

## Jaclyn K Saunders

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<https://jaclynsaunders.github.io>

<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).

### 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** Dec 2018–July 2019  
*co-chair, Austin, TX*

**UW College of the Environment Associate Dean of Diversity & Access Hiring Committee, member** Dec 2015–Aug 2016

**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](http://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 17<sup>th</sup> 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 19<sup>th</sup> annual Scientific Computing with Python Conference. *Remote*. July 8, 2020. [https://github.com/jaclynasaunders/SciPy\\_2020\\_Ocean\\_Data](https://github.com/jaclynasaunders/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**, Mcllvin 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**, Mcllvin 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  $PO_4:AsO_4$  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:**

<b>Software Carpentry Instructor</b>		Nov 2014
<b>eOCEAN102: Introduction to Oceanography for Non-majors (on-line course).</b>		Summer 2015
- 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.		Winter 2015
		Summer 2014
<b>OCEAN430: Biological Oceanography for Oceanography Seniors</b>		Fall 2014
- 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 2013
<b>OCEAN201: TA Introduction to Oceanography for Science &amp; Engineering Majors Lab</b>		Spring 2014
<b>OCEAN102: TA Introduction to Oceanography for Non-majors (in-class)</b>		Winter 2014
<b>OCEAN 539C: Biological Oceanography Graduate Student Seminar</b>		Spring 2013
- Led a 1 credit seminar on environmental bioinformatics		
<b>OCEAN200: TA Introduction to Oceanography for Science &amp; Engineering Majors</b>		Spring 2011
- Lead TA during Spring 2010 - Organized other TA's and assisted in training of new TA's		Spring 2010

**Mentorship:**

<b>Kelsey Gibbons</b>	Fisheries Major. <i>Mary Gates Research Fellow 2016.</i> Graduated Spring 2017.	Spring 2015-Fall 2016
<b>Natalie Kellogg</b>	Oceanography & Biochemistry Majors. <i>Mary Gates Research Fellow 2017.</i> Graduated Spring 2017.	Winter 2016-Fall 2016
<b>Claire Knox</b>	Oceanography Major. <i>Mary Gates Research Fellow 2015.</i> Graduated Spring 2015.	Spring 2014- Summer 2015
<b>Michael Lee</b>	Computer Science & Engineering Major. <i>UW ALVA GenOM (Genomics Outreach for Minorities) Project Awardee.</i> Graduated Spring 2018.	Summer 2015
<b>Myesa Legendre-Fixx</b>	Oceanography & Ecology Majors. <i>UW ALVA GenOM (Genomics Outreach for Minorities) Project Awardee.</i> <i>NASA SURP (Summer Undergraduate Research Program) Internship.</i> Graduated Spring 2018.	Summer 2013- Spring 2015
<b>Jennefer Lopez</b>	Fisheries Major. <i>Mary Gates Research Fellow 2013.</i> <i>UW ALVA GenOM (Genomics Outreach for Minorities) Project Awardee.</i> 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, External Affairs Office**, May 2008  
*Washington, DC*
  - **AmeriCorps Internship: Science & Natural Resource Management Division, Padre Island National Seashore**, June-Aug 2008  
*Corpus Christi, TX*