Hannah M. Carroll, Ph.D.

Department of Earth, Planetary, and Space Sciences, University of California, Los Angeles

Email: hcarroll@epss.ucla.edu | Phone: 515-991-4058 | GitHub | ORCiD | Research Gate | Google Scholar | Twitter

Education

Ph.D., Ecology and Evolutionary Biology

2020

Co-major: Environmental Science

Iowa State University, Ames

Dissertation: "Late Quaternary Paleoecology of the North American Midcontinent"

- Advisors: Lynn Clark and Alan Wanamaker

B.S. Environmental Science

2008

University of Washington, Tacoma

Appointments

IRACDA Postdoctoral Fellow

2020 - present

Departments of Earth, Planetary, and Space Sciences; Ecology and Evolutionary Biology; Institute of the Environment and Sustainability, University of California, Los Angeles

- Research mentors: Aradhna Tripati and Nathan Kraft

Early Career Fellow, Center for Diverse Leadership in Science

2020 - present

University of California, Los Angeles

Adjunct Professor

2021 - present

School of Environment and Sustainability, Department of Natural and Environmental Sciences,

Western Colorado University, Gunnison

Lecturer

2022 - present

Department of Biological Sciences, California State University of Los Angeles

Postdoctoral Research Associate

2020

Department of Ecology, Evolution, and Organismal Biology, Iowa State University, Ames, IA

- Supervisor: Grace Wilkinson

Awards and Honors

Research Excellence Award, Iowa State University. For academically superior dissertation research. 2020 **Senior Assistantship**, Iowa State University Department of Ecology, Evolution, and Organismal Biology. Competitive research assistantship providing one semester of stipend, tuition, and benefits (\$15,132). 2019

Professional and Scientific Team CYtation Award, Iowa State University. Presented to the members of the ISU Stormwater Management Committee. For going above and beyond the call of duty to make a significant impact on the institution. 2017

Teaching Excellence Award, Iowa State University. For outstanding teaching by a graduate student. 2016 **Participant, {GeoChronR} Workshop**, Competitive–entry 3–day workshop in time–uncertain data analysis using the GeoChron package for R. NSF-funded; travel, room and board, and workshop entry expenses paid. Organizers: Nick McKay, Julien Emile-Geay. 2016

Peer-Reviewed Publications

- *Indicates undergraduate co-author
- 8. Lucarelli, J.K, **H.M. Carroll**, B. Elliott, A. Arnold, R. F., R. Eagle, A. Priyadarshi, A. Tripati. Equilibrated gas-based carbonate standard clumped isotope (Δ_{47} and Δ_{48}) values on the absolute reference frame. Under revision at **Rapid Communications in Mass Spectrometry**. Preprint available at: https://doi.org/10.31223/X5T318
- 7. Román-Palacios, C., **H.M. Carroll**, A. J. Arnold, R. J. Flores, S. Petersen, K. A. McKinnon, A. Tripati. BayClump: Bayesian Calibration and Temperature Reconstructions for Clumped Isotope Thermometry. Under revision at **Geochemistry, Geophysics, Geosystems**. Preprint available at: https://www.essoar.org/doi/abs/10.1002/essoar.10507995.1
- 6. Houston, D.D., J.D. Satler, T.K. Stack*, **H.M. Carroll**, A.M. Bevan*, A.L. Moya*, and K.D. Alexander. 2021. A Phylogenomic perspective on the evolutionary history of the stonefly genus *Suwallia* (Plecoptera: Chloroperlidae) revealed by ultraconserved genomic elements. **Molecular Phylogenetics and Evolution**. DOI: https://doi.org/10.1016/j.ympev.2021.107320
- 5. Upadhyay, D., J. Lucarelli, A. Arnold, R. Flores, H. Bricker, R.N. Ulrich, G. Jesmok, L. Santi, W. Defliese, R. Eagle, **H.M. Carroll**, J. Bateman, V. Petryshyn, S. Loyd, J. Tang, A. Priyadarshi, B. Elliott, and A. Tripati. 2021. Carbonate clumped isotope analysis (Δ_{47}) of 21 carbonate standards determined via gas source isotope ratio mass spectrometry on four instrumental configurations using carbonate-based standardization and multi-year datasets. **Rapid Communications in Mass Spectrometry** 35(17):e9143. DOI: http://dx.doi.org/10.1002/rcm.9143
- 4. Ulrich, R.N., M. Guillermic, J. Campbell*, A. Hakim*, R. Han*, S. Singh*, J.D. Stewart, C. Román-Palacios, **H.M. Carroll**, I. De Corte, R.E. Gilmore, W. Doss, A. Tripati, J.B. Ries, and R.A. Eagle. 2021. Patterns of trace element incorporation in carbonate biominerals recapitulate phylogeny for diverse marine organisms. **Frontiers in Earth Science Geochemistry** 9:641760. DOI: https://doi.org/10.3389/feart.2021.641760
- 3. Wamboldt, J.J., A.D. Wanamaker, **H.M. Carroll**, R. Schultz, and J.E. Morris. 2020. Trophic dynamics of a reservoir fishery following an introduction of a top predator: Insights from stable carbon and nitrogen isotopes. **Fisheries Management and Ecology**. 27:531–539. DOI: http://dx.doi.org/10.1111/fme.12445
- 2. **Carroll, H.M.**, A.D. Wanamaker, L.G. Clark, and B.J. Wilsey. 2020. Ragweed and sagebrush pollen can distinguish between vegetation types at broad spatial scales. **Ecosphere** 11(5):e03120 DOI: https://doi.org/10.1002/ecs2.3120
- 1. **Carroll, H.M.**, D.D. Houston, S. Ankerstjerne, and A.D. Wanamaker, Jr. 2019. Using light stable isotopes to assess stream food web ecology in a general ecology laboratory course. **Journal of Biological Education**. DOI: https://doi.org/10.1080/00219266.2019.1707263

Technical Reports

- 10. **Significant contributor**, Municipal separate storm sewer system 2017 annual report. Department of Environmental Health and Safety and Facilities Planning and Management. Iowa State University.
- 9. **Significant contributor**, Municipal separate storm sewer system 2016 annual report. Department of Environmental Health and Safety and Facilities Planning and Management. Iowa State University.
- 8. Downing, J.A., C.T. Filstrup, D.L. Kendall, L. Whitehouse, and **H. Carroll**. 2016. A diagnostic–feasibility study for the restoration of Silver Lake, Palo Alto County. Iowa State University Limnology Laboratory and Iowa Department of Natural Resources.

- 7. Downing, J.A., C.T. Filstrup, D.L. Kendall, L. Whitehouse, and **H. Carroll**. 2015. A diagnostic–feasibility study for the restoration of North and South Twin Lakes. Iowa State University Limnology Laboratory and Iowa Department of Natural Resources.
- 6. **Significant contributor**, Municipal separate storm sewer system 2015 annual report. Department of Environmental Health and Safety and Facilities Planning and Management. Iowa State University.
- 5. **Significant contributor**, Municipal separate storm sewer system 2014 annual report. Department of Environmental Health and Safety and Facilities Planning and Management. Iowa State University.
- 4. **Significant contributor**, Municipal separate storm sewer system 2013 annual report. Department of Environmental Health and Safety and Facilities Planning and Management. Iowa State University.
- 3. Norris, J.G., I.E. Fraser, and **H. Julich**. 2012. Underwater Videographic Survey of Submerged Aquatic Vegetation in Sequim Bay, WA, August 2011. Report to Hansi Halls, Environmental Planning Manager, Jamestown S'Klallam Tribe, Sequim, WA.
- 2. Norris, J.G., I.E. Fraser, and **H. Julich**. 2011. Defining fish use of subtidal vegetated habitats of the Elwha and comparative shorelines. Report to Cathy Lear, Clallam County Planning Biologist, Port Angeles, Washington.
- 1. Schanz, A., **H. Julich**, L. Ferrier, and H. Berry. 2010. Eelgrass Stressor-Response Project: Report 2007—2008. Nearshore Habitat Program. Washington Dept. of Natural Resources, Olympia, WA.

Teaching

Mentored Teaching Practicum

IRACDA Program at UCLA, in Collaboration with California State University of Los Angeles

Biol 4620: Plant Ecology [Mentored by Alexandra (Sasha) Wright] (2 semesters) 2021—2022

Courses Taught as Instructor of Record

Indicates redevelopment or co-redevelopment of existing course

Indicates development of new course

California State University of Los Angeles

Biol 4540: Special Topics, biological sciences journal club (co-instructor) (2 semesters)	2021—2022
Biol 3000: Biostatistics Laboratory (online) (1 semester)	2022

Iowa State University, Ames

EnSci 490: Independent Study (6 semesters)	2014—2018
EnSci 203: Exploration of Environmental Science (5 semesters)	2014—2018
EnSci 202: Exploration of Environmental Issues (5 semesters)	2013—2017
EnSci 204X: Applied Exploration of Environmental Science I (3 semesters)	2015—2017
EnSci 205X: Applied Exploration of Environmental Science II (2 semesters)	2016—2017
Biol 486xw: Aquatic Ecology Online (1 semester)	2016
Biol 486L: Aquatic Ecology Laboratory, field & laboratory components (1 semester)	2013

Courses Taught as a Teaching Assistant

Iowa State University, Ames

Biol 312L: General Ecology Laboratory, field and laboratory components (3 semesters)	2018—2019
Biol 212L: Principles of Biology Laboratory II (1 semester)	2019
Biol 394: Study Abroad: Maya Mountains & Calabash Caye,	2015
international field course (1 semester in classroom, 2 weeks abroad in Belize)	
Biol 486xw: Aquatic Ecology Online (3 semesters)	2013—2015

Grants

Grant in Aid of Research, Sigma Xi. Awarded to graduate student mentee Robert Ulrich. 2021. *The biomineralization of plants: Connecting Ficus cystoliths to climate using geochemistry and functional traits* \$500

Professional Development Grant, Iowa State University Environmental Science Program. 2019. Awarded for travel to the American Geophysical Union annual meeting. \$200

Harry and Audrey Finch Scholarship (Finch Funds Award), Iowa State University Department of Ecology, Evolution, and Organismal Biology. 2019. *A high-resolution, multiproxy record of climate, vegetation, and fire history at the southern limit of the temperate tallgrass prairie, USA* Awarded for travel to the American Geophysical Union annual meeting. \$1,000

Professional Advancement Grant, Iowa State University Graduate and Professional Student Senate. 2019. Awarded for travel to the Botanical Society of America Annual Meeting. \$200

Professional Advancement Grant Funds Matching, Iowa State University Department of Ecology, Evolution, and Organismal Biology. 2019. Awarded for travel to the Botanical Society of America Annual Meeting. \$100

Graduate Student Research Grant, Geological Society of America. 2019. *Paleoecology of the Tallgrass Prairie-Ozark Forest Ecotone*. \$2,500

Graduate Student Research Grant, Geological Society of America. 2018. *Late Quaternary Paleoecology of the Tallgrass Prairie-Ozark Forest Ecotone*. \$2,500

Harry and Audrey Finch Scholarship (Finch Funds Award), Iowa State University Department of Ecology, Evolution, and Organismal Biology. 2016. *Paleoecological Investigation of the Tallgrass Prairie-Ozark Forest Ecotone*. \$1,500

Lois Tiffany Scholarship Award, Iowa State University Department of Ecology, Evolution, and Organismal Biology. 2016. *Holocene Paleoecology of the Midwestern United States*. \$750

Harry and Audrey Finch Scholarship (Finch Funds Award), Iowa State University Department of Ecology, Evolution, and Organismal Biology. 2015. *Paleoecology of the bamboo thickets of eastern Bolivia*. \$2,000

Curriculum Development Grant, Iowa State University College of Liberal Arts and Sciences. 2014. Awarded to redevelop Biol 488 - *Identification of Aquatic Organisms Online Course*. \$1,000

Student Travel Award, Association for the Sciences of Limnology and Oceanography (ASLO). 2014. Awarded for travel to the ASLO Annual Meeting. \$500

Service (Past Three Years)

Member - Master's of Science in Ecology Council, Western Colorado University	Begins August 2022
Facilitator - Cultivating Leadership for Change and Justice in the Geosciences	2021
Workshop 4: Progress and lessons learned after one year of anti-racism efforts in the geosciences.	
Facilitator - Cultivating Leadership for Change and Justice in the Geosciences	2021
Workshop 3: Effective strategies for student organizing. American Meteorological Society Annual Meeting	
Facilitator - Cultivating Leadership for Change and Justice in the Geosciences	2020
Workshop 2: Exploring challenges to diversifying faculty. American Geophysical Union Ar	ınual Meeting
Panelist - Biol 606: Ecological Research Methods, Career panel for MS Ecology	2020
Students about lesser-known subdisciplines of ecology, Western Colorado University	
Assistant Facilitator - Cultivating Leadership for Change and Justice in the Geosciences	2020

Workshop 1: Call to action: Anti-racism efforts in the geosciences. Geological Society of America Annual Meeting Volunteer - Letters to a Pre-Scientist penpal program 2019

Workshops

Carroll, H. and C. Román-Palacios. *R stats bootcamp: Part 2.* Hands-on R statistics and coding workshop. Tripati lab, Department of Earth, Planetary, and Space Sciences, University of California Los Angeles. 2021.

Carroll, H. *Publication quality plotting in R.* Hands-on R coding workshop for the Statistics Tutoring Center's Statistics Bootcamp series. Western Colorado University, Gunnison. 2021. Recording: https://youtu.be/9cGO9fjtbvg

Carroll, H. and C. Román-Palacios. *R stats bootcamp: Part 1.* R statistics demonstration. Tripati lab, Department of Earth, Planetary, and Space Sciences, University of California Los Angeles. 2021.

Carroll, H. *You've got data! Now what?: How to pick the right tests for your dataset (and why you should choose your tests first next time).* R workshop in statistics for graduate students. Western Colorado University, Gunnison. 2020. Recording: https://www.youtube.com/watch?v=-lKle5byG2Y&feature=youtu.be

Invited Talks and Guest Lectures

Carroll, H. *Functional paleoecology: Emerging tools for refining paleoclimate reconstructions.* Invited seminar for University of Southern California, Los Angeles. 2022.

Carroll, H. *Computational data science approaches to paleoecology and paleoclimatology.* Invited seminar for the Geobiology graduate student organization at California Institute of Technology, Pasadena. 2021.

Carroll, H. *Stable isotopes analysis.* Guest lecture with lab for general ecology course (Biology 302) in stable isotopes analysis using R. 2021. Western Colorado University, Gunnison.

Carroll, H. *Stable isotopes analysis*. Guest lecture with lab for general ecology course (Biology 302) in stable isotopes analysis using R. 2020. Western Colorado University, Gunnison.

Carroll, H. *Spatial data wrangling in R.* Demonstration for LunchinatoRS: an R-focused lunch seminar. 2019. Iowa State University, Ames

Carroll, H. *New Solutions for Old Problems: The Power of Big Data in Late Quaternary Paleoecology.* Departmental seminar. 2018. University of Washington, Tacoma.

Carroll, H. *Stream Health and Ecology.* Guest lecture with field component. Biology 211 - Introductory Biology for Nonmajors. 2018. Iowa State University, Ames.

Carroll, H. *Water Quality on the Iowa State University Campus.* National Pollutant Discharge Elimination System Stakeholders Meeting. 2016. Iowa State University, Ames.

Carroll, H. *Lake Eutrophication and Land Use.* Departmental seminar. 2015. University of Wisconsin - Stout, Menomonie.

Presentations and Posters

[†]Denotes presenter, if other than self | *Indicates undergraduate co-author

Samuelson, R.A.[†], D.D. Houston, R. Japuntich, D. Cammack, and **H.M. Carroll**. 2021. Three-species on the move: *Tracking movement patterns to inform conservation of three native fishes in the Dolores River Basin*. Desert Fishes Council Annual Meeting. Virtual Conference.

Ulrich, R.N.[†], M. Guillermic, J. Campbell*, A. Hakim*, R. Han*, S. Singh*, J.D. Stewart, C. Román-Palacios, **H.M. Carroll**, I. DeCorte, R.E. Gilmore, W. Doss, A. Tripati, J.B. Ries, and R.A. Eagle. 2021. *Interspecific element incorporation in biogenic carbonates recapitulates phylogeny for diverse marine species*. Presentation given at Goldschmidt 2021 virtual meeting.

J.K. Lucarelli[†], **H.M. Carroll**, B. Purgstaller, M. Dietzel, R.A. Eagle, and A. Tripati. 2021. *Paired* (Δ_{47}) *and* (Δ_{48}) *carbonate clumped isotope data: Standard values, multi-instrument comparisons, mixing effects, and disequilibrium effects*. Presentation given at Goldschmidt 2021 virtual meeting.

- Samuelson, R.[†], D. Cammack, **H.M. Carroll**, D.D. Houston, R. Japuntich, and K. Thompson. 2021. *Passive monitoring of the native 'three-species' in the Dolores River Basin and land management implications*. Presentation given at the CO/WY American Fisheries Society virtual conference.
- **Carroll, H.**, A.D. Wanamaker, L.G. Clark, B.E. Caissie, and J. Galang*. 2019. *A high-resolution, multiproxy record of climate, vegetation, and fire history at the southern limit of the temperate tallgrass prairie, USA.*American Geophysical Union Meeting, San Francisco, CA
- **Carroll, H.**, A.D. Wanamaker, L.G. Clark, B.J. Wilsey. 2019. Ambrosia *and* Artemisia *pollen can distinguish between vegetation types at broad spatial scales*. Botanical Society of America Annual Meeting, Tucson, AZ
- **Carroll, H.**, L.G. Clark, B.E. Caissie, and A.D. Wanamaker. 2019. *Late Quaternary vegetation dynamics at the southern limit of the temperate tallgrass prairie*. Environmental Science Graduate Student Symposium, Ames, IA
- **Carroll, H.**, L.G. Clark, and A.D. Wanamaker. 2018. *Preparation of a phytolith reference collection for the study of late Quaternary paleoecology in Missouri*. Environmental Science Graduate Student Symposium, Ames, IA
- **Carroll, H.**, 2018. *Late Quaternary paleoecology of the North American midcontinent.* Iowa State University Dept of Ecology, Evolution, and Organismal Biology Three Minute Thesis Competition
- **Carroll, H.**, L.G. Clark, and A.D. Wanamaker. 2017. *Tracking Holocene vegetation change in the tallgrass prairie region: the power of big data in paleoecology.* Environmental Science Graduate Student Symposium, Ames, IA
- **Carroll, H.**, C.T. Filstrup, and J.A. Downing. 2016. *Comparative palynology of two agriculturally eutrophic lakes* Environmental Science Graduate Student Symposium, Ames, IA
- **Carroll, H.** and J.A. Downing. 2015. *Water quality declines and diversity loss in an agriculturally eutrophic landscape* Environmental Science Graduate Student Symposium, Ames, IA
- **Carroll, H.** and J.A. Downing. 2015. *Paleolimnological analysis of Iowa's changing landscapes* Graduate Research in Evolutionary Biology and Ecology symposium, Ames, IA
- **Julich, H.** and J.A. Downing. 2014. *Two hundred years of landscape change: Consequences for East Okoboji Lake, Iowa* Assoc. for the Sciences of Limnology and Oceanography Meeting, Portland, OR
- **Julich, H.** and J.A. Downing. 2014. *Use of palynological techniques to reconstruct macrophyte loss and multiple stable states in a eutrophic lake.* Graduate Research in Evolutionary Biology and Ecology symposium, Ames, IA
- **Julich, H.** and J.A. Downing. 2013. *Use of palynological techniques to reconstruct macrophyte loss and multiple stable states in a eutrophic lake.* Assoc. for the Sciences of Limnology and Oceanography, New Orleans, LA
- **Julich, H.** and B.J. Becker. 2008. *An evaluation of conditions in* in situ *mesocosms* Western Society of Naturalists Meeting, Vancouver, BC, Canada
- **Julich, H.** and B.J. Becker. 2008. In situ *culturing of larval sand dollars*, Dendraster excentricus, *in Friday Harbor*, *Washington*. University of Washington Tacoma Environmental Research Symposium, Tacoma, WA
- **Julich, H.** and B.J. Becker. 2008. In situ *culturing of larval sand dollars*, Dendraster excentricus, *in Friday Harbor*, *Washington*. UW Undergraduate Research Symposium, Seattle, WA
- **Julich, H.** and B.J. Becker. 2007. *In situ culturing of larval sand dollars*, Dendraster excentricus, *in Friday Harbor, Washington*. Western Society of Naturalists Meeting, Ventura, CA

Mentorship

[31 total; includes 19 women and 8 students from other historically minoritized demographics in STEM; undergraduate students except where noted]

⁺Indicates undergraduate mentee who subsequently completed a Master's *Italics* indicate Master's or PhD mentee who has successfully defended

*Indicates mentorship of Master's student [‡]Indicates mentorship of PhD student ^cIndicates advisory committee membership ^aIndicates advisory committee chair

University of California, Los Angeles

Deepshikha Upadhyay[‡], *Jamie Lucarelli*[‡], Robert Ulrich[‡], Jade Knighton[‡]

Western Colorado University, Gunnison

*Reece Samuelson**, *Ellie Orr**, *Bronwyn Taylor**^c, Jake Bartholomew*^c, Ashley Hurst*^c, Laurel Trout*^a (Admitted for Fall 2022)

Iowa State University, Ames

Jacqueline Galang, Alejand Hernandez-Delgado, Juan-Carlos Mungaray, Juan Perez, Kathryn Holmes, Logan Crees⁺, Lindsay Mack, Josiah Ihnen, Marlyssa Crow⁺, Nicole Stout, Shelby Poole, Samuel Freestone, Emily Martin (Honors)⁺, Eric Tagatz, Megan Koppenhafer, Connor Nicholas, Molly Zelinskas, Molli Wienhold, Mariah Mahaney, Sarah Leichty (Honors)⁺, William Tony Manriquez

Selected Trainings and Certifications

*CIRTL: Center for the Integration of Research, Teaching and Learning, https://www.cirtl.net/

CIRTL Certification: Associate Level Certification in University Teaching. 2021.

CIRTL Training: **Decolonizing the Curriculum in STEAM**. 2021.

CIRTL Training: **Trauma-Responsive Teaching**. 2021.

CIRTL Training: Becoming an Anti-Racist Educator. 2021.

IRACDA@UCLA Training: Interrupting Bias in the Classroom. 2021.

Mental Health First Aid Certification. 2021.

Entering Mentoring Training. 2021.

UCLA Center for Education Innovation & Learning in the Sciences (CEILS) Online Summer Scientific Teaching Institute: **Foundations of Equitable Course Design & Inclusive Teaching**. 2021.

Interviews in the Popular or University Press

Iowa State University Department of Ecology, Evolution, and Organismal Biology. Departmental Spotlight. "Introducing environmental science to a growing number of undergraduates." September 2017

Visions Magazine (Iowa State University Alumni Association). "Three Billion Years: The Evolution of a State." November 2016

Environmental Monitor. "Future scientists get real-world skills in Iowa State water quality monitoring courses." March 5, 2014

Iowa State Daily. "ISU students to monitor campus impact on water." February 28, 2014

Ames Tribune. "ISU students study campus impact on waterways." February 25, 2014

Iowa State University News Service. "Iowa State students will check water quality on campus this semester." February 19, 2014

Iowa State Daily. "Carolyn Hoskinson makes first appearance in Iowa, speaks out about underground leakage." November 19, 2013

Professional References

Dr. Lynn G. Clark

Professor and Interim Chair, Department of Ecology, Evolution, and Organismal Biology

Iowa State University Email: lgclark@iastate.edu Phone: 515-294-8218

Address:

251 Bessey Hall 2200 Osborn Drive Ames, IA 50011-1020

Dr. Alan D. Wanamaker

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Dr. Aradhna Tripati

Associate Professor, Institute of the Environment and Sustainability; Departments of Atmospheric and Oceanic

Sciences; Earth, Planetary, and Space Sciences; Director, Center for Diverse Leadership in Science

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Dr. Nathan J.B. Kraft

Professor, Department of Ecology and Evolutionary Biology

University of California, Los Angeles

Email: nkraft@ucla.edu Phone: 310-825-3593

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Dr. Alexandra (Sasha) Wright

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