

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

Rutgers University, New Brunswick, NJ

Postdoctoral Associate, Department of Ecology, Evolution, and Natural Resources, 2020 – present

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 AND
FELLOWSHIPS

Zegar Family Foundation Grant (co-wrote grant with Steven D. Gaines, Owen R. Liu, and Mary McElroy; \$194,902), 2019 – 2021

H. William Kuni Bren Research Award (co-wrote grant with Casey C. O’Hara, Sebastian Tapia, and Margaret W. Wilson; \$15,000), 2017

National Oceanic and Atmospheric Administration Saltonstall-Kennedy Grant (ghost-written for Fathom Consulting; \$70,000), 2016

National Fish and Wildlife Federation Fisheries Innovation Fund Grant (ghost-written for Fathom Consulting; \$550,000), 2016

National Defense Science and Engineering Graduate Fellowship (\$153,226), 2014 – 2017

Bren School Fellowship (\$40,000; deferred to 2017)

National Fish and Wildlife Federation Fisheries Innovation Fund Grant (ghost-written for Fathom Consulting; \$85,000), 2014

High Meadows Fellowship, Environmental Defense Fund and Princeton University (\$73,163 plus benefits), 2012 – 2014

National Fish and Wildlife Federation Fisheries Innovation Fund Grant (ghost-written for the Environmental Defense Fund; \$90,000), 2013

Smithsonian Tropical Research Institute Short-Term Fellowship (\$2,400), 2011

AWARDS AND
HONORS

Runner-Up Best Short Talk, Bren PhD Student Symposium, 2017
Semifinalist, UCSB Grad Slam, 2015
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
Sigma Xi Research Society, 2012

PEER-REVIEWED
PUBLICATIONS

In Press and Published

1. 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](https://doi.org/10.1096/fj.202001161R)
2. 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)
3. **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)
4. 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., S.D. Jupiter, S. Albert, K.R.N. Anthony, R.J. Hamilton, **A. Fredston-Hermann**, B.S. Halpern, H.-Y. Lin, J. Maina, S. Mangubhai, P.J. Mumby, H.P. Possingham, M.I. Saunders, V.J.D. Tulloch, A. Wenger, and C.J. Klein. (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)
6. **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)
7. Burgess, M.G., **A. Fredston-Hermann**, M. Pinsky, S.D. Gaines, and D. Tilman. (2017). Reply to Le Pape et al: Management is key to preventing marine extinctions. *Proceedings of the National Academy of Sciences* 114(31): E6275-E6276. [10.1073/pnas.1708147114](https://doi.org/10.1073/pnas.1708147114)
8. 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)
9. **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)
10. **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)

In Preparation, Review or Revision (drafts available upon request)

1. **Fredston, A.**, M. Pinsky, R.L. Selden, C. Szuwalski, J.T. Thorson, S.D. Gaines, and B.S. Halpern. Range edges of North American marine species are tracking climate change over decades. *In revision, Global Change Biology*. Preprint: [10.22541/au.160331933.33155622/v1](https://doi.org/10.22541/au.160331933.33155622/v1)

2. Hoel, P.*, **A. Fredston**, and B.S. Halpern. Modeling threat of runoff to coastal ocean environments. *In prep. for Frontiers in Marine Science*.
3. Kong, J.D., E. Moberg, R. Selden, **A. Fredston**, and M. Pinsky. Using stage structure to infer process-based models for species on the move. *In prep. for Methods in Ecology and Evolution*.
4. Tapia-Lewin, S., **A. Fredston**, C. O'Hara, M. Wilson, E. Finkbeiner, F. Micheli, R. Molina, S. Gelcich, J.E. Cinner, and B.S. Halpern. Sustainability in small-scale fisheries through the lens of rights-based management, stability and adaptive capacity. *In prep. for Proceedings of the National Academy of Sciences*.

* Student authors (undergraduate or Masters)

TEACHING

Instruction

Teaching assistant, ESM201: Ecology of Managed Ecosystems (graduate course), UCSB (Instructor: David Tilman), 2018

Lectures and Workshops

Guest lecture, 16:215:599: Advanced Ecological Data Analysis (graduate course), Rutgers University (Instructors: Malin Pinsky and Rachael Winfree), 2021

Using data science to understand and predict human impacts on the global oceans. OSCAR Summer Team Impact Projects (undergraduate research program), George Mason University (Instructor: Amy Fowler), 2020

Workflows and best practices for collaborative coding. Eco-Data-Science R Workshop, UCSB, 2020

Introduction to GitHub. Eco-Data-Science R workshop, UCSB, 2018

Guest lecture, NTRES3500: Computational Skills for Efficient Data Processing and Analysis (upper-level undergraduate course), Cornell University (Instructor: Nina Therkildsen), 2018

Introduction to GitHub. Ecology and Evolutionary Biology, Cornell University, 2018

Data wrangling with the Tidyverse. Eco-Data-Science R workshop, UCSB, 2018

Guest lecture, BIO323: Ecology (upper-level undergraduate course), Saint Mary's College (Instructor: Joel Ralston), 2017

Guest lecture, ES193: Conservation Planning (upper-level undergraduate course), UCSB (Instructor: Stephanie Moret), 2017

Introduction to GitHub. Eco-Data-Science R workshop, UCSB, 2017

INVITED TALKS

Understanding and predicting Anthropocene range dynamics in the sea, Ecology, Evolution, and Marine Biology, University of California, Santa Barbara, 2021

Causes and consequences of species range shifts in a changing climate, Graduate Program in Ecology and Evolution, Rutgers University, 2020

Range edge dynamics of marine species in a changing climate, School for Marine Science and Technology, University of Massachusetts Dartmouth, 2020

Understanding and managing range dynamics in a warming ocean, National Center for Ecological Analysis and Synthesis, 2019

Understanding and managing range dynamics in a warming ocean, School of Oceanography, University of Washington*, 2019

Non-climate processes and “species on the move”, National Center for Ecological Analysis and Synthesis, 2017

* Cancelled due to weather

CONTRIBUTED
PRESENTATIONS

Realized thermal niche tracking at range limits of North American marine species, Ecological Society of America meeting, 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

Do TURFs confer resilience to climate change? (with Casey O’Hara), Bren PhD Student Symposium, Santa Barbara, CA, 2018

Marine biogeographic controls on climate-related range shifts, Ecological Society of America meeting, Portland, OR, 2017

How far can marine species shift their ranges in response to climate change?, UCSB Grad Slam, Santa Barbara, CA, 2017

Predicting the effects of non-climate processes on “species on the move” (Runner-Up: Best Short Talk Award), Bren PhD Student Symposium, Santa Barbara, CA, 2017

Non-climate drivers of species distributions in the Anthropocene, Western Society of Naturalists Meeting, Monterey, CA, 2016

A conceptual framework for understanding the relative impact of nitrogen runoff on coastal ecosystems (semifinalist), UCSB Grad Slam, Santa Barbara, CA, 2015

Reconstructing a pristine non-coral reef community in the southwestern Caribbean, International Coral Reef Symposium, Cairns, Queensland, Australia, 2012

INVITED
WORKSHOPS,
WORKING GROUPS,
AND SHORT
COURSES

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

Review Editor, *Frontiers in Marine Science*, 2020 – present
Diversity, Equity, and Inclusion Committee, Ecology and Evolution Graduate Program, Rutgers University, 2020 – present
EEB Mentor Match, Small Pond Science / Dynamic Ecology blogs, 2019 – 2020
Co-Chair, Bren Seminar Committee, UCSB, 2016 – 2018
Bren PhD Student Symposium Committee (Chair 2015 – 2016), UCSB, 2014 – 2017
Women in STEM Mentorship Program, UCSB, 2016 – 2017
Bren PhD Program Committee, UCSB, 2015 – 2016
Residential College Adviser, Princeton University, 2011 – 2012
Peer-reviewed publications refereed: *Scientific Reports*, *BioScience*, *Global Change Biology*, *Conservation Biology*, *Global Ecology and Biogeography*, *Journal of Biogeography*, *Ecography*, *Ecology and Evolution*, *Ecosphere*, *Fisheries Oceanography*, *Frontiers in Marine Science*, *Progress in Oceanography*, *Current Research in Environmental Sustainability*
Publons score (last 12 months): 13
Grants, fellowships, and awards refereed: Ecological Society of America Buell Award; Ecological Society of America Lotka-Volterra Prize; Ecological Society of Australia Holsworth Wildlife Research Endowment

POLICY AND
OUTREACH

Presentations

Predicting Near-Term Fisheries Shifts Under Climate Change (with Malin Pinsky and Brandon Muffley), Lenfest Ocean Program, 2020

Careers in Sustainable Fisheries, Salem County Vocational Technical High School, Woodstown, NJ, 2020

Publications

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

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

COMMUNITY
SERVICE

Teenage Independent Living Training Mentor, LifeTies, Trenton, NJ, 2021 – present

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, International Biogeography Society, Western Society of Naturalists