

# Hannah M. Carroll

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

## Curriculum Vitae

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✉ [hcarroll@iastate.edu](mailto:hcarroll@iastate.edu) ☎ 515-991-4058 🌐 hannahcarroll 🐦 hmcarro 🆔 0000-0003-3343-3358

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## Education

**PhD Candidate, Ecology and Evolutionary Biology** 2012—present

**Co-major: Environmental Science**

Iowa State University, Ames

Dissertation: “Late Quaternary Paleoecology of the North American Midcontinent”

Advisors: Dr. Lynn G. Clark and Dr. Alan D. Wanamaker

Committee: Dr. Beth E. Caissie, Dr. Brian J. Wilsey, Dr. Haldre S. Rogers, Dr. Richard G. Baker

**Bachelor of Science, Environmental Science** 2008

University of Washington, Tacoma

Thesis: “Evaluating Conditions in *In-Situ* Mesocosms”

Advisor: Dr. Bonnie J. Becker

## Awards and Honors

Iowa State University Graduate College Research Excellence Award April 2020

This award is to recognize academically superior graduate students for outstanding research accomplishments as documented in their theses and dissertations.

Department of Ecology, Evolution, and Organismal Biology Senior Assistantship. 2019

Competitive research assistantship provides stipend, tuition, and benefits for the Spring 2020 semester.

Iowa State University Professional and Scientific Team Cytation Award 2017

Presented to the members of the ISU Stormwater Management Committee.

This award honors a team that: 1) has performed above and beyond the call of duty,

2) has done something extraordinarily well, and

3) has acted in such a way as to make a significant impact on the institution within the past year.

Iowa State University Graduate College Teaching Excellence Award 2016

This award honors the top 10% of graduate students at ISU for outstanding teaching, as evaluated by their academic departments.

Participant, {GeoChronR} Workshop 2016

Competitive—entry 3—day workshop hosted at Northern Arizona University 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

## Publications

- Carroll, H.M.**, D.D. Houston, S. Ankerstjerne, and A.D. Wanamaker, Jr. Available online Dec. 31, 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>
- Carroll, H.M.**, L.G. Clark, A.D. Wanamaker, and B.J. Wilsey. Ragweed and sagebrush pollen can distinguish between vegetation types at broad spatial scales. In press at *Ecosphere*.
- Wamboldt, J.J., A.D. Wanamaker, **H.M. Carroll**, R. Schultz, and J.E. Morris. Under revision at *Fisheries Management and Ecology*. Trophic dynamics of a reservoir fishery following an introduction of a top predator: Insights from stable carbon and nitrogen isotopes. Revision submitted.
- Carroll, H.M.**, A.D. Wanamaker, and L.G. Clark. In prep. GeoPollen: An interactive, user-friendly Shiny Dashboard application for visualization and analysis of pollen data. Target: *PLOS One*. Anticipated submission: March 2020.
- Cox, M., **H.M. Carroll**, T. Gallaher, H.T. Horner, P.C. Klahs, and L.G. Clark. In prep. Mature grass (Poaceae) root anatomy: A phylogenetic survey and potential functional correlations. Target: *American Journal of Botany*. Anticipated submission: April 2020.
- Carroll, H.M.**, A.D. Wanamaker, L.G. Clark, B.E. Caissie, J.K. Galang, and D.D. Houston. In prep. Late Quaternary vegetation, fire, and hydroclimate at the southern limit of the temperate tallgrass prairie, Missouri, USA. Target: *Quaternary Science Reviews*. Anticipated submission: June 2020.

## Technical Reports

- Significant contributor**, Municipal separate storm sewer system 2017 annual report. Department of Environmental Health and Safety and Facilities Planning and Management. Iowa State University.
- Significant contributor**, Municipal separate storm sewer system 2016 annual report. Department of Environmental Health and Safety and Facilities Planning and Management. Iowa State University.
- 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.
- 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.
- Significant contributor**, Municipal separate storm sewer system 2015 annual report. Department of Environmental Health and Safety and Facilities Planning and Management. Iowa State University.
- Significant contributor**, Municipal separate storm sewer system 2014 annual report. Department of Environmental Health and Safety and Facilities Planning and Management. Iowa State University.
- Significant contributor**, Municipal separate storm sewer system 2013 annual report. Department of Environmental Health and Safety and Facilities Planning and Management. Iowa State University.
- 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.
- 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.
- Schanz, A., **H. Julich**, L. Ferrier, and H. Berry. 2010. Eelgrass Stressor-Response Project: Report 2007—2008. Nearshore Habitat Program. Washington Department of Natural Resources, Olympia, WA.

## Teaching

*Indicates redevelopment or co-redevelopment of existing course*

**Indicates development of new course**

### Courses Taught as Instructor of Record

#### Iowa State University, Ames

EnSci 490: Independent Study (6 semesters)	2014—2018
<b>EnSci 203: Exploration of Environmental Science</b> (5 semesters)	2014—2018
<i>EnSci 202: Exploration of Environmental Issues</i> (5 semesters)	2013—2017
<b>EnSci 204X: Applied Exploration of Environmental Science I</b> (3 semesters)	2015—2017
<b>EnSci 205X: Applied Exploration of Environmental Science II</b> (2 semesters)	2016—2017
Biol 486xw: Aquatic Ecology Online (1 semester)	2016
<i>Biol 486L: Aquatic Ecology Laboratory</i> , 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, international field course (1 semester in classroom, 2 weeks abroad in Belize)	2015
Biol 486xw: Aquatic Ecology Online (3 semesters)	2013—2015

#### University of Washington, Tacoma

Undergraduate Teaching Assistant - TESC 442: Marine Ecology, field course (1 quarter)	2008
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## Grants

Iowa State University Environmental Science Program Professional Development Grant Awarded for travel to the American Geophysical Union annual meeting	2019
Iowa State University Department of Ecology, Evolution, and Organismal Biology, Harry and Audrey Finch Scholarship (Finch Funds Award). <i>A high-resolution, multiproxy record of climate, vegetation, and fire history at the southern limit of the temperate tallgrass prairie, USA</i> Awarded for travel to the American Geophysical Union annual meeting	2019
Iowa State University Graduate and Professional Student Senate Professional Advancement Grant Awarded for travel to Botany 2019	2019
Iowa State University Department of Ecology, Evolution, and Organismal Biology PAG funds matching. Awarded for travel to Botany 2019	2019
Geological Society of America Graduate Student Research Grant, <i>Paleoecology of the Tallgrass Prairie-Ozark Forest Ecotone</i>	2019
Geological Society of America Graduate Student Research Grant, <i>Late Quaternary Paleoecology of the Tallgrass Prairie-Ozark Forest Ecotone</i>	2018
Iowa State University Department of Ecology, Evolution, and Organismal Biology, Harry and Audrey Finch Scholarship (Finch Funds Award), <i>Paleoecological Investigation of the Tallgrass Prairie-Ozark Forest Ecotone</i>	2016
Iowa State University Department of Ecology, Evolution, and Organismal Biology, Lois Tiffany Scholarship Award, <i>Holocene Paleoecology of the Midwestern United States</i>	2016

Iowa State University Department of Ecology, Evolution, and Organismal Biology, Harry and Audrey Finch Scholarship (Finch Funds Award), <i>Paleoecology of the bamboo thickets of eastern Bolivia</i>	2015
Iowa State University College of Liberal Arts and Sciences Curriculum Development Grant, awarded to redevelop Biol 488 - <i>Identification of Aquatic Organisms Online Course</i> .	2014
Association for the Sciences of Limnology and Oceanography (ASLO) Student Travel Award	2014
<b>Significant contributor</b> , Downing, J.A., C. Filstrup, and C. Williams. <i>Twin Lakes, Iowa, Diagnostic and Feasibility Study</i>	2013
Contributed to portion awarded by Iowa Department of Natural Resources for paleolimnological study of Twin Lakes, Iowa.	
<b>Significant contributor</b> , Downing, J.A., C. Filstrup, and C. Williams. <i>Silver Lake, Iowa, Diagnostic and Feasibility Study</i>	2013
Contributed to portion awarded by Iowa Department of Natural Resources for paleolimnological study of Silver Lake, Iowa.	

## Service

Volunteer - Letters to a Pre-Scientist penpal program	2019
Graduate Student Representative - ISU Stormwater Management Committee	2014—2018
Curriculum Committee Representative , Department of Ecology, Evolution, and Organismal Biology Graduate Student Organization	2017—2018
Skype a Scientist, two high school classrooms	2018
Certified Volunteer - IOWATER volunteer water quality monitoring program	2014—2017
President - Environmental Science Graduate Student Organization	2014—2015
Graduate Student Representative - Plant or Microbial Processes Faculty Search Committee	2014—2015
Volunteer Judge - Eco Day, Nevada Middle School	2015
Volunteer Judge - Des Moines Public Schools Science Fair	2014—2015
Graduate Student Representative - EEOB external review panel	2014
Volunteer Judge - Iowa State Science and Technology Fair	2014
Volunteer Judge - Introduction to Environmental Issues Final Projects	2014
Workshop Leader - <i>All About Mussels</i> workshop for fifth grade students	2014
Social Outreach and Safety Chair - Environmental Science Graduate Student Organization	2013—2014
Volunteer - Iowa Children's Water Festival	2013

## Invited Talks and Guest Lectures

Carroll, H. <i>Spatial data wrangling in R</i> . Demonstration for Lunchinators: an R-focused lunch seminar. Iowa State University, Ames	2019
Carroll, H. <i>New Solutions for Old Problems: The Power of Big Data in Late Quaternary Paleoecology</i> . Departmental seminar. University of Washington, Tacoma	2018
Carroll, H. <i>Stream Health and Ecology</i> . Invited guest lecture with field component. Biology 211 - Introductory Biology for Nonmajors. Iowa State University, Ames	2018
Carroll, H. <i>Water Quality on the Iowa State University Campus</i> . National Pollutant Discharge Elimination System Stakeholders Meeting. Iowa State University, Ames	2016
Carroll, H. <i>Lake Eutrophication and Land Use</i> . Departmental seminar. University of Wisconsin, Stout, Menomonie	2015

## Presentations and Posters

- 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*. Botany 2019 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 Department of Ecology, Evolution, and Organismal Biology Three Minute Thesis Competition, Ames, IA
- 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 Meeting, New Orleans, LA
- Julich, H.** and B.J. Becker. 2008. *An evaluation of conditions 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

[22 total; includes 13 women and 5 students from traditionally underrepresented demographics in STEM]

### 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

## **University of Washington, Tacoma**

Lindsay McCormick

### **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

<http://www.fondriest.com/news/future-scientists-get-real-world-skills-iowa-state-water-quality-monitoring-courses.htm>

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

[http://www.iowastatedaily.com/news/article\\_01050a06-9fe2-11e3-9d48-001a4bcf887a.html](http://www.iowastatedaily.com/news/article_01050a06-9fe2-11e3-9d48-001a4bcf887a.html)

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

<http://www.amestrib.com/news/ames-and-story-county/isu-students-study-campus-impact-waterways>

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

<http://www.news.iastate.edu/news/2014/02/19/watertesting2014>

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

### **Professional Memberships (Past Five Years)**

Association for Experiential Education (AEE), Association for Women in Science (AWIS), The Geological Society of America (GSA), Botanical Society of America (BSA), American Geophysical Union (AGU), Ecological Society of America (ESA)