

Alexa Fredston, Ph.D.

Department of Ecology, Evolution, and Natural Resources | Rutgers University
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EDUCATION

- 2014-2020 **Ph.D. Environmental Science and Management**
Bren School, University of California Santa Barbara (UCSB)
Dissertation: Causes and consequences of species range edge shifts in a warming ocean
Committee: Benjamin S. Halpern (co-adviser), Steven D. Gaines (co-adviser), Malin Pinsky
- 2008-2012 **B.A. Ecology and Evolutionary Biology, *summa cum laude***
Princeton University
Thesis: A paleontological approach to the 'shifting baselines' question in ecology: A case study of Caribbean reef-based mollusk communities
Adviser: Stephen W. Pacala

WORK AND RESEARCH

- 2020-current **Postdoctoral Associate**, Department of Ecology, Evolution, and Natural Resources, Rutgers University (*Adviser:* Malin Pinsky)
New Brunswick, NJ
- 2019 **Graduate Student Researcher**, Iterative Eden Project, National Center for Ecological Analysis and Synthesis
Santa Barbara, CA
- 2014-2019 **Fisheries Management Consultant**, Fathom Consulting
Santa Barbara, CA
- 2012-2014 **High Meadows Fellow**, Pacific Oceans Team, Environmental Defense Fund
San Francisco, CA
- 2011 **Short-Term Fellow**, Smithsonian Tropical Research Institute
Bocas del Toro and Panama City, Panama

GRANTS AND FELLOWSHIPS

- 2019-2021 Zegar Family Foundation Grant (co-wrote grant with Steven D. Gaines, Owen R. Liu, and Mary McElroy; \$194,902)
- 2017 H. William Kuni Bren Research Award (co-wrote grant with Casey C. O'Hara, Sebastian Tapia, and Margaret W. Wilson; \$15,000)
- 2016 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)

- 2014-2017 National Defense Science and Engineering Graduate Fellowship (\$153,226)
- 2014 Bren School Fellowship (~\$40,000; deferred to 2017)
- 2014 National Fish and Wildlife Federation Fisheries Innovation Fund Grant (ghost-written for Fathom Consulting; ~\$85,000)
- 2012-2014 High Meadows Fellowship, High Meadows Fund and Environmental Defense Fund, Princeton University (\$73,163 plus benefits)
- 2013 National Fish and Wildlife Federation Fisheries Innovation Fund Grant (ghost-written for the Environmental Defense Fund; ~\$90,000)
- 2011 Smithsonian Tropical Research Institute Short-Term Fellowship (\$2,400)

AWARDS AND HONORS

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

PEER-REVIEWED PUBLICATIONS

In Press and Published

1. 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.
2. **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.
3. 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.
4. 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: 1106-1116.
5. **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.

6. 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.
7. 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.

Press coverage by *Science Daily*, *Breitbart*, *UPI*, *Futurity*, and others.
8. **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.
9. **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.

In Preparation, Review or Revision

10. P. Hoel*, **A. Fredston**, and B. S. Halpern. Modeling threat of runoff to coastal ocean environments. *In review*.†
11. **A. Fredston**, 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 prep*.†
12. 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*.†

* Student authors (undergraduate or Masters)

† Draft available upon request

TEACHING

Instruction

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

Lectures and Workshops

Summer 2020 *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)*

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

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

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

- Spring 2018 *Introduction to GitHub*. Ecology and Evolutionary Biology, Cornell University
- Winter 2018 *Data wrangling with the Tidyverse*. Eco-Data-Science R workshop, UCSB
- Fall 2017 *Guest lecture*, BIO323: Ecology (upper-level undergraduate course), Saint Mary's College (Instructor: Joel Ralston)*
- Spring 2017 *Guest lecture*, ES193: Conservation Planning (upper-level undergraduate course), UCSB (Instructor: Stephanie Moret)
- Spring 2017 *Introduction to GitHub*. Eco-Data-Science R workshop, UCSB

* Presented remotely via webinar

INVITED SEMINARS

- 2020 *Range edge dynamics of marine species in a changing climate*. School for Marine Science and Technology, University of Massachusetts Dartmouth*
- 2019 *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†
- 2017 *Non-climate processes and "species on the move."* National Center for Ecological Analysis and Synthesis

* Presented remotely via webinar

† Cancelled due to weather

CONTRIBUTED PRESENTATIONS

- 2020 *Realized thermal niche tracking at range limits of North American marine species*. Ecological Society of America Meeting (virtual)
- 2019 *Historical range edge dynamics of marine fishes in a global warming hotspot*. Species on the Move, Kruger National Park, South Africa
- 2018 *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 in Waterville Valley, NH
- 2018 *Do TURFs confer resilience to climate change?* Bren PhD Student Symposium in Santa Barbara, CA (with Casey C. O'Hara)
- 2017 *Marine biogeographic controls on climate-related range shifts*. Ecological Society of America Meeting in Portland, OR
- 2017 *How far can marine species shift their ranges in response to climate change?* UCSB Grad Slam in Santa Barbara, CA
- 2017 *Predicting the effects of non-climate processes on "species on the move."* Bren PhD Student Symposium in Santa Barbara, CA (Runner-Up Best Short Talk Award)
- 2016 *Non-climate drivers of species distributions in the Anthropocene*. Western Society of Naturalists Meeting in Monterey, CA

- 2015 *A conceptual framework for understanding the relative impact of nitrogen runoff on coastal ecosystems*. UCSB Grad Slam in Santa Barbara, CA (semifinalist)
- 2012 *Reconstructing a pristine non-coral reef community in the southwestern Caribbean*. International Coral Reef Symposium in Cairns, Queensland, Australia

INVITED WORKSHOPS, WORKING GROUPS, AND SHORT COURSES

- 2020 Near-term Ecological Forecasting Initiative Summer Course, Boston University*
- 2020 “Location, Location, Location” Species Distribution Modeling Workshop, Northwest Fisheries Science Center*
- 2019 Bayesian Modeling for Socio-Environmental Data Short Course, National Socio-Environmental Synthesis Center
- 2014-2016 Science for Nature and People Working Group: Ridges to Reef Fisheries, National Center for Ecological Analysis and Synthesis

* Events were organized remotely

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

- 2020-current Ecology and Evolution Graduate Program Diversity, Equity, Inclusion, and Belonging Committee, Rutgers
- 2019-2020 EEB Mentor Match, Small Pond Science / Dynamic Ecology blogs
- 2016-2018 Co-Chair, Bren Seminar Committee, UCSB
- 2014-2017 Bren PhD Student Symposium Committee (Chair 2015-2016), UCSB
- 2016-2017 Women in STEM Mentorship Program, UCSB
- 2015-2016 Bren PhD Program Committee, UCSB
- 2011-2012 Residential College Adviser, Princeton University

Peer-reviewed publications refereed: *BioScience*, *Conservation Biology*, *Current Research in Environmental Sustainability*, *Ecography*, *Ecosphere*, *Fisheries Oceanography*, *Global Ecology and Biogeography*, *Journal of Biogeography*, *Progress in Oceanography*

Grants, fellowships, and awards refereed: Ecological Society of America Buell Award;
Ecological Society of America Lotka-Volterra Prize

POLICY, OUTREACH, AND ENGAGEMENT

Presentations

2020 Salem County Vocational Technical High School, Woodstown, NJ*

* Presented remotely via webinar

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

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

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

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

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

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

PROFESSIONAL MEMBERSHIPS

Ecological Society of America, International Biogeography Society, Western Society of Naturalists