**CURRICULUM VITAE**

**MAKOTO (Mak) SAITO**

Senior Scientist with Tenure, Stanley Watson Chair Telephone: (508)-289-2393

Dept. of Marine Chemistry and Geochemistry Email: msaito@whoi.edu

Woods Hole Oceanographic Institution Web: [www.whoi.edu/saitolab](http://www.whoi.edu/saitolab)

Woods Hole MA 02543 Twitter: @MakASaito

# 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.

2003 Princeton University, Postdoctoral Fellow

**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, 2011-2017

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

2020 Stanley Watson Senior Scientist Chair

**PROFESSIONAL AFFILIATIONS**

Member, American Society for Limnology and Oceanography

Member, American Geophysical Union

Member, Union of Concerned Scientists

Member, America Chemical Society

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 (Metallomics)

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** 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 Intrastructure Needs for OCB community, July 24, 2014

2014-2016 Steering committee member for Oceanography and Geobiology OMICS ECOGEO Research Coordination Network

2015 Co-organized GEOTRACES Biogeotraces working group meeting for incorporation of biological and biochemical parameters into 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

2018-present Lead PI for the Ocean Protein Portal EarthCube Prototype <http://www.oceanproteinportal.org>

2017-present Lead and Science PI for Biological Chemical Data Management Office (BCO-DMO)

2018-present US National Representative for the International BioGeoSCAPES Effort

2021-present Knowledge Transfer Coordinator – Center for Chemical Currencies of a Microbial Planet (C-CoMP)

2021-present Member of Executive Committee for Center for Chemical Currencies of a Microbial Planet (C-CoMP)

2021 OCB Ocean Metaproteomics Intercomparison Workshop. Co-organizer with Dr. Matthew McIlvin. September 16-17th 2021.

2022-present Lead PI Accel-Net Development of an International Network for the Study of Ocean Metabolism and Nutrient Cycles on a Changing Planet (BioGeoSCAPES). Developed the Biogeoscapes.org website, organized multiple meetings and coordinated activities and grant management.

2023 Co-organized BioGeoSCAPES Intercalibration Webinar with Harriet Alexander and Maite Maldonado

2023 Co-organized BioGeoSCAPES Data Management Webinar with Harriet Alexander

2023-4 Session co-chair ASLO/OSM

2023-present Co-Organizer of BioGeoSCAPES International Science Planning Meeting November 5-9, Woods Hole MA USA. 2023

*Editorial and Reviewing Activities*

2013 – present Advisory Board Member – Metallomics Journal

2014 – present Editorial Board – Environmental Microbiology Reports

2007 – 2021 Associate Editor – Marine Chemistry

2010 – 2021 Review Editor – Frontiers in Aquatic Microbiology

2011 – 2021 Editorial Board – Frontiers in Microbiological Chemistry

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

**PROFESSIONAL ACTIVITIES** *- WHOI (Non-Education Related):*

Biosafety Committee, Chemistry Department representative (?-present)

ICP-MS Facility Committee (?-2016)

75th Anniversary Committee

Ocean Microbiome Catalyst Project Participant 2016-2017

Department Faculty Search Committee 2017-2018

PI for the Biological and Chemical Data Management Office (BCO-DMO), 2017-present

Co-Chair of the Gender Equity Program Advisory Committee 2017

Search Committee for Human Resources Training Position Hire 2020

Co-Chair of the Workplace Climate Committee 2018-2022

**PARTICIPATION IN EDUCATION**

*Advising Overview:* Student and Post-Doc Advising: advised or advising 13 Ph.D. students, 3 Masters students, 11 Post-doctorates, and 8 summer undergraduates students

*Graduate Advising:*

*Doctorate Students:*

Anne Thompson - MIT-WHOI Doctorate student, 2004-2009, co-advised with Chisholm

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

Carly Buchwald - MIT-WHOI Doctorate student 2011-2012 (primary advisor K. Casciotti)

Nicholas Hawco - MIT-WHOI Doctorate Student 2011-2017

Noelle Held - MIT-WHOI Doctorate Student 2014-2019

Riss Kellogg - MIT-WHOI Doctorate Student 2017-2022

Deepa Rao - MIT-WHOI Doctorate Student 2017-2022 (primary advisor Mick Follows)

Rebecca Chmiel - MIT-WHOI Doctorate Student 2017-2023

Annaliese Meyer - MIT-WHOI Doctorate Student 2021-present

Emily Burdige - MIT-WHOI Doctorate Student 2022-present (co-advised with Adam Subhas)

Fadime Stemmer - MIT-WHOI Doctorate Student 2023-present

*Masters Students:*

Whitney Krey - MIT-WHOI Masters student, 2005-2008, co-advised with Webb and Delong

Tyler Goepfert - MIT-WHOI Masters Student 2010-2013

Daniel Tabersky - University of Duisberg-Essen Masters Student 2010

*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, 2017-2019, co-advised with Colleen Hansel

Natalie Cohen, Simons Postdoctoral Scholar, 2017-2020

Michael Mazzotta, Drefyus Environmental Chemistry Scholar, 2018-2020

Jaci Saunders, NASA/GMBF Postdoctoral Scholar/Investigator, 2017-2022

Margaret Mars Brisbin WHOI Postdoctoral Scholar, 2021-2023

Ichiko Sugiyama WHOI Postdoctoral Investigator 2022-present

Viktoria Steck WHOI Postdoctoral Investigator October 2023-present

Loay Jabre Postdoctoral Investigator October 2023-present

*Undergraduate Advising - WHOI Summer Student Fellows, PEP Fellows and Guest Students, Post-Bac Advising:*

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)

Kristina McCormack (University of Sweden, 2022)

 Dominique Kelly, C-COMP Post-Bac, 2022-present

*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), Jennifer Kenyon (Buesseler Student), Deepa Rao (Follows Student), Tianyi Huang (Boyle Student), Donald Martocello (Wankel Student), Jingxuan (Jay) Li (Repeta Student), Katie Halloran (Kujawinski Student), Jack Goodspeed Payette (Fournier 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)

External Examiner for Margaret Mars Brisbin, Okinawa Institute Science and Technology (2020)

External Examiner for Indrani Sarker, Macquarie University Australia (2020)

*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, 2019, 2021, 2023)

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, 2013-2023

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:*

Dr. Matthew McIlvin, Research Specialist, 2010-present

Paloma Lopez, Research Associate, 2021-present

Annie Stefanides, Research Assistant 2023-present

Dawn Moran, Research Associate, 2007-2022

Laura Rea, Research Assistant, 2017-2018

Luis Valentin, Research Assistant, 2016-2018

Marissa Kellogg, Research Assistant, 2016-2017

Meghan Jelloe, Research Assistant, 2014-2015

Dr. Vladimir Bulygin, Research Associate, 2007-2009

Abigail Noble, Research Assistant, 2004-2006

Erin Bertrand, Research Assistant, 2005-2006

Tyler Goepfert, Research Assistant, 2004-2008

# CRUISE PARTICIPATION AND FIELD WORK

1995 June R/V *Westward*, Coastal Atlantic

1996 June R/V *Oceanus*, Sargasso Sea

1997 March R/V *Oceanus*, Sargasso Sea

1998 February R/V *Oceanus*, Sargasso Sea

1998 August R/V *Oceanu*s, Sargasso Sea

1999 September R/V *Oceanus*, Sargasso Sea

2000 August-October R/V *Melville*, San Diego CA to Arica, Chile

## 2003 June-July R/V *Kilo Moana*, Seattle to Dutch Harbor, Alaska

## 2004 February R/V *Kilo Moana*, Central Pacific - *Chief Scientist*

## 2005 January R/V *Wecoma*, Hawaiian Islands, E-Flux program

## 2005 July-August R/V *Knorr*, Panama to Galapagos - *Chief Scientist*

## 2005/2006 December-January R/V *N.B. Palmer*, Ross Sea, Antarctica

2006 June R/V *Seward Johnson*, Equatorial Atlantic

2006 November-December R/V *N.B. Palmer*, Ross Sea, Antarctica

2007 November-December R/V *Knorr*, South Atlantic - *Chief Scientist*

2009 January-February McMurdo Sound, Antarctica *- Expedition leader*

2009 November-December McMurdo Sound, Antarctica - *Expedition leader*

2011 October 1st-26th , 2012 R/V *Kilo Moana*, Central Pacific - *Co-Chief Scientist with Carl Lamborg*

2015 January 30th-February 4th R/V *Atlantic Explorer*, Bermuda Atlantic Time Series

2016 January 15th-February 12th R/V *Falko*r, Hawaii to Tahiti - *Chief Scientist*

2017 July 5-9th R/V Armstrong, AUV Clio Engineering Trials, Woods Hole to Woods Hole

2017-2018 Dec 16th – Jan 20th R/V N.B. Palmer Punta Arenas to McMurdo Station, Antarctica

2018 April 12th-15th R/V Atlantic Explorer, BATS - AUV Clio Deployment

2018 June 13th-16th R/V Atlantic Explorer, BATS - AUV Clio Deployment

2018 October 20th-24th R/V Atlantic Explorer, BATS - AUV Clio Deployment

2019 April 20th-24th R/V Atlantic Explorer, BATS - AUV Clio Deployment

2019 June 16-28th R/V Atlantic Explorer AE1913, Bermuda - Woods Hole w/Clio – *Chief Scientist*

2023 May 2nd – June 9th R/V Atlantis, Costa Rica AT50-10 - San Diego – *Chief Scientist (with Alyson Santoro Co-Chief Scientist)*

**PATENTS**

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

**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>

METATRYP Version 2.0 Jaci Saunders, David Gaylord <https://github.com/WHOIGit/metatryp-2.0>

**Informatics Websites for Proteomics Datasets**

<http://Metatryp.whoi.edu> Launched at Ocean Sciences Feburary 2018

<https://metatryp-coronavirus.whoi.edu/> Corona virus instance of METATRYP

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

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

1. Natalie R. Cohen, Arianna I. Krinos, Riss M. Kell, Rebecca Chmiel, Dawn M. Moran, Matthew R. McIlvin, Paloma Z. Lopez, Alexander Barth, Joshua Stone, John A. Breier, Michael V. Jakuba, Rod Johnson, Harriet Alexander, Mak A. Saito. Protistan metabolism across the western North Atlantic Ocean revealed through autonomous underwater profiling. Submitted
2. Mak A. Saito, Jaclyn K. Saunders, Matthew R. McIlvin, Erin M. Bertrand, John A. Breier, Margaret Mars Brisbin,Sophie M. Colston, Jaimee R. Compton, Tim J. Griffin, W. Judson Hervey, Robert L. Hettich, Pratik D. Jagtap, Michael Janech, Rod Johnson, Rick Keil, Hugo Kleikamp, Dagmar Leary, Lennart Martens, J. Scott P. McCain, Eli Moore, Subina Mehta,Dawn M. Moran,Jacqui Neibauer, Benjamin A. Neely, Michael V. Jakuba, Jim Johnson, Megan Duffy, Gerhard J. Herndl, Richard Giannone, Ryan Mueller, Brook L. Nunn, Martin Pabst, Samantha Peters, Andrew Rajczewski, Elden Rowland, Brian Searle,Tim Van Den Bossche, Gary J. Vora, Jacob R. Waldbauer, Haiyan Zheng, Zihao Zhao. Results from a Multi-Laboratory Ocean Metaproteomic Intercomparison: Effects of LC-MS Acquisition and Data Analysis Procedures. In review at ISME Communications.
3. Madeline M. Paoletti#, Gregory P. Fournier, Erin L. Dolan, Mak A. Saito. 2023. Metaproteogenomic profile of a mesopelagic adenylylsulfate reductase: Course-based discovery using the Ocean Protein Portal. J. Proteome Res. 22, 9, 2871–2879. <https://pubs.acs.org/doi/full/10.1021/acs.jproteome.3c00152>
4. Chmiel\*, R. J., Kellogg, R. M., Rao, D., Moran, D. M., DiTullio, G. R., and Saito, M. A. 2023. Low Cobalt Inventories in the Amundsen and Ross Seas Driven by High Demand for Labile Cobalt Uptake Among Native Phytoplankton Communities. Biogeosciences. https://doi.org/10.5194/egusphere-2023-402
5. Margaret Mars Brisbin, Alese Schofield, Matthew R McIlvin, Arianna I Krinos, Harriet Alexander, Mak A Saito. Vitamin B12 conveys a protective advantage to phycosphere-associated bacteria at high temperatures. ISME Communications*.* **3**, 88 (2023). <https://doi.org/10.1038/s43705-023-00298-6>
6. JT Middleton, A Paytan, M Auro, MA Saito, TJ Horner, [Barium isotope signatures of barite–fluid ion exchange in Equatorial Pacific sediments](https://scholar.google.com/citations?view_op=view_citation&hl=en&user=UYLjZe4AAAAJ&sortby=pubdate&citation_for_view=UYLjZe4AAAAJ:-4bc1-6Giq0C). Earth and Planetary Science Letters. 612, 118150. <https://doi.org/10.1016/j.epsl.2023.118150>
7. Nathan S Garcia, Mingyu Du, Michele Guindani, Matt McIlvin, Dawn M Moran, Mak A Saito, and Adam C Martiny. Cellular proteome identifies regulation of marine *Synechococcus* elemental stoichiometry and cell traits under global change. Submitted.
8. Laura M. Whitmore; Julie Granger; Yang Xiang; Lauren E. Kipp; Angelica Pasqualini; Robert Newton; Alison M. Agather; Robert F. Anderson; Erin E. Black; Katlin L. Bowman; Annie Bourbonnais; Mark A. Brzezinski; Randelle M. Bundy; Matthew A. Charette; R. Lawrence Edwards; Jessica N. Fitzsimmons; Dennis A. Hansell; Phoebe J. Lam; Peter Morton; Mak Saito; Alan M. Shiller; William M. Smethie; Benjamin S. Twining; Ryan J. Woosley; Ruifeng Zhang. A U.S. GEOTRACES synthesis of the Arctic Ocean Upper Halocline: multielemental tracers in the Amerasian Basin reveal interlinked biogeochemical and physical processes**.** Progress in Oceanography. In Review.
9. Discovery, diversity and distribution of functional dark matter through global metagenomics Georgios A. Pavlopoulos, Fotis A. Baltoumas, Sirui Liu, Oguz Selvitopi, Antonio Pedro Camargo,Stephen Nayfach, Ariful Azad, Simon Roux, Lee Call, Natalia N. Ivanova, I Min Chen, David Paez-Espino, Evangelos Karatzas. Novel Metagenome Protein Families Consortium, Ioannis Iliopoulos, Konstantinos Konstantinidis, James M. Tiedje, Jennifer Pett-Ridge, David Baker, Axel Visel, Christos A. Ouzounis, Sergey Ovchinnikov, Aydin Buluç, Nikos C. Kyrpides. Nature. In press.
10. Browning, T.J., Saito, M.A., Garaba, S.P., Wang, X., Achterberg, E.P., Moore, C.M., Engel, A., Mcllvin, M.R., Moran, D., Voss, D. and Zielinski, O. 2023. Persistent equatorial Pacific iron limitation under ENSO forcing. *Nature*, 621, 330–335.
11. Riss M. Kellogg, Nicole L. Schanke, Lauren E. Lees, Rebecca J. Chmiel, Deepa Rao, Margaret M. Brisbin, Dawn M. Moran, Matthew R. McIlvin, Francesco Bolinesi, Raffaella Casotti, Cecilia Balestra, Tristan J. Horner, Adam V. Subhas, Robert B. Dunbar, Andrew E. Allen, Giacomo R. DiTullio, Mak A. Saito. Zinc-Iron co-limitation of natural marine phytoplankton assemblages in coastal Antarctica. In Review at PNAS.
12. Deepa Rao, Zoltan Fussy, Dawn M. Moran, Matthew R. McIlvin, Andrew E. Allen, Michael J Follows, Mak A. Saito. Flexible B12 ecophysiology of *Phaeocystis antarctica* due to a fusion B12-independent methionine synthase with widespread homologues. In revision at PNAS.
13. Johnson, Matthew D., Holly V. Moeller, Christopher Paight, Riss M. Kellogg, Matthew R. McIlvin, Mak A. Saito, and Erica Lasek-Nesselquist. 2023. Functional control and metabolic integration of stolen organelles in a photosynthetic ciliate. *Current Biology* 33, no. 5 (2023): 973-980. https://doi.org/10.1016/j.cub.2023.01.027
14. Webb, Eric A., Noelle A. Held, Yiming Zhao, Elaina D. Graham, Asa E. Conover, Jake Semones, Michael D. Lee et al. 2023. Importance of mobile genetic element immunity in numerically abundant *Trichodesmium* clades. ISME communications. 3, no. 1: 15. https://doi.org/10.1038/s43705-023-00214-y
15. Jaclyn K. Saunders*+*, Matthew McIlvin, Chris L. Dupont, Drishti Kaul, Dawn Moran, Tristan Horner, Sarah M. Laperriere, Eric Webb, Tanja Bosak, Alyson E. Santoro,and Mak A. Saito. 2022. Microbial Functional Diversity across Biogeochemical Provinces in the Central Pacific Ocean. 119(37), e2200014119. <https://doi.org/10.1073/pnas.2200014119>
16. K. Kunde, N. A. Held, C. E. Davis, N. J. Wyatt, E. L. Mann, E. M. S. Woodward, M.R. McIlvin, A. Tagliabue, B. S. Twining, C. Mahaffey, M.A. Saito, M. C. Lohan.Trace metal effects on cyanobacterial alkaline phosphatase concentrations in the subtropical North Atlantic. Submitted.
17. Randelle M. Bundy, Lauren E. Manck, Rene M. Boiteau, Jiwoon Park, Edward F. DeLong, Nicholas J. Hawco, Matthew J. Church, Mak A. Saito, Daniel J. Repeta.Seasonal siderophore uptake and biosynthesis associated with carbon flux at Station ALOHA. Submitted. Saunders JK, Duffy ME, Kellogg N,Gibbons K, Gawel JE, Saito M, Rigg A, McIlvin M, Knox C, Legendre-Fixx M, Lopez J, Acker M, and Rocap G. Divergent responses to arsenic among strains of the Cyanobacterium *Prochlorococcus*: toxicity, resilience, and enhanced growth. Submitted
18. Mary Ann Moran, Elizabeth B. Kujawinski, William F. Schroer, Shady A. Amin, Nicholas R. Bates, Erin M. Bertrand, Rogier Braakman, C. Titus Brown, Markus W. Covert, Scott C. Doney, Sonya T. Dyhrman, Arthur S. Edison, A. Murat Eren, Naomi M. Levine, Liang Li, Avena C. Ross, Mak A. Saito, Alyson E. Santoro, Daniel Segrè, Ashley Shade, Matthew B. Sullivan, Assaf Vardi. 2022. Microbial metabolites in the marine carbon cycle. *Nature Microbiology*, *7*(4), 508-523. <https://doi.org/10.1038/s41564-022-01090-3>
19. Chris M Marsay, William M Landing, Devon Umstead, Claire P Till, Robert Freiberger, Jessica N Fitzsimmons, Nathan T Lanning, Alan M Shiller, Mariko Hatta, Rebecca Chmiel, Mak Saito, Clifton S Buck. 2022. [Does Sea Spray Aerosol Contribute Significantly to Aerosol Trace Element Loading? A Case Study From the US GEOTRACES Pacific Meridional Transect (GP15)](https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2022GB007416). Global Biogeochemical Cycles 36. 8. e2022GB007416. <https://doi.org/10.1029/2022GB007416>
20. Chmiel, R., Lanning, N., Laubach, A., Lee, J.M., Fitzsimmons, J., Hatta, M., Jenkins, W., Lam, P., McIlvin, M., Tagliabue, A. and Saito, M., 2022. Major processes of the dissolved cobalt cycle in the North and equatorial Pacific Ocean. *Biogeosciences*, *19*(9), 2365-2395. <https://doi.org/10.5194/bg-19-2365-2022>
21. German, C.R., Baumberger, T., Lilley, M.D., Lupton, J.E., Noble, A.E., Saito, M., Thurber, A.R. and Blackman, D.K., 2022. Hydrothermal Exploration of the Southern Chile Rise: Sediment‐Hosted Venting at the Chile Triple Junction. *Geochemistry, Geophysics, Geosystems*, *23*(3), p.e2021GC010317.
22. Mars Brisbin, Margaret, Satoshi Mitarai, Mak A. Saito, and Harriet Alexander. 2022. Microbiomes of bloom-forming *Phaeocystis* algae are stable and consistently recruited, with both symbiotic and opportunistic modes.  *ISME J* **16**, 2255–2264. <https://doi.org/10.1038/s41396-022-01263-2>
23. Tanya Marshall, Julie Granger, Karen L. Casciotti, Kirstin Dähnke, Kay-Christian Emeis, Dario Marconi, Matthew R. McIlvin, Abigail E. Noble, Mak A. Saito, Daniel M. Sigman, Sarah E. Fawcett. 2022. The Angola Gyre is a hotspot of dinitrogen fixation in the South Atlantic Ocean. *Commun Earth Environ* **3**, 151. <https://doi.org/10.1038/s43247-022-00474-x>
24. Zhou Liang, Kelly McCabe, Sarah E. Fawcett, Heather J. Forrer, Catherine Jeandel, Dario Marconi, Hélène Planquette, Mak A. Saito, Jill A. Sohm, Rachel K. Thomas, Eric A. Webb, Robert T. Letscher, Angela N. Knapp. A global ocean dissolved organic phosphorus concentration database (DOPv2021). *Sci Data* **9**, 772 (2022). Scientific Data. <https://doi.org/10.1038/s41597-022-01873-7>
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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](http://www.whoi.edu/sites/Corsacs), with over 16,000 unique visitors)
* Oceanus Audio [Slideshow](http://www.whoi.edu/oceanus/invisiblerealm) on Antarctic Proteomic Research
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**PUBLISHED ABSTRACTS**

Comparing microeukaryote metatranscriptomes and metaproteomes captured using an autonomous underwater vehicle Natalie Cohen, Arianna Krinos, Harriet Alexander, Riss Kellogg, Rebecca Chmiel, Dawn Moran, Matt McIlvin, Paloma Lopez, John Breier, Michael Jakuba, Rod Johnson, Mak Saito. ASLO Meeting, Palma de Mallorca, Spain 2023.

Global patterns and drivers of C:N:P in marine ecosystems. Nathan Garcia, Mak Saito, Adam Fagan, Catherine Garcia, Tatsuro Tanioka. ASLO Meeting, Palma de Mallorca, Spain 2023.

Development and Testing of Spectral Libraries for Ocean Metaproteomics Analyses Leveraging the Ocean Protein Portal. Margaret A Mars Brisbin ; Matthew McIlvin ; Damian Wilburn ; Harriet Alexander ; Andy Allen ; Natalie Cohen ; Jaclyn Saunders ; Adam Shepherd ; Brian C Searle ; Mak A. Saito. American Society for Mass Spectrometry Meeting. June 2022, Minneapolis.

Can data-independent acquisition mass spectrometry be used confidently for metaproteomics?

Annaliese C.S. Meyer ; Andrew T Rajczewski ; Alfredo Blakeley-Ruiz ; Matthew McIlvin ; Tim Van Den Bossche ; Timothy J Griffin ; Brian C. Searle ; Makoto Saito ; Manuel Kleiner ; Pratik Dilip Jagtap

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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. Rynearson, 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](http://www.sgmeet.com/osm2012/viewabstract2.asp?AbstractID=11862). ASLO meeting Salt Lake City, February 2012.

[Noble, A. E., M.A. Saito. Insight Into The Chemical Speciation Of Cobalt In The North Atlantic](http://www.sgmeet.com/osm2012/viewabstract2.asp?AbstractID=12439). 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*.](http://www.sgmeet.com/osm2012/viewabstract2.asp?AbstractID=10122) 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 *Crocosphaera 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, Canad, 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. Wallsgrove, J.W. Moffett, B.N. Popp. Iron and Cobalt Co-Limitation in the Central North Pacific and Bering Sea.](http://www.sgmeet.com/aslo/honolulu2004/viewabstract2.asp?AbstractID=1188&SessionID=SS5.03) 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*](http://www.sgmeet.com/aslo/honolulu2004/viewabstract2.asp?AbstractID=966&SessionID=SS5.03). 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 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.

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| **PAPERS PRESENTED AT MEETINGS AND INVITED LECTURES** |

* 1st Joint International Conference ICOBTE and ICHMET ([International Conference of Biogeochemistry of Trace Elements and International Conference of Heavy Metals](https://icobte-ichmet-2023.com/frontend/index.php)) September 2023. Wuppertal, Germany. Plenary Speaker
* Cellular Biology of Metals Gordon Research Conference. Zinc and Cobalt Responsive Proteins in Marine Diatoms and Evidence for Zn-Fe-C co-limitation in Antarctica. July 30th-August 4th. Poster
* Chemical Oceanography Gordon Research Conference. Capturing Changes in the Bio-inorganic Chemistry of the Sea using Trace Metal and Metaproteomic Observations. July 16-21st. Keynote Session Speaker
* 4th [International Ross Sea Conference](https://www.rossseaconference.org/ross/index.html). Naples Italy. July 3-7th. Invited Speaker
* CINAC, University of Costa Rica, invited speaker. April 27th, 2023. Invited talk
* EAWAG, Zurich, Switzerland. Exploring functional marine microbial biogeochemistry using metaproteomics and metalloproteomics. March 16, 2023. Invited Speaker. [Recorded Talk](https://www.youtube.com/watch?v=Hzg3OhmR5J8)
* Clark University Fall 2022 Department Seminar Series. October 12, 2022. Invited Speaker
* Marine microbes in a changing climate, Royal Society Meeting, September 12-13, 2022. Invited Speaker
* OCB Meeting, BioGeoSCAPES Accel-Net and Omics Intercalibration Session, June 2022. Panelist

### [ProSynFest Conference](https://www.prosynfest2020.com/)  Córdoba Spain, March 16-19th 2022. Invited Speaker

### 4th International Metaproteomics Symposium. September 27-29, 2021 Neumunster Abbey, Luxembourg. Invited Speaker

### University of California Santa Cruz, October 8th, 2021. Invited Virtual Lecture

### Cellular Biology of Metals. Gordon Research Conference. October 2021. Invited Lecture

### Tara AtlantECO workshop. June 4th, 2021

### ASLO Meeting, Invited Lecture ASLO Presentation “Why Environmental Nutrient Stress Biomarkers Work: Protein-Transcript Correlations and Review of Biomarker Discoveries” June 2021 YouTube [video](https://www.youtube.com/watch?v=89Sq6B0s6Zs)

### UN Ocean Shot presentation BioGeoSCAPES concept. February 2nd 2021. [Recording](https://youtu.be/yGLImSF_Vc8)

### University of Southern California Department Seminar series November 17th 2020.

### Ocean Protein Portal Lighting talk AGU EarthCube booth, December 4, 2020.

### GEOTRACES GP15 Mini-Seminar November 5th, 2020. [Recording](https://drive.google.com/file/d/1O0xO7dpNLKQ3AZydufuinnh99ORrntrv/view?usp=sharing)

### Oregon State University Center for Genome Research and Bioinformatics. October 14th, 2020. Invited Virtual Lecture. [Recording](https://media.oregonstate.edu/media/t/1_vpt1sw3n)

### Tri-Service Microbiome Consortia. April 12-14th 2020. Invited Virtual Lecture.

### Marine Chemistry and Geochemistry Department Seminar March 2nd 2021.

### Stockholm University Aquatic Microbial Ecology Lecture Series. Invited Lecture November 18, 2020. [Recording](https://youtube.com/playlist?list=PL27AI8qr2l3h12_Weap75OITIjQgqfwbl)

### Marine Biogeochemistry. Gordon Research Conference. Hong Kong. June 2020. Invited Speaker Cancelled due to COVID-19.

### Scripps Institute of Oceanography, April 29th 2020. Invited Virtual Lecture

### Geobiology. Gordon Research Conference. Texas, January 2020. Invited Lecture

### Metals in Biology. Gordon Research Conference. California, January 2019, Invited Lecture

### Science Beyond Guyot: 25 Years of Hess Fellows – A Symposium During Reunions. Princeton University. May 31st, 2019. Invited Speaker

### 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. 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. Monthly Evening Lecture Series. Invited Speaker

### 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. Presentation

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

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

### 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.

### Biogeotraces 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