

Jaclyn K Saunders
jsaunders@whoi.edu
<https://github.com/jaclynsaunders>
<https://bitbucket.org/jaclynk>

Education:

M.S. and Ph.D. Oceanography Sept 2009-Dec 2016
School of Oceanography, University of Washington, *Seattle, WA*
“Evolutionary response of marine bacteria to the co-occurring pnictogens phosphorus and arsenic”
Advisor: Gabrielle Rocap

Graduate Certificate Sept 2014-Dec 2016
Astrobiology Program, University of Washington, *Seattle, WA*
Research Rotation Advisors: Roger Buick & Eva Stüeken
“Arsenic concentrations in Precambrian marine sedimentary shales”

B.S. Biology, minor in Chemistry Aug 2003-Dec 2007
University of Pittsburgh, *Pittsburgh, PA*

B.A. Political Science Aug 2003-Dec 2007
University of Pittsburgh, *Pittsburgh, PA*

Fellowships & Awards:

2017 NASA Postdoctoral Program Fellowship	Sept 2017-Sept 2019
2015 NASA Earth and Space Science Graduate Fellowship	Sept 2015-Aug 2016
2010 National Science Foundation Graduate Research Fellowship	Jun 2010-Jun2013
UW College of the Environment Exceptional Mentoring of Undergraduates Award (Student)	May 2015

Grant Support:

2020 National Science Foundation ICER - EarthCube Data Capabilities: Expanding the Ocean Protein Portal Capabilities for Use in Biochemical Research and Education. (Sept 2020 – August 2022).
Mak Saito (PI), Danie Kinkade (Co-I), Adam Shepherd (Co-I), **Jaclyn Saunders** (Co-I). (\$599,989).

Research Experience:

Gordon & Betty Moore Semantic Data Postdoctoral Investigator Nov 2019-Present
Woods Hole Oceanographic Institution, *Woods Hole, MA*
Advisors:
Mak Saito – Marine Chemistry & Geochemistry Department, Woods Hole
Oceanographic Institution (MC&G), *Woods Hole, MA*
Danie Kinkade & Adam Shepherd – Biological and Chemical Oceanography Data
Management Office (BCO-DMO), *Woods Hole, MA*

NASA Postdoctoral Program Fellow

"Arsenic based metabolisms in the open ocean: An unexplored frontier"

Woods Hole Oceanographic Institution, *Woods Hole, MA*

Massachusetts Institute of Technology, *Cambridge, MA*

Advisors:

Mak Saito – Marine Chemistry & Geochemistry Department (MC&G), Woods Hole Oceanographic Institution, *Woods Hole, MA*

Tanja Bosak – Department of Earth and Planetary Sciences (EAPS), Massachusetts Institute of Technology, *Cambridge, MA*

Rocap Lab, Postdoctoral Research Affiliate

Aug 2016-Mar 2017

School of Oceanography, University of Washington, *Seattle, WA*

Advisor:

Gabrielle Rocap – School of Oceanography, University of Washington, *Seattle, WA*

Rocap Lab, Graduate Research Assistant

Sept 2009-Aug 2016

School of Oceanography, University of Washington, *Seattle, WA*

Advisor:

Gabrielle Rocap – School of Oceanography, University of Washington, *Seattle, WA*

Programming Language Proficiencies:

Python, R, SPARQL, SQL (SQLite & PostgreSQL), some Java

Professional Activities & Service:

Manuscript reviewer: *Nature Communications, Geobiology, Biogeochemistry, Limnology & Oceanography Methods, Marine Chemistry, PNAS, Nature Communications Biology, Environmental Microbiology*

NASA Panel Review, Member

2019

Scientific Computing with Python (SciPy) 2019 Conference, Earth Sciences Symposia
co-chair, Austin, TX

Dec 2018–July 2019

UW College of the Environment Associate Dean of

Dec 2015–Aug 2016

Diversity & Access Hiring Committee, member

UW College of the Environment Student Advisory Council to the Dean, co-chair

May 2014-Aug 2016

UW Forum on Science Ethics & Policy, Leader

Sept 2013-Aug 2016

AAAS Emerging Leaders in Science & Society, Campus Liaison

Jan - Dec 2013

The Student Conservation Association, National Alumni Council Member

Apr 2010-Oct 2012

UW Graduate & Professional Student Senate Science & Policy Summit, executive committee member

Oct 2010-May 2011

Making the Difference Campaign, Federal Ambassador, University of Washington & the Partnership for Public Service

Sept 2009-Aug 2010

Publications:

- **Saunders JK, McKay C, and Rocap G. (In revision at PeerJ). "PHANS-C Pipeline: Phylogenetic Assignment of Next generation Sequences - in the Cloud".** <https://phans-c-pipeline.readthedocs.io>.
- Cohen N, McIlvin M, Moran D, Held N, **Saunders JK**, Hawco N, Brosnahan M, DiTullio G, Lamborg C, McCrow J, Dupont C, Allen A, and Saito MA. (2021). **"Dinoflagellates alter their carbon and nutrient strategies across environmental gradients in the central Pacific Ocean"**. *Nature Microbiology* 6 (2) 173-186. DOI: 10.1038/s41564-020-00814-7.
- **Saunders JK**, Gaylord D, Symmonds N, Shepherd A, Kinkade D, McIlvin M, Dupont C, and Saito MA. (2020). **"METATryp v 2.0: Least Common Ancestor Analysis of Tryptic Peptides for Taxonomic Inference - Standalone Software and Web Servers for Marine Microorganisms & Coronaviruses"**. *Journal of Proteome Research* 19 (11) 4718-4729. DOI: 10.1021/acs.jproteome.0c00385 <https://metatryp.whoi.edu/> & <https://metatryp-coronavirus.whoi.edu/>
- Saito M, **Saunders JK**, Chagnon M, Gaylord D, Shepherd A, Held N, Symmonds N, York A, Charron M, and Kinkade D. (2020). **"Development of an Ocean Protein Portal for Interactive Discovery and Education"**. *Journal of Proteome Research*. DOI: 10.1021/acs.jproteome.0c00382 www.oceanproteinportal.org
- Saito MA, McIlvin M, Moran D, Santoro AE, Dupont C, Rafter P, **Saunders JK**, Kaul D, Lamborg C, Westley M, Valois F, and Waterbury J. (2020). **"Abundant Nitrite Oxidoreductase Metalloenzyme in the Mesopelagic Metaproteome of Pacific Oxygen Minimum Zones Extremities"**. *Nature Geoscience* 13 (5) 355-362. DOI: 10.1038/s41561-020-0565-6
- **Saunders JK**, Fuchsman CA, McKay C, and Rocap G. (2019). **"A Complete Arsenic-based Respiratory Cycle in the Marine Microbial Communities of Pelagic Oxygen Deficient Zones"**. *Proceedings of the National Academy of Sciences (PNAS)* 116 (20) 9925-9930. DOI: 10.1073/pnas.1818349116
- Saito, MA, Bertrand E, Duffy M, Gaylord D, Held NA, Hervey J, Hettich R, Jagtap P, Janech M, Kinkade D, Leary D, McIlvin M, Moore E, Morris R, Neely B, Nunn B, **Saunders JK**, Shepherd A, Symmonds N, and Walsh D (2019). **"Progress and Challenges in Ocean Metaproteomics and Proposed Best Practices for Data Sharing"**. *Journal of Proteome Research* 18 (4) 1461-1476. DOI: 10.1021/acs.jproteome.8b00761
- Held NA, **Saunders JK**, Futrelle J, and Saito MA (2018). **"Harnessing the Power of Scientific Python to Investigate Biogeochemistry and Metaproteomes of the Central Pacific Ocean"**. *Proceedings of the 17th Python in Science Conference* 106-112. DOI: 10.25080/Majora-4af1f417-010.
- Fuchsman CA, Devol AH, **Saunders JK**, McKay C, and Rocap G (2017). **"Niche Partitioning of the N cycling microbial community of an offshore Oxygen Deficient Zone"**. *Frontiers in Microbiology* 8:2384.

- **Saunders JK and Rocap G (2016). “Arsenic detoxification strategies vary with environmental phosphate concentrations in global *Prochlorococcus* populations”**. *The ISME Journal* 10:197-209.
- Krumhardt KM, Callnan K, Roache-Johnson K, Swett T, Robinson D, Reistetter EN, **Saunders JK**, Rocap G, and Moore LR (2013). **“Effects of phosphorus starvation versus limitation on the marine cyanobacterium *Prochlorococcus* MED4 I: uptake physiology”**. *Environmental Microbiology* 15: 2114-2128.
- Reistetter EN, Krumhardt K, Callnan K, Roache-Johnson K, **Saunders JK**, Moore LR, and Rocap G (2013). **“Effects of phosphorus starvation versus limitation on the marine cyanobacterium *Prochlorococcus* MED4 II: gene expression”**. *Environmental Microbiology* 15: 2129-2143.
- Szlavecz K, McCormick M, Xia L, **Saunders JK**, Morcol T, Whigham D, Filley T, and Csuzdi C (2011). **“Ecosystem effects of non-native earthworms in Mid-Atlantic deciduous forests”**. *Biological Invasions* 13 (5) 1165-1182.

Presentations:

- **Saunders JK. “Application of metaproteomics for understanding marine microbial communities and SARS-CoV-2 detection”**. Biology Department Seminar. Woods Hole Oceanographic Institution. *Remote*. July 16, 2020. [oral presentation].
- **Saunders JK, Shepherd A, Kinkade D, and Saito MA. “Oceanography, Data Ontology, and the Semantic Web”**. SciPy 2020. The 19th annual Scientific Computing with Python Conference. *Remote*. July 8, 2020. https://github.com/jaclynsaunders/SciPy_2020_Ocean_Data [oral presentation].
- **Saunders JK, McIlvin M, Moran D, Held N, Santoro A, Dupont C, Horner TJ, Webb E, and Saito MA. “Tracking Microbial Bioenergetic Enzymes in Sub-Environments of Pelagic OMZs”**. Chemical Oceanography GRC: Discovering Chemical Processes and Mechanisms in a Changing Ocean. Gordon Research Conference. *Holderness, New Hampshire*. July 17, 2019. [invited oral presentation]
- **Saunders JK, McIlvin M, Moran D, Held N, Santoro A, Dupont C, and Saito MA. “Assessing the validity of protein inference on a large environmental metaproteomic dataset”**. ASMS 2019 Atlanta. American Society of Mass Spectrometry. *Atlanta, Georgia*. June 4, 2019. [poster presentation]
- **Saunders JK. “Tracking microbial bioenergetic enzymes in the pelagic waters of OMZs”**. Old Dominion University Ocean, Earth & Atmospheric Sciences Seminar. *Norfolk, Virginia*. March 28, 2019. [Invited seminar]
- **Saunders JK, McIlvin M, Moran D, Held N, Futrelle J, Webb E, Santoro A, Dupont C, and Saito MA. “Functional Diversity of Bioenergetic Pathways across Oxygen Gradients in the Central Pacific”**. ASLO Aquatic Science Meeting 2019. *San Juan, Puerto Rico*. February 28, 2019. [oral presentation]
- **Saunders JK, Held N, Shepherd A, Chagnon M, Gaylord D, York A, Symmonds N, Kinkade D, and Saito MA. “Introducing the Ocean Protein Portal: Prototype Launch – oceanproteinportal.org”**. ASLO

Aquatic Science Meeting 2019. *San Juan, Puerto Rico*. February 26, 2019. [oral presentation]

- Held NA*, **Saunders JK***, Futrelle J, and Saito MA (*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. [oral presentation]
- **Saunders JK**, McIlvin M, Moran D, Held N, Futrelle J, Webb E, Santoro A, Dupont C, and Saito MA. **“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. [poster presentation]
- **Saunders JK**, McIlvin M, Moran D, Held N, Futrelle J, Webb E, Santoro A, Dupont C, and Saito MA. **“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. [oral presentation]
- **Saunders JK**. **“Arsenic as Energy: from Archean availability to modern marine metabolisms”**. Woods Hole Oceanographic Institution, Marine Chemistry & Geochemistry Seminar. *Woods Hole, Massachusetts*. October 11, 2016. [invited seminar]
- **Saunders JK**. **“Response of the marine picocyanobacterium *Prochlorococcus* to phosphate stress”**. Massachusetts Institute of Technology, Microbial Systems Seminar. *Cambridge, Massachusetts*. April 20, 2016. [invited seminar]
- **Saunders JK**, Rocap G. **“Arsenic based metabolisms in a global oxygen minimum zone: the potential for another cryptic cycle”**. Gordon Research Conference on Geobiology. *Galveston, Texas*. February 3, 2016. [poster presentation]
- **Saunders JK**, Rocap G. **“Genomic capacity for arsenic based metabolisms in global Oxygen Minimum Zones”**. AbSciCon 2015 (Astrobiology Science Conference). *Chicago, Illinois*. June 15-19, 2015. [oral presentation]
- **Saunders JK**, Rocap G. **“Environmental availability of $\text{PO}_4\text{:AsO}_4$ a selective force on the occurrence of *Prochlorococcus* arsenic detoxification mechanisms in natural populations”**. Gordon Research Conference on Marine Microbes. Bentley University. *Waltham, Massachusetts*. June 21-27, 2014. [poster presentation]
- **Saunders JK**, Rocap G. **“Basin scale differences in *Prochlorococcus* arsenic detoxification mechanisms: connecting biochemical pathways with their biogeochemically relevant end products”**. ASLO Aquatic Sciences Meeting. *New Orleans, Louisiana*. February 22, 2013. [oral presentation]

Teaching:**Software Carpentry Instructor****eOCEAN102:** Introduction to Oceanography for Non-majors (on-line course).

- New course offered in Summer 2014. Helped create the course content & led half of weekly in-person seminars. During Winter 2015, primary role in course was content generation and supervision of the junior TA.

Nov 2014
 Summer 2015
 Winter 2015
 Summer 2014

OCEAN430: Biological Oceanography for Oceanography Seniors

- Led 1 weekly seminar per week. Responsible for creating and grading all homework assignments. Created and ran computer lab on bioinformatics. Primary instructor for last 1/3 of course fall 2014.

Fall 2014
 Fall 2013

OCEAN201: TA Introduction to Oceanography for Science & Engineering Majors Lab

Spring 2014

OCEAN102: TA Introduction to Oceanography for Non-majors (in-class)

Winter 2014

OCEAN 539C: Biological Oceanography Graduate Student Seminar

Spring 2013

- Led a 1 credit seminar on environmental bioinformatics

OCEAN200: TA Introduction to Oceanography for Science & Engineering Majors

Spring 2011
 Spring 2010

- Lead TA during Spring 2010 - Organized other TA's and assisted in training of new TA's

Mentorship:**Kelsey Gibbons**

Fisheries Major. *Mary Gates Research Fellow 2016*.
 Graduated Spring 2017.

Spring 2015-Fall 2016

Natalie Kellogg

Oceanography & Biochemistry Majors. *Mary Gates Research Fellow 2017*. Graduated Spring 2017.

Winter 2016-Fall 2016

Claire Knox

Oceanography Major. *Mary Gates Research Fellow 2015*. Graduated Spring 2015.

Spring 2014-
 Summer 2015

Michael Lee

Computer Science & Engineering Major. *UW ALVA GenOM (Genomics Outreach for Minorities) Project Awardee*. Graduated Spring 2018.

Summer 2015

Myesa Legendre-Fixx

Oceanography & Ecology Majors. *UW ALVA GenOM (Genomics Outreach for Minorities) Project Awardee*.
NASA SURP (Summer Undergraduate Research Program) Internship. Graduated Spring 2018.

Summer 2013-
 Spring 2015

Jennefer Lopez

Fisheries Major. *Mary Gates Research Fellow 2013*.
UW ALVA GenOM (Genomics Outreach for Minorities) Project Awardee. Graduated Spring 2014.

Summer 2010-
 Spring 2014

Oceanographic Cruises:

- **Eastern Tropical North Pacific Oxygen Gradients Cruise, R/V Oceanus,** Mazatlán, Mexico to San Diego, California - tropical North Pacific Ocean

June 2018

- **TriCoLim – *Trichodesmium* N-Fe Co-limitation Cruise, R/V Atlantis,** Equatorial Transatlantic cruise: Praia, Cape Verde to San Juan, Puerto Rico

Feb-Mar 2018

- **UW Astrobiology Workshop – Oceanographic Cruise, *R/V Thomas G Thompson*, Puget Sound, WA to continental shelf break, USA** Oct 2014
- **C-MORE Training Cruise in Microbial Oceanography, *R/V Kilo Moana*, Station ALOHA, North Pacific Subtropical Gyre** June 2013
- **GeoMICS Research Cruise combining geochemical and molecular techniques to study marine transition zones, *R/V Thomas G Thompson*, Line P, North Pacific Ocean** May 2012
- **Oceans and Human Health “H2O” Cruise, *R/V Thomas G Thompson*, Puget Sound, Washington, USA** Oct 2010
Oct 2011
- **PRISM Puget Sound Time-Series Cruise, *R/V Thomas G Thompson*, Puget Sound, Washington, USA** Dec 2009

Related Research Experience:

Smithsonian Environmental Research Center Internship, Jan-Mar 2009
Protistan Ecology Lab - Harmful Algal Blooms, *Edgewater, MD*
Advisor: Mario Sengco

Smithsonian Environmental Research Center Internship, Sept-Dec 2008
Plant Ecology Lab – Invasive Earthworm Impacts, *Edgewater, MD*
Advisor: Melissa McCormick

Undergraduate Research, NSF Research Experience for Undergraduates Oct 2006-Dec 2007
Kalisz Lab, University of Pittsburgh – Plant Population Genetics, *Pittsburgh, PA*
Advisors: Susan Kalisz & April Randle

Additional Related Professional Experience:

National Park Service, Biological Science Technician (GS-5) May-Aug 2009
National Mall and Memorial Parks, Washington, DC

Unilever-Student Conservation Association Congressional- National Parks Internship Jan-Sept 2008

- **Internship with Congressman Christopher Shays CT-04,** Jan-May 2008
Washington, DC

- **Internship with the Department of the Interior, Office of the Secretary,** May 2008
External Affairs Office, Washington, DC

- **AmeriCorps Internship: Science & Natural Resource Management Division,** June-Aug 2008
Padre Island National Seashore, Corpus Christi, TX