

Erin L. McParland, Ph.D.

Simons Foundation Postdoctoral Fellow

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Research Interests

- Role of labile dissolved organic matter and marine microbes interactions in carbon cycling
- Composition and activity of labile organic sulfur compounds in the surface ocean
- Contribution of labile compounds to global-scale ecosystem and climate dynamics

Professional Preparation

2021-Present **Simons Foundation Postdoctoral Fellow**

WHOI, Department of Marine Chemistry and Geochemistry
Research sponsor: Dr. Elizabeth Kujawinski

2019-2021 **Woods Hole Oceanographic Institution Postdoctoral Scholar**

WHOI, Department of Marine Chemistry and Geochemistry
Faculty sponsor: Dr. Elizabeth Kujawinski

2019 **Ph.D. Marine Biology and Biological Oceanography**

University of Southern California (USC)
Dissertation advisor: Dr. Naomi M. Levine

2013 **B.S. Marine Science and Chemical Oceanography, Chemistry minor,
Magna cum laude**

University of South Carolina
Magellan Scholar advisor: Dr. Claudia Benitez-Nelson

Selected Grants, Awards, and Honors

- 2022 “Developing resources for the study of Methylated Sulfur compound cycling PROCesses in the ocean (DMS-PRO)”. SCOR Working Group Full Member
- 2020 Dissertations Symposium in Chemical Oceanography (DISCO) invitee
- 2020 Simons Postdoctoral Fellowship in Marine Microbial Ecology- \$261,000
- 2019 USC William E. Trusten Outstanding Graduate Student in Biology Award
- 2019 WHOI Postdoctoral Scholarship- \$104,350
- 2017 USC Gerald Bakus Research Fellowship- \$3,000
- 2017 USC Women in Science and Engineering Leadership Award
- 2014 Department of Defense, NDSEG Graduate Fellowship- \$93,000
- 2014 NSF Graduate Research Fellowship- *Honorable Mention*
- 2013 USC Dornsife PhD Tyler Environmental Fellowship- \$28,000
- 2012 First Place Poster, University of South Carolina Discovery Day Undergrad Symposium
- 2011 NOAA Ernest F. Hollings Scholar
- 2010 NSF REU participant at Dauphin Island Sea Laboratory with Dr. Ronald Kiene

Publications

Peer-reviewed**Co-first authors**+Former USC undergraduate co-authors.*

1. O'Brien, J., **McParland, E.**, Bramucci, A., Ostrowski, M., Siboni, N., Ingleton, T., Brown, M., Levine, N., Laverock, B., Petrou, K., Seymour, J. 2022. The microbiological drivers of temporally dynamic DMSP cycling processes in Australian coastal shelf waters. *Frontiers in Microbiology*. DOI: 10.3389/fmicb.2022.894026
2. O'Brien, J., **McParland, E.**, Bramucci, A., Siboni, N., Ostrowski, M., Kalkhe, T., Levine, N., Brown, M., Van De Kamp, J., Bodrossy, L., Messer, L., Petrou, K., Seymour, J. 2022. Biogeographical and seasonal dynamics of the marine Roseobacter community and ecological links to DMSP-producing phytoplankton. *ISME Communications*. DOI: 10.1038/s43705-022-00099-3
3. **McParland, E.***, Alexander, H*., Johnson, W*. 2021. The osmolyte ties that bind: genomic insights into synthesis and breakdown of organic osmolytes in marine microbes. *Frontiers in Marine Science Special Edition: Role of micronutrients in mediating microbial community interactions*. DOI:10.3389/fmars.2021.689306
4. **McParland, E.**, Lee, M., Webb, E., Alexander, H., Levine, N. 2021. DMSP synthesis genes distinguish two types of DMSP producer phenotypes. *Environmental Microbiology*. DOI:10.1111/1462-2920.15393
5. Jackson, R., Matrai, P., Woodhouse, M., Cropp, R., Jones, G., Deschaseaux, E., Omori, Y., **McParland, E.**, Swan, H., Tanimoto, H. 2021. Parameterizing the impact of seawater temperature and irradiance on dimethylsulfide (DMS) in the Great Barrier Reef and the contribution of coral reefs to the global sulfur cycle. *JGR Oceans*. DOI:10.1029/2020jc016783
6. **McParland, E.**, Wright, A.⁺, Art, K.⁺, He, M.⁺, Levine, N. 2020. Evidence for contrasting roles of DMSP production in *Emiliania huxleyi* and *Thalassiosira oceanica*. *New Phytologist*. DOI:10.1111/nph.16374
7. **McParland, E.** and N. Levine. 2019. The role of differential DMSP production and community composition in predicting variability of global surface DMSP concentrations. *Limnology & Oceanography*. DOI:10.1002/lno.11076
8. Jones, G., Curran, M., Deschaseaux, E., Omori, Y., Tanimoto, H., Swan, H., Eyre, B., Ivey, J., **McParland, E.**, Gabric, A., Cropp, R. 2018. The flux and emission of DMS from the Great Barrier Reef region and potential influence on the climate of Northeast Australia. *JGR Atmospheres*. DOI:10.1029/2018JD029210
9. Lee, M., Walworth, N., **McParland, E.**, Fu, F., Mincer, T., Levine, N., Hutchins, D., Webb, E. 2017. The Trichodesmium consortium: conserved heterotrophic co-occurrence and genomic signatures of potential interactions. *ISME Journal*. DOI:10.1038/ismej.2017.49
10. **McParland, E.**, Benitez-Nelson, C., Taylor, G., Thunell, R., Rollings, A., Lorenzoni, L. 2015. Cycling of suspended particulate phosphorus in the redoxcline of the Cariaco Basin. *Marine Chemistry*. DOI:10.1016/j.marchem.2015.07.008

In prep

1. **McParland, E.**, Longnecker, K., Kido Soule, M., Swarr, G., Vergin, K., Carlson, C., Kujawinski, E. Foundational exometabolites are produced by a functionally redundant microbiome at the oligotrophic time-series Bermuda Atlantic Time-series Study (BATS).
2. Curry, R., Carlson, C., Blanco-Bercial, L., **McParland, E.**, Liu, S. A physical framework for defining seasonality of the oligotrophic Atlantic ocean at the Bermuda Atlantic Time-series Study (BATS).

Other Publications

1. Porat, S.*, and **McParland, E.*** 12 Years of the Young Researchers Program: Lessons learned from alumni surveys and interviews. *In prep.*
2. **McParland, E.** 2016. Science, cells and the smell of the sea. <https://schmidtocean.org/cruise-log-post/science-cells-and-the-smell-of-the-sea/>
3. **McParland, E.** 2016. DMS: The anti-greenhouse gas. <http://earth.usc.edu/sciencepolicy/dms-the-anti-greenhouse-gas/>

Scientific Community Contributions

2021: “Assigning putative DMSP production/synthesis to environmental 18S OTU sequences”. I developed publicly available analytical pipeline that is used by the O’Brien paper above (*in review*). DOI:10.5281/zenodo.5090864

2020: “Pipeline for pre-processing a multi-batch untargeted exometabolome experiment with XCMS on a high-performance compute system”. The computational pipeline used for preparing the untargeted exometabolome time series (*in prep*). <https://github.com/emcparland/UntargCode>

Academic Presentations

2022 **BIOS-SCOPE All Hands Workshop**, Boston, MA

Talk: The functionally redundant marine microbiome results in a predictable exometabolome. **ASLO Ocean Sciences Meeting**, virtual

Invited Talk: Advances in marine exometabolomics for Advancing Microfluidics and Metabolomics in Microbial Ecology Workshop

Talk: Seasonal and diel variability of a depth-resolved exometabolome at the BATS

Poster: The genomic potential for dissolved organic sulfur utilization by marine heterotrophs in the euphotic zone (*Undergraduate-led presentation)

2021 **WHOI MC&G Department Departmental seminar** virtual

Talk: Seasonal and diel variability of a depth-resolved exometabolome at the BATS

BioGeoSCAPES OCB Scoping Workshop, virtual

Poster: Seasonal and diel variability of a depth-resolved exometabolome at the BATS

Simons Early Career Investigators Meeting, virtual (Simons Foundation Life Sciences)

Poster: Quantifying the ecology of organic sulfur in the surface ocean

NSF Dissertations in Chemical Oceanography, Kauai, Hawaii

Invited Talk: The dynamic regulation of DMSP production by marine phytoplankton

M2C2 Marine Microbial Chemical Communication Seminar, virtual (Weizmann Insti.)

Talk: Seasonal and diel dynamics of the BATS untargeted exometabolome

Ocean Carbon and Biogeochemistry Summer Workshop, virtual (WHOI OCB)

Poster: Seasonal and diel dynamics of the BATS untargeted exometabolome

Moore lab (UCSD) group meeting, virtual

Invited Talk: Organic sulfur’s potential for limiting marine heterotrophs

2020 **Joint Simons Marine Collaborations Meeting**, virtual

Poster: Untargeted quantification of chemical currencies driving DOM cycling

ASLO Ocean Sciences Meeting, San Diego, CA

Talk: Evidence for two independent ecological roles of DMSP

BIOS-SCOPE All Hands Workshop, San Diego, CA

Poster: The BATS untargeted exometabolome

WHOI Postdoctoral Symposium, virtual

Talk: Quantifying the chemical currencies of marine microbes - Best figure award

- 2019 **SEOS department seminar at University of South Carolina**, Columbia, SC
Invited Talk: Organic sulfur in the surface ocean: what, when and why?
WHOI Geochemistry seminar, Woods Hole, MA
Invited Talk: Dynamic regulation of DMSP synthesis drives global surface DMSP concentrations
- 2018 **Marine Microbes Gordon Research Conference**, Lucca, Italy
Poster: DMSP is differentially regulated by high and low DMSP producers
ASLO Ocean Sciences Meeting, Portland, OR
Poster: Two groups of DMSP producers with significantly different production dynamics
- 2014 **Ocean Global Change Biology Gordon Conference**, Waterville Valley, NH
Poster: DMSP response to nutrient limitation by N₂-fixing cyanobacteria in high CO₂
6th Symposium: Biological and Environmental Chemistry of DMS(P), Barcelona, Spain
Poster: DMSP production in high CO₂ oceans by N₂-fixing cyanobacteria
- 2013 **ASLO Aquatic Sciences Meeting**, New Orleans, LA
Poster: Suspended particulate phosphorus cycling across the redoxcline of Cariaco Basin

At Sea Experience

- 2021 AR62, Nov 17-24, R/V *Armstrong*, Woods Hole to southern New England outer-shelf
Chief Scientist: Magdalena Andrew (WHOI)
- 2021 BIOS-SCOPE diel process study cruise, Aug 4-8, R/V *Atlantic Explorer*, BATS, Bermuda
Chief Scientist: Craig Carlson (UCSB)
- 2017 DMS(P) Cycling in the Subarctic NE Pacific, Aug 11-27, R/V *Atlantis*, Alaska to Oregon
Chief Scientists: Ron Kiene (DISL) and Philippe Tortell (UBC)
- 2016 Climatic aerosol particles of GBR, Sept 26-Oct 25, R/V *Investigator*, Great Barrier Reef
Chief Scientist: Zoran Ristovski (QUT), Supervisor: Justin Seymour (UTS)
- 2016 ProteOMZ, Jan 13- Feb 8, R/V *Falkor*, Hawaii to Tahiti
Chief Scientist: Mak Saito (WHOI)

Teaching Experience

- 2017, **Guest lecture** in Biological Oceanography, USC: “Dissolved organic matter cycling”
 2018 *Designed and presented 1.5 hour lecture, currently still used in curriculum*
- 2017, **Teaching assistant** for Biological Oceanography, USC
 2018 *Led weekly labs, assisted in curriculum design, organized weekend field trip*
- 2013 **Teaching assistant** for Chemical Oceanography, University of South Carolina
Led weekly lab sections

Mentoring

- 2021-2022 Mentor USC undergraduate researcher Michelle DeMers (virtual)
Currently a research assistant at MIT
- 2017-2019 Mentor USC undergraduate researchers Kristin Art, Emily Vainstein, Adrian Salgado
- 2017-2019 WiSE mentor for USC undergraduate Hannah Adams
Currently a graduate student at Scripps
- 2018-2019 Mentor USC undergraduate researcher Meagan He
Currently a PhD student at USC
- 2017 Mentor Young Researchers Program participant Alexia Olguin
Currently a Comparative Literature major at UPenn
- 2016-2018 Mentor USC undergraduate researcher Alexandra Koops as a SOAR Fellow
Currently in medical school

2016-2018 Mentor USC undergraduate researcher Jeremy Fricke as a Provost Summer Fellow

2015-2017 Mentor USC undergraduate researcher Anna Wright as a WiSE and SOAR Fellow

Currently a scientist at the NWT LTER

Diversity Actions and Community Engagement

2022 *Host* URGE Town Hall at ASLO Ocean Sciences Meeting

2021 *Participant* in WHOI URGE pod (Unlearning racism in geoscience) and currently assisting in action implementation

2020-2021 *Volunteer* for the WHOI Workplace Climate Committee and the WHOI Committee on Diversity and Inclusion (Messaging and Implementation working group)

2020-2021 *Volunteer* presentations for Skype a Scientist virtually (3rd, 5th, and 12th grade)

2020 *Invited speaker* on ocean climate change at Harwichport Yacht Club (50 adults)

2013-2018 *Program coordinator* for USC Young Researchers Program- obtained funding (~\$25,000/yr) and facilitated 6-week research program for Los Angeles high schoolers

2017 *Volunteer* presentations for the Los Angeles Youth Business Alliance (10th grade)

2017 *Volunteer coordinator* for USC and CalTech Project Scientist field trip (~100 students, ages 5-14)

2017 *Volunteer* presentations USC Wonderkids afterschool program (ages 5-10)

2015, 2016 *Volunteer leader* Wrigley Marine Institute field trip for Los Angeles 4th grade students

2014, 2015 *Volunteer* presentations at Vermont Ave Elementary School Career Day

2013 *Volunteer instructor* for University of South Carolina ScienceQuest- local afterschool science program

2009-2011 *Volunteer* Education Outreach for University of South Carolina Marine Science Club- traveling touch tank presentations at local elementary schools

Service and Professional Development

2021 ADVANCEGeo Bystander Training

2020-2021 At-large member of WHOI Postdoctoral Association- advocate for postdoctoral scholars and facilitate professional development workshops

2017-2019 Co-founder and Chair of USC MEB Graduate Student Association

2015-2016 Co-organizer of USC MEB Departmental Seminar

Invited participant for NSF proposal review panel

Invited peer reviewer for *Biogeosciences*, *Environmental Science & Technology*, *ISME*, *JGR Oceans*, *Limnology and Oceanography*, *Marine Biology*, *PNAS*, *Progress in Oceanography*, *Science*, NDSEG fellowship