Alexa Fredston

Education	University of California, Santa Barbara
	Ph.D., Bren School of Environmental Science and Management, 2020 Committee: Steven D. Gaines (co-adviser), Benjamin S. Halpern (co-adviser), Malin Pinsky Dissertation: Causes and consequences of species range edge shifts in a warming ocean
	Princeton University
	 B.A. summa cum laude, Ecology and Evolutionary Biology, 2012 Adviser: Stephen W. Pacala Thesis: A paleontological approach to the "shifting baselines" question in ecology: A case study of Caribbean reef-based mollusk communities
Employment	University of California, Santa Cruz , Santa Cruz, CA Assistant Professor, Department of Ocean Sciences, 2023 – present
	Rutgers University, New Brunswick, NJ Postdoctoral Associate, Department of Ecology, Evolution, and Natural Resources, 2020 – 2022 Part-Time Lecturer, Department of Ecology, Evolution, and Natural Resources, 2022
	Fathom Consulting , Santa Barbara, CA Fisheries Management Consultant, 2014 – 2019
	Environmental Defense Fund , San Francisco, CA High Meadows Fellow, 2012 – 2014
	Smithsonian Tropical Research Institute, Panama Short-Term Fellow, 2011
Grants	Zegar Family Foundation Renewal Grant (Co-PI), \$685,240, 2023 – 2025 Zegar Family Foundation Grant (Co-PI), \$194,902, 2019 – 2021
Awards, Honors, and Fellowships	Outstanding Oral Presentation, Effect of Climate Change on the World's Ocean meeting, 2023 Runner-Up Best Short Talk, Bren PhD Student Symposium, 2017 Semifinalist, UCSB Grad Slam, 2015
	National Defense Science and Engineering Graduate Fellowship ($$153,226$), 2014 – 2017
	Bren School Fellowship (\$40,000; deferred to 2017)
	Highest Honors, Department of Ecology and Evolutionary Biology, Princeton University, 2012
	Charles M. Cannon Memorial Prize for Best Presentation of a Senior Thesis, Department of Ecology and Evolutionary Biology, Princeton University, 2012
PEER- 18. Reviewed Publications	Maureaud, A.M., Z. Kitchel, A. Fredston , R. Guralnick, J. Palacios-Abrantes, M.L.D. Palomares, M.L. Pinsky, N.L. Shackell, J.T. Thorson, B. Mérigot, and the FISHGLOB Consortium. In press. FISHGLOB: A collaborative infrastructure for marine science and management. <i>Conservation Science and Practice</i> . 10.31219/osf.io/mh46b

- Fredston, A.L. and J.S.S. Lowndes. 2024. Welcoming more participation in open data science for the oceans. Annual Review of Marine Science 16: 537-549. 10.1146/annurev-marine-041723-094741
- Maureaud, A.M., J. Palacios-Abrantes, Z. Kitchel, L. Mannocci, M.L. Pinsky, A. Fredston, E. Beukhof, D.L. Forrest, R. Frelat, M.L.D. Palomares, L. Pecuchet, J.T. Thorson, P.D. van Denderen, and B. Mérigot. 2024. An integrated database of fish biodiversity sampled with scientific bottom trawl surveys. *Scientific Data* 11(24). 10.1038/s41597-023-02866-w
- Fredston, A., W.W.L. Cheung, T.L. Frölicher, Z. Kitchel, A. Maureaud, J.T. Thorson, A. Auber, B. Mérigot, J. Palacios-Abrantes, M.L.D. Palomares, L. Pecuchet, N. Shackell, and M.L. Pinsky. 2023. Marine heatwaves are not a dominant driver of change in demersal fishes. *Nature* 621: 324-329. 10.1038/s41586-023-06449-y

News & Views by Payne, M.R.: 10.1038/d41586-023-02594-6

Press coverage by *BBC*, *Agence France-Presse*, *Axios* (USA), *Le Figaro* (France), *Deutschland-funk* (Germany), *Weekendavisen* (Denmark), and others.

- Burgess, M., S. Becker, R.E. Langendorf, A. Fredston, and C. Brooks. 2023. Climate change scenarios in fisheries and aquatic conservation research. *ICES Journal of Marine Science* 80(5): 1163-1178. 10.1093/icesjms/fsad045
- 13. Halpern, B.S., et al. 2023. Priorities for synthesis in ecology and environmental science. Ecosphere 14(1): e4342. 10.1002/ecs2.4342
- Brodie, S., et al. 2022. Advancing practices for modeling species distribution changes under climate change. Global Change Biology 28(22): 6586-6601. 10.1111/gcb.16371
- Hoel, P.*, A. Fredston, and B.S. Halpern. 2022. A global evaluation framework for risk of marine ecological diversity loss from land-based impacts. *Frontiers in Marine Science* 9. 10.3389/fmars.2022.796050
- Fredston, A., M. Pinsky, R.L. Selden, C. Szuwalski, J.T. Thorson, S.D. Gaines, and B.S. Halpern. 2021. Range edges of North American marine species are tracking climate change over decades. *Global Change Biology* 27(13): 3145-3156. 10.1111/gcb.15614
- 9. Pandya, U.M., A. Tellechea, M. A. Manzanares, C. Egbuta, J. Daubriac, C. Jaramilla, F. Samra, A. Fredston, M. Michalak, and L.I. Gold. 2020. Calreticulin exploits TGF-β for extracellular matrix induction engineering a tissue regenerative process. *The FASEB Journal* 34(12): 15849-15874. 10.1096/fj.202001161R
- Taylor-Burns, R.*, C. Cochran*, K. Ferron*, M. Harris*, C. Thomas*, A. Fredston, and B. Kendall. 2020. Locating gaps in the California Current Ocean Acidification Monitoring Network. *Science Progress* 103(3): 1-27. 10.1177/0036850420936204
- Fredston-Hermann, A., R. Selden, M. Pinsky, S.D. Gaines, and B.S. Halpern. 2020. Cold range edges of marine fishes track climate change better than warm edges. *Global Change Biology* 26(5): 2908-2922. 10.1111/gcb.15035
- Burgess, M.G., A. Fredston-Hermann, D. Tilman, M. Loreau, and S.D. Gaines. 2019. Broadly inflicted stressors can cause ecosystem thinning. *Theoretical Ecology* 12(2): 207-223. 10.1007/s12080-019-0417-4
- Brown, C.J., et al. 2019. A guide to modelling priorities for managing land-based impacts on coastal ecosystems. Journal of Applied Ecology 56(5): 1106-1116. 10.1111/1365-2664.13331
- 4. Fredston-Hermann, A., S.D. Gaines, and B.S. Halpern. 2018. Biogeographic constraints to marine conservation in a changing climate. Annals of the New York Academy of Sciences: The Year in Ecology and Conservation Biology 1429(1): 5-17. 10.1111/nyas.13597
- Burgess, M.G., C. Costello, A. Fredston-Hermann, M. Pinsky, S.D. Gaines, D. Tilman, and S. Polasky. 2017. Range contraction enables harvesting to extinction. *Proceedings of the National Academy of Sciences* 114(15): 3945-3950. 10.1073/pnas.1607551114

Letter by Le Pape, O., S. Bonhommeau, A.-E. Nieblas, and J.-M. Fromentin: 10.1073/pnas.1706893114

Reply by Burgess, M.G., A. Fredston-Hermann, M.L. Pinsky, S.D. Gaines, and D. Tilman: 10.1073/pnas.1708147114

Press coverage by *Futurity*, *UPI*, and others.

- Fredston-Hermann, A., C.J. Brown, S. Albert, C. Klein, S. Mangubhai, J.L. Nelson, L. Teneva, A. Wenger, S.D. Gaines, and B.S. Halpern. 2016. Where does river runoff matter for coastal marine conservation? *Frontiers in Marine Science* 3(273): 1-10. 10.3389/fmars.2016.00273
- Fredston-Hermann, A.L., A. O'Dea, F. Rodriguez, W.G. Thompson, and J.A. Todd. 2013. Marked ecological shifts in seagrass and reef molluscan communities since the mid-Holocene in the Southwestern Caribbean. *Bulletin of Marine Science* 89(4): 983-1002. 10.5343/bms.2012.1077

PREPRINTS Fredston, A.L.**, M.W. Tingley**, et al. Reimagining species on the move over space and time. In revision, *Trends in Ecology and Evolution*. 10.32942/X2G902

Fredston, A.L. Measuring the edges of species' geographic ranges. In revision, *Methods in Ecology* and Evolution. 10.32942/X2QP69

Nazario, E., N. Lezama-Ochoa, M. Czapanskiy, H. Dewar, A. Preti, **A. Fredston**, M. Pinsky, M.P. Buil, and E. Hazen. Dissolved oxygen and metabolic parameters improve species distribution models for a marine predator. Submitted, *Ecological Applications*. 10.22541/au.174100231.19056955/v1

Kitchel, Z.J., *et al.* Temporal dynamics of biotic homogenization and differentiation across marine fish communities. In review, *PLOS Climate.* 10.31223/X5GM7M

Soifer, L.G., et al. Why extreme events matter for species redistribution. In review, Trends in Ecology and Evolution. 10.32942/X2ZH0G

* denotes mentee authors, ** denotes co-first authors

OTHER Fredston, A. and B.S. Halpern. 2023. Estuarine and Coastal Marine Organism Responses to PUBLICATIONS Climate Change. In: *Climate Change and Estuaries*, edited by M.J. Kennish, H.W. Paerl, and J.R. Crosswell. *CRC Press.*

Pinsky, M., and A. Fredston. 2022. A stark future for ocean life. *Science* 376(6592): 452-453. 10.1126/science.abo4259

Lowman, D., S. McTee, and A. Fredston-Hermann. July 2014. 2014 National Electronic Monitoring Workshop: Final Summary Report. *Environmental Defense Fund*.

Norvell, M., L. Damrosch, B. Blue, S. Jud, S. McTee, **A. Fredston-Hermann**, H. McGonigal, M. Stevens, M. Bell, and K. Labrum. June 2014. Exempted Fishing Permit Application: Electronic Monitoring for Groundfish IFQ Vessels in 2015 and 2016. *Pacific Fishery Management Council Briefing Book.*

TEACHING Instruction

Instructor, Biological Principles for Environmental Sciences (introductory undergraduate course), UCSC, 2023

Co-Instructor, Biological Oceanography (advanced undergraduate course), UCSC, 2023

Instructor, Statistical Programming for Ecology, Evolution, and Environmental Science (graduate course), Rutgers University, 2022

Teaching assistant, Ecology of Managed Ecosystems (graduate course), UCSB (Instructor: David Tilman), 2018

Workshops

Introduction to species distribution modeling in R, UCSC, 2025

The theory and practice of effective scientific figures. Ocean Sciences PhD program, UCSC, 2024 Authoring websites, documents, and more with Markdown, Society for Open, Reliable, and Transparent Ecology and Evolutionary Biology (SORTEE) webinar, 2022 Mapping open source datasets for ecology and evolutionary biology, SORTEE Conference, 2022 Authoring websites, documents, and more with Markdown, SORTEE Conference, 2022 Workflows and best practices for collaborative coding, Eco-Data-Science, UCSB, 2020 Introduction to GitHub, Eco-Data-Science, UCSB, 2018 Introduction to GitHub, Ecology and Evolutionary Biology, Cornell University, 2018 Data wrangling with the Tidyverse, Eco-Data-Science, UCSB, 2018 Introduction to GitHub, Eco-Data-Science, UCSB, 2017 INVITED TALKS Ecology Seminar, Scripps Institution of Oceanography, University of California, San Diego, 2025 Department of Biological Sciences, San Jose State University, 2024 Department of Ecology and Evolutionary Biology, University of California, Santa Cruz, 2023 Plenary, Species on the Move, Bonita Springs, Florida, 2023 Fisheries Ecology Division Seminar Series, National Oceanic and Atmospheric Administration Southwest Fisheries Science Center, 2023 School of Aquatic and Fishery Sciences Quantitative Seminar, University of Washington, 2023 Life Science Seminar Series, LaSalle University, 2022 Wildlife, Fish, and Conservation Biology Seminar, University of California, Davis, 2022 Earth and Environment Seminar, Boston University, 2022 Biology Seminar, University of Houston, 2022 Earth and Environmental Sciences Seminar, Lehigh University, 2022 Biology Seminar, Temple University, 2021 Panelist, Whitman College, 2021 Ecology and Evolutionary Biology Seminar, Kansas State University, 2021 Environmental Studies Seminar, University of Colorado Boulder, 2021 Seminar, U.S. Northeast Climate-Fisheries Seminar Series, 2021 Ridley Seminar, Newcastle University, 2021 Seminar, Thünen Institute of Sea Fisheries, 2021 Les Ecologistes Seminar, Simon Fraser University, 2021 Sustainable Oceans NSF Research Traineeship Seminar, University of California, Davis, 2021 Centre for Biodiversity and Conservation Science Seminar, University of Queensland, 2021 Biodiversity Legendary Internal Seminar Series, University of British Columbia, 2021 Ecology, Evolution, and Marine Biology Seminar, University of California, Santa Barbara, 2021 Ecology and Evolution Seminar, Rutgers University, 2020 School for Marine Science and Technology Seminar, University of Massachusetts Dartmouth, 2020 National Center for Ecological Analysis and Synthesis Roundtable, 2019 National Center for Ecological Analysis and Synthesis Roundtable, 2017

Contributed Presentations	$Measuring \ the \ edges \ of \ species' \ geographic \ ranges, \ American \ Society \ of \ Naturalists meeting, \ Asilomar, CA, 2025$
	Spatial ecological forecasting: applications to marine fish range dynamics, Ecological Society of America meeting (ESA), Portland, OR, 2023
	Marine heatwaves are not a dominant driver of change in North Atlantic and Pacific fish commu- nities, Effect of Climate Change on the World's Ocean meeting, Bergen, Norway, 2023
	Forecasting range shifts with process-based models and big data, ESA, Montreal, Canada, 2022
	Process-based forecasting of near-term range shifts in marine species, American Fisheries Society meeting, Baltimore, MD, 2021
	Process-based forecasting of near-term range shifts in marine species, ESA, virtual, 2021
	A process-based forecast of near-term distributional shifts in marine species, Society for Industrial and Applied Mathematics meeting, virtual, 2021
	Realized thermal niche tracking at range limits of North American marine species, ESA, virtual, 2020
	Historical range edge dynamics of marine fishes in a global warming hotspot, Species on the Move, Kruger National Park, South Africa, 2019
	Complex dynamics of the "warm" range edge in Northeast U.S. marine species under rapid climate change (poster), Gordon Research Conference on Ocean Global Change Biology, Waterville Valley, NH, 2018
	Marine biogeographic controls on climate-related range shifts, ESA, Portland, OR, 2017
	Non-climate drivers of species distributions in the Anthropocene, Western Society of Naturalists Meeting, Monterey, CA, 2016
	Reconstructing a pristine non-coral reef community in the southwestern Caribbean, International Coral Reef Symposium, Cairns, Queensland, Australia, 2012
Public and Stakeholder Outreach	Science Communication
	Species on the Move!, Slugs and Steins, UCSC, 2025
	R for the Planet, NY-R Conference, 2021
	R for the Planet, R-Ladies Amsterdam, 2021
	Interviews: All Things Wild Podcast (2021), LEST Talk (2022)
	Skype a Scientist engagements: Salem County Vocational Technical High School, Woodstown, NJ (2020), Oscar F. Smith High School, Chesapeake, VA (2021)
	Quoted in The Atlantic, Scientific American, The Daily Beast, and others
	Policy Presentations
	Mid-Atlantic Fishery Management Council (MAFMC), 2023
	Scientific and Statistical Committee, MAFMC, 2023
	Ecosystem and Ocean Planning Committee and Advisory Panel, MAFMC, 2023
	Ecosystem and Ocean Planning Committee and Advisory Panel, MAFMC, 2022

Ecosystem and Ocean Planning Committee and Advisory Panel, MAFMC, 2020

SYNERGISTICBiodiversity Data Science working group, National Center for Ecological Analysis and SynthesisACTIVITIES(NCEAS), 2024 – 2026

Steering Committee and working group member, Fish Biodiversity under Global Change (FISH-GLOB), Centre for the Synthesis and Analysis of Biodiversity (France) / Canadian Institute of Ecology and Evolution, 2020 – present

Environmental Data Science Summit, NCEAS, 2023

Future of Synthesis Summit, NCEAS, 2021

Near-term Ecological Forecasting Initiative Summer Course, Boston University, 2020

"Location, Location" Species Distribution Modeling Workshop, Northwest Fisheries Science Center, 2020

Bayesian Modeling for Socio-Environmental Data Short Course, National Socio-Environmental Synthesis Center, 2019

Science for Nature and People working group: Ridges to Reef Fisheries, NCEAS, 2014 – 2016