

## EDUCATION

**University of California, Santa Barbara**

Ph.D., Bren School of Environmental Science and Management, awarded 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, awarded 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

**National Center for Ecological Analysis and Synthesis**, Santa Barbara, CA

Graduate Student Researcher, Iterative Eden Project, 2019

**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

H. William Kuni Bren Research Award (Co-PI), \$15,000, 2017

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

18. **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](https://doi.org/10.1146/annurev-marine-041723-094741)
17. 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. M  rigot. 2024. An integrated database of fish biodiversity sampled with scientific bottom trawl surveys. *Scientific Data* 11(24). [10.1038/s41597-023-02866-w](https://doi.org/10.1038/s41597-023-02866-w)
16. **Fredston, A.** and B.S. Halpern. 2023. Estuarine and Coastal Marine Organism Responses to Climate Change. In: *Climate Change and Estuaries*, edited by M.J. Kennish, H.W. Paerl, and J.R. Crosswell. *CRC Press*.
15. **Fredston, A.**, W.W.L. Cheung, T.L. Fr  licher, Z. Kitchel, A. Maureaud, J.T. Thorson, A. Auber, B. M  rigot, 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](https://doi.org/10.1038/s41586-023-06449-y)  
     *News & Views* by Payne, M.R.: [10.1038/d41586-023-02594-6](https://doi.org/10.1038/d41586-023-02594-6)  
     Press coverage by *BBC*, *Agence France-Presse*, *Axios* (USA), *Le Figaro* (France), *Deutschlandfunk* (Germany), *Weekendavisen* (Denmark), and others.
14. 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](https://doi.org/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](https://doi.org/10.1002/ecs2.4342)
12. 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](https://doi.org/10.1111/gcb.16371)
11. 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](https://doi.org/10.3389/fmars.2022.796050)
10. **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](https://doi.org/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-   for extracellular matrix induction engineering a tissue regenerative process. *The FASEB Journal* 34(12): 15849-15874. [10.1096/fj.202001161R](https://doi.org/10.1096/fj.202001161R)
8. 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](https://doi.org/10.1177/0036850420936204)
7. **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](https://doi.org/10.1111/gcb.15035)
6. 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](https://doi.org/10.1007/s12080-019-0417-4)
5. 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](https://doi.org/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](https://doi.org/10.1111/nyas.13597)

3. 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](https://doi.org/10.1073/pnas.1607551114)  
 Letter by Le Pape, O., S. Bonhommeau, A.-E. Nieblas, and J.-M. Fromentin: [10.1073/pnas.1706893114](https://doi.org/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](https://doi.org/10.1073/pnas.1708147114)  
 Press coverage by *Futurity*, *UPI*, and others.
2. **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](https://doi.org/10.3389/fmars.2016.00273)
1. **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](https://doi.org/10.5343/bms.2012.1077)

#### PREPRINTS

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. M  rigot, and the FISHGLOB Consortium. FISHGLOB: A collaborative infrastructure for marine science and management. [10.31219/osf.io/mh46b](https://doi.org/10.31219/osf.io/mh46b)

#### OTHER PUBLICATIONS

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

*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

#### University Guest Lectures

Dynamics of Marine Ecosystems (upper-level undergraduate course), UCSC (Instructor: Jerome Fiechter), 2023

Conservation and Management of Aquatic Resources (undergraduate course), University of Washington (Instructor: Daniel Ovando), 2022

Aquatic Food and Resource Management (upper-level undergraduate course), UCSB (Instructor: Halley Froehlich), 2021

Advanced Ecological Data Analysis (graduate course), Rutgers University (Instructors: Malin Pinsky and Rachael Winfree), 2021

OSCAR Summer Team Impact Projects (undergraduate research program), George Mason University (Instructor: Amy Fowler), 2020

Computational Skills for Efficient Data Processing and Analysis (upper-level undergraduate course), Cornell University (Instructor: Nina Therkildsen), 2018

Ecology (upper-level undergraduate course), Saint Mary's College (Instructor: Joel Ralston), 2017

Conservation Planning (upper-level undergraduate course), UCSB (Instructor: Stephanie Moret), 2017

#### INVITED TALKS

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

*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 communities*, 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

*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 *Scientific American*, *The Daily Beast*, and others

Policy Presentations

Mid-Atlantic Fishery Management Council, 2023  
 Scientific and Statistical Committee, Mid-Atlantic Fishery Management Council, 2023  
 Ecosystem and Ocean Planning Committee and Advisory Panel, Mid-Atlantic Fishery Management

Council, 2023

Ecosystem and Ocean Planning Committee and Advisory Panel, Mid-Atlantic Fishery Management Council, 2022

Ecosystem and Ocean Planning Committee and Advisory Panel, Mid-Atlantic Fishery Management Council, 2020

Lenfest Ocean Program, 2020

#### SYNERGISTIC ACTIVITIES

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, National Center for Ecological Analysis and Synthesis, 2023

Future of Synthesis Summit, National Center for Ecological Analysis and Synthesis, 2021

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

“Location, 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, National Center for Ecological Analysis and Synthesis, 2014 – 2016

#### MENTORING

UCSB undergraduate: Paige Hoel, “Evaluating risk of human induced impacts on coastal oceans”

Bren Masters in Environmental Science and Management (MESM) group projects:

Jo Anna Beck, Nathan Burroughs, Leah Gonzales, Alyssa Obester, and Elijah Papen, “Quantifying the benefits of river restoration for Chinook salmon on the Lower Yuba River”

Courtney Cochran, Kelly Ferron, Madison Harris, Rae Taylor-Burns, and Courtney Thomas, “Ocean acidification monitoring network design and hotspot mapping in the California Current System”

#### ACADEMIC AND PROFESSIONAL SERVICE

Admissions Committee, Ocean Sciences, UCSC, 2023 – present

Recruitment Search Committee, Ocean Sciences, UCSC, 2023

Treasurer and Board Member, Society for Open, Reliable, and Transparent Ecology and Evolutionary Biology, 2021 – present

School of Environmental and Biological Sciences Diversity, Equity, and Inclusion Strategic Plan Steering Committee (Chair: Faculty Subcommittee), Rutgers University, 2021

Diversity, Equity, and Inclusion Committee, Ecology and Evolution Graduate Program (Office of Disability Services liaison), Rutgers University, 2020 – 2022

EEB Mentor Match, Small Pond Science / Dynamic Ecology blogs, 2019 – 2020

Seminar Committee (Co-Chair), Bren School, UCSB, 2016 – 2018

PhD Student Symposium Committee (Chair 2015 – 2016), Bren School, UCSB, 2014 – 2017

Women in STEM Mentorship Program, UCSB, 2016 – 2017

PhD Program Committee, Bren School, UCSB, 2015 – 2016

Residential College Adviser, Princeton University, 2011 – 2012

Peer-reviewed publications refereed: *Science Advances*, *Nature Ecology and Evolution*, *Scientific Reports*, *Nature Communications*, *BioScience*, *Global Change Biology*, *Conservation Biology*, *Methods*

*in Ecology and Evolution, ICES Journal of Marine Science, Ecography, Global Ecology and Biogeography, Oikos, Journal of Biogeography, Ecology and Evolution, Ecosphere, Fisheries Oceanography, Diversity and Distributions, Marine Ecology Progress Series, Frontiers in Marine Science, Progress in Oceanography, Current Research in Environmental Sustainability, Reviews in Fish Biology and Fisheries, PeerJ*

Grants, fellowships, and awards refereed: National Science Foundation Biological Oceanography Program; Ecological Society of America Buell Award; Ecological Society of America Lotka-Volterra Prize; Ecological Society of Australia Holsworth Wildlife Research Endowment

COMMUNITY  
SERVICE

Member, Mercer County Medical Reserve Corps, Mercer County, NJ, 2021 – 2022

Teenage Independent Living Training Mentor, LifeTies, Trenton, NJ, 2020 – 2022

Volunteer, Cayuga Medical Center, Ithaca, NY, 2019 – 2020

Volunteer EMT, Doctors Without Walls–Santa Barbara Street Medicine, Santa Barbara, CA, 2015 – 2018

Member, Santa Barbara County Medical Reserve Corps, Santa Barbara, CA, 2015 – 2018

Volunteer EMT, Bay Area Mountain Rescue Unit, San Francisco Bay Area, CA, 2013 – 2014

Volunteer EMT, Corresponding Secretary, and EMS Lieutenant, Princeton First Aid and Rescue Squad, Princeton, NJ, 2009 – 2012

PROFESSIONAL  
MEMBERSHIPS

Ecological Society of America; Society for Open, Reliable, and Transparent Ecology and Evolutionary Biology