

Heili Lowman

Department of Biology
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EDUCATION

Doctor of Philosophy (Ph.D.), Ecology, Evolution, and Marine Biology September 2015 — June 2020
University of California Santa Barbara, Santa Barbara, CA

Bachelor of Arts (B.A.), Double Major in Chemistry and French & Francophone Studies August 2008 — May 2012
Vassar College, Poughkeepsie, NY

PROFESSIONAL EXPERIENCE

Postdoctoral Associate, *Duke University* March 2024 — present
Visiting Scholar, *Duke University* June 2022 — February 2024
Postdoctoral Scholar, *University of Nevada Reno* March 2021 — February 2024
Scientist, *Southern California Coastal Water Research Project* June 2020 — February 2021
Graduate Researcher and Teaching Assistant, *University of California Santa Barbara* September 2015 — June 2020
Research Assistant, *University of Iowa* September 2013 — August 2015
Senior Associate, *Berkeley Research Group* November 2012 — February 2014
Communications Coordinator, *National Marine Sanctuary Foundation* August — November 2012

PUBLICATIONS

Peer-reviewed manuscripts

In Press or Published (*denotes student mentee co-author)

- Carter, A., **H.E. Lowman**, C. Barbosa, J. Blaszczak, S. Collins, M. DeSiervo, M. Dunkle, I. Oleksy, C. Torrens, R.O. Hall, Jr. 2024. Exceptions to the heterotrophic rule: Prevalence and drivers of autotrophy in streams and rivers. *Ecosystems*.
- Marzolf, N.S., M.J. Vlah, **H.E. Lowman**, W.M. Slaughter, E.S. Bernhardt. 2024. Phenology of gross primary productivity in rivers displays high variability within years but stability across years. *Limnology & Oceanography Letters*, 9, 524–531.
- **Lowman, H.E.**, J. Blaszczak, A. Cale, X. Dong, S. Earl, J. Grabow, N.B. Grimm, T.K. Harms, J. Melack, A.M. Reinhold, B. Summers, A.J. Webster. 2024. Persistent and lagged effects of fire on stream solutes linked to intermittent precipitation in arid lands. *Biogeochemistry Letters*, 167, 777–791.
- **Lowman, H.E.**, R. Shriver, R.O. Hall, Jr., J. Harvey, P. Savoy, C. Yackulic, J. Blaszczak. 2024. Macroscale controls determine the recovery of river ecosystem productivity following flood disturbances. *Proceedings of the National Academy of Sciences*, 121, e2307065121.
- **Lowman, H.E.**, M.E. Hirsch, M.A. Brzezinski, J.M. Melack. 2023. Sandy marine sediments surrounding giant kelp forests provide recycled nutrients. *Journal of Coastal Research*, 39, 442–454.
- Halpern, B., C. Boettiger, M.C. Dietze, [and 113 others, including **H.E. Lowman**]. 2023. Priorities for synthesis in ecology and environmental science. *Ecosphere*, 14, e4342.
- **Lowman, H.E.**, M. Moingt, A.R. Zimmerman, J. Dugan, J.M. Melack. 2022. Distribution of terrestrial organic material in intertidal and nearshore marine sediment due to debris flow emergency response. *Science of the Total Environment*, 843, 1568886.
- Thornton Hampton, L., **H. E. Lowman**, S. Coffin, [and 18 others]. 2022. A living tool for the continued exploration of microplastic toxicity. *Microplastics and Nanoplastics*, 2, 13.
- Stein, E.D., J.S. Brown, A. Canney, M. Mirkhanian*, **H. Lowman**, K. O'Connor, R. Clark. 2022. Prioritizing stream protection, restoration and management actions using landscape modeling and spatial analysis. *Water*, 14, 1375.
- **Lowman, H.E.**, K.A. Emery, J.E. Dugan, R.J. Miller. 2021. Nutritional quality of giant kelp declines due to warming ocean temperatures. *Oikos*, 2022, e08619.
- **Lowman, H.E.**, M. Moingt, M. Lucotte, J.M. Melack, H.M. Page. 2021. Terrestrial organic matter inputs to nearshore marine sediment under prolonged drought followed by significant rainfall as indicated by lignin. *Estuaries and Coasts*, 44, 2159–2172.
- **Lowman, H.E.**, K.A. Emery, L. Kubler-Dudgeon*, J.E. Dugan, J.M. Melack. 2019. Contribution of macroalgal wrack consumers to dissolved inorganic nitrogen concentrations in intertidal pore waters of sandy beaches. *Estuarine, Coastal and Shelf Science*, 219, 363–371.
- Schroer, A.L., **H.E. Lowman**, C.L. Just. 2015. Educating the aware, informed, and action-oriented sustainable citizen. *Sustainability*, 7, 1985–1999.

- Aldeborgh, H., K. George, M. Howe, **H. Lowman**, H. Moustakas, N. Strunsky, J.M. Tanski. 2014. Analysis of small molecule X-ray crystal structures: Chemical crystallography with undergraduate students in a teaching laboratory. *Journal of Chemical Crystallography*, 44, 70–81.

In Revision, In Review, or Submitted (pdfs available upon request)

- Harms, T., **H.E. Lowman**, J.R. Blaszczak, A. Cale, X. Dong, S. Earl, L. Gaines-Sewell, J. Grabow, E. Hanan, J. Melack, A.M. Reinhold, B. Summers, A.J. Webster, N.B. Grimm. Fire influence on land-water interactions in aridland catchments. Undergoing Revision for *BioScience*.

Reports, theses, and other publications

- Lowman, H.E.**, M. DeSiervo, R.O. Hall Jr., [and 26 others]. 2024. Collaborative consortia can boost postdoctoral workforce development. *Proceedings of the National Academy of Sciences*, 121(28), e2401812121.
- Gushulak, C., P. Bodmer, C. Rosa de Carvalho, R. Gladstone-Gallagher, Y.P. Lee, **H. Lowman**, N. Oguguah, K. Meinikmann, Y. Rii, B. Rodríguez-Cardona, M. Bizic. 2023. The silent mental health and well-being crisis of early career researchers in aquatic sciences. *Limnology and Oceanography Bulletin*, 32(1), 16-17.
- Stein, E.D., J.S. Brown, A. Canney, M. Mirkhanian, **H. Lowman**, K. O'Connor, R. Clark. 2022. Prioritizing stream protection, restoration and management actions using landscape modeling and spatial analysis. *Southern California Coastal Water Research Project Technical Report*, 1246.
- Mazor, R.D., B. Topping, T.-L. Nadeau, K.M. Fritz, J. Kelso, R. Harrington, W. Beck, K. McCune, **H. Lowman**, A. Allen, R. Leidy, J.T. Robb, G.C.L. David. 2021. User manual for a beta streamflow duration assessment method for the arid West of the United States. V 1.0, Document No. EPA-800-5-21001.
- Lowman, H.** 2020. Nutrient and organic matter cycling in the nearshore ocean and marine sediment of the Santa Barbara Channel. *University of California Santa Barbara*, ProQuest ID: Lowman_ucsb_0035D_14735.

Published Data and R Packages

- Carter, A. M., **H. Lowman**, J. Blaszczak, I. Oleksy, M. Dunkle, L. Katona, C. Torrens. 2024. `except_heterotrophy`: Code for analyzing autotrophy in rivers ver 0. *Zenodo*.
- Lowman, H.E.**, J. Blaszczak, A. Cale, X. Dong, S. Earl, J. Grabow, N. Grimm, T. Harms, J. Melack, A.M. Reinhold, B. Summers, A. Webster. 2024. Data and Code for Lowman et al. 2024, Persistent and lagged effects of fire on stream solutes linked to intermittent precipitation in arid lands ver 1. *Zenodo*.
- Lowman, H.E.**, R. Shriver, R.O. Hall, Jr., J. Harvey, P. Savoy, C. Yackulic, J. Blaszczak. 2024. Data and Code for Lowman et al. 2024, Macroscale controls determine the recovery of river ecosystem productivity following flood disturbances ver 1. *Zenodo*.
- Santa Barbara Coastal LTER, **H. Lowman**, M. Hirsch, M. Brzezinski, J. Melack. 2022. SBC LTER: Reef: Dissolved nitrogen fluxes from kelp forest sediment ver 1. *Environmental Data Initiative*.
- Santa Barbara Coastal LTER, **H. Lowman**, M Moingt, A. Zimmerman, J. Dugan, J. Melack. 2022. SBC LTER: Beach: Distribution of terrestrial organic material in intertidal and nearshore marine sediment due to debris flow response efforts ver 1. *Environmental Data Initiative*.
- Santa Barbara Coastal LTER, **H. Lowman**, J. Melack, M. Brzezinski. 2021. SBC LTER: Ocean: Diel nearshore water profiles (CTD and chemistry) during stratified conditions ver 1. *Environmental Data Initiative*.
- Lowman, H.**, K. Emery, L. Kubler-Dudgeon, J. Dugan, J. Melack. 2020. SBC LTER: Beach: Data to support “Contribution of macroalgal wrack consumers to dissolved inorganic nitrogen concentrations in intertidal pore waters of sandy beaches” ver 1. *Environmental Data Initiative*.
- Bui, A., **H. Lowman**, A. Guerra. 2019. *calecopal*: a California-inspired package of color palettes.
- Santa Barbara Coastal LTER, Page, H., **H. Lowman**, J. Melack, J. Smith, D. Reed. 2018. SBC LTER: Ocean: Particulate organic matter content and composition of stream, estuarine, and marine sediments ver 2. *Environmental Data Initiative*.

RESEARCH GRANTS

Scientific Peers Advancing Research Collaborations (SPARC) Award (2023) \$19,720

National Center for Ecological Analysis and Synthesis

“Quantifying interactive effects of precipitation and fire regimes on catchment biogeochemistry of arid lands”

Lead PI: Tamara Harms, University of Alaska Fairbanks

Not eligible to be co-PI due to university regulations

Roles & Responsibilities: Drafted grant proposal, co-led working group, co-led timeseries analyses, led resulting manuscript

Lake Tahoe License Plate Program Grant (2022) \$81,827

Nevada Department of State Lands

“Making the smart watershed-to-lake connection: using high-frequency sensors and process-based aquatic ecosystem models to predict nearshore greening in Lake Tahoe”

Lead PIs: Joanna Blaszczak and Sudeep Chandra, University of Nevada Reno

Not eligible to be co-PI due to university regulations

Roles & Responsibilities: Revised grant proposal, co-led working group, assisted with field and lab work, led lake data analyses

Worster Summer Research Award (2018) \$5,400

University of California Santa Barbara

“Investigating zooplankton as a source of nitrogen for kelp forests during low nutrient periods”

Lead PI: Heili Lowman

Undergraduate Student: Kat Le

Associated Students Coastal Fund Grant (2018) \$8,840

University of California Santa Barbara

“Composition of debris deposited on Goleta Beach and persistence in marine ecosystems”

Lead PI: Heili Lowman

Undergraduate Students: Kat Le, Lila Kubler-Dudgeon

Ecology, Evolution, and Marine Biology Departmental Block Grant (2018) \$1,000

University of California Santa Barbara

“Lignin phenols as biomarkers of terrestrial organic matter in the Santa Barbara Channel”

Lead PI: Heili Lowman

SELECTED FELLOWSHIPS and AWARDS

Precision Measurement Engineering (PME) New Researcher Award	2022
University of California President’s Dissertation Year Fellowship	2019
Santa Barbara Coastal Long-Term Ecological Research Graduate Fellowship	2016
Department of Ecology, Evolution, and Marine Biology Fellowship, University of California Santa Barbara	2015
Environmental Research Institute Scholarship, Vassar College	2012
National Science Foundation Research Experiences for Undergraduates Award, Texas A&M University Galveston	2010

CONFERENCE ACTIVITIES

Conference Program Committees

- Early Career Representative. 2024. *Ocean Sciences Meeting*, New Orleans, LA.

Organized Oral Sessions

- “Amplifying voices in: Climate change impacts on aquatic systems.” 2024. *Association for the Sciences of Limnology and Oceanography Summer Meeting*, Madison, WI.
- “Ecological models as tools for integrating aquatic sciences.” 2022. *Joint Aquatic Sciences Meeting*, Grand Rapids, MI.
- “Marine sediments: Fluxes, fauna, and forecasting.” 2020. *Ocean Sciences Meeting*, San Diego, CA.

Contributed Presentations (*denotes first-author)

- “Quantifying ecological memory of ocean warming using long-term macroalgal time-series data.” 2024. *Ocean Sciences Meeting*, New Orleans, LA.*
- “Understanding wildfire impacts on stream biogeochemistry across aridland precipitation regimes.” 2023. *American Geophysical Union Fall Meeting*, San Francisco, CA.
- “Precipitation variability mediates the effects of wildland fire on the biogeochemistry of an intermittent aridland stream.” 2023. *American Geophysical Union Fall Meeting*, San Francisco, CA.
- “Are annual river productivity regimes changing through time?” 2023. *Ecological Society of America Annual Meeting*, Portland, OR.
- “Littorally turning green: Quantifying variability in nearshore benthic metabolism in an oligotrophic mountain lake.” 2023. *Aquatic Sciences Meeting*, Palma de Mallorca, Spain.*
- “Predicting river resilience to disturbance in streams and rivers across the U.S.” 2022. *Data Science and Open Science for Aquatic Research*, Virtual summit.*
- “Predicting river ecosystem dynamics using population models to inform freshwater management.” 2022. *Joint Aquatic Sciences Meeting*, Grand Rapids, MI.
- “ToMEX: Toxicity of microplastics explorer.” 2022. *Society of Environmental Toxicology and Chemistry Southern California Chapter Annual Meeting*, Ventura, CA.
- “Wildfire impacts to aridland stream chemistry across a hydroclimatic gradient.” 2021. *American Geophysical Union Fall Meeting*, New Orleans, LA.
- “Marine sediments surrounding giant kelp forests supply recycled nutrients to the overlying water column.” 2021. *Coastal and Estuarine Research Federation Biennial Conference*, Virtual summit.*

- “Distribution of terrestrial organic material in nearshore marine ecosystems due to debris flow emergency response.” 2019. *Coastal and Estuarine Research Federation Biennial Conference*, Mobile, AL.*
- “Lignin phenols as biomarkers of terrestrial organic matter in the Santa Barbara Channel.” 2018. *Association for the Sciences of Limnology and Oceanography Summer Meeting*, Victoria, Canada.*

INVITED SEMINARS

University Program in Ecology, Duke University	December 2023
National Center for Ecological Analysis and Synthesis	May 2023
Department of Ecology, Evolution, and Conservation Biology, University of Nevada Reno	March 2023
Department of Natural Resources and Environmental Science, University of Nevada Reno	October 2022
Department of Biology, Southern California Coastal Water Research Project	January 2020
Biogeosciences Seminar Series, University of California Santa Barbara	November 2017

TEACHING EXPERIENCE

Academic Teaching Experience

University of Nevada Reno

Guest Lecturer, NRES 701c: Science Writing Spring 2023
 Department of Natural Resources and Environmental Science 12 students

Guest Lecturer, BIOL 314: Ecology and Population Biology Spring 2022
 Department of Biology 30 students

University of California Santa Barbara

Teaching Assistant, ESM 202: Environmental Biogeochemistry Winter 2017, 2018, 2019
 Bren School of Environmental Science and Management 88, 83, 74 students

Lead Teaching Assistant, EEMB 148: Stream Ecology Spring 2017, 2018
 Department of Ecology, Evolution, and Marine Biology 141, 125 students

Teaching Assistant, EEMB 142B: Environmental Processes in Oceans and Lakes Winter 2016
 Department of Ecology, Evolution, and Marine Biology 86 students

Bilingual Teaching Experience

Group Leader, French Language and Culture Summer 2012
 The Experiment in International Living, World Learning 10 students

Counselor, Suured Tüdrukud Summer 2008
 Seedrioru Estonian Summer Camp 10 campers

WORKSHOPS LED

Quantifying interactive effects of fire and precipitation regimes on catchment biogeochemistry of aridlands May 2023
 National Center for Ecological Analysis and Synthesis

Temporal trends in nutritional content of primary production September 2022
 Long-Term Ecological Research All Scientists' Meeting

Building your own RShiny application May 2022
 Modelscapes Consortium Annual Meeting

Introduction to RShiny March 2022
 University of Wyoming Confronting Models with Data Working Group

Introduction to R for ecologists (website link) April 2021
 University of California Santa Barbara

Tidy Tuesday R Workshop Series (website link) August 2020 — February 2021
 Southern California Coastal Water Research Project

Visualizing and mapping bioassessment data in R (website link) California Aquatic Bioassessment Workgroup/CA Chapter of the Society for Freshwater Science	October 2020
Introduction to R workshop Santa Barbara Coastal Long-Term Ecological Research Summer REU Program	July 2017

MENTORING

Undergraduate and High School Research Projects Advised and Awards

Peggy Chen, North Carolina School of Science and Mathematics <i>“The Salt Watch Dashboard: Empowering coastal communities with a solution-centered and data-driven tool”</i>	2024
Erin Chen, Duke University <i>“Developing a machine-learning training dataset for aquatic insect identification”</i> National Science Foundation Research Experiences for Undergraduates (NSF REU) Award	2024
Rija Masroor, College of William and Mary <i>“DOM Explorer: A tool for visualizing dissolved organic matter in streams across North America”</i> NSF REU Award	2022
Kat Le, University of California Santa Barbara <i>“Investigating pelagic zooplankton as a source of nutrients for giant kelp forests”</i> Worster Summer Research Award	2017 — 2019
Elena Staguhn, University of Maryland <i>“The impact of Thomas Fire debris on nutrient cycling in nearshore marine sediments”</i> NSF REU Award	2018
Lila Kubler-Dudgeon, University of California Santa Barbara <i>“Contribution of talitrid amphipods and their kelp wrack consumption to sandy beach nitrogen cycling”</i>	2018
Chloe Dean (née Smith), Oregon Institute of Technology <i>“Effects of low pH on microbially mediated nitrogen transformations in marine sediments”</i> NSF REU Award Association for the Sciences of Limnology and Oceanography’s Multicultural Program Award	2017

Undergraduate, Graduate, and Professional Mentees

Kelly Loria, University of Nevada Reno	2021 — present
Madio Wallner, Vassar College	2022 — 2023
Annie Holt, Southern California Coastal Water Research Project	2021 — 2022
Angelina Zuelow, California State University Fullerton	2021
Jhenevieve Cabasal, California State University Long Beach	2020 — 2021
Megan Mirkhanian, University of California Irvine	2020
Tyler Daniel, University of California Santa Barbara	2019 — 2020
Angela Delossantos, University of California Santa Barbara	2017 — 2019
Belle Jiyarom, University of California Santa Barbara	2018
Sophie O’Hare, University of California Santa Barbara	2018
Kristine Robinson, University of California Santa Barbara	2017 — 2018
Timothy Ngo, University of California Santa Barbara	2017
Paige Rasmussen, University of California Santa Barbara	2017

OUTREACH, EDUCATION, and DIVERSITY-RELATED ACTIVITIES

Mentor , Association for the Sciences of Limnology and Oceanography’s (ASLO) Multicultural Program	2023, 2024
Mentor , National Science Foundation Research Experiences for Undergraduates	2017, 2018, 2022, 2024
Facilitator , Ocean Sciences Meeting Non-Academic Career Panel	2024
Volunteer , Safe Ocean Sciences Meeting Program	2024
Facilitator , ASLO’s Amplifying Voices Seminar Series	2023
Mentor , Joint Aquatic Sciences Meeting	2022
Mentor & Student Presentation Judge , Coastal and Estuarine Research Federation Biennial Conference	2021

Facilitator , Global Water Center Data Therapy Workshop Series, University of Nevada Reno	2021
Facilitator , Cover Letter and CV Workshop, Southern California Coastal Water Research Project	2020
Panelist , Career Panel for Ecology Undergraduates, University of California Santa Barbara (UCSB)	2017, 2018, 2020
Volunteer , Coastal and Estuarine Research Federation Biennial Conference	2019
Facilitator , Ocean Change Biology Undergraduate Research Skills Workshop, UCSB	2019
Panelist , Graduate Students for Diversity in Science, UCSB	2019
Judge , Santa Barbara County Science Fair	2019
Student Presentation Judge , Ecology, Evolution, & Marine Biology Graduate Symposium, UCSB	2019
Facilitator , Ocean Change Biology Career Panel, UCSB	2018, 2019
Mentor , Long-Term Ecological Research All Scientists' Meeting	2018
Mentor , Women in Science and Engineering, UCSB	2017 — 2018
Volunteer , Santa Barbara World Oceans Day	2017
Facilitator , Graduate School Application Workshop, UCSB	2017
Facilitator , Career Panel for Ecology Undergraduates, University of California Santa Barbara (UCSB)	2016
Volunteer , Texas Marine Mammal Stranding Network	2010
Volunteer , Auburn Heights Preserve	2009

PROFESSIONAL SERVICE

Association for the Sciences of Limnology and Oceanography	
Member and Networking Sub-Committee Lead, Early Career Committee	2022 — present

Peer-review activities

Manuscript reviewer: *Biogeochemistry*, *Estuaries & Coasts*, *European Journal of Phycology*, *Hydrobiologia*, *Journal of Marine Science*, *Journal of Marine Systems*, *Marine Environmental Research*, *PLoS ONE*

Proposal reviewer: *Maryland Sea Grant*

Professional memberships and associations

American Geophysical Union (AGU)
 Association for the Sciences of Limnology and Oceanography (ASLO)
 Society for Open, Reliable, and Transparent Ecology and Evolutionary Biology (SORTEE)
 Collaborative for Research in Aridland Stream Systems (CRASS)
 Hubbard Brook Long Term Ecological Research (HB LTER)
 Santa Barbara Coastal Long Term Ecological Research (SBC LTER)

DEPARTMENTAL and INSTITUTIONAL SERVICE

Southern California Coastal Water Research Project (SCCWRP)	
Member, Professional Development Training Team	2020 — 2021

University of California Santa Barbara

Graduate Student Representative, Freshwater Ecology Faculty Hiring Committee	2019 — 2020
Coordinator, Biogeosciences Seminar Series	2018 — 2020
Coordinator, Professional Development Seminar Series: Academic Positions	2018
Coordinator, Statistical Methods and Data Visualization in Ecology Working Group	2017 — 2018
Coordinator, Foundational Literature in Ecology Reading Group	2016

Vassar College

Captain, Synchronized Ice Skating Team	2011 — 2012
Tour Guide, Office of Admissions	2010 — 2012
Captain/Treasurer, Ski Team	2009 — 2012

MEDIA

"UNR researchers take part in the most extensive study on river resiliency to flooding." KOLO News	2024
"Researchers shed light on river resiliency to flooding." Nevada Today (story link)	2024
"Managing mudslide debris after fires." Eos (story link)	2022
"After the debris flow." The Current (story link)	2022
"Giant kelp is getting less nutritious." Hakai Magazine (story link)	2022
"Giant kelp is losing nitrogen in warming waters." Santa Barbara Independent (story link)	2021
"Climate change makes kelp less nutritious." Long-Term Ecological Research Network (story link)	2021
"Kelp's nutrition under rising temperatures and the importance of long-term data." The Bottom Line (story link)	2021

“UCSB researchers find long-term rising sea temperature decreases the nutritional value of giant kelp.” KCBX (story link)	2021
“Warmer Water, Less Nutrition.” The Current (story link)	2021
“Tidy coding on Tidy Tuesday.” SCCWRP Director’s Report (story link)	2020
Featured Scientist, Long-Term Ecological Research Network (story link)	2019
“Clearing the Shoreline.” KEYT News	2018

ADDITIONAL SKILLS and EXPERTISE

Software and Computing Skills/Certificates

R/RMarkdown/RShiny, STAN, Git/GitHub, SLURM, Zotero, High performance computing clusters	<i>proficient</i>
Python, JMP, Mendeley	<i>working knowledge</i>
MATLAB, SQL	<i>novice</i>
<i>The Carpentries</i> Certified Instructor	

Languages

English	<i>fluent</i>
Estonian, French	<i>conversational</i>
Italian	<i>novice</i>