011GB004085>
3. Sedwick, P.N., **C.M. Marsay**, B.M. Sohst, A.M. Aguilar-Islas, M.C. Lohan, M.C. Long, K.R. Arrigo, R.B. Dunbar, M.A. Saito, W.O. Smith, G.R. DiTullio (2011). Early season depletion of dissolved iron in the Ross Sea polynya: implications for iron dynamics on the Antarctic continental shelf. *Journal of Geophysical Research – Oceans*, 116, C12019, <https://doi.org/10.1029/2010JC006553>

2. Sedwick, P.N., N.S. Garcia, S.F. Riseman, **C.M. Marsay**, G.R. DiTullio (2007). Evidence for high iron requirements of colonial *Phaeocystis antarctica* at low irradiance. *Biogeochemistry*, 83, 83-97, <https://doi.org/10.1007/s10533-007-9081-7>
1. Sedwick, P.N., T.M. Church, A.R. Bowie, **C.M. Marsay**, S.J. Ussher, K.M. Achilles, P.J. Lethaby, R.J. Johnson, M.M. Sarin, D.J. McGillicuddy (2005). Iron in the Sargasso Sea (Bermuda Atlantic Time-series Study region) during summer: eolian imprint, spatiotemporal variability, and ecological implications. *Global Biogeochemical Cycles*, 19, GB4006, <https://doi.org/10.1029/2004GB002445>

## Manuscripts in Review/in Preparation

- **Marsay, C.M.**, E.P. Achterberg. Particulate iron and other trace elements in near-surface water of the high latitude North Atlantic following the 2010 Eyjafjallajökull eruption. *Manuscript in review at Marine Chemistry*.
- **Marsay, C.M.**, E.P. Achterberg, R. Sanders and members of the IBIS team. Sinking fluxes of trace elements and major biogenic phases in the upper ocean during the Irminger Basin Iron Study. *Manuscript in preparation*.
- Mukherjee, P., **C.M. Marsay**, S. Yu, C.S. Buck, W.M. Landing, Y. Gao. Characterization of the water-soluble inorganic and organic species on aerosols over the Arctic Ocean. *In preparation for submission to Earth and Space Science*.
- Jensen, L., C.S. Buck, **C.M. Marsay**, J.N. Fitzsimmons. Biogeochemical cycling of colloidal trace metals in the Arctic cryosphere. *Manuscript in preparation for submission to Journal of Geophysical Research: Oceans*.
- **Marsay, C.M.**, C.S. Buck, D. Kadko. Concentrations and deposition fluxes of aerosol trace elements during the 2018 U.S. GEOTRACES Pacific Meridional Transect (PMT). *Manuscript in preparation*.

## Teaching and Mentoring Experience

University of South Carolina, Earth and Ocean Sciences (spring 2015)

- *MSCI313: The Chemistry of the Sea*, 4 credit hours (Instructor for ~60 undergraduate students)

University of Southampton, Ocean and Earth Sciences (2009-2012)

- *Applied Biogeochemistry and Pollution* (TA for graduate students; laboratory-based)
- *Introduction to Ocean Biogeochemistry* (TA for undergraduates; classroom based)
- *Coastal and Estuarine Oceanography* (TA for undergraduates; fieldwork and laboratory-based)
- *Environmental Analytical Chemistry* (TA for undergraduates; fieldwork and laboratory-based)

Skidaway Institute of Oceanography, University of Georgia (2018 – present)

- Training and mentoring of graduate students involved in several projects within the Buck research group.

Various (2004 – present)

- Supervision and/or training of visiting scientists, graduate and undergraduate students using clean room facilities at Bermuda Institute of Ocean Sciences, National Oceanography Centre Southampton, University of South Carolina, and Skidaway Institute of Oceanography.

## Invited Seminars and Public Engagement

- 2020 Radio interview for WABE (regional) and picked up by NPR (national) about Arctic research during the coronavirus pandemic (April/May).
- 2019 Local TV interviews for WTOG and WJCL about upcoming participation in MOSAiC (November).
- 2019 Radio interviews for WABE (regional) and GPB (local) about upcoming participation in MOSAiC (November).
- 2016 Rutgers University, Department of Earth and Environmental Sciences Seminar Series (28<sup>th</sup> September) – “From Antarctic shelf seas to Arctic melt ponds: insights into iron cycling in the polar regions”.
- 2016 Rotary Club of Savannah Sunrise Hilton Garden Inn, Savannah (28<sup>th</sup> April) – “US Arctic GEOTRACES 2015: oceanography at the North Pole”.
- 2014 Skidaway Institute of Oceanography, University of Georgia, SkIO Seminar Series (15<sup>th</sup> October) – “Dissolved iron supply to surface waters of the Ross Sea”.
- 2014 University of South Carolina, School of the Earth, Ocean and Environment, MSCI Departmental Seminar (10<sup>th</sup> October) – “Processes regulating dissolved iron supply in the Ross Sea”.

## Past Awards

- Ocean Carbon and Biogeochemistry (OCB) travel award to attend 2019 OCB workshop – Ocean-Atmosphere Interactions: Scoping directions for U.S. research (August 2019, \$300).
- OCB travel award to attend the 2019 SOLAS Open Science Conference (November 2018, \$1000).
- UGA Office of the Vice Provost for Research travel assistance award to attend ASLO 2017 Aquatic Sciences Meeting (awarded 2016, \$946).
- Challenger Society for Marine Science travel award to attend ASLO 2011 Aquatic Sciences Meeting (2011, £500).
- NOCS PhD Studentship (2009-2011, ~£40,000 co-funded by School of Ocean and Earth Science at University of Southampton and the Natural Environment Research Council).

## Conference Presentations (last six years only; presenter underlined)

- Buck, C.S., C. Marsay, W.M. Landing (2020). Aerosol trace element concentrations and fractional solubility in the North Pacific Ocean: US GEOTRACES GP-15 Pacific Meridional Transect (poster). Ocean Sciences Meeting, San Diego, CA, USA.
- Kadko, D.C., W.M. Landing, C. Buck, C.M. Marsay (2020). Quantifying atmospheric trace element deposition on a global scale with GEOTRACES transect data (poster). Ocean Sciences Meeting, San Diego, CA, USA.
- Fan, S., C.M. Marsay, B. Lai, W.M. Landing, E.D. Ingall, C.S. Buck, P.L. Morton, Y. Gao (2019). Chemical composition and oxidation state of iron-containing aerosol particles observed during US GEOTRACES Western Arctic cruise GN01 (poster). AGU Fall Meeting, San Francisco, CA, USA.
- Marsay, C.M., W.M. Landing, C.S. Buck (2019). Concentrations, provenance, and fluxes of aerosol trace metals along the US GEOTRACES Pacific Meridional Transect (poster). SOLAS Open Science Conference, Sapporo, Japan.
- Buck, C.S., R.U. Shelley, C. Marsay, W.M. Landing (2018). Particle-size effects on aerosol fractional solubility in samples from US GEOTRACES section cruises. AGU Fall Meeting, Washington, D.C., USA.

- Giering, S.L.C., R. Sanders, A.P. Martin, S. Henson, J.S. Riley, **C.M. Marsay**, D. Johns (2018). Sinking fast and slow in the ocean: how particle flux profiles can fool us. Ocean Sciences Meeting, Portland, OR, USA.
- Buck, C.S., W. Landing, A. Aguilar-Islas, **C. Marsay**, D. Kadko (2017). Aerosol deposition and fractional solubility of trace elements in the remote ocean. Goldschmidt Conference, Paris, France.
- Marsay, C.M.**, W.M. Landing, P.L. Morton, B. Summers, C.S. Buck (2017). Dissolved and particulate trace elements in Arctic meltponds. (poster) Southeastern Biogeochemistry Symposium, Athens, GA, USA.
- Buck, C.S., **C. Marsay**, A. Ebling, P. Morton, B. Summers, W. Landing (2017). Aerosol concentration, composition, and fractional solubility on the US GEOTRACES Western Arctic cruise. ASLO Aquatic Sciences Meeting, Honolulu, HI, USA.
- Marsay, C.M.**, W.M. Landing, P. Morton, B. Summers, S. Rauschenberg, B. Twining, J. Fitzsimmons, N. Lanning, C.S. Buck (2017). Dissolved and particulate trace elements in Arctic melt ponds. ASLO Aquatic Sciences Meeting, Honolulu, HI, USA.
- Mukherjee, P., Y. Gao, **C. Marsay**, C. Buck, W. Landing (2017). Characterization of the water-soluble inorganic and organic species on aerosols in the Arctic troposphere during summer. (poster) ASLO Aquatic Sciences Meeting, Honolulu, HI, USA.
- Summers, B.A., P.L. Morton, V.J. Salters, W.M. Landing, C.S. Buck, **C.M. Marsay** (2017). A comparison of extremes: Pb isotopic composition in Arctic and Indian aerosols. ASLO Aquatic Sciences Meeting, Honolulu, HI, USA.
- John, S.G., J.N. Fitzsimmons, **C.M. Marsay**, C.R. German, R.M. Sherrell (2016). Sinking feelings: iron isotope and global circulation model evidence for the fate of Fe from the East Pacific Rise hydrothermal system. Goldschmidt Conference, Yokohama, Japan.
- Gao, Y., C. Buck, **C. Marsay**, P. Mukherjee, W. Landing (2016). Mass-size distribution of selected nutrient elements in aerosols and their air-to-sea fluxes to the Arctic Ocean: preliminary results from the US GEOTRACES Arctic cruise in summer 2015. (poster) Ocean Sciences Meeting, New Orleans, LA, USA.
- Marsay, C.M.**, C. Buck, W. Landing, N. Wyatt (2016). Atmospheric deposition to the Arctic Ocean: concentrations of dissolved trace metals elements in melt ponds during US GEOTRACES Western Arctic section. (poster) Ocean Sciences Meeting, New Orleans, LA, USA.
- McGillicuddy, D.J., P.N. Sedwick, M.S. Dinniman, K. Arrigo, T.S. Bibby, B.J. Greenan, E.E. Hofmann, J.S. Klinck, W.O. Smith, S. Mack, **C.M. Marsay**, B.M. Sohst, G. van Dijken (2016). Iron supply and demand in an Antarctic shelf ecosystem. Ocean Sciences Meeting, New Orleans, LA, USA.
- Ceballos-Romero, E., M. Villa-Alfageme, F. Le Moigne, S. Henson, **C.M. Marsay**, R. Garcia-Tenorio (2015). On the use of PELAGRA sediment traps and radionuclides ( $^{234}\text{Th}$ ,  $^{210}\text{Po}$ ) for estimating particle export efficiency. Goldschmidt Conference, Prague, Czech Republic.
- Ceballos-Romero, E., M. Villa-Alfageme, F. Le Moigne, S.A. Henson, **C.M. Marsay** (2015). Comparison of PELAGRA sediment traps and radioactive as proxies for the estimation of export efficiency. ASLO Aquatic Sciences Meeting, Grenada, Spain.
- Sanders, R.J., S.A. Henson, **C.M. Marsay** (2015). Controls over mesopelagic mineralisation. ASLO Aquatic Sciences Meeting, Grenada, Spain.
- Ussher, S.J., M. Fishwick, **C. Marsay**, P.N. Sedwick (2015). Soluble and colloidal iron fractionation following aerosol dissolution in the surface Atlantic Ocean. ASLO Aquatic Sciences Meeting, Grenada, Spain.

## Professional Service

- Reviewer of manuscripts for *Biogeosciences*, *Antarctic Science*, *Journal of Marine Systems*, *Marine Chemistry*, *Continental Shelf Research*, *Chemical Geology*, *Frontiers in Marine Science*, *Ocean Science*.
- Reviewer of proposals for *National Science Foundation Biological Oceanography Program*.
- Student presentation judge at:
  - 6<sup>th</sup> Annual Southeastern Biogeochemistry Symposium, Columbia, SC (2019)
  - 4<sup>th</sup> Annual Southeastern Biogeochemistry Symposium, Athens, GA (2017)
  - Ocean Sciences meeting, New Orleans, LA (2016)

## Workshop Participation

- Ocean Carbon Biogeochemistry Workshop – Ocean-Atmosphere Interactions: scoping directions for US research. Sterling, VA, USA. October 2019.
- US GEOTRACES GP15 Planning Workshop. Norfolk, VA, USA. March 2018.
- US GEOTRACES GN01 Data Workshop. Miami, FL, USA. October 2017.
- Arctic GEOTRACES Early Career Workshop. Aquatic Sciences meeting, Honolulu, HI, USA. February 2017.
- US GEOTRACES GP16 Data Workshop. Catalina Island, CA, USA. November 2015.
- 3<sup>rd</sup> GEOTRACES Data-Model Synergy Workshop. Barcelona, Spain. November 2011.
- Coordination Action Carbon Observation System (COCOS) Workshop. Bergen, Norway. June 2010.
- Aerosol Iron Solubility Workshop. Norwich, UK. February 2009.

## Professional Affiliations

- Association for the Sciences of Limnology and Oceanography
- American Geophysical Union
- The Oceanography Society

## Fieldwork Experience

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| 2020      | MOSAic leg 3, Arctic Ocean, <i>RV Polarstern</i> ( <i>Kapitan Dranitsyn</i> , <i>RV Sonne</i> ). Aerosol sampling for trace elements and aerosol/seawater/sea-ice/snow sampling for beryllium-7.                           |
| 2018      | US Pacific GEOTRACES (GP15), Pacific Ocean, <i>RV Roger Revelle</i> . Aerosol and precipitation sampling for trace element and isotopes analysis.  |
| 2015      | US Arctic GEOTRACES (GN01), Arctic Ocean, <i>USCGC Healy</i> . Aerosol, precipitation and melt pond sampling for trace element and isotopes analysis.  |
| 2011/2012 | PRISM-RS, Ross Sea, <i>RV Nathaniel B Palmer</i> . Seawater sampling; analysis of dissolved iron.  |
| 2010      | Irminger Basin Iron Study, North Atlantic (2 cruises), <i>RRS Discovery</i> . Sampling marine particles for trace metal, organic carbon and biomineral analysis, using sediment traps and in situ pumps; aerosol sampling. |
| 2010      | Extended Ellet Line, North Atlantic, <i>RRS Discovery</i> . Sampling marine particulate material for trace metal analysis using in situ pumps; aerosol sampling.   |
| 2009      | Porcupine Abyssal Plain, North Atlantic, <i>RRS Discovery</i> . Sampling sinking particulate material using sediment traps for organic carbon and biomineral analysis.   |

- 2009 Extended Ellet Line, North Atlantic, *RRS Discovery*. Sampling marine particulate material for trace metal analysis using in situ pumps.
- 2009 Faroe Islands, *RV Magnus Heinason*. Underway sampling of seawater samples for dissolved iron analysis.
- 2008 FeAST project (4 cruises), Sargasso Sea, *RV Atlantic Explorer*. Seawater and atmospheric sampling for trace metal analysis.
- 2007 FeAST project (3 cruises), Sargasso Sea, *RV Atlantic Explorer*. Seawater and atmospheric sampling for trace metal analysis.
- 2006 CORSACS-2, Ross Sea, *RV Nathaniel B Palmer*. Seawater sampling for trace metal analysis.
- 2005/2006 CORSACS-1, Ross Sea, *RV Nathaniel B Palmer*. Seawater sampling for trace metal analysis.
- 2004 FeATMISS project (2 cruises), Sargasso Sea, *RV Weatherbird II*. Seawater and atmospheric sampling for trace metal analysis.
- 2003 FeATMISS project, Sargasso Sea, *RV Weatherbird II*. Seawater and atmospheric sampling for trace metal analysis.
- 2003-2008 Tudor Hill Marine Atmospheric Observatory, Bermuda: collection of precipitation and aerosol (bulk/size-fractionated) samples for trace metals, major ions, lipids and Be-7 analysis; collection of air samples for greenhouse gas analysis; maintenance of ozone detector, meteorological equipment and observatory infrastructure.
- 2001-2002 & 2009-2012 Miscellaneous estuarine and near-shore small boat fieldwork.

### **Laboratory/Analytical Experience**

- Extensive experience at several different institutions of working in, managing and maintaining (trace metal) clean laboratories.
- Familiar with established methods for processing particulate material for analysis of trace metals, organic carbon and biominerals.
- ICP-MS (Thermo-Scientific Element II sector field, Perkin Elmer NexION 300D quadrupole, Thermo-Scientific Neptune multi-collector) analysis of trace elements in natural samples, including method development.
- Use of flow-injection analysis for the determination of dissolved iron.