

CURRICULUM VITAE

MAK ANDERSON SAITO

Associate Scientist with Tenure

Dept. of Marine Chemistry and Geochemistry

Woods Hole Oceanographic Institution

Woods Hole MA 02543

Telephone: (508)-289-2393

Email: msaito@whoi.edu

www.whoi.edu/saitolab

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

Co-Principal Investigator for the Biological Chemical Oceanography Data Management Office, 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 and Workplace Climate Committee (GEPAC, 2017; renamed Workplace Climate Committee 2018 - present)

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

2002-2003 Participant in Diatom Genome Annotation (*Thalassiosira pseudonana*) 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
- 2017-present Science PI for Biological Chemical Data Management Office (BCO-DMO)

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, 10 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 Dan Repeta
Veronique Oldham Postdoctoral Scholar, 2017-present, co-advised with Colleen Hansel
Jaci Saunders, 2017-present NASA Postdoctoral Scholar
Natalie Cohen, 2017-present Simons Postdoctoral Scholar
Michael Mazzotta 2018-present Drefyus Environmental Chemistry Scholar

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, 2016-2018
Laura Rea, Research Assistant I, 2017-2018

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> , AUV Clio Engineering Trials, Woods Hole to Woods Hole.
2017-2018 Dec 16 th – Jan 20 th	R/V <i>N.B. Palmer</i> Punta Arenas to McMurdo Station, Antarctica
2018 April 12 th -15 th	R/V <i>Atlantic Explorer</i> , BATS - AUV Clio Deployment
2018 June 13 th -16 th	R/V <i>Atlantic Explorer</i> , BATS - AUV Clio Deployment

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 McIlvin.

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>

Informatics Websites for Proteomics Datasets

<http://Metatryp.who.edu> Launched at Ocean Sciences February 2018

<http://Oceanproteinportal.org> Launched summer of 2018 at ASMS, SciPy, and EarthCube

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

1. Saito, Mak; Bertrand, Erin ; Duffy, Megan; Gaylord, David; Held, Noelle; Hervey, Judson; Hettich, Robert; Jagtap, Pratik; Janech, Michael ; Kinkade, Danie; Leary, Dagmar ; McIlvin, Matthew; Moore, Eli; Morris, Robert; Neely, Benjamin; Nunn, Brook; Saunders, Jaclyn; Shepherd, Adam; Symmonds, Nick; Walsh, David. Progress and Challenges in Ocean Metaproteomics and Proposed Best Practices for Data Sharing. Submitted to Journal of Proteome Research (ACS Journal).
2. Kathleen M. Munson, Carl H. Lamborg, Rene M. Boiteau, and Mak A. Saito. Dynamic mercury methylation and demethylation in oligotrophic marine waters. Biogeosciences. Under revision.
3. Cohen, Natalie R., Weida Gong, Dawn M. Moran, Matthew R. McIlvin, Mak A. Saito, and Adrian Marchetti. 2018. Transcriptomic and proteomic responses of the oceanic diatom *Pseudo-nitzschia granii* to iron limitation. *Environmental microbiology*.
4. Emma Tarrant, Gustavo P. Riboldi, Matthew R. McIlvin, Jack Stevenson, Anna Barwinska-Sendra, Louisa J. Stewart, Mak A. Saito, Kevin J. Waldron. Proteomic analysis of the response of *Staphylococcus aureus* to elevated copper indicates major effects on metal homeostasis and alterations to carbon metabolism. In revision at Metallomics.
5. Held*, N.A., McIlvin, M.R., Moran, D.M., Laub, M.T., Saito, M.A. Ecological drivers of two-component signaling-based regulation in marine bacteria. In review at mSystems.
6. Bender[†], S.J., D. Moran, M.R. McIlvin, H. Zheng, J.P. McCrow, J. Badger, G.R. DiTullio, A.E. Allen, M.A. Saito. 2018. Major proteome reorganization upon iron-induced colony formation in the Southern Ocean marine Haptophyte *Phaeocystis antarctica*. Biogeosciences 15, 4923-4942, <https://doi.org/10.5194/bg-15-4923-2018>.
7. Held, Noelle and Saunders, Jaclyn and Futrelle, Joe and Saito, Mak. Harnessing the Power of Scientific Python to Investigate Biogeochemistry and Metaproteomes of the Central Pacific Ocean. *Proceedings of the Python in Science Conference*, 2018. [doi:10.25080/Majora-4af1f417-010](https://doi.org/10.25080/Majora-4af1f417-010)
8. Schlitzer, Reiner; Anderson, Robert F; Dodas, Elena Masferrer; Lohan, Maeve; Geibert, Walter; Tagliabue, Alessandro; Bowie, Andrew; Jeandel, Catherine; Maldonado, Maria T;

- Landing, William M; Cockwell, Donna; Abadie, Cyril; Abouchami, Wafa; Achterberg, Eric P; Agather, Alison; Aguliar-Islas, Ana; Van Aken, Hendrik M; Andersen, Morten; Archer, Corey; Auro, Maureen; De Baar, Hein J; Baars, Oliver; Baker, Alex R; Bakker, Karel; Basak, Chandranath; Baskaran, Mark; Bates, Nicholas R; Bauch, Dorothea; Van Beek, Pieter; Behrens, Melanie K; Black, Erin; Bluhm, Katrin; Bopp, Laurent; Bouman, Heather; Bowman, Katlin; Bown, Johann; Boyd, Philip; Boye, Marie; Boyle, Edward A; Branellec, Pierre; Bridgestock, Luke; Brissebrat, Guillaume; Browning, Thomas; Bruland, Kenneth W; Brumsack, Hans-Jürgen; Brzezinski, Mark; Buck, Clifton S; Buck, Kristen N; Buesseler, Ken; Bull, Abby; Butler, Edward; Cai, Pinghe; Mor, Patricia Cámara; Cardinal, Damien; Carlson, Craig; Carrasco, Gonzalo; Casacuberta, Núria; . The GEOTRACES Intermediate Data Product 2017. *Chemical Geology*. 493. 210-223.
9. Moffett, James W; German, Christopher R; Peters, Brian D; Jenkins, William J; Swift, James H; Casciotti, Karen L; Sanial, V; Kipp, LE; Henderson, PB; van Beek, P; Charette, MA; Black, Erin E; Buesseler, Ken O; Pike, Steven M; Lam, Phoebe J; Kipp, Lauren E; Sanial, Virginie; Henderson, Paul B; van Beek, Pieter; Charette, Matthew A; John, Seth G; Helgoe, Joshua; Townsend, Emily; Weber, Tom; Till, Claire; Cutter, Gregory A; Moffett, James G; Nielsdóttir, Maria C; Lee, Jong-Mi; Heller, Maija I; Mehic, Sanjin; Bates, Nicholas R; Ohnemus, Daniel C; Twining, Benjamin S; Hawco, Nicholas J; Saito, Mak A; Lott, Dempsey E; Cahill, Kevin L; Longworth, Brett; Hoffman, Colleen L; Nicholas, Sarah L; Fitzsimmons, Jessica N; Toner, Brandy M; Marsay, Chris M; Pavia, Frank; Anderson, Robert; Vivancos, Sebastian; Fleisher, Martin; Edwards, R Lawrence; Buck, Kristen N; Sedwick, Peter N; Sohst, Bettina; Carlson, Craig A; Ho, Peng; Shiller, Alan M. 2018. The US GEOTRACES Eastern Tropical Pacific Transect (GP16). *Marine Chemistry*. 201. 1-5.
 10. Bundy, Randelle M., Rene M. Boiteau, Craig McLean, Kendra A. Turk-Kubo, Matt R. McIlvin, Mak A. Saito, Benjamin AS Van Mooy, and Daniel J. Repeta. 2018. Distinct Siderophores Contribute to Iron Cycling in the Mesopelagic at Station ALOHA. *Frontiers in Marine Science* 5 (2018): 61.
 11. Tagliabue, Alessandro, Nicholas J. Hawco, Randelle M. Bundy, William M. Landing, Angela Milne, Peter L. Morton, and Mak A. Saito. 2018. The role of external inputs and internal cycling in shaping the global ocean cobalt distribution: insights from the first cobalt biogeochemical model. *Global Biogeochemical Cycles* 32, no. 4. 594-616.
 12. Walworth, Nathan G., Michael D. Lee, Christopher Suffridge, Pingping Qu, Fei-Xue Fu, Mak A. Saito, Eric A. Webb, Sergio A. Sañudo-Wilhelmy, and David A. Hutchins. 2018. Functional genomics and phylogenetic evidence suggest genus-wide cobalamin production by the globally distributed marine nitrogen fixer *Trichodesmium*. *Frontiers in microbiology* 9. 189.
 13. Hawco, Nicholas J., and Mak A. Saito. 2018. Competitive inhibition of cobalt uptake by zinc and manganese in a Pacific *Prochlorococcus* strain: Insights into metal homeostasis in a streamlined oligotrophic cyanobacterium. *Limnology and Oceanography*.
 14. Lee, M.D., Webb, E.A., Walworth, N.G., Fu, F.X., Held*, N.A, Saito, M.A., Hutchins, D.A. 2017. Transcriptional profiles of the *Trichodesmium* consortium following long term CO₂ adaptation: community nitrogen cycling, respiration, and ecological niche-space delineation. *Applied and Environmental Microbiology*. AEM-02026.
 15. 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*. 201. 151-166.
 16. Saito, Mak A., Abigail E. Noble*, Dan Ohnemus, Nicholas Hawco*, Seth John, Phoebe Lam, Ben Twining, Rod Johnson, Dawn Moran, Matthew McIlvin. 2017. The Acceleration of Dissolved Cobalt's Ecological Stoichiometry due to Biological Uptake, Remineralization, and Scavenging in the Atlantic Ocean. *Biogeosciences*. 14:20. 4637-4662.
 17. 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

18. 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.
19. 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.
20. 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*.
21. 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.
22. 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.
23. 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.
24. 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.
25. 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.
26. 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.
27. 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*.
28. 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*.
29. 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
30. 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.
31. 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.
32. 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.

33. 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.
34. Swanner, E. D., Wu, W., Hao, L., Wüstner, M. L., Obst, M., Moran, D. M., McIlvin, 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.
35. Santoro, Alyson E., Christopher L. Dupont, R. Alex Richter, Matthew T. Craig, Paul Carini, Matthew R. McIlvin, 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.
36. 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.
37. 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.
38. 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.
39. 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.
40. The GEOTRACES Group. 2015. The GEOTRACES intermediate data product 2014. *Marine Chemistry* 177. 1-8.
41. 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.
42. 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.
43. Austin, Rachel Narehood, Mak A. Saito. 2014. Metals in Marine Biochemistry. *Metallomics*. 6.6. 1105-1106.
44. 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>.
45. 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.
46. 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.
47. 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.
48. 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.

49. 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.
50. 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.
51. 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.
52. 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.
53. 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>.
54. 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.
55. 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. Maraño, 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.
56. 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.
57. 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.
58. Alexander H., B.D. Jenkins, T.A. Rynearson, 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.
59. 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.
60. Mackey, Katherine R.M., Kathryn Roberts, Michael W. Lomas, Mak A. Saito, Anton F Post, Adina Paytan. 2012. Variable solubility and ecological impact of atmospheric phosphorus deposition. *Environ. Sci. Technol.* DOI: 10.1021/es3007996.
61. Saito, Mak A. 2012. The Rise of Oxygen and Aerobic Biochemistry. *Structure*. 20:1. 1–2.
62. Noble*, A.E., C.H. Lamborg, D. Ohnemus, P.J. Lam, K. T.J. Goepfert, C.I. Measures, C.H. Frame, K.L. Casciotti, G.R. DiTullio, J. Jennings, and M.A. Saito. 2012. Basin-scale plumes of cobalt, iron, and manganese emanating from the Benguela-Angola front in the South Atlantic Ocean. *Limnology and Oceanography*. 57:4. 989-1010.
63. Jakuba, R., M.A. Saito, J.W. Moffett, Y. Xu. 2012. Dissolved zinc in the subarctic North Pacific and Bering Sea: Its distribution, speciation, and importance to primary producers. *Global Biogeochemical Cycles*. 26, GB2015, doi:10.1029/2010GB004004.

64. Dyhrman, Sonya T., Bethany D. Jenkins, Tatiana A. Rynearson, Mak A. Saito, Melissa L. Mercier, Harriet Alexander, LeAnn P. Whitney, Andrea Drzewianowski, Vladimir V. Bulygin, Erin M. Bertrand, Zhijin Wu, Claudia Benitez-Nelson, Abigail Heithoff. 2012. Coordination in the transcriptome and proteome of the diatom *Thalassiosira pseudonana* reveals a diverse phosphorus stress response. *PLoS One*. 7:3. e33768.
65. Wurch, Louie L., Erin M. Bertrand, Mak A. Saito, Benjamin A.S. Van Mooy, Sonya T. Dyhrman. Proteome changes driven by phosphorus stress and recovery in the brown tide-forming alga, *Aureococcus anophagefferens*. *PLOS One*. 6(12): e28949. doi:10.1371/journal.pone.0028949.
66. de Souza, Gregory F., Ben C. Reynolds, Jörg Rickli, Martin Frank, Mak Saito, Loes J. A. Gerringa, Bernard Bourdon. 2012. Southern Ocean control of silicon stable isotope distribution in the deep Atlantic Ocean. *Global Biogeochemical Cycles*. 26, GB2035, doi:10.1029/2011GB004141.
67. Saito, M.A., Vladimir Bulygin, Dawn Moran, Craig Taylor, Christopher Scholin. 2011. Examination of Microbial Proteome Preservation Techniques Applicable to Autonomous Environmental Sample Collection. *Front. Microbio*. 2:215. doi: 10.3389/fmicb.2011.0021.
68. Sohm, Jill A., Jason Hilton, Abigail Noble, Jonathan P. Zehr, Mak A. Saito, Eric A. Webb. 2011. Nitrogen fixation in the South Atlantic Gyre and the Benguela upwelling system. *Geophys. Res. Lett*. 38, L16608, doi:10.1029/2011GL048315.
69. Thompson, A.W. *, K. Huang, M.A. Saito, S.W. Chisholm. 2011. Transcriptome response of high and low-light adapted *Prochlorococcus* strains to changing iron availability. *ISME Journal*. 1-15. doi: 10.1038/ismej.2011.49.
70. Bertrand*, E. M., M.A. Saito, P.A. Lee, R.B. Dunbar, G.R. DiTullio. 2011. Iron limitation of springtime bacterial and phytoplankton populations in the Ross Sea: Interactive effects of iron and vitamin B₁₂ nutrition. *Front. Microbiology*. 2:160. doi: 10.3389/fmicb.2011.00160
71. Saito, M.A., E.M. Bertrand, V. Bulygin, D. Moran, S. Dutkiewicz, F.M. Monteiro, M.J. Follows, F.W. Valois, J.B. Waterbury. 2011. Iron Conservation by Reduction of Metalloenzyme Inventories in the Marine Diazotroph *Crocospaera watsonii*. *Proc. Natl. Acad. Sci*. doi:10.1073/pnas.1006943108.
72. Saito, M.A., T.J. Goepfert, A.E. Noble, P.N. Sedwick, G.R. DiTullio. 2010. A Seasonal Study of Dissolved Cobalt in the Ross Sea of Antarctica: Micronutrient Control, Absence of Observed Scavenging, and Relationships with Zn, Cd, and P. *Biogeosciences*. 7. 4059-4082.
73. Bertrand, E.M. *, M.A. Saito, Y. Jae Jeon, B.A. Neilan. 2011. Vitamin B₁₂ biosynthesis gene diversity in the Ross Sea: the identification of a new group of polar B₁₂-biosynthesizers. *Environmental Microbiology*. doi:10.1111/j.1462-2920.2011.02428.x
74. Gobler, C.J. (and 29 others). Ecological Niche of Harmful Alga, *Aureococcus Anophagefferens*, revealed in genome. 2010. *Proc. Natl. Acad. Sci*.
75. Higgins, M.B., F.L. Wolfe-Simon, R.S. Robinson, Y. Qin, M.A. Saito, A. Pearson. 2011. Paleoenvironmental implications of taxonomic variation among $\delta^{15}\text{N}$ values of chloropigments. *Geochimica et Cosmochimica Acta*. 75:22. 7351-7363.
76. Sedwick, P.N., C.M. Marsay, A.M. Aguilar-Islas, M.C. Lohan, B.M. Sohst, 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*. 116:C12019.
77. Wu, Z., B.D. Jenkins, T.A. Rynearson, S.T. Dyhrman, M.A. Saito, M. Mercier, L. Whitney. 2010. Empirical Bayes Analysis of Sequencing-based Transcriptional Profiling without Replicates. *BMC Bioinformatics*. 11:564. doi:10.1186/1471-2105-11-564.
78. Saito, M.A. 2009. Less Nickel for More Oxygen. *Nature*. 458. 714-715.
79. Saito, M.A., T.J. Goepfert. 2008. Zinc-cobalt co-limitation in *Phaeocystis antarctica*. *Limnology and Oceanography*, 53(1). 266-275.

80. Saito, M.A., T.J. Goepfert, J.T. Ritt. 2008. Some thoughts on the concept of co-limitation: Three definitions and the importance of bioavailability. *Limnology and Oceanography*. 53(1). 276-290.
81. Church, M.J., K.M. Björkman, D.M. Karl, M.A. Saito, and J.P. Zehr. 2008. Regional distributions of nitrogen fixing bacteria in the Pacific Ocean. *Limnology and Oceanography*. 53(1). 63-77.
82. Noble, A.E.* , M.A. Saito, K. Maiti, C. Benitez-Nelson. 2008. A concentrating mechanism for cobalt within a cyclonic eddy and sources of cobalt, manganese, and iron in intermediate waters near the Hawaiian Islands. *Deep-Sea Research II*. 55. 1473-1490.
83. Bertrand*, E.M., M.A. Saito, J.M. Rose, C.R. Riesselman, M.C. Lohan, A.E. Noble, P.A. Lee, G.R. DiTullio. 2007. Vitamin B₁₂ and iron co-limitation of phytoplankton growth in the Ross Sea. *Limnology and Oceanography*, 52(3). 1079-1093.
84. Montsant, A., A.E. Allen, S. Coesel, A. De Martino, A. Falciatore, M. Heijde, K. Jabbari, U. Maheswari, M. Mangogna, E. Rayko, M. Saut, A. Vardi, K.E. Apt, J.A. Berges, A. Chiovitti, A.K. Davis, M.Z. Hadi, T.W. Lane, J.C. Lippmeier, D. Martinez, M.S. Parker, G.J. Pazour, M.A. Saito, K. Thamtracoln, D.S. Rokhsar, E.V. Armbrust, C. Bowler. 2007. Identification and Comparative Genomic Analysis of Signaling and Regulatory Components in the Diatom *Thalassiosira pseudonana*. *Journal of Phycology*. 43. 585-604.
85. Moore, L., A. Coe, E. Zinser, M.A. Saito, M. Sullivan, D. Lindell, K. Frois-Moniz, J. Waterbury, S.W. Chisholm. 2007. Culturing of the marine cyanobacterium *Prochlorococcus*. *Limnology and Oceanography Methods*. 5. 353-362.
86. John, S.G., R.W. Geis, M.A. Saito, E.A. Boyle. 2007. Zinc isotope fractionation during high-affinity and low-affinity transport in *Thalassiosira oceanica*. *Limnology and Oceanography*. 52(6). 2710-2714.
87. Castruita, M., M.A. Saito, P.C. Schottel, L.A. Elmegreen, S. Myneni, E.I. Stiefel, F.M.M. Morel. 2006. Overexpression and characterization of an iron storage and DNA-binding Dps protein from *Trichodesmium erythraeum*. *Applied and Environmental Microbiology*. 72(4). 2918-2924.
88. Saito, M.A., D.L. Schneider. 2006. Examination of the precipitation chemistry and improvements in precision using the Mg(OH)₂ preconcentration ICP-MS method for high-throughput analysis of open-ocean Fe and Mn in seawater. *Analytica Chimica Acta*. 565. 222-233.
89. Lane⁺, T.W., M.A. Saito⁺, G.N. George, I.J. Pickering, R.C. Prince, F.M.M. Morel. 2005. A Cadmium Enzyme from a Marine Diatom. *Nature*. 435. 42. ⁺co-first authors, written by Saito
90. Saito, M.A., G. Rocap, J.W. Moffett. 2005. Production of Cobalt Binding Ligands in a *Synechococcus* Feature at the Costa Rica Upwelling Dome. *Limnology and Oceanography*. 50. 279-290.
91. Armbrust, E.V., J.A. Berges, C. Bowler, B.R. Green, D. Martinez, N.H. Putnam, S. Zhou, A.E. Allen, K.E. Apt, M. Bechner, M.A. Brzezinski, B.K. Chaal, A. Chiovitti, A.K. Davis, M.S. Demarest, J.C. Detter, T. Glavina, D. Goodstein, M.Z. Hadi, U. Hellsten, M. Hildebrand, B.D. Jenkins, J. Jurka, V.V. Kapitonov, N. Kröger, W.W.Y. Lau, T.W. Lane, F.W. Larimer, J.C. Lippmeier, S. Lucas, M. Medina, A. Montsant, M. Obornik, M.S. Parker, B. Palenik, G.J. Pazour, P. M. Richardson, T.A. Rynearson, M.A. Saito, D.C. Schwartz, K. Thamtracoln, K. Valentin, A.Vardi, F.P. Wilkerson, D. S. Rokhsar. 2004. Analysis of whole genome sequence of the centric diatom *Thalassiosira pseudonana*. *Science*. 306. 79-86.
92. Edgcomb, V.P., S.J. Molyneaux, M.A. Saito, K. Lloyd, S. Böer, C.O. Wirsen, M.S. Atkins and A. Teske. 2004. Sulfide Ameliorates Metal Toxicity for Deep-Sea Hydrothermal Vent Archaea. *Applied and Environmental Microbiology*. 70(4). 2551-2555.
93. Saito, M.A., G.R. DiTullio, J.W. Moffett. 2004. Cobalt and Nickel in the Peru Upwelling Region: A major flux of labile cobalt utilized as a micronutrient. *Global Biogeochemical Cycles*. 18. GB4030. 1-14.
94. Morel, F.M.M., A.J. Milligan. M.A. Saito. 2003. "Marine Bioinorganic Chemistry: The Role of Trace of Metals in the Oceanic Cycles of Major Nutrients" in *Treatise on Geochemistry* edited by K.K. Turekian, H.D. Holland, Elsevier Science Ltd, Cambridge, UK.

95. Saito, M.A., D. Sigman, F.M.M. Morel. 2003. The bioinorganic chemistry of the ancient ocean: the co-evolution of cyanobacterial metal requirements and biogeochemical cycles at the Archean-Proterozoic boundary? *Inorganica Chimica Acta*. 356C. 308-318.
96. Atkins, M.S., M.A. Hanna, E.A. Kupetsky, M.A. Saito, C.D. Taylor, C.O. Wirsen. 2002. Tolerance of flagellated protozoa to extreme environmental conditions potentially encountered at deep-sea hydrothermal vents. *Marine Ecological Progress Series*. 226. 63-75.
97. Saito, M.A., J.W. Moffett. 2002. Temporal and Spatial Variability of Cobalt in the Atlantic Ocean. *Geochimica et Cosmochimica Acta*. 66(11). 1943-1953.
98. Saito, M.A., S.W. Chisholm, J.W. Moffett, J. Waterbury. 2002. Cobalt limitation and uptake in the marine cyanobacterium *Prochlorococcus*. *Limnology and Oceanography*. 47(6). 1629-1636.
99. Saito, M.A., J.W. Moffett. 2001. Complexation of cobalt by natural organic ligands in the Sargasso Sea as determined by a new high-sensitivity electrochemical cobalt speciation method suitable for open ocean work. *Marine Chemistry*. 75. 49-68.

BOOK CHAPTERS AND THESES

1. Saito, M.A. 2001. The Biogeochemistry of Cobalt in the Sargasso Sea. Ph.D. Thesis. MIT/WHOI Joint Program in Chemical Oceanography.
2. Saito, Mak. 2015. The Hydrosphere as Microbial Habitat. Chapter 5 in Geomicrobiology. 6th Edition. Edited by Lutz and Newman.
3. Saito, M. A., Breier, C., Jakuba, M., McIlvin, M., and Moran, D. 2017. ENVISIONING A CHEMICAL METAPROTEOMICS CAPABILITY FOR BIOCHEMICAL RESEARCH AND DIAGNOSIS OF GLOBAL OCEAN MICROBIOMES In: The Chemistry of Microbiomes: Proceedings of a Seminar Series, National Academies Press, National Academies of Sciences, Engineering, Medicine. 29-36.

OUTREACH BOOKS

- 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.
- To the Top of the World. 2016. Kaitlin Bowman and Elizabeth Saito Children's Book on GEOTRACES Arctic Expedition. Self-published. All proceeds donated to science conservation and children's education organizations, and copies donated to libraries and schools. Supported as a NSF Broader Outreach effort award to M. Saito.

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
- [Oceanus](#) Article on Vitamin B₁₂ Claw and Proteomics
- 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](#)
- Inside Manned Systems [article](#) on AUV Clio, December 29th 2016.
- UPI [article](#) on ocean deoxygenation, July 8th 2017.
- Falmouth Community Television story on the AUV Clio, September 2017.
- Cape Code Times [article](#) on AUV Clio, July 30th 2017.

PUBLISHED ABSTRACTS

John A Breier, Michael Jakuba, Mak A Saito, Gregory Dick, Daniel Gomez-Ibanez, Kaitlyn Tradd, Sharon L Grim, Rebecca Chmiel, Matthew R McIlvin, Abigail Emery Noble, Brianna Alanis, Marissa Morgan Kellogg, Javier Garcia. *Clio*: a vertical sampling AUV for next-generation ocean sectional studies. ASLO Ocean Sciences Meeting Portland Oregon, February 15, 2018. Poster

Mak A Saito, Matthew R McIlvin. Dawn M Moran, Alyson E Santoro, Eric A Webb, Michael D Lee. Christopher L Dupont. Tristan J Horner, Noelle Held. Surveying Metalloproteins in the Euphotic Zone and Oxygen Minimum Zone of the Central Pacific Ocean and Their Influence on Biogeochemical Cycles. ASLO Ocean Sciences Meeting Portland Oregon, February 15, 2018. Oral Presentation.

Alyson E Santoro, Mak A Saito, Matthew R McIlvin, Dawn M Moran. Trace Metal Requirements of Nitrite-Oxidizing Bacteria: Implications for Nitrite Oxidation in the Upper Mesopelagic. ASLO Ocean Sciences Meeting Portland Oregon, February 15, 2018. Poster

Hannah Ake, Matt Biddle, Nancy J Copley, Danie Kinkade, Shannon Rauch, Mak A Saito, Adam Shepherd, Peter H Wiebe, Megan Switzer, Amber York. BCO-DMO – a domain-specific repository for oceanographic data from around the world. ASLO Ocean Sciences Meeting Portland Oregon, February 15, 2018. Poster

Adam Shepherd, Douglas Fils, Danie Kinkade, Mak A Saito. The Frictionless Data Package: Data Containerization for Addressing Big Data Challenges. ASLO Ocean Sciences Meeting Portland Oregon, February 15, 2018. Poster

Mak A Saito, Matthew R McIlvin, Jaci Saunders, Noelle Held, Dawn M Moran, Laura Rea, Luis Valentin, Tristan J Horner, Danie Kinkade, Adam Shepherd, David Gaylord, Nick Symmonds, Joe Futrelle, Mike Jakuba, Chip Breier. Improving Global and Targeted Metaproteomic Analyses of Oceanic Microbiomes:(Developing an ocean ecosystem health capability). ABRF Conference Myrtle Beach, SC.April 24th, 2018.

Noelle Held ; Matthew McIlvin ; Jaclyn Saunders ; Joe Futrelle ;Claire Mahaffey ; Maeve Lohan ;Malcolm Woodward ; Mak Saito. Approaches for Environmental Phosphoproteomics: Measuring, validating and interpreting a "Metaphosphoproteome". ASMS 2018 San Diego. American Society of Mass Spectrometry. San Diego, California. June 6, 2018.

Best Practices for Data Sharing of Ocean Metaproteomic Data Workshop Results. Matt McIlvin ; Erin M. Bertrand ; Megan Duffy ; David Gaylord ;Noelle Held ; W. Judson Hervey ; Robert L. Hettich ; Pratik D Jagtap ; Michael G. Janech ; Danie Kinkade ; Dasha Leary ;Eli Moore ; Robert Morris ; Benjamin Neely ; Brook Nunn ; Jaclyn K. Saunders; Adam Shepherd ; Nick Symmonds ;David Walsh ; Mak Saito. ASMS 2018 San Diego. American Society of Mass Spectrometry. San Diego, California. June 6, 2018.

Jaclyn K. Saunders, Matthew McIlvin, Dawn Moran, Noelle Held, Joe Futrelle, Alyson Santoro, Chris Dupont, Mak A. Saito. "Characterization of the Central Pacific Oxygen Minimum Zone: The Results of the ProteOMZ Expedition." ASMS 2018 San Diego. American Society of Mass Spectrometry. San Diego, California. June 6, 2018.

Development of an Ocean Protein Portal for Exploration of Marine Metaproteomic Datasets Mak Saito ; David Gaylord ;Adam Shepherd ; Jaclyn Saunders ;Noelle Held ; Michael Chagnon ; Nick Symmonds ; Danie Kinkade ; Alex Dorsk; Matthew McIlvin. ASMS 2018 San Diego. American Society of Mass Spectrometry. San Diego, California. June 6, 2018.

Cobalt Speciation in the Amundsen and Ross Seas during Bloom Conditions
Chmiel R, DiTullio G & Saito M. Goldschmidt Conference. Boston 2018

A Unique Mn Redox Cycle in the Ross Sea Oldham V, Saito M, diTullio J & Hansel C.
Goldschmidt Conference. Boston 2018

Cohen NR, McIlvin MR, Moran DM, Hawco NJ, DiTullio GR, McCrow JP, Dupont CL, Allen AE, Saito MA. Nitrate, iron and B₁₂ stress in eukaryotic phytoplankton of the tropical and equatorial Pacific. Northeastern Geobiology Symposium. Woods Hole, MA. April 2018.

Cohen NR, McIlvin MR, Moran DM, Hawco NJ, DiTullio GR, McCrow JP, Dupont CL, Allen AE, Saito MA. Nitrate, iron and B₁₂ stress in eukaryotic phytoplankton of the central Pacific

Ocean. Ocean Carbon & Biogeochemistry Workshop. Woods Hole, MA. June 2018.

Jaclyn K. Saunders, Matthew McIlvin, Dawn Moran, Noelle Held, Joe Futrelle, Eric Webb, Alyson Santoro, Chris Dupont, Mak A. Saito. "Proteomic characterization of Central Pacific Oxygen Minimum Zone microbial communities." Marine Microbes GRC: Elucidating Microbial Processes Across Spatial and Temporal Scales. Gordon Research Conference. Lucca, Italy. July 3, 2018.

Noelle A. Held*, Jaclyn K. Saunders*, Joe Futrelle, Mak A. Saito. (*co-presenters of work) "Harnessing the Power of Scientific Python to Investigate Biogeochemistry and Metaproteomes of the Central Pacific Ocean." SciPy 2018. The 17th annual Scientific Computing with Python conference. Austin, Texas. July 11, 2018.

Mak Saito, Matthew McIlvin, Dawn Moran, Luis Valentin, Nicholas Hawco. A Comparison of Adaptive Responses to Metal and Nutrient Scarcity in the Between Atlantic and Pacific Oceanic Regions. International Conference on Biological Inorganic Chemistry (ICBIC-18), Florianopolis, Brazil July, 2017.

Mak Saito; Matthew McIlvin; Dawn Moran; Luis Valentin; Romain Hugué; Shannon Eliuk; Graeme McAlister; Rod Johnson. Diagnosis of Ecosystem Adaptive Responses by Analysis of Hundreds of Peptide Biomarkers in the North Atlantic Ocean using Targeted Metaproteomics. American Society for Mass Spectrometry, June 7th 2017. *Poster*.

Luis Valentin-Alvarado, L. E.; Nicholas Hawco, N.; Matthew McIlvin, 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.

Hawco, N. J.; McIlvin, M. R.; Moran, D. M.; Tagliabue, A.; Saito, M. A.; COBALT METABOLISM IN PROCHLOROCOCCUS: POTENTIAL FOR LIMITATION AND INTERFERENCE BY OTHER METALS (Abstract ID:29850), ASLO Meeting, Honolulu Hawaii, February 2017.

Gauglitz, J. M.; McLean, C.; Boiteau, R. M.; McIlvin, M. R.; Moran, D. M.; Repeta, D. J.; Saito, M. A.; BIOAVAILABILITY OF DEFERRIOXAMINE SIDEROPHORES AND THE PROTEOMIC RESPONSES OF A MARINE VIBRIO TO LOW IRON (Abstract ID:29530) ASLO Meeting, Honolulu Hawaii, February 2017.

Saito, M. A.; McIlvin, M. R.; Moran, D. M.; Hawco, N. J.; Matheson, J.; Sedwick, P. N.; Noble, A. E.; Bates, N. R.; Lomas, M. W.; Johnson, R.; LAYERING OF ADAPTIVE NUTRIENT RESPONSES IN THE NORTH ATLANTIC SUBTROPICAL GYRE AS DETECTED BY METAPROTEOMICS. ASLO Meeting, Honolulu Hawaii, February 2017.

Held, N. A.; Saito, M. A.; McIlvin, M. R.; Moran, D. M.; SENSING AND SIGNALING: TWO-COMPONENT SYSTEMS IN MARINE MICROBES (E) (Abstract ID:29775). ASLO Meeting, Honolulu Hawaii, February 2017.

Walworth, N. G.; Hutchins, D. A.; Fu, F.; Lee, M. D.; Saito, M. A.; Webb, E. A.; TRANSCRIPTOMIC AND PROTEOMIC ANALYSES OF TRICHODESMIUM UNDER IRON AND PHOSPHORUS CO-LIMITATION IN THE PRESENT AND FUTURE OCEAN (Abstract ID:30019). ASLO Meeting, Honolulu Hawaii, February 2017.

Bundy, R. M.; Saito, M. A.; Hawco, N. J.; Tagliabue, A.; WIDESPREAD DISTRIBUTION OF ELEVATED SURFACE COBALT IN THE ARCTIC OCEAN (Abstract ID: 29120). ASLO Meeting, Honolulu Hawaii, February 2017.

Kellogg, M.; Moran, D. M.; McIlvin, M.; Moosburner, M.; Allen, A. E.; Saito, M. A.; IDENTIFICATION OF THE HIGH-AFFINITY ZINC TRANSPORTER AND POTENTIAL FOR USE AS A BIOMARKER DETECTED BY PROTEOMICS IN THE MARINE DIATOM THALASSIOSIRA PSEUDONANA (E)(Abstract ID: 29967). ASLO Meeting, Honolulu Hawaii, February 2017.

Mak Saito; Matt McIlvin; Dawn Moran; Alyson Santoro; Chris Dupont; Michael Rappe; ProteOMZ: Development of Biogeochemically Relevant Peptide Biomarkers for High-Throughput Marine Microbial Ecosystem Characterization in Oceanic Oxygen Minimum Zones. American Society for Mass Spectrometry, June 2016. *Poster*.

Saito, Mak A., Alexander Dorsk, Anton Post, Matthew McIlvin, Michael S. Rappe, Giacomo DiTullio, Dawn Moran. Needles in the blue Sea: Sub-species specificity by targeted metaproteomics of the vast oceanic microbial metaproteome. AGU Meeting San Francisco. December 2015.

Saito, M.A., M. McIlvin, A. E. Santoro, D. M. Moran, C. L. Dupont, P. A. Rafter and C. H. Lamborg. Prevalence of Metalloenzymes in Oxygen Minimum Zones Extremities: Implicit Widespread Mesopelagic Nitrogen Cycling Activity and Potential Impacts of Deoxygenation on Nitrogen and Iron Biogeochemical Cycles. ASLO/AGU Ocean Sciences Meeting. New Orleans, Louisiana. February 21-26, 2016. *Oral Presentation*.

Held, Noelle, Matthew McIlvin, Mak Saito. Identification of Phosphorylation Sites in Marine Microbes. American Society for Mass Spectrometry, May 31 – June 4, 2015. St. Louis Missouri.

Saito, Mak, Matthew McIlvin, Dawn Moran, Alex Dorsk, Anton Post. Targeted Metaproteomics: Finding Needles in the Deep Blue Sea. American Society for Mass Spectrometry, May 31 – June 4, 2015. St. Louis Missouri.

Walworth, N G., F. X. Fu, E.A. Webb, M.A. Saito, D. Moran, M.R. McIlvin, J. Gale, C. Johnson, D.A. Hutchins. Comparative functional genomics and epigenomics of *Trichodesmium* adapted to long-term elevated CO₂ under simultaneous iron and phosphorus co-limitation (Abstract ID: 25521). Association for the Sciences of Limnology and Oceanography, Granada Spain. February 22-25, 2015.

Gauglitz, J.M., M.R. McIlvin, J.B. Waterbury, M.A. Saito. Influence of iron on the proteome of the unicellular diazotroph *Crocospaera Watsonii* WH8501 (Abstract ID: 26348). Association for the Sciences of Limnology and Oceanography, Granada Spain. February 22-25, 2015.

Bender, S.J., D. Moran, M. McIlvin, A.E. Allen, M. Saito. Unfolding colony formation mechanisms in *Phaeocystis antarctica* (Abstract ID: 27320). Association for the Sciences of Limnology and Oceanography, Granada Spain. February 22-25, 2015.

Saito, M.A., M.R. McIlvin, D.M. Moran, A. Santoro, C. Dupont, T.J. Goepfert, P. Rafter, D.M. Sigman, J.W. Waterbury, C.H. Lamborg. Distributions of oceanic microbial metalloenzymes and their potential role in nitrogen biogeochemical cycling as measured by targeted metaproteomics (Abstract ID: 27386). Association for the Sciences of Limnology and Oceanography, Granada Spain. February 22-25, 2015.

McIlvin, Matthew, J. Dafhne Aguirre, Hillary Clark, Valeria Culotta, Mak Saito. Metallomic Analysis of Metalloproteins within the Lyme Disease Pathogen *Borrelia burgdorferi*. American Society for Mass Spectrometry June 2014 Poster

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

Saito, M.A., M. McIlvin, D.M. Moran, C.H. Lamborg, G. DiTullio. "Detection and Distribution of Metalloenzymes in Pacific Ocean Environments". ASLO Meeting, New Orleans. February 2013. Oral Presentation.

Noble, A.E., N. Held, M.A. Saito. Probing the chemical speciation of cobalt: preservation artifacts and redox sensitive ligands. Ocean Sciences Meeting Hawaii, 2014.

Mackey, K., M. McIlvin, A. Post, M. Saito. Strain-specific response of marine synechococcus to iron limitation. Ocean Sciences Meeting Hawaii, 2014.

Hawco, N.J., M.R. McIlvin, M.A. Saito. A meridional cobalt section from the Equatorial Pacific. Ocean Sciences Meeting Hawaii, 2014.

Ahlgren, N.A., A. Noble, L. Moore, M. Saito, R. Rocap. The unique trace metal and macronutrient conditions of the Costa Rica Upwelling Dome upwelling support a distinct and dense community of Synechococcus. Ocean Sciences Meeting Hawaii, 2014.

Munson, K.M., C.H. Lamborg, G.J. Swarr, M.A. Saito. Mercury species concentrations and fluxes in the Tropical and Equatorial Central Pacific Ocean. Ocean Sciences Meeting Hawaii, 2014. Oral Presentation.

Santoro, A.E., C.L. Dupont, M.A. Saito. The genome and proteome of an ammonia-oxidizing archaeon from the open ocean. Ocean Sciences Meeting Hawaii, 2014. Oral Presentation.

Saito, M.A., M. McIlvin, D.M. Moran, C.H. Lamborg, G. DiTullio. Distribution of Metalloenzymes in Pacific Ocean Environments as Detected by Proteomic Analysis. Goldschmidt Conference, Florence Italy August 27, 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.

McIlvin, M., K. Waldron, D. Moran, N. Robinson, M. Saito. Metalloprotein Characterization of the Marine Cyanobacteria: Diving into Marine Microbial Metallomes and the Search for Novel Metalloproteins in the Oceans. American Society for Mass Spectrometry. Vancouver, Canada, June 2012.

Saito, M., E. Bertrand. Marine metalloprotein abundance patterns yield insight into the implications of metal scarcity for oceanic biogeochemical processes. ACS Meeting, Environmental Bioinorganic Session. San Diego, CA. March 29, 2012.

Jenkins, B.D., T.A. Ryneerson, S.T. Dyhrman, M.A. Saito, P.D. Chappell, L.P. Whitney, H. Alexander, E. M. Bertrand. From Lab To Launch: Integrating Biomarkers Derived From Genomics and Proteomics Approaches Into Remote Observing Platforms. ASLO meeting Salt Lake City, February 2012.

Noble, A. E., M.A. Saito. Insight Into The Chemical Speciation Of Cobalt In The North Atlantic. ASLO meeting Salt Lake City, February 2012.

Dyhrman, S.T., L.L.;Wurch, C.J. Gobler, E. Bertrand, M. Saito. Transcriptome and Proteome Profiling Identifies Pathways of Nutrient Metabolism In *Aureococcus anophagefferens*. ASLO meeting Salt Lake City, February 2012.

Saito, M.A., E.M. Bertrand, V. Bulygin, A.D. Cox, T.J. Goepfert, D. Moran. The Potential for Colimitation of Marine Primary Productivity: Three Biochemical Definitions, Field Observations, Application of Proteomic Diagnostics, and Comments on the Future (*Invited*). AGU/ASLO Ocean Sciences Meeting Portland, February 2010.

Bertrand, E.M., V. Bulygin, M.A. Saito. Proteomics of Vitamin B₁₂ and Iron Stress and Co-stress in Marine Diatoms. AGU/ASLO Ocean Sciences Meeting Portland, February 2010.

Saito, M.A., A.E. Noble, 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.

Saito, M.A., E.M. Bertrand, V. Bulygin, D. Moran, J.B. Waterbury. Strategies for Economization of Cellular Iron in *Crocospaera watsonii* as Revealed by Global Quantitative Proteomic Analysis. Goldschmidt Conference, Davos, Switzerland, June 2009.

Noble, A.E., T. Goepfert, M.A. Saito. Cobalt Biogeochemistry in the South Atlantic: An Ocean Section of Total Dissolved Cobalt, and Prospects for a High Throughput ICP-MS Method. AGU December 2008. Poster Presentation.

Saito, M.A., E.M. Bertrand, V. Bulygin, D. Moran, J.B. Waterbury. Proteomic Analysis of the marine cyanobacterium *Synechococcus* WH8102 and implications for estimates of the cellular iron content. 2008 AGU Fall Meeting, San Francisco.

Saito, M.A., E.M. Bertrand, A. Anber. Neoproterozoic Oxygenation of Earth's Surface Environments Reflected in the Late Evolution of the O₂-Dependent Vitamin B₁₂ Biosynthesis Pathway. AGU Fall Meeting, San Francisco, 2008. Invited Speaker.

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. Wirsén, 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. Wirsén, 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

ACS New Orleans. Alfred Bader Award in Bioinorganic or Bioorganic Chemistry: Symposium in honor of Alison Butler. March 17th, 2018. *Oral Presentation*

Presentation to Massachusetts Life Sciences at WHOI, November 28th 2017.

Thermo Power Users Meeting, ASMS Pre-Meeting Users Group. San Diego June 2018. Invited Talk.

ASMS Meeting San Diego. June 2018. *Poster*

Francois Morel Retirement Celebration Princeton University. June 11th 2018. *Poster*.

OCB Meeting WHOI 2018. *Poster*

Marine Microbes GRC Meeting Il Ciocco Italy. July 2018. *Poster*.

Annual Foundation Marine Microbial Investigators Meeting. July 23th 2018. *Oral Presentation*

ASLO Meeting. Portland Oregon. February 2018. *Oral Presentation*

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. May 3-5th, 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*.

Biogeochemicals 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.*