

CURRICULUM VITAE

MAK ANDERSON SAITO

Associate Scientist with Tenure

Dept. of Marine Chemistry and Geochemistry

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EDUCATION

1990 The Sidwell Friends School, Washington D.C.

1994 Oberlin College, B.A., Biology and Environmental Studies majors,
Chemistry minor (Highest Honors)

2001 MIT/WHOI Joint Program in Chemical Oceanography, Ph.D.

PROFESSIONAL EXPERIENCE

Constructed Wetlands Project Manager - Lorain County General Health District, Ohio, 1993-1995

Research Assistant - Ohio Geological Survey, Lake Erie Division, 1994-1995

Graduate Research Assistant, Woods Hole Oceanographic Institution, 1995-2001

Harry Hess Post-Doctoral Scholar, Geosciences Department, Princeton University, 2001-2003

Assistant Scientist, Marine Chemistry and Geochemistry Department, Woods Hole Oceanographic Institution, 2003-2007

Associate Scientist, Marine Chemistry and Geochemistry Department, Woods Hole Oceanographic Institution, 2007-2011

Associate Scientist with Tenure, Marine Chemistry and Geochemistry Department, Woods Hole Oceanographic Institution, 2011-present

Senior Scientist, Marine Chemistry and Geochemistry Department, Woods Hole Oceanographic Institution, 2017-present

FELLOWSHIPS AND AWARDS

1990 Thomas Sidwell Award, The Sidwell Friends School

1993 Mellon Foundation Grant for Environmental Research, Oberlin College

1993 Environmental Careers Organization (ECO) - Student Initiated Project Fellowship

1994 Mellon Foundation Grant for Environmental Research, Oberlin College

1994 Norman Wright Biology Award, Oberlin College

1994 Joyce Gorn Award in Environmental Studies, Oberlin College

1995-1996 National Science Foundation Coastal Trainee Graduate Fellowship

1998-1999 Massachusetts Institute of Technology Martin Sustainability Fellow

1996-2000 EPA STAR Graduate Fellowship

2000 Ocean Venture Fund Research Grant, WHOI

2001-2003 Hess Post-doctoral Fellowship in Geosciences, Princeton University

2005 Office of Naval Research Young Investigator Award

2005 Ruth and Paul Fye WHOI Graduate Student Paper Award in Chemical Oceanography

2012 National Academy of Sciences Kavli Fellow

2012 Gordon and Betty Moore Foundation Marine Microbial Investigator Award

PROFESSIONAL AFFILIATIONS

Member, American Society for Limnology and Oceanography

Member, American Geophysical Union
 Member, Union of Concerned Scientists
 Member, American Society of Biochemistry and Molecular Biology
 Member, American Society for Mass Spectrometry
 Member, The Geochemical Society

RESEARCH INTERESTS

Proteomics and Marine Metaproteomics
 Trace Metal Biogeochemistry of Bioactive Metals and Vitamins (Co, Fe, Cd, Zn, Mn, Ni, and B₁₂)
 Trace Metal Requirements and Metalloenzyme Use in Life (Metalloomics)
 Discovery of Novel Metalloenzymes in Microbes
 Bioinorganic Chemistry
 The Co-Evolution of Biogeochemical Cycles and Life Throughout Earth History
 The Influence of Human Economies on Global and Regional Biogeochemical Cycles

PROFESSIONAL ACTIVITIES

WHOI (Non-Education Related):

Biosafety Committee, Chemistry Department representative
 ICP-MS Facility Committee
 75th Anniversary Committee
 Ocean Microbiome Catalyst Project Participant 2016-2017
 Department Faculty Search Committee 2017-2018
 Co-PI for the Biological and Chemical Data Management Office (BCO-DMO), 2017-present
 Co-Chair of the Gender Equity Program Advisory Committee (GEPAC, 2017-present)

Outside WHOI (Other than Attendance at Society/National Meetings):

2002-2003	Participant in Diatom Genome Annotation (<i>Thalassiosira pseudonana</i>) at the Joint Genome Institute
2005	Co-Session Chair, Metal Cycling, ASLO meeting, Salt Lake City, February
2005	Co-Session Chair, Trace Element Biogeochemistry, American Chemical Society Meeting – Geosciences Division, San Diego, March 17-18
2006	Co-Session Chair, Trace Elements and Isotopes. ASLO meeting Victoria, Canada, June
2011	Co-Session Chair, Trace Metals and their Nutritional Importance to Phytoplankton and Bacteria, ASLO Aquatic Sciences Meeting, San Juan Puerto Rico
2012	Vice-Chair Bioinorganic Chemistry Gordon Research Conference
2014	Co-Session Goldschmidt: The Biogeochemical Cycling of the Nutrients N, P and Si: Terrestrial and Marine Insights for the Present, Past and Future
2011-2014	US Ocean Carbon and Biogeochemistry Scientific Steering Committee Member
2014	Session Chair, Insights from Model Systems. Marine Microbes Gordon Research Conference, Waltham MA, June 22-27, 2014
2014	Discussion leader Ocean Carbon and Biogeochemistry Summer Workshop. Led community discussion on Ocean Omics Data and Infrastructure Needs for OCB community, July 24, 2014
2014-2016	Steering committee member for Oceanography and Geobiology OMICS ECOGEO Research Coordination Network

- 2015 Co-organized a GEOTRACES SSC “Biogeotraces” small working group meeting at WHOI December 2015 to facilitate incorporation of biological and biochemical parameters into the 2017 GEOTRACES Intermediate Data Product
- 2016 Discussion Moderator for Micronutrients Working Group, GEOTRACES Internal Cycling Synthesis Meeting, Lamont August 2016
- 2016 ECOGEO Town Hall presenter ASLO-AGU OSM Meeting 2016
- 2016 SeaView Workshop Participant ASLO-AGU OSM Meeting 2016
- 2016 Session Chair: “Microbes” at the Copper in Biology 16 Conference
- 2015-2017 Vice-Chair for Chemical Oceanography Gordon Research Conference
- 2017-2019 Chair for Chemical Oceanography Gordon Research Conference

Editorial and Reviewing Activities

- 2007 – present Associate Editor – Marine Chemistry
- 2010 – present Review Editor – Frontiers in Aquatic Microbiology
- 2011 – present Editorial Board – Frontiers in Microbiological Chemistry
- 2013 – present Advisory Board Member – Metallomics, Royal Society Journal
- 2014 – present Editorial Board – Environmental Microbiology Reports
- Manuscript reviewer for Aquatic Microbial Ecology, Aquatic Sciences, Aquatic Toxicology, Astrobiology, Biogeosciences, Biotechnology Progress, Deep-Sea Research, Earth Atmospheric Planetary Science Letters, Ecology, Ecology Letters, Environmental Microbiology, Environmental Microbiology Reports, Environmental Science and Technology, Estuarine, Coastal and Shelf Science, Frontiers in Aquatic Microbiology, Frontiers in Microbiological Chemistry, Geobiology, Geochemical Transactions, Journal of Geophysical Research – Oceans, Limnology and Oceanography, Limnology and Oceanography Methods, Marine Chemistry, Marine Ecology Progress Series, Nature, Nature Biotechnology, Nature Geosciences, Plant Cell & Environment, Plos One, Proceedings of the Royal Society B, Proceedings National Academy of Science USA, Science
- Proposal reviewer for National Science Foundation, NASA, NSERC, Hudson River Foundation, Deutsche Forschungsgemeinschaft (DFG), United States-Israel Binational Science Foundation, Academia Sinica Taiwan, Netherlands Organization for Scientific Research, CRNS
- Panel member for National Science Foundation (Chemical Oceanography and Polar Programs)
- Panel member for NASA Astrobiology Program

PARTICIPATION IN EDUCATION

Advising Overview: Student and Post-Doc Advising: advised or advising 9 Ph.D. students, 3 Masters students, 8 Post-doctorates, and 8 summer undergraduates students

Graduate Advising:

- Anne Thompson - MIT-WHOI Doctorate student, 2004-2009, co-advised with Chisholm
- Whitney Krey - MIT-WHOI Masters student, 2005-2008, co-advised with Webb and Delong
- Alysia Cox - MIT-WHOI Doctorate graduate student, 2005-2011
- Erin Bertrand - MIT-WHOI Doctorate student 2006-2012
- Abigail Noble - MIT-WHOI Doctorate student 2006-2012
- Tyler Goepfert - MIT-WHOI Masters Student 2010-2013
- Daniel Tabersky - University of Duisberg-Essen Masters Student 2010
- Carly Buchwald - MIT-WHOI Doctorate student 2011-2012 (primary advisor K. Casciotti)

Nick Hawco - MIT-WHOI Doctorate Student 2011-2017
Noelle Held - MIT-WHOI Doctorate Student 2014-present
Marissa Kellogg - MIT-WHOI Doctorate Student 2017-present
Rebecca Chmiel - MIT-WHOI Doctorate Student 2017-present

Post-Doctorates:

Chad Hammerschmidt, Postdoctoral Scholar, 2005-2007
Katherine Mackey, Postdoctoral Scholar, 2011-2014
Sara Bender, Postdoctoral Scholar, 2013-2015
Tristan Horner, Postdoctoral Scholar, 2014-2015
Julia Gauglitz, Postdoctoral Scholar, 2014-2017
Randelle Bundy Postdoctoral Scholar, 2014-2017, co-advised with Repeta
Veronique Oldham Postdoctoral Scholar, 2017-present, co-advised with Hansel
Jaci Saunders, 2017-present
Natalie Cohen, 2017-present

Undergraduate Advising - WHOI Summer Student Fellows, Guest Students, and PEP Diversity Fellows:

Erin Bertrand (Bates College, 2005)
Alexandra Borst (Pomona College, 2004)
Allison St. Vincent (MIT, 2009)
Sarah Choyke (Haverford, 2009)
Emily Lorch (Plymouth UK, 2009, 2010)
Noelle Held (Stetson University, 2013)
Marissa Kellogg (Boston College, 2015, 2016)
Luis Valentin (U. Puerto Rico, 2016)

Thesis Committee and Defense Chairs:

Committee Member for Rachel Wisniewski (Moffett student), Madeli Castruita (Stiefel and Morel Student), Seth John (Boyle student), Jake Waldbauer (Chisholm Student), Yanmei Shi (DeLong Student), Laure-Anne Ventouras (DeLong Student), Daniel Ohnemus (Lam Student), Carly Buchwald (Casciotti Student), Rene Boiteau (Repeta Student), Bethanie Edwards (Van Mooy Student), Keisuke Inomura (Follows Student), David Shire (Rutgers, Kustka Student)

Chaired Thesis Proposal Defense of Kathleen Munson, December 13th 2013 (Lamborg Student)
Chaired Doctoral Thesis of Virginia Rich (Ed DeLong Student, June 2008)
Chaired Doctoral Thesis of Li Li (U. Mass Boston, April 29th 2009, Gordon Wallace Advisor)
Chaired Thesis Proposal Defense for Gabriela Farfan (2015)
External Examiner for Gabriel Dulaquais (University of Brest 2015)
External Examiner for David Jansen (U. Victoria 2017)
Chaired Doctoral Thesis of Winn Johnson (2017)

Teaching

2008-present Marine Bioinorganic Chemistry, MIT-WHOI Graduate Course 12.741 (Offered in alternate years)
Guest Lecturer for Microbial Diversity Course at MBL on Proteomics and Metal Nutrition 2014, 2015, 2016, 2017
Guest Lecturer for Microbial Biogeochemistry (2015, 2017)
Guest Lecturer at Sea Education Association, Antarctic Science, March 11, 2015

Teaching assistant for graduate level class Aquatic Chemistry, MIT (1996)

Education Administration

Joint Committee for Chemical Oceanography (JCCO) for the MIT-WHOI Joint Program, 2013-present

WHOI Chemical Oceanography General Exam Co-Coordinator (2005, 2011)

First-year Chemical Oceanography Graduate Student Advising Committee (2003-2004, 2010-2011)

Pre-selection Committee for WHOI Dean search (2016)

WHOI Dean and VP Search Committee (2017)

SUPERVISION AT WHOI

Technical Staff:

Dawn Moran, Research Associate II, 2007-present

Dr. Matt McIlvin, Research Associate III, 2010-present

Meghan Jelloe, Research Assistant I (part-time), 2014-2015

Dr. Vladimir Bulygin, Research Associate II, 2007-2009

Abigail Noble, Research Assistant II, 2004-2006

Erin Bertrand, Research Assistant II, 2005-2006

Tyler Goepfert, Research Assistant II, 2004-2005; Research Assistant III, 2005-2008

Marissa Kellogg, Research Assistant I, 2016-2017

Luis Valentin, Research Assistant I, 2016-present

CRUISE PARTICIPATION AND FIELD WORK

1995 June	R/V <i>Westward</i> , Coastal Atlantic
1996 June	R/V <i>Oceanus</i> , Sargasso Sea
1997 March	R/V <i>Oceanus</i> , Sargasso Sea
1998 February	R/V <i>Oceanus</i> , Sargasso Sea
1998 August	R/V <i>Oceanus</i> , Sargasso Sea
1999 September	R/V <i>Oceanus</i> , Sargasso Sea
2000 August-October	R/V <i>Melville</i> , San Diego CA to Arica, Chile
2003 June-July	R/V <i>Kilo Moana</i> , Seattle to Dutch Harbor, Alaska
2004 February	R/V <i>Kilo Moana</i> , Central Pacific - <i>Chief Scientist</i>
2005 January	R/V <i>Wecoma</i> , Hawaiian Islands, E-Flux program
2005 July-August	R/V <i>Knorr</i> , Panama to Galapagos - <i>Chief Scientist</i>
2005/2006 December-January	R/V <i>N.B. Palmer</i> , Ross Sea, Antarctica
2006 June	R/V <i>Seward Johnson</i> , Equatorial Atlantic
2006 November-December	R/V <i>N.B. Palmer</i> , Ross Sea, Antarctica
2007 November-December	R/V <i>Knorr</i> , South Atlantic - <i>Chief Scientist</i>
2009 January-February	McMurdo Sound, Antarctica - <i>Expedition leader</i>
2009 November-December	McMurdo Sound, Antarctica - <i>Expedition leader</i>
2011 October 1-26, 2012	R/V <i>Kilo Moana</i> , Central Pacific - <i>Co-Chief Scientist with Carl Lamborg</i>
2015 January 30-February 4 th	R/V <i>Atlantic Explorer</i> , Bermuda Atlantic Time Series
2016 January 15-February 12 th	R/V <i>Falkor</i> , Hawaii to Tahiti - <i>Chief Scientist</i>
2017 July 5-9 th	R/V <i>Armstrong</i> , Woods Hole to Woods Hole.

PATENTS

Cobalamin Acquisition Protein and Use Thereof. U.S. Patent No. 9,234,012 Mak Saito and Erin Bertrand.

Compositions and Methods for Absolute Quantification of Proteins. US Provisional Patent 62/242,137. Mak Saito and Matthew Mcllvin.

SOFTWARE

METATRYP – Python Libraries for in silico analysis of shared tryptic peptides across microbial genomes. Alex Dorsk and Mak Saito <https://github.com/saitomics/metatryp> New version at <https://metatryp.who.edu> updated by David Gaylord and Nick Symmonds.

PAPERS IN REFEREED JOURNALS (*Ph.D. Advisee, +Post-Doc Advisees)

1. Bender⁺, S.J., D. Moran, M.R. Mcllvin, H. Zheng, J.P. McCrow, J. Badger, G.R. DiTullio, A.E. Allen, M.A. Saito. Major proteome reorganization upon iron-induced colony formation in the Southern Ocean marine Haptophyte *Phaeocystis antarctica*. In revision at Nature Communications.
2. Held^{*}, N.A., Mcllvin, M.R., Moran, D.M., Laub, M.T., Saito, M.A. Ecological drivers of two-component signaling-based regulation in marine bacteria. Submitted to ISME.
3. Lee, M.D., Webb, E.A., Walworth, N.G., Fu, F.X., Held^{*}, N.A, Saito, M.A., Hutchins, D.A. Transcriptional profiles of the *Trichodesmium* consortium following long term CO₂ adaptation: community nitrogen cycling, respiration, and ecological niche-space delineation. Applied and Environmental Microbiology. Accepted.
4. Hawco^{*}, N.J., Lam, P.J., Lee, J.M., Ohnemus, D.C., Noble^{*}, A.E., Wyatt, N.J., Lohan, M.C. and Saito, M.A., 2017. Cobalt scavenging in the mesopelagic ocean and its influence on global mass balance: Synthesizing water column and sedimentary fluxes. *Marine Chemistry*. In Press.
5. Saito, Mak A., Abigail E. Noble^{*}, Dan Ohnemus, Nicholas Hawco^{*}, Seth John, Phoebe Lam, Ben Twining, Rod Johnson, Dawn Moran, Matthew Mcllvin. Dissolved Cobalt and Speciation from the US North Atlantic GEOTRACES Zonal Transect: The Acceleration of Dissolved Cobalt's Ecological Stoichiometry due to Biological Uptake, Remineralization, and Scavenging in the Atlantic Ocean. Biogeosciences. In Press.
6. Noble^{*}, A. E., Ohnemus, D. C., Hawco^{*}, N. J., Lam, P. J., & Saito, M. A. 2017. Coastal sources, sinks and strong organic complexation of dissolved cobalt within the US North Atlantic GEOTRACES transect GA03. *Biogeosciences*, 14(11), 2715-2739. doi: 10.5194/bg-14-2715-2017
7. Hutchins, D. A., Fu, F., Walworth, N. G., Lee, M. D., Saito, M. A., & Webb, E. A. 2017. Comment on "The complex effects of ocean acidification on the prominent N₂-fixing cyanobacterium *Trichodesmium*". *Science*, 357(6356), eaao0067.
8. Santoro, A. E., Saito, M. A., Goepfert^{*}, T. J., Lamborg, C. H., Dupont, C. L., & DiTullio, G. R. 2017. Thaumarchaeal ecotype distributions across the equatorial Pacific Ocean and their potential roles in nitrification and sinking flux attenuation. *Limnology and Oceanography*. 62. 1984-2003.
9. Tagliabue, Alessandro, Andrew Bowie, Philip Boyd, Kristen Buck, Kenneth Johnson, Mak Saito. 2017. New insights into the modulation of ocean biogeochemistry by iron. 543. 51-59. *Nature*.
10. Chong, W., Jiménez, J., Mcllvin, M., Saito, M. A., & Kwakye, G. F. 2017. α -Synuclein Enhances Cadmium Uptake and Neurotoxicity via Oxidative Stress and Caspase Activated Cell Death Mechanisms in a Dopaminergic Cell Model of Parkinson's Disease. *Neurotoxicity Research*. 1-16.
11. Sanial, V., Kipp, L., Henderson, P., van Beek, P., Reyss, J.-L., Hammond, D., Hawco, N., Saito, M., Resing, J., and Sedwick, P.: Radium-228 as a tracer of dissolved trace element inputs from the Peruvian continental margin, *Marine Chemistry*, 2017.
12. Boiteau, Rene, Claire P. Till, Angel Ruacho, Randelle M. Bundy⁺, Nicholas J. Hawco^{*}, Amy M. McKenna, Katherine A. Barbeau, Kenneth W. Bruland, Mak A. Saito, Daniel J. Repeta. 2016.

Structural Characterization of Natural Nickel and Copper Binding Ligands along the US GEOTRACES Eastern Pacific Zonal Transect. *Frontiers in Marine Science*. 3.

13. Robbins, Jamie, Brian Kendall, Noah Planavsky, Chris Reinhard, Camille Partin, Stefan Lalonde, Clint Scott, Dalton Hardisty, Simon Poulton, Andrey Bekker, Tim Lyons, Mak Saito, Chris Dupont, Dan Alessi, Ross Large, Kurt Konhauser. Trace elements at the intersection of biological and marine geochemical evolution. 2016. *Earth Science Reviews*. 163. 323-348.
14. Hawco*, N.J., D.C. Ohnemus, J.A. Resing, B.S. Twining, M.A. Saito. 2016. A cobalt plume in the oxygen minimum zone of the Eastern Tropical South Pacific. *Biogeosciences*. 2016. 1-60.
15. Walworth, Nathan G., Fei-Xue Fu, Eric A. Webb, Mak A. Saito, Dawn Moran, Matthew R. Mcllvin, Michael D. Lee, David A. Hutchins. 2016. Mechanisms of increased *Trichodesmium* fitness under iron and phosphorus co-limitation in the present and future ocean. *Nature Communications*. 7. 12081.
16. Boiteau, Rene M., Daniel R. Mende, Nicholas J. Hawco*, Matthew R. Mcllvin, Peter N. Sedwick, Mak A. Saito, Edward F. DeLong, Daniel J. Repeta. 2016. Siderophore-based microbial adaptations to iron scarcity across the eastern Pacific Ocean. *Proc. Natl. Acad. Sci.*
17. Zheng, Xin-Yuan, Yves Plancherel, Mak A. Saito, Gideon M. Henderson. 2016. Rare earth elements (REEs) in the tropical South Atlantic and quantitative deconvolution of their non-conservative behavior. *Geochimica Cosmochimica Acta*. 177. 217-237. *Provided samples, contributed to manuscript editing and discussion of data.*
18. Mackey⁺, K. R., Post, A. F., Mcllvin, M. R., & Saito, M. A. (2017). Physiological and proteomic characterization of light adaptations in marine *Synechococcus*. *Environmental microbiology*. 19:6. 2348-2365
19. Mackey⁺, K.M., A.F. Post, M.R. Mcllvin, G.A. Cutter, S. John, M.A. Saito. 2015. Divergent responses of Atlantic coastal and oceanic *Synechococcus* to iron limitation. *Proceedings of the National Academy of Sciences*. 112:32. 9944–9949, doi: 10.1073/pnas.1509448112.
20. Hutchins, D.A., Nathan S. Walworth, Eric A. Webb, Mak A. Saito, Dawn Moran, Matthew R. Mcllvin, Jasmine Gale, Fei-Xue Fu. 2015. Irreversibly increased nitrogen fixation in *Trichodesmium* experimentally adapted to elevated carbon dioxide. *Nature*. 6. doi:10.1038/ncomms9155.
21. Saito, M. A., A. Dorsk, A.F. Post, M. Mcllvin, M.S. Rappé, G. DiTullio, D. Moran. 2015. Needles in the Blue Sea: Sub-Species Specificity in Targeted Protein Biomarker Analyses within the Vast Oceanic Microbial Metaproteome. *Proteomics*. 15. 3521-3531. DOI: 10.1002/pmic.201400630.
22. Sohm, J. A., Ahlgren, N. A., Thomson, Z. J., Williams, C., Moffett, J. W., Saito, M. A., Webb, E. A., and Rocap, G.: Co-occurring *Synechococcus* ecotypes occupy four major oceanic regimes defined by temperature, macronutrients and iron, *The ISME journal*, 10, 333-345, 2016.
23. Swanner, E. D., Wu, W., Hao, L., Wüstner, M. L., Obst, M., Moran, D. M., Mcllvin, M. R., Saito, M. A., and Kappler, A. 2015. Physiology, Fe (II) oxidation, and Fe mineral formation by a marine planktonic cyanobacterium grown under ferruginous conditions, *Frontiers in Earth Science*, 3, 60.
24. Santoro, Alyson E., Christopher L. Dupont, R. Alex Richter, Matthew T. Craig, Paul Carini, Matthew R. Mcllvin, Youngik Yang, William D. Orsi, Dawn M. Moran, Mak A. Saito. 2015. Genomic and proteomic characterization of “*Candidatus Nitrosopelagicus brevis*”: An ammonia-oxidizing archaeon from the open ocean. *Proceedings of the National Academy of Sciences*. 201416223.
25. Boyle, E.A., R.F. Anderson, G.A. Cutter, R. Fine, W.J. Jenkins, M. Saito. 2015. Introduction to the US GEOTRACES North Atlantic Transect (GA-03): USGT10 and USGT11 cruises. *Deep Sea Research Part II: Topical Studies in Oceanography*. 116. 1-5.
26. Horner⁺, T.J., H.M. Williams, J.R. Hein, M.A. Saito, K.W. Burton, A.N. Halliday, S.G. Nielsen. 2015. Persistence of deeply sourced iron in the Pacific Ocean. *Proceedings of the National Academy of Sciences*. 112 (5). 1292-1297.

27. Guannel, M., D. Haring, M. Twiner, Z. Wang, A. Noble, P. Lee, M. Saito, G. Rocap. Toxigenicity and biogeography of the diatom *Pseudo-nitzschia* across distinct environmental regimes in the South Atlantic Ocean. 2015. *Marine Ecology Progress Series*, 526. 67-87.
28. Munson, K.M., C.H. Lamborg, G.J. Swarr, M.A. Saito. 2015. Mercury Species Concentrations and Fluxes in the Central Tropical Pacific Ocean. *Global Biogeochemical Cycles*. DOI: 10.1002/2015GB005120.
29. The GEOTRACES Group. 2015. The GEOTRACES intermediate data product 2014. *Marine Chemistry* 177. 1-8.
30. Saito, M.A., M.R. McIlvin, D.M. Moran, T.J. Goepfert, G.R. DiTullio, A.F. Post, C. H. Lamborg. 2014. Multiple nutrient stresses at intersecting Pacific Ocean biomes detected by protein biomarkers. *Science*. 345. 1173-1177.
31. Lamborg, C.H., C.R. Hammerschmidt, K.L. Bowman, G.J. Swarr, K.M. Munson, D.C. Ohnemus, P.J. Lam, L.-E. Heimbürger, M.J.A. Rijkenberg, and M.A. Saito. 2014. A global ocean inventory of anthropogenic mercury based on water column measurements. *Nature*. 512. 65-68.
32. Austin, Rachel Narehood, Mak A. Saito. 2014. Metals in Marine Biochemistry. *Metallomics*. 6.6. 1105-1106.
33. Lee, Peter A. Erin M. Bertrand*, Mak A. Saito, Giacomo R. DiTullio. 2015. Influence of Vitamin B₁₂ availability on oceanic dimethylsulfide. *Environmental Chemistry*. <http://dx.doi.org/10.1071/EN15043>.
34. Mackey[†], K.R., C.-T. Chien, A.F. Post, M.A. Saito, A. Paytan. 2015. Rapid and gradual modes of aerosol trace metal dissolution in seawater. *Frontiers in Microbiology*. 5. 794.
35. Cox, Alysia. D.*, A.E. Noble* M.A. Saito. 2014. Cadmium enriched stable isotope uptake and addition experiments with natural phytoplankton assemblages in the Costa Rica Upwelling Dome. *Marine Chemistry*. 166. 70-81.
36. Swanner, Elizabeth D., Noah J. Planavsky, Stefan V. Lalonde, Leslie J. Robbins, Andrey Bekker, Olivier J. Rouxel, Mak A. Saito, Andreas Kappler, Stephen J. Mojzsis, Kurt O. Konhauser. 2014. Cobalt and marine redox evolution. *Earth and Planetary Science Letters*. 390. 253-263.
37. Ahlgren, N.A., A. Noble, A.P. Patton, K. Roache-Johnson, L. Jackson, D. Robinson, C. McKay, L.R. Moore, M.A. Saito, and G. Rocap. 2014. The unique trace metal and mixed layer conditions of the Costa Rica upwelling dome support a distinct and dense community of *Synechococcus*. *Limnology and Oceanography*. 59. 2166-2184.
38. Cox*, Alysia, Mak Saito. 2013. Proteomic responses of oceanic *Synechococcus* WH8102 to phosphate and zinc scarcity and cadmium additions. *Frontiers in Microbiological Chemistry*. 4. 387. doi: 10.3389/fmicb.2013.00387.
39. Noble*, Abigail E., Dawn M. Moran, Andrew E. Allen, Mak A. Saito. 2013. Dissolved and particulate trace metal micronutrients under the McMurdo Sound seasonal sea ice: basal sea ice communities as a capacitor for iron. *Frontiers in Microbiological Chemistry*. doi: 10.3389/fchem.2013.00025.
40. Bertrand*, Erin M., Dawn M. Moran, Matthew R. McIlvin, Jeffrey M. Hoffman, Andrew E. Allen, Mak A. Saito. Methionine synthase interreplacement in diatom cultures and communities and the persistence of B₁₂ use by eukaryotic phytoplankton. *Limnology and Oceanography*. 58. 4. 1431-1450.
41. Saito, M.A., A.E. Noble*, A. Tagliabue, T. J. Goepfert, C.H. Lamborg, W.J. Jenkins. 2013. A Large Hydrothermal Iron Plume in the South Atlantic and Implications for Global Iron Cycling. *Nature Geosciences*. 6(9). 775-779.
42. Aguirre, J. Daphne, Hillary M. Clark, Matthew McIlvin, Christine Vazquez, Shaina L. Palmere, Dennis Grab, J. Seshu, Mak A. Saito, Valeria C. Culotta. 2013. A Manganese-Rich Environment Supports Superoxide Dismutase Activity in the Lyme Disease Pathogen, *Borrelia burgdorferi*. *Journal of Biological Chemistry*. <http://www.jbc.org/cgi/doi/10.1074/jbc.M112.433540>.

43. Robbins, L.J., S.V. Lalonde, M.A. Saito, N.J. Planavsky, A.M. Mloszewski, E. Pecoits, C. Scott, C.L. Dupont, A. Kappler, and K.O. Konhauser. 2013. Authigenic iron oxide proxies for marine zinc over geological time and implications for eukaryotic metallome evolution. *Geobiology*. DOI: 10.1111/gbi.12036.
44. Moore, C.M., M.M. Mills, K.R. Arrigo, I. Berman-Frank, L. Bopp, P.W. Boyd, E.D. Galbraith, R.J. Geider, C. Guieu, S.L. Jaccard, T.D. Jickells, J. LaRoche, T. Lenton, N.M. Mahowald, E. Marañón, I. Marinov, J.K. Moore, T. Nakatsuka, A. Oschlies, M.A. Saito, T.F. Thingstad, A. Tsuda, and O. Ulloa. 2013. Processes and patterns of Ocean Nutrient Limitation. *Nature Geosciences*. 6. 702-710.
45. Halperin, D., F. Ribalet, K. Weitz, M. A. Saito, B. Howe, E. Armbrust. 2013. In *Real-time collaborative analysis with (almost) pure SQL: a case study in biogeochemical oceanography*, Proceedings of the 25th International Conference on Scientific and Statistical Database Management, ACM: 2013; p 28.
46. Mackey[†], K.R.M., K. Caldeira, A. Grossman, D. Moran, M. McIlvin, A. Paytan, M Saito. 2013. Effect of temperature on photosynthesis and growth in diverse marine *Synechococcus* strains. *Plant Physiology*. DOI:10.1104/pp.113.221937.
47. Alexander H., B.D. Jenkins, T.A. Ryneerson, M.A. Saito, M.L. Mercier, S.T. Dyhrman. 2012. Identifying reference genes with stable expression from high throughput sequence data. *Frontiers in Aquatic Microbiology*. 3. 385. doi: 10.3389/fmicb.2012.00385.
48. Bertrand, E.M.* , A.E. Allen, C.L. Dupont, T. Norden-Krichmar, J. Bai, M.A. Saito. 2012. Impact of Cobalamin Starvation on Diatom Molecular Physiology and the Identification of a Novel Cobalamin Acquisition Protein. *Proc. Nat. Acad. Sci.* www.pnas.org/cgi/doi/10.1073/pnas.1201731109.
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- Antarctic Adventures. 2011. Elizabeth Saito and Mak Saito. Children's Book on Antarctic Science, self-published. All proceeds donated to local children's organizations, and copies donated to libraries and schools.
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OUTREACH MEDIA, WEB, PRESENTATIONS

- CORSACS Antarctica Cruises Outreach Website (Controls on Ross Sea Algal Community Structure www.whoi.edu/sites/Corsacs, with over 16,000 unique visitors)
- Oceanus Audio [Slideshow](#) on Antarctic Proteomic Research
- [Oceanus](#) Article on Hotbunking of Iron in Marine Nitrogen Fixing Cyanobacteria
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- Oceanus Article on Lyme Disease and metalloenzymes
- Living Lab Live Radio [Interview](#), National Public Radio WCAI, June 3, 2013
- Evening Presentation for the Woods Hole Children's School of Science on Antarctica and Vitamins, July 2013
- Media interviews regarding South Atlantic Hydrothermal Iron Plume Study August 2013 ([New York Times](#), [NBC](#), [Science Daily](#), Die Welt (Germany), Science Times, La Gran Epoca (Spain).
- Interviewed in Imagine Magazine by the Center for Talented Youth January 2015 Edition on exploring career options as a marine scientist
- Media reports related to 2014 Science Protein Biomarker manuscript ([Oceanus](#), [NSF](#), [Live Science](#), [Phys Org](#), [Yahoo News](#))
- Feature blog post on [Proteomics news](#), the most popular proteomics blog
- News related to Tristan Horner's 2015 PNAS Iron paper ([Science 2.0](#), [Hydro-International](#))
- News related to 2015 Nature manuscript on irreversible changes in phytoplankton ([USC](#), [WHOI](#), [Washington Post](#), [The Scientist](#), [Grind TV](#))
- Laboratory and dock tour for visiting Sidwell Friends High School Students, April 11, 2015
- Microbiome experiments and lecture, Ocean Science Journalism Fellows, September 2015
- News related to the environmental influence on and analytical uncertainties of ball inflation (widely [syndicated AP story](#), original blog [post](#))
- GEOTRACES [Highlight](#) on Mackey et al., PNAS manuscript
- Living Lab Radio on Science and Art aboard the R/V Falkor: <http://capeandislands.org/post/art-science-synergy-work-tropical-pacific#stream/0>
- [National Academy of Science Chemical Roundtable](#) Lecture on the Chemistry of Ocean Microbiomes, October 19, 2016, Washington DC and [Webcast](#)
- Interviewed for Inside Manned Systems [article](#) on AUV Clio, December 29th 2016.

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Luis Valentin-Alvarado, L. E.; Nicholas Hawco, N.; Matthew Mclvin, M. R.; Mak Saito*, M.; EXPLORING THE POTENTIAL FOR CARBONIC ANHYDRASE (CA) PROTEIN AS BIOMARKER FOR GROWTH RATE ESTIMATES OF *PROCHLOROCOCCUS* IN THE OCEAN (E) (Abstract ID: 29167) ASLO Meeting, Honolulu Hawaii, February 27th, 2017.

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Saito, M.A., A.E. Noble, A.Cox, T.J. Goepfert. Trace Element Distributions and Phytoplankton Colimitations on a Full Depth Ocean Section in the South Atlantic Ocean. Goldschmidt Conference, Davos, Switzerland, June 2009. Keynote Talk.

Saito, M.A. The bioinorganic chemistry of the ancient ocean: the co-evolution of cyanobacterial metal requirements and biogeochemical cycles at the Archean-Proterozoic boundary? Goldschmidt Conference, Melbourne, Australia, August 2006. Invited Talk.

Saito, M.A., A.E. Noble, M.B. Westley, B.N. Popp. Evidence of Redox Cycling of Cobalt in the Costa Rica Dome and Central Pacific: Similarities to Nitrite and Nitrous Oxide Distributions. ASLO Meeting, Victoria Canada June 2006. Oral Presentation and Co-Session Chair.

John, S.G., B.A. Bergquist, M.A. Saito, E.A. Boyle. The Marine Biological Cycling of Zn Isotopes. ASLO Meeting, Victoria Canada June 2006. Oral Presentation.

Thompson, A.W., M.A. Saito, S.W. Chisholm. *Prochlorococcus* Iron Requirements and Whole Genome Response to Iron Starvation. ASLO Meeting, Victoria, Canada, June 2006. Oral Presentation.

Cox, A.D., A.E. Noble, M.A. Saito. Cadmium Stable Isotope Uptake by Phytoplankton, Speciation, and Toxicity Experiments in the Costa Rica Upwelling Dome. ASLO Meeting, Victoria, Canada, June 2006. Poster Presentation.

Bertrand, E.M., A.E. Noble, D.J. Repeta, E.A. Webb, M.A. Saito. Contrasting vitamin B₁₂ and cobalt uptake in phytoplankton populations in the Costa Rica Upwelling Dome. ASLO Meeting, Victoria, Canada, June 2006. Poster Presentation.

Goepfert, T.J., M.A. Saito. Cobalt substitution of the zinc requirement in *Phaeocystis antarctica* and thoughts on the concept of co-limitation. ASLO Meeting, Victoria, Canada, June 2006. Poster Presentation.

Noble, A.E., K. Maita, C. Benitez-Nelson, M.A. Saito. Cobalt, manganese, cadmium, and iron among the Hawaiian Islands: The influence of cyclonic eddies and hydrothermal signals. ASLO Meeting, Victoria, Canada, June 2006. Poster Presentation.

Saito, M.A. Cobalt, iron, and manganese biogeochemistry in the Equatorial Pacific and recovery experiments using the MgOH₂ precipitation ICP-MS method. American Chemical Society Geochemical Division. March 16, 2005. San Diego, Oral Presentation and Co-Session Chair.

Saito, M.A. Cobalt, iron, and manganese biogeochemistry in the Equatorial Pacific: Cobalt Scavenging in the Oxygen Minimum Zones. ASLO meeting February 2005. Oral Presentation and Co-Session Chair.

Saito, M.A., D.M. Sigman, F.M.M. Morel. The Bioinorganic Chemistry of the Ancient Ocean: The Co-Evolution of Cyanobacterial Metal Requirements and Biogeochemical Cycles at the Archean-Proterozoic Boundary? Environmental Bioinorganic Chemistry Gordon Conference. Maine, 2004.

Saito, M.A., Y. Xu, R. Wisniewski, J.W. Moffett. Cobalt Biogeochemistry in the North and Equatorial Pacific: Observations of Cobalt Limitation, and Cobalt Scavenging in Oxygen Minimum Zones. Environmental Bioinorganic Chemistry Gordon Conference. Maine, 2004.

Edgcomb, V.P., S.J. Molyneaux, M.A. Saito, K. Lloyd, S. Böer, C.O. Wirsen, M.S. Atkins, A. Teske. Sulfide Ameliorates Metal Toxicity for Deep-Sea Hydrothermal Vent Archaea. Environmental Bioinorganic Chemistry Gordon Conference. Maine, 2004.

Saito, M.A., Y. Xu, R. Wisniewski, R.J. Wallsgrave, J.W. Moffett, B.N. Popp. Iron and Cobalt Co-Limitation in the Central North Pacific and Bering Sea. ASLO-TOS, Hawaii, February 2004.

Castruita, M., M.A. Saito, P.C. Schottel, E.I. Stiefel, F.M.M. Morel. Cloning and Overexpression of an Iron Storage Protein in *Trichodesmium erythrae*. ASLO-TOS, February 2004, Hawaii.

Saito M.A., G. DiTullio, J.W. Moffett. Depletion of Cobalt as a Micronutrient in the Eastern Equatorial Pacific. Goldschmidt Conference, Kurashiki Japan. September 2003.

Castruita, M., M.A. Saito, P.C. Schottel, M.J. Grossman, M.K. Cody, F.M.M. Morel, E.I. Stiefel. Nature's Iron Controllers: Ferritin-Family Proteins in Bacteria. Departments of Chemistry and Geosciences, Princeton University, Princeton. ACS MARM (Middle Atlantic Regional Meeting), Princeton NJ, 2003.

Saito, M.A., T-Y Ho, F.M.M. Morel. Cadmium Toxicity to Marine *Synechococcus* at Picomolar Concentrations: Vestigial Interactions Indicative of Ancient Ocean Chemistry. ASLO Aquatic Sciences Meeting. Salt Lake City, Utah. 2003.

Saito, M.A., T.W. Lane, G. Taroncher-Oldenburg, F.M. M. Morel, B.B. Ward. A Search for Cobalt Proteins in *Synechococcus*: Overexpression of the Gamma Carbonic Anhydrase Enzyme and a Genome Wide Analysis of Cobalt Limited Cells. ASLO/AGU Ocean Sciences Meeting. Honolulu, Hawaii, USA 2002.

Saito, M.A., J.W. Moffett. Temporal and Spatial Variability of Cobalt in the Atlantic Ocean. AGU/ASLO Ocean Sciences Meeting. Honolulu, Hawaii. February 2002.

Saito, M.A.. The Coupling of the Biogeochemistry of Cobalt and the Bioinorganic Chemistry of Cobalt Carbonic Anhydrases. Gordon Conference on Environmental Bioinorganic Chemistry. June, 2002.

Edgcomb, V.P., S. Boer, S. Molyneaux, K. Lloyd, C. Wirsen, J. Erickson, M.A. Saito, M. Atkins, A. Teske. Hyperthermophiles of the Hydrothermal Vent Subsurfaces: Limits of Life and extraterrestrial analogs. 2nd Astrobiology Science Conference, NASA-Ames, 2002.

Edgcomb, V.P., S. Boer, S. Molyneaux, K. Lloyd, C. Wirsen, J. Erickson, M.A. Saito, M. Atkins, A. Teske. Hyperthermophiles of the hydrothermal vent subsurface: limits of life and extraterrestrial analogs (Poster Presentation). *Eos, Transactions, American Geophysical Union*, 83(4), Ocean Sciences Meet. Suppl., Abstract OS32B-130, 2002.

Castruita, M., I. E. Stiefel, F. M.M. Morel, M.A. Saito, G. Taroncher-Oldenberg Iron, Bacterioferritin, and the Marine Cyanobacterium *Synechococcus* WH8102. Presented at the 2002 Gordon Research Conference on Environmental Bioinorganic Chemistry, Andover, NH, June 2002.

Saito, M.A., F.M.M. Morel. Cobalt and Cadmium Carbonic Anhydrases in Marine Phytoplankton. American Chemical Society, Environmental Bioinorganic Chemistry Session. Orlando, 2002.

Saito, M.A., T-Y Ho, F.M.M. Morel. An unexpected turn in the trace metal trio story (Co,Cd, Zn): Cadmium toxicity to *Synechococcus* WH8102 at picomolar levels. Chemical Oceanography Gordon Conference, Oxford England, 2002.

Saito, M.A. Cobalt and Cadmium Carbonic Anhydrases in Marine Phytoplankton: Biogeochemical and Genomic Analyses. Gordon Conference on Environmental Bioinorganic Chemistry, June 2002.

Saito, M.A., J.W. Moffett. Cobalt Speciation in the Equatorial Pacific and Peru Upwelling Region: Sources and Chemical Properties of Natural Cobalt Ligands. American Society for Limnology and Oceanography, New Mexico, February 2001.

Saito, M.A., J.W. Moffett. Cobalt Speciation in the Equatorial Pacific and Peru Upwelling Region: Sources and Chemical Properties of Natural Cobalt Ligands. Gordon Conference New Hampshire, August, 2001.

Saito, M.A., F.M.M Morel. Metal Substitution in the Cyanobacteria. Center for Bioinorganic Chemistry Annual Meeting, Princeton, June, 2001.

Saito, M.A. The Influence of Cyanobacteria on the Marine Biogeochemistry of Cobalt. 2001 DIALOG ASLO Recent Dissertations.

Saito, M.A. The Biogeochemistry of Cobalt in the Sargasso Sea. 2000 DISCO Dissertations in Chemical Oceanography Conference, Honolulu, Hawaii October, 2000.

Saito, M.A., S.W. Chisholm, J.W. Moffett. Cobalt Uptake Mechanisms in *Prochlorococcus*: "Cobalophores" Versus the Free-Ion Model. American Society for Limnology and Oceanography, San Antonio, Texas, February, 2000.

Saito, M.A., J.W. Moffett, S.W. Chisholm. Are Cobalt Ligands Produced by *Prochlorococcus*? American Society for Limnology and Oceanography, Santa Fe, New Mexico, February, 1999.

Moffett, J.W., M.A. Saito. Organic Complexation of Cobalt in the Sargasso Sea. American Society for Limnology and Oceanography, Santa Fe, New Mexico, February, 1999.

Saito, M.A., M.R. Twiss. Total cobalt and copper concentrations in Lake Erie surface waters. Proceedings of the 41st Conference of the International Association for Great Lakes Research, 1998.

PAPERS PRESENTED AT MEETINGS AND INVITED LECTURES

Honolulu Aquarium, October 3rd, 2017. 5th year anniversary event for the R/V Falkor, Schmidt Ocean Institute. *Invited Interactive Data Display.*

WHOI Ocean Science Journalism Symposium, 2017. *Invited Speaker.*

International Conference on Biological Inorganic Chemistry (ICBIC-18), Florianopolis, Brazil July, 2017. *Keynote Speaker.*

Goldschmidt Geochemistry Meeting, Paris France. August 14, 2017. *Speaker.*

Chemical Oceanography Gordon Research Conference, July 26th 2017. *Poster.*

Annual Foundation Marine Microbial Investigators Meeting. July 19th 2017. *Speaker.*

American Society for Mass Spectrometry, June 7th 2017. *Poster.*

Presentations at Ocean Metaproteomics for Data Sharing Workshop. May3-5th, 2017. *Speaker.*

Royal Society of Chemistry Session on "Genomics, Proteomics and Other 'Omics" Pittcon, 2017. Chicago. *Invited speaker.*

ASLO Meeting, Honolulu Hawaii, February 27th, 2017. *Speaker.*

National Academy of Sciences Chemistry of Microbiome Seminar Series. December 7, 2016. Washington DC. *Panelist.*

National Academy of Sciences Chemistry of Microbiome-Oceans Seminar Series. October 19, 2016. Washington DC. *Invited Speaker.*

Naval Research Laboratory, October 18, 2016, Washington DC. *Invited Speaker.*

10th International Copper Meeting: Copper in Biology, Sorrento Italy. Sept 27, 2016. *Invited Speaker.*

Greater Boston Mass Spectrometry Discussion Group, November 17, 2015. *Invited Speaker Monthly Evening Lecture Series.*

University of California Santa Barbara, October 19, 2015, *Invited Speaker.*

Harvard University Microbial Science Initiative, September 10, 2015, *Invited Speaker*.

Cell Biology of Metals Gordon Research Conference. July 27, 2015. *Invited Speaker*.

Ocean Acidification Principal Investigators Meeting, Woods Hole June 11, 2015. *Invited Speaker*.

Bermuda Institute of Ocean Sciences January 28, 2015. *Invited Speaker*.

University of Dartmouth, March 10, 2015. *Invited Speaker*.

Sea Education Association. March 10, 2015. Lecture to Students on Antarctica.

ASLO Meeting, Session: The Molecular Ecology of Microbe-Metal Interactions in the Ocean Environment. Granada Spain, February 23, 2015. *Invited Speaker*.

Laboratoire des Sciences de l'Environnement Marin (LEMAR), Institut Universitaire Européen de la Mer, Technopôle Brest Iroise. November 20, 2014. *Department Seminar*.

Marine Biological Laboratory. November 14, 2014. *Invited Seminar*.

Congresso Brasileiro De Oceanografia (Brazilian Congress of Oceanography). Itajai, Santa Catarina, Brazil. October 2014. *Keynote Speaker*.

9th International Copper Meeting: Copper in Biology. Vico Equense, Italy. October 2014. *Invited Speaker*.

WHOI Ocean Science Journalism Symposium. September 9, 2014. *Invited Speaker*.

Biometals. Duke University. July 2014. *Invited Speaker*.

Ocean Global Change Biology Gordon Research Conference. Waterville Valley New Hampshire, July 6-11, 2014. *Invited Speaker*.

Saito, Mak, Matthew McIlvin, Dawn Moran, Tyler Goepfert, Giacomo DiTullio, Carl Lamborg. Multiple Nutrient Stresses at Intersecting Pacific Ocean Biomes Detected by Protein Biomarkers. American Society for Mass Spectrometry. Baltimore Maryland, June 14-19, 2014. *Poster*.

Environmental Geochemistry and Geophysics Seminar, Princeton University, March 27, 2014. *Invited Speaker*.

Saito, M.A., M. McIlvin, D.M. Moran, C.H. Lamborg, G. DiTullio. Intersection of nutrient limitation biomes in the Equatorial Pacific Ocean as detected by quantitation of proteomic biomarkers (Abstract ID: 16377). Ocean Sciences Meeting Hawaii, February 2014.

University of Rochester Biology Department. *Invited Lecture*, January 27th 2014.

University of Victoria, School of Earth and Ocean Sciences. *Invited Lecture*, January 21, 2014.

University of Santa Cruz, Department of Ocean Sciences. October 4, 2013. *Student-Selected Invited Speaker*.

WHOI Ocean Science Journalism Symposium. September 12, 2013. *Invited Speaker*.

"Distribution of Metalloenzymes in Pacific Ocean Environments as Detected by Proteomic Analysis" Goldschmidt Florence Italy August 27, 2013. *Keynote Speaker*

Evening Presentation for the Woods Hole Children's School of Science on Antarctica and Vitamins, July 2013.

"Distribution of nutrient stress biomarkers and metalloenzymes in the Pacific Ocean". Ocean Carbon and Biogeochemistry Summer Workshop. Woods Hole MA, July 23, 2013.

Saito, Mak, Matthew McIlvin, Dawn Moran, Tyler Goepfert, Alyson Santoro, Carl Lamborg, Vlad Zabrouskov, Justin Blethrow. Discovery and Quantitation of the Marine Microbial Metaproteome in the Central Pacific Ocean.; American Society of Mass Spectrometry. Minneapolis MN, June 12, 2013. *Poster*.

Microbial ecology and biogeochemistry of oxygen-deficient marine waters, 18-22 March 2013, Santa Cruz, Chile. *Invited Speaker*.

"Detection and Distribution of Metalloenzymes in Pacific Ocean Environments". ASLO Meeting, New Orleans. February 2013. *Oral Presentation*.

"Metalloproteins in the Ocean: Strategies for Coping with Extreme Metal Scarcity". Metals in Biology Gordon Research Conference. Ventura California January 2013. *Invited Speaker*.

"Metalloenzymes from Marine Microbes of the Pacific Ocean Oxygen Minimum Zones". 8th International Copper Meeting: Copper in Biology. Sardinia Italy. October 4, 2012. *Invited Speaker*.
 WHOI Ocean Science Journalism Symposium *Invited Speaker*. September 13, 2012.
 "Proteomic Investigations of Key Biogeochemical Marine Metalloenzymes". Marine Microbes Gordon Research Conference, June 25, 2012. Il Ciocco Tuscany Italy. *Invited Speaker*.
 American Chemical Society San Diego CA. March 29, 2012. *Invited Speaker*.
 Forsythe Institute, Boston MA, January 31, 2012. *Invited Speaker*.
 Chemical Oceanography Gordon Research Conference, August 16, 2011, *Invited Speaker*.
 Ocean Carbon and Biology Global Biogeochemical Flux – Ocean Observing Initiative Scoping Workshop May 2011, *Invited Speaker*.
 Polar Marine Science Gordon Research Conference, March 2011. *Invited speaker*.
 Upper-Ocean Nutrient Limitation IGBP workshop, Southampton UK. November 2010, *Invited Speaker*.
 Biogotraces Workshop Los Angeles, November 2010, *Invited Speaker*.
 Society for General Microbiology, Metals and Microbes Session, Nottingham UK. September 8, 2010. *Invited speaker*.
 EU COST Speciation Database Workshop, Kiel Germany, August 2010, *Invited speaker*.
 Organic Geochemistry Gordon Conference, August 3, 2010. *Invited speaker*.
 Environmental Bioinorganic Chemistry Gordon Conference, June 2010. *Invited speaker*.
 Caltech, May 5, 2010. *Invited speaker*.
 Massachusetts Institute of Technology, EAPS March 5, 2010, *Invited speaker*.
 Goldschmidt Conference, Davos Switzerland June 2009, *Keynote Lecture*.
 U. Mass Boston, April 29, 2009. *Invited speaker*.
 Stanford University February 2009. *Invited speaker*.
 Marine Chemistry and Geochemistry Department Lecture WHOI, February 2009.
 AGU Fall Meeting, San Francisco, December 2008. *Invited Speaker*.
 Rutgers University, October 6, 2008. *Invited speaker*.
 GEOTRACES Pacific Cruise Planning Meeting, U. Southern California October 1-3 2008, *Plenary Speaker*.
 Environmental Bioinorganic Chemistry Gordon Conference June 2008, *Invited Speaker*.
 Medical University of South Carolina, Student Open House, June 2008, *Keynote Speaker*.
 Environmental Bioinorganic Chemistry Gordon Conference, June 2008, *Invited Speaker*.
 Stanford University, Oceans Seminar, May 2008. *Invited Speaker*.
 WHOI Summer Student Fellow Lecture Series. July 2008.
 Children's School of Science. Presentation to Global Sustainability and Experiments Class. July 2008.
 GEOTRACES, Atlantic Basin Planning Meeting. September 2007, Oxford University. *Invited Speaker*.
 Ocean Carbon Biogeochemistry Workshop, July 2007. *Invited Speaker*.
 University of Kyoto, June 2007. *Invited Speaker*.
 Stonybrook University, May 2006. *Invited Speaker*.
 Harvard University, October 2006. Microbial Science Initiative *Invited Speaker*.
 U. Rhode Island. September 2006. *Invited Speaker*.
 Oregon Graduate Institute. September 2006. *Invited Speaker*.
 Old Dominion University. September 2006. *Invited Speaker*.
 Goldschmidt August 2006. *Invited Speaker*.
 ASLO June 2006. Oral Presentation and Co-Session Chair.
 American Chemical Society Meeting, March 16, 2005. Oral Presentation and Co-Session Chair
 ASLO February 2005. Oral Presentation and Co-Session Chair.
 Earth Atmospheric Planetary Sciences Department, MIT. December 3, 2004. *Invited Speaker*.
 Summer Lecture Series. Woods Hole Oceanographic Institution. July 8, 2004.
 American Society for Limnology and Oceanography –TOS meeting, February 2004, Hawaii. Presentation

Goldschmidt Conference, Kurashiki Japan. September 2003. Oral Presentation.
McGill University, November 12, 2003. *Invited Speaker*.
Stanford University, Geosciences Department. October 23, 2003. *Invited Speaker*.
University of South Carolina, Columbia. April 2003. *Invited Speaker*.
Gordon Research Conference on Environmental Bioinorganic Chemistry. June 18, 2002. *Invited Speaker*.
Gordon Research Conference on Environmental Bioinorganic Chemistry, Andover, NH, June 16-21, 2002.
Poster
AGU/ASLO Ocean Sciences Meeting. Honolulu, Hawaii. February 2002. Oral Presentation.
Environmental Geochemistry and Geophysics Seminar. Princeton University. 2002
American Chemical Society, Environmental Bioinorganic Chemistry Session. Orlando, 2002. *Invited Speaker*.
Chemical Oceanography Gordon Conference, Oxford England. 2002. Poster.
Princeton Bioinorganic Chemistry Supergroup, Department of Chemistry. December 4, 2002.
Wesleyan University. February 2002. *Invited Speaker*.
Marine Chemistry and Geochemistry Department Seminar. April 3, 2002. *Invited Speaker*.
American Chemical Society, Environmental Bioinorganic Chemistry Session. Orlando, 2002. *Invited Speaker*.
American Society for Limnology and Oceanography. February 2001 New Mexico. Oral Presentation.
American Society for Limnology and Oceanography. February 13, 2001 New Mexico.
Center for Bioinorganic Chemistry Annual Meeting, Princeton. June 20, 2001. *Invited Speaker*.
College of Marine Studies Seminar Series, University of Delaware in Lewes. November 6, 2001. *Invited Speaker*.
2001 DIALOG ASLO Recent Dissertations Conference, BBSR, Bermuda.
Woods Hole Oceanographic Institution. Summer Student Lecture Series. June 23, 2000.
Marine Chemistry and Geochemistry Seminar, Woods Hole Oceanographic Institution. June 12, 2000.
Dissertations in Chemical Oceanography Conference. October 24, 2000. Honolulu, Hawaii.
American Society for Limnology and Oceanography. 2000. San Antonio, Texas. Oral Presentation.
Office of Naval Research History of Oceanography Conference. WHOI. March 2000. Poster.
American Society for Limnology and Oceanography. February 3, 1999. Santa Fe, New Mexico. Oral Presentation.
American Society for Limnology and Oceanography. February 4, 1999. Santa Fe, New Mexico. Oral Presentation.
Aquatic Sciences Seminar. Civil and Environmental Engineering MIT. November 1999.
MIT Environmental Biology Seminar. April 30, 1999. *Invited Speaker*.