

MARA FREILICH

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PROFESSIONAL APPOINTMENTS

Brown University, Assistant Professor *2023-present*
Division of Applied Mathematics and Department of Earth, Environmental, and Planetary Sciences
Affiliated Faculty, Institute at Brown for Environment and Society and Data Science Initiative
Scripps Institution of Oceanography, UCSD, Postdoctoral Fellow *2021-2023*
Pontificia Universidad Católica de Chile, Fulbright Fellow *2016*

EDUCATION

MIT-Woods Hole Oceanographic Institution Joint Program in Oceanography,
Doctor of Philosophy in Physical Oceanography *2015-2021*
Thesis: “Vertical Fluxes in the Upper Ocean” advised by Dr Amala Mahadevan
Brown University, Bachelor of Science in Applied Math with honors, *magna cum laude* *2011-2015*

PUBLICATIONS

Peer-reviewed book

1. **Freilich, M.**, Turan, I., Varner, J., Yarina, L., eds. (in press, forthcoming 2025). Climate Changed: Models and the Built World. Columbia University Press.

Pre-prints

Group members are underlined.

4. Gonzalez, M., Dove, L.A., **Freilich, M.A.** (in prep). *Biogeochemical Properties of Antarctic Winter Water Are Shaped by Eddy Processes*
3. Centeno, D., Sinclair, R., Montgomery, Q., Palomino, A., Taboada, J., Lopez, A., Marquez, C., Arzeno-Soltero, I.B., **Freilich, M.A.** (in review). *Hypereutrophication, Hydrogen Sulfide, and Environmental Injustices: Mechanisms and Knowledge Gaps at the Salton Sea*.
2. Ruiz Seitz, L., and **Freilich, M. A.** (in review). *Joint effects of submesoscale lateral dispersion and biological reactions on biogeochemical flux*.
1. Dove, L.A., **Freilich, M.A.**, Siegelman, L., Fox-Kemper, B., Hall, P. (in review). *Pycnocline Stratification Shapes Submesoscale Vertical Tracer Transport*

Peer-reviewed journal publications

* - indicates authors contributed equally. Group members are underlined.

31. Duffy, M.L., Barnes, L.Y., Wirz, C.D., Ranganathan, M., **Freilich, M.A.**, Freese, L.M., Lalk, E. and Wilcots, J., (2025). *Factors influencing underrepresented geoscientists’ decisions to accept or decline faculty job offers*. Communications Earth and Environment.
30. Torres, H.S., Wineteer, A., Rodriguez, E., Klein, P., Thompson, A.F., Perkovic-Martin, D., Molemaker, J., Hypolite, D.J., Callies, J., Farrar, T., D’Asaro, E.A., **Freilich, M.A.** (2025) *Submesoscale eddy contribution to ocean vertical heat flux diagnosed from airborne observations*. Geophysical Research Letters.
29. Hung, C., Diamond, C., Sinclair, R., Lee, M. C., Stenstrom, M., **Freilich, M. A.**, Montgomery, Q., Marquez, C., Lyons, T. W. (2024). *Nutrient loading as a key cause of short-and long-term anthropogenic ecological degradation of the Salton Sea*. Scientific Reports, 14(1), 31247.

28. Martin, A.P., Bahamondes Dominguez, A. Baker, C.A., Baumas, C., Bisson, K.M., Cavan, E., **Freilich, M.**, Galbraith, E., Galí, M., Henson, S., Kvale, K.F., Lemmen, C., Luo, J.Y., McMonagle, H., de Melo Virissimo, F., Möller, K., Richon, C., Suresh, I., Wilson, J.D., Woodstock, M.S., Yool, A. (2024). *When to add a new process to a model – and when not: A marine biogeochemical perspective*. Ecological Modelling, 498, 110870.
27. Pillar, H., Hetherington, E., Levin, L.A., Cimoli, L., Lauderdale, J., Van Der Grient, J., Johannes, K., Heimbach, P., Smith, L., (19 additional authors including **Freilich, M.A.**) (2024). *Future Directions for Deep Ocean Climate Science and Evidence-Based Decision Making*. Frontiers in Climate
26. Hsu, T.-Y., Mazloff, M., Gille, S., **Freilich, M.**, Sun, R., Cornelle, B. (2024). *Response of Sea Surface Temperature to Atmospheric Rivers*. Nature Communications.
25. **Freilich, M.**, Poirier, C., Dever, M., Alou, E., Allen, J., Cabornero, A., Choi, C., Sudek, L., Ruiz, S., Pascual, A., Farrar, J.T., D’Asaro, E., Worden, A.Z., Mahadevan, A. (2024). *Microbially enriched intrusions from the deep chlorophyll maximum transport carbon to the mesopelagic ocean*. Proceedings of the National Academy of Sciences.
24. Arboleda-Baena, C, **Freilich, M.**, Pareja, C, Logares, R, De la Iglesia, R, and Navarrete, S. (2024). *Microbial communities network structure across strong environmental gradients: How do they compare to macroorganisms?*. FEMS Microbiology Ecology, fiae017.
23. Cao, H., **Freilich, M.**, Song, X., Jing, Z., Fox-Kemper, B., Qiu, B., Hetland, R., Chai, F., Chen, D., Ruiz, S. (2024) *Isopycnal submesoscale stirring sustains subsurface chlorophyll maximum in ocean cyclonic eddies*. Geophysical Research Letters.
22. Centeno, D., Arzeno-Soltero, I., Delgado, A., **Freilich, M.**, Marquez, C., Montgomery, Q., Palomino, A., Penalber, G., Sinclair, R. (2023). *Salton Sea Environmental Work and the Importance of Community Science*. Oceanography.
21. Youngs, M., **Freilich, M.**, Lovenduski, N. (2023). *Air-Sea CO₂ Fluxes Driven By Topography in a Southern Ocean Channel*. Geophysical Research Letters.
20. Plummer, A.*, **Freilich, M.***, Choi, C.J., Sudek, L., Benzi, R., Toschi, F., Worden, A.Z., Mahadevan, A. (2023). *Oceanic frontal divergence alters phytoplankton competition*. Journal of Geophysical Research: Oceans, e2023JC019902.
19. **Freilich, M.**, Lenain, L., Gille, S. (2023). *Characterizing the role of non-linear interactions in the transition to submesoscale dynamics at a dense filament*. Geophysical Research Letters, 50 (15), e2023GL103745.
18. Lenain, L., Smeltzer, B., Pizzo, N., **Freilich, M.**, Colosi, L, Ellingsen, S., Grare, L., Peyriere, H., Statom, N. (2023). *Airborne observations of surface winds, waves and currents from meso to submesoscales*. Geophysical Research Letters, 50 (8), e2022GL102468.
17. Esposito, G., Donnet, S., Berta, M., Shcherbina, A., **Freilich, M.**, Centurioni, L., D’Asaro, E., Farrar, J.T., Johnston, T.M.S., Mahadevan, A., Ozgokmen, T., Pascual, A., Poulain, P.-M., Ruiz, S., Tarry, D., Griffa, A. (2023). *Inertial oscillations and frontal instabilities at an Alboran Sea front: Effects on divergence and vertical transport*. Journal of Geophysical Research: Oceans, 128 (3), e2022JC019004.
16. Aravind, H.M., Verma, V., Sarkar, S., **Freilich, M.**, Mahadevan, A., Haley, P., Lermusiaux, P.F.J., and Allshouse, M.R. (2023). *Lagrangian surface signatures reveal upper-ocean subduction*. Ocean Modelling, 181, 102136.
15. Cutolo, E., Pascual, A., Ruiz, S., Johnston, T.M.S., **Freilich, M.**, Mahadevan, A., Shcherbina, A., Poulain, P.-M., Ozgokmen, T., Centurioni, L.R., Rudnick, D., D’Asaro, E. (2022). *Diagnosing Frontal Dynamics from Observations using a Variational Approach*. Journal of Geophysical Research: Oceans, 127 (11), e2021JC018336.
14. Hall, C. A., Illingworth, S., Mohadjer, S., Koll Roxy, M., Poku, C., Otu-Larbio, F., Reano, D., **Freilich, M.**, Veisaga, M-L, Valencia, M., Morales, J. (2022). *GC Insights: Diversifying the Geosciences in Higher*

Education: a Manifesto for Change. Geoscience Communication, 5, 275–280.

13. **Freilich, M.**, Flierl, G., Mahadevan, A. (2022). *Diversity of growth rates maximizes phytoplankton productivity in an eddying ocean*. Geophysical Research Letters, e2021GL096180.
12. **Freilich, M.**, Mignot, A., Flierl, G., and Ferrari, R. (2021). *An investigation of grazing behaviors that result in winter phytoplankton biomass accumulation*. Biogeosciences, 18, 5595–5607.
11. Ranganathan, M., Lalk, E., Freese, L., **Freilich, M.**, Wilcots, J., Duffy, M., and Shivamoggi, R (2021). *Trends in the representation of women among US geoscience faculty from 1999-2020: the long road towards gender parity*. AGU Advances, 2 (3), e2021AV000436.
10. **Freilich, M.** and Mahadevan, A. (2021). *Coherent pathways for subduction from the surface mixed layer at ocean fronts*. Journal of Geophysical Research: Oceans, 126 (5), e2020JC017042.
9. **Freilich, M.**, Rebolledo, R., Corcoran, D., and Marquet, P. (2020). *Reconstructing ecological networks with noisy data*. Proceedings of the Royal Society A, 476 (2237), 20190739.
8. Dever, M., **Freilich, M.**, Farrar, J.T., Hodges, B., Lanagan, T., Baron, A., Mahadevan, A., (2020). *EcoCTD for profiling oceanic physical-biological properties from an underway ship*. Journal of Atmospheric and Oceanic Technology, 37 (5), 825-840.
7. Shroyer, E., Gordon, A., Spiro Jaeger, G., **Freilich, M.** Waterhouse, A., Farrar, J.T., Sarma, V.V.S.S., Venkatesan, R., Weller, R., Moum, J., and Mahadevan, A. (2019) *Upper Layer Thermohaline Structure of the Bay of Bengal during the 2013 Northeast Monsoon*. Deep Sea Research II, 104630.
6. **Freilich, M.** and Mahadevan, A. (2019). *Decomposition of vertical velocity for nutrient transport in the upper ocean*. Journal of Physical Oceanography, 49 (6), 1561-1575.
Awarded Fye Award for Excellence in Oceanographic Research Graduate Student Best Paper Award
5. **Freilich, M.**, Weiters, E., Broitman, B., Navarrete, S. (2018) *Species co-occurrence networks: can they reveal trophic and non-trophic interactions in ecological communities?*. Ecology, 99 (3), 690-699.
4. Mahadevan, A., Spiro-Jaeger, G., **Freilich, M.** Omand, M., Shroyer, E., Sengupta, D., Sharma, R. (2016) *Freshwater in the Bay of Bengal: Its fate and role in air-sea heat exchange*. Oceanography, 29 (2), 72-81.
3. Lucas, A.J., Nash, J.D., Pinkel, R., MacKinnon, J.A., Tandon, A., Mahadevan, A., Omand, M., **Freilich, M.**, Sengupta, D., Ravichandran, M., Le Boyer, A., and Moum, J. (2016) *Adrift upon a salinity-stratified sea: a view of upper ocean processes in the Bay of Bengal during the southwest monsoon*. Oceanography, 29 (2), 134-145.
2. Gordon, A., Shroyer, E., Mahadevan, A., Sengupta, D., and **Freilich, M.** (2016) *Bay of Bengal: Upper Ocean Circulation from the 2013 Northeast Monsoon*. Oceanography, 29 (2), 82-91
1. **Freilich, M.** and Connolly, S. (2015). *Phylogenetic Community Structure When Similarity-Based Competition and Environmental Filtering Determine Abundances*. Global Ecology and Biogeography, 24: 1390-1400.

Non-peer reviewed publications

3. Lerner, P., Palevsky, H.I., Busecke, J., **Freilich, M.**, Cavan, E., Eddebbar, Y., Fassbender, A., Lauderdale, J., Luo, J., Mongwe, P., Stephens, B., Traylor, S. [CMIP6 Biogeochemistry](#)
doi: <https://doi.org/10.5281/zenodo.3559209> [Project coordinator]
2. Dever, M., **Freilich, M.**, Hodges, B.A., Farrar, J.T., Lanagan, T., Mahadevan, A., “UCTD and EcoCTD Observations from the CALYPSO Pilot Experiment (2018): Cruise and Data Report”, 2019-01, DOI:10.1575/1912/23637, <https://hdl.handle.net/1912/23637>
1. Haitians and Guantanamo: Who is a refugee? What is a refuge? Guantanamo Public Memory Project. National Traveling Exhibit. 2012.

FELLOWSHIPS AND ACADEMIC HONORS

NASA group achievement award (awarded to S-MODE science team)	2023
Chemical Currencies of a Microbial Planet, Faculty Fellowship	2023-2025
Oberwolfach Leibniz Graduate Student Grant	2022
Scripps Institutional Postdoc Program	2021-2023
AGU Voices for Science Fellowship	2021-2022
EAPS Community Builder Award (team award to Towards Increasing Diversity in EAPS)	2021
Fye Award for Excellence in Oceanographic Research Graduate Student Best Paper Award	2020
Martin Fellowship for Sustainability	2018-2020
Fulbright Fellowship	2016
National Defense Science and Engineering Graduate Fellowship	2015-2018
Jerome L Stein Memorial Award, Division of Applied Math, Brown University	2015
Summer Student Fellowship, Woods Hole Oceanographic Institution	2014
Phi Beta Kappa (elected as a junior)	2014
Royce Fellowship, Brown University research fellowship	2013
Columbia Economics Review Climate Policy Competition, Winner	2012
American Meteorological Society Scholarship	2011

GRANTS

Current

Ocean Biogeochemistry Virtual Institute, *Ocean Margins Initiative*, Lead PIs A. Mahadevan, E. Mahu, M. Omand, PIs A. Lucas, K. Appeaning-Addo, B. Arbic, B. Jönsson, C. Durkin, D. Lindell, D. Menemenlis, J.T. Farrar, J. Ansong, **MA Freilich**, M. Church, M. Mazloff, N. Levine, P. Girguis 2024-2029

NASA EPSCoR, *Precipitation extremes and land-sea biogeochemical connections in the California Current System*, PI **MA Freilich** 2024-2025

NASA Ocean Biology and Biogeochemistry, *Mechanistic insight into submesoscale biogeochemical fluxes from surface observations*, PI **MA Freilich** 2024-2025

NASA Applied Sciences, *NASA Earth Observations for Resilient Salton Sea Communities*, PI **MA Freilich**, co-Is Alianza Coachella Valley, I.B. Arzeno-Soltero, K. Heitz, R. Sinclair, Q. Montgomery 2023-2027

NASA Sub-Mesoscale Ocean Dynamics Experiment, *Mechanistic insight into vertical biogeochemical fluxes using S-MODE observations* 2024-2025

NSF STC Chemical Currencies of a Microbial Planet, *Biophysical mechanisms of dissolved organic carbon flux*, subaward to **MA Freilich** 2023-2025

NASA Ocean Vector Winds Science Team, *Coupling between the ocean and the atmosphere from meso to submesoscales*, PI L Lenain, co-Is **MA Freilich**, N Pizzo 2023-2027

Burroughs Wellcome Fund, *Environmental geochemistry, human health, and environmental justice: Hydrogen sulfide and the Salton Sea*, PI **MA Freilich**, Collaborators I Arzeno Soltero, R Sinclair, Climate Change and Human Health Seed Grant 2023-2025

Conicyt (Chile), Exploración 2022, *Biological and Quantum Open System Dynamics: evolution, innovation and mathematical foundations*, PIs Pablo Marquet and Rolando Rebolledo, co-PIs NR Aburto, L Videla, C Quiñinao, M Tejo, **MA Freilich**, H Olivero 2023-2025

Pending

NSF Office of Polar Programs, *Antarctic Winter Water as a Conduit for Biophysical Ventilation across the Southern Ocean*, PI L. Dove, **Co-PI MA Freilich** 2025-2028

Completed

ESI Curriculum Mini-Grants for Infusing Sustainability in STEM	2021
Access to the Sea , 1 day of ship time on R/V Neil Armstrong	2019
Grassle Fellowship Fund	2018
Montrym Fund	2018
MISTI-Chile – UC Graduate Student Seed Fund	2017-2018

FIELDWORK

· S-MODE IOP 2 (North Pacific Ocean), Biological sampling lead	April 6-May 3, 2023
· S-MODE IOP 1 (North Pacific Ocean), Biological sampling lead	October 6-November 1, 2022
· Physical Oceanography Ship Time Cruise (Northeast US Shelfbreak), Co-PI	November 15-22, 2019
· Joint Program Cruise (Northeast US Shelfbreak), Co-Chief Scientist	September 20-22, 2019
· Calypso (Western Mediterranean Sea), Biogeochemical sampling lead	March 21 - April 12, 2019
· Calypso Pilot (Western Mediterranean Sea), Biogeochemical sampling lead	June, 2018
· Investigating Vertical Exchanges (Mediterranean Sea), Biogeochemical sampling lead	July 17-24, 2017

TEACHING

Courses

· EEPS1400: Climate Modeling I (48 students)	Fall 2024
· APMA2980: Geophysical Fluid Dynamics Independent Study (1 student)	Spring 2024
· APMA1930P: Mathematics and Climate (21 students)	Spring 2024

Gull Island Institute

2022-present

Advisory Committee

University Course Guest Lectures

· Ocean Biogeochemical Cycles, Brown	2023
· Ethical Challenges in Engineering, Brown	2023
· Computational Ocean Modeling, MIT-WHOI	2022
· Ethics Seminar, MIT	2020, 2021
· Sociopolitical Perspectives on Math and Science Education, University of Illinois at Urbana-Champaign	2020
· Social Movements in Boston, Northeastern University	2019
· Biophysical Interactions, MIT-WHOI	2019, 2021

Curriculum Assistant

2019-2021

Write climate science-related problem sets for first year math courses

MIT

MENTORING

Research advisor

Postdocs

· Lilian Dove, NOAA Climate & Global Change Postdoctoral Fellow	2023-present
· Arianna Krinos, C-CoMP Postdoctoral Fellow	2024-present

PhD students

· Alejandra Lopez, EEPS PhD student	2024-present
· Élise Beaudin, EEPS PhD student (co-advisor with Emanuele di Lorenzo)	2024-present
· Katarina Merk, EEPS PhD student	2024-present
· Lulabel Ruiz Seitz, APMA PhD student	2023-present

Research assistants

- Emily Hu, Bridge to PhD Fellow 2024-present
- Diego Centeno, research assistant, “Salton Sea Community Science” 2023-2024

Undergraduates

- Anjali Shah '25, senior thesis “Ice-algae blooms” 09/2024-present
- Ayushman Choudhury '25, UTRA, senior thesis “Carbon Fluxes in the Southern Ocean” 01/2024-present
- Wyatt Simienski '26, UTRA “How big are ocean fronts?” 09/2024-present
- Tommy Frank '25, UTRA, “EEPS1400: Climate Modeling I” 07/2024-present
- Margaret Gonzalez '26, Leadership Alliance, “Antarctic Winter Water and the global carbon cycle” 06-08/2024
- Cassidy Charles '26, Presidential Scholars Program, “Noisy Plankton Blooms” 01-08/2024

PhD advisory committees: Uthkarsh Das (EEPS, 2023-present), Anna Lo Piccolo (EEPS, 2023-present), John Nicklas (EEPS, 2023-present), Alexia Rojas (EEPS, 2024-present), Simone Tetu (APMA academic advisor, 2024-present), Gillian Cheong (EEPS, 2024-present), Brianna Hoegler (EEPS, 2024-present)

Undergraduate thesis readers: Jasper Chen (APMA-CS, 2024), Lorenzo Davidson (EEPS, 2024), Anna Lapre (APMA-CS, 2025)

PRESENTATIONS

Invited presentations and seminars

2024: University of Chile Center for Mathematical Modeling, Bard College, New England Dynamics Seminar, Clivar Workshop on Pathways Connecting Climate Changes to the Deep Ocean, University of Southern California, Isaac Newton Institute, Gordon Research Conference on Ocean Mixing, NASA Ames Earth Science Division, University of Toronto, Nature Editors Community

2023: Scripps Institution of Oceanography, Oregon State University, University of Rhode Island, Sante Fe Institute, APS Physics of Climate webinar

2022: NASA Jet Propulsion Lab, University of Washington Applied Physics Lab, Winds and Currents Webinar, Alfred Wegener Institute Carbon Seminar, FilaChange Paris, Second National Conference: Justice in Geoscience, CYU ECODEP 2022 Conference on Networks Reconstruction, Brown University, University of California Berkeley EPS Seminar, Yale University EPS Seminar, Ocean Sciences Meeting “New insights into submesoscale ocean biogeochemistry”, Gordon Research Seminar on Ocean Mixing, NYU Courant Institute Atmosphere Ocean Science Colloquium

2021: Physical Oceanography Dissertation Symposium, NOAA Coastal Ocean Modeling Science Seminar, University of California Santa Barbara, Marine Science Seminar, Woods Hole Oceanographic Institution Department of Physical Oceanography, MIT Program in Atmosphere, Oceans, and Climate

2020: University of Massachusetts, Dartmouth School for Marine Science & Technology Seminar, University of Washington Oceanography Seminar, Caltech Oceanography Seminar

2019: Woods Hole Oceanographic Institution Department of Physical Oceanography

2018: Brown University, Sarah Doyle Center for Women and Gender, Brown University Department of Earth, Environmental, and Planetary Sciences

2015: Princeton University Department of Atmospheric and Oceanic Sciences

2014: Intensive Workshop on Greenhouse Gas Emissions Reductions in RI: From Goals to Implementation

Contributed talks (selected)

9. **Freilich, M.**, Lenain, L., Gille, S. (2024 February). *Observations of localized submesoscale kinetic energy fluxes*. Talk presented at Ocean Sciences Meeting, New Orleans, LA.

8. Centeno, D., Arzeno-Soltero, I., Delgado, A., **Freilich, M.**, Marquez, C., Montgomery, Q., Palomino, A., Penalber, G., Sinclair, R. (2024 February). *Salton Sea Environmental Work and the Importance of Community Science*. Talk presented at Ocean Sciences Meeting, New Orleans, LA.
7. **Freilich, M.**, Alou, E., Poirier, C., Bachy, C., Dever, M., Choi, C., Sudek, L., Allen, J., Cabornero, A., Ruiz, S., Pascual, A., Farrar, T., D'Asaro, E., Worden, A., Mahadevan, A. (2023 June). *Microbially enriched intrusions from the deep chlorophyll maximum transport carbon to the mesopelagic ocean*. Talk presented at ASLO Aquatic Sciences Meeting. Palma de Mallorca, Spain.
6. **Freilich, M.**, Alou, E., Poirier, C., Bachy, C., Dever, M., Choi, C., Sudek, L., Allen, J., Cabornero, A., Ruiz, S., Pascual, A., Farrar, T., D'Asaro, E., Worden, A., Mahadevan, A. (2022 February). *Microbially enriched intrusions from the deep chlorophyll maximum transport carbon to the mesopelagic ocean*. Talk presented at Ocean Sciences Meeting. Virtual.
5. **Freilich, M.** and Mahadevan, A. (2020 November). *Coherent pathways for vertical transport from the surface mixed layer to ocean interior*. Talk presented at the American Physical Society Division of Fluid Dynamics meeting. Virtual.
4. **Freilich, M.** and Mahadevan, A. (2020 February). *The Vertical Structure of Vertical Velocity*. Talk presented at Ocean Sciences Meeting. San Diego, CA.
3. **Freilich, M.** and Mahadevan, A., (2020 February). *Is vertical nutrient supply influenced by phytoplankton physiology?*. Talk presented at Ocean Sciences Meeting. San Diego, CA.
2. **Freilich, M.**, Curry, R., Flierl, G., Mahadevan, A. (2018 February) *Deciphering Pathways for Vertical Nutrient Supply*. Talk presented at Ocean Sciences Meeting. Portland, OR.
1. **Freilich, M.**, Rebolledo, R., Marquet, P. (2018 January) *Reconstructing species interaction networks from time series data: The effect of stochastic noise*. Talk presented at MIT Ecology Meeting. Cambridge, MA.

Contributed posters (selected)

2. Dove, L., **Freilich, M.**, (2024 February). *Distribution of submesoscale tracer transport shaped by density stratification across the Southern Ocean*. Poster presented at Ocean Sciences Meeting, New Orleans, LA.
1. Centeno, D., Arzeno-Soltero, I., **Freilich, M.**, Sinclair, R., Palomino, A., Montgomery, Q., Taboada, J. (2024 February). *Unveiling the Seasonality and Dynamics of Hydrogen Sulfide Outgassing and Gypsum Precipitation Events in the Salton Sea*. Poster presented at Ocean Sciences Meeting, New Orleans, LA.

Conference participation (as invited participant)

5. Climate Applications of Layering, Isaac Newton Institute (2024 May).
4. Multiscale Wave-Turbulence Dynamics in the Atmosphere and Ocean, MFO, Oberwolfach (2022 September).
3. Environmental Data Science Summit, National Center for Ecological Analysis and Synthesis (2023 February).
2. Gordon Research Conference on Ocean Mixing (2018 June, 2022 June).
1. Life in a Turbulent Environment: How the dynamic ocean shapes the distribution, diversity and growth of microorganisms, Harvard Radcliffe Institute (2015 February).

ACADEMIC AND UNIVERSITY SERVICE

- *Service to scientific community*

Associate Editor, Journal of Physical Oceanography 2022-present

Executive Committee, APS Topical Group on the Physics of Climate, member-at-large 2022-2024

Conference organizer, From Filaments to Climate Change (CLIVAR workshop) 2022

Session Convener

· Ocean Sciences Meeting. [Session: Scaling Nature's Symphony] 2024

- Ocean Sciences Meeting. [Session: Community Science] 2024
- Ocean Sciences Meeting. [Session: Vertical Transport] 2022, 2024
- American Physical Society [Session: Statistical and Nonlinear Physics of Earth and its Climate] 2023
- Graduate Climate Conference 2017, 2019
- Ocean Carbon and Biogeochemistry meeting. [Session: Student lightning talks] 2017

Society for Women in Marine Science, treasurer 2019-2021

Executive committee and outreach lead, Graduate Climate Conference 2017, 2019

Reviewer for AGU books, Biogeosciences, Deep Sea Research I, Ecology Letters, FEMS Microbiology Reviews, Geophysical Research Letters, The ISME Journal, Journal of Geophysical Research: Oceans, Marine Ecology Progress Series, Nature Climate Change, Journal of Physical Oceanography, Proceedings of the National Academy of Sciences, Science Advances

Abstract reviewer for SACNAS

- *University Service*

Division of Applied Mathematics DEI Committee 2024-2025

Department of Earth, Environmental, and Planetary Sciences Colloquium Committee 2023-2024

Professional affiliations: Society for Industrial and Applied Mathematics, American Geophysical Union, The Oceanography Society, American Physical Society

OUTREACH

Scientific Lead, Salton Sea Environmental Timeseries 2021-present

Outreach in schools, 14 presentations in English and Spanish to over 300 students 2015-present

The Old Farmer's Almanac, "Current Events: How and why the oceans hold a key to our future climate", (circulation 3 million). 2024

UNESCO, invited panelist. "Empowering women in the Ocean Decade." November 2020

MIT Science Policy Initiative, invited panelist, "Oceans and Climate" November 2019

Rhode Island School of Design, keynote speaker, "Reclaiming STEAM" April 2019

Science Fair Judge, McCormack Middle School February 2019

National Park Service, PLACE fellowship, presenter "Career Pathways to Marine Science" November 2018

Oceanus magazine, "[Forecasting Where Ocean Life Thrives.](#)" 2018

Public Lecture Series on Climate Science and Policy, lecturer and coordinator January 2016