

RACHEL E. BOWES

Post-doctoral Research Fellow, Karlstad University
Email: rebowes.ecology@gmail.com; Telephone: +46 076 203 64 23
Website: <https://rebowesecology.com>

EDUCATION

- 2011-2016 Ph.D. Department of Ecology and Evolutionary Biology
University of Kansas (KU), Lawrence, KS
Dissertation with Honors: Temporal analysis of river food webs
Advisor: James H. Thorp
- 2007-2011 B.A. Honors Pre-Professional Zoology, Chemistry
Ohio Wesleyan University (OWU), Delaware, OH

PROFESSIONAL APPOINTMENTS, TRAINING, AND EMPLOYMENT

- 2019-2021 Post-doctoral Researcher, Karlstad University, Sweden
Evaluation and Improvement of Connectivity and Habitat in Swedish Rivers
- 2017-2019 Post-doctoral Research Fellow, Karlstad University, Sweden
Ecology of River Connectivity
- 2016-2017 Post-doctoral Researcher, KU and Kansas Biological Survey
NSF Macroystem Biology: Hierarchical Functioning of River Macroystems in
Temperate Steppes – From Continental to Hydrogeomorphic Patch Scales
- 2013-2016 Graduate Research Assistant, KU and Kansas Biological Survey
- 2007-2011 Secretary assistant and librarian, OWU Music Department
- 2010 Research Assistant, Summer Science Research Program, OWU
- 2009 Seasonal Forest Ranger, DuPage County Forest Preserve District, IL

PUBLICATIONS

- Thorp, J.H., M. Delong, and **R.E. Bowes** (2019). Trophic Relations, Trophic relations, hydrogeomorphology, and ecosystem size in a river macrosystem. *Ecosphere*. In Review.
- Bowes, R.E.**, J.H. Thorp, and M. Delong (2019). Reweaving river food webs through time. *Freshwater Biology*. DOI: 10.1111/fwb.13432.
- Bowes, R.E.**, J.H. Thorp, and D.C. Reuman (2017). Multidimensional metrics of niche space for use with diverse analytical techniques. *Nature Scientific Reports*, DOI: 10.1038/srep41599.
- Thorp, J.H., and **R.E. Bowes** (2017). Carbon sources in riverine food webs — new evidence from amino acid isotopic techniques. *Ecosystems*, DOI: 10.1007/s10021-016-0091-y.
- Bowes, R.E.**, and J.H. Thorp (2015). Consequences of employing amino acid vs bulk-tissue, stable isotope analysis: a laboratory trophic position experiment. *Ecosphere*, 6 (Issue #1; Article 14): 1-12.
- Bowes, R.E.**, M.H. Lafferty, and J.H. Thorp (2014). Less means more: nutrient stress leads to higher $\delta^{15}\text{N}$ ratios in fish. *Freshwater Biology*, 59: 1926-1931.



GRANTS

- Bowes, R. (Co-PI), J.H. Thorp (PI) (2015-2017). NSF Doctoral Dissertation Improvement Grant (DDIG). Dissertation Research: Historical Changes in Food Web Structure of Large Rivers (\$17,427)
- Bowes, R. (PI) (2014). University of Kansas Field Station Grant. Benthic invertebrate depth distribution in lake with a deep metalimnetic photosynthetic community (\$500)
- Bowes, R. (Co-author and unofficial Co-PI), J.H. Thorp (PI) (2012-2014). NSF Early-Concept Grants for Exploratory Research (EAGER). Comparison of Amino-Acid and Bulk-Tissue Stable Isotope Techniques for Analyzing Current and Historical Food Webs (\$124,000)
- Bowes, R. (Co-PI), S.J. Hankison (PI) (2010). Ohio Wesleyan University Theory to Practice Grant Program. Mate preferences associated with MHC alleles in the sailfin molly, *Poecilia latipinna* (\$2000)

AWARDS AND FELLOWSHIPS

- Distinguished Dissertation Awards Nomination (2017), Council of Graduate Schools and ProQuest Dissertations Publishing
- Argersinger Prize for Outstanding Doctoral Dissertation in Science, Technology, Engineering, and Math (2017), KU Endowment Association, Graduate Studies
- KU Women of Distinction Award (2016), Humanitarian in Science, KU
- Outstanding Undergraduate Poster Award: Sydney Bolin (2015), Governor's Conference on the Future of Water in Kansas, Manhattan, KS (\$250)
- Graduate Research Award (2015), Association of Women Geoscientists, (\$1000)
- Depart. Ecology and Evolutionary Biology Summer Fellowship (2015), KU (\$3000)
- Undergraduate Research Mentor Award, Honorable Mention (2015), Center for Undergraduate Research, KU
- Graduate Scholarly Presentation Travel Fund Award (2015), KU (\$500)
- Graduate Research Consultant (2014), Center for Undergraduate Research, KU (\$500)
- Depart. Ecology and Evolutionary Biology Summer Fellowship (2014), KU (\$2000)
- Undergraduate Research Mentor Award (2014), Center for Undergraduate Research, KU (\$500)
- Outstanding Undergraduate Poster Award: Holly Lafferty (2013), Governor's Conference on the Future of Water in Kansas, Manhattan, KS (\$500)
- Graduate Research Fellowship, Honorable Mention (2013), National Science Foundation
- Outstanding Presentation (2012), Dept. of Ecology and Evolutionary Biology, Univ. of Kansas
- Graduate Research Fellowship, Honorable Mention (2012), National Science Foundation
- Elizabeth Cass Wills Prize for Graduate Study in Zoology (2011), Ohio Wesleyan University
- Charles Turner Award (2011), National Science Foundation and Animal Behavior Society



MENTORSHIP

The emphasis in my mentorship is on the students designing and implementing their own research projects, and development of writing skills, scientific inquiry frameworks, fundamental research techniques, and dissemination abilities are also important. I work closely with the students that I mentor in all areas: writing a personal statement and curriculum vitae; reading and discussing primary literature; teaching field and laboratory techniques; and exploring and applying to graduate schools, grants, and internships.

Ph.D. Students (1)

Jeffery Marker (2019-current)

Masters Students (2)

Ranja Risberg (Karlstad University, 2019-2020)

Elio Bottagisio (Karlstad University, 2018-2019)

Undergraduate Students (9)

Björn Borgiel (Karlstad University, 2018)

Tamara Tyner (KU, 2016-2018)

KU Biology Undergraduate Research and Travel Fund Awardee

KU Department of Ecology and Evolutionary Biology and University Honors

Sydney Bolin (KU, 2015-2016)

Governor's Conference on the Future of Water in Kansas, Outstanding Undergraduate
Poster Award

AWG Undergraduate Research Scholarship

KU Undergraduate Research Award

KU Undergraduate Biology Research Award

Rachel Watson (KU, 2015)

KU BioScholar

Brendan Martin (KU, 2014-2015)

KU Department of Ecology and Evolutionary Biology and University Honors

KU Undergraduate Travel Award

Howieson Opportunity Fund Awardee

KU Undergraduate Research Award

Valerie Paul (KU, 2013-2015)

M. Holliday Lafferty (KU, 2012-2014)

KU Department of Ecology and Evolutionary Biology and University Honors

Governor's Conference on the Future of Water in Kansas, Outstanding Undergraduate
Poster Award

KU Undergraduate Research Award

John Millsap (KU, 2012-2013)

Morgan Manger (KU, 2013)



TEACHING EXPERIENCE AND GUEST LECTURES

Course Instructor

Tropical Forest and Marine Ecology in Dominica, University of Kansas (2016)
Laboratory and Field Methods in Ecology, University of Kansas (2013-2015)

Graduate Teaching Assistant

Marine Biology in Bonaire, University of Kansas (2015)
Introductory Organismal Biology, University of Kansas (2012-2015)
Introductory Organismal Biology (Honors), University of Kansas (2014)
Introductory Cell Biology (Honors), University of Kansas (2012)
Introductory Cell Biology, University of Kansas (2011-2012)

Guest lecturer

Aquatic Invertebrate Ecology, University of Kansas (2017)
Marine Biology, University of Kansas (2014-2016)
Introductory Organismal Biology, University of Kansas (2012)

PRESENTATIONS

Seminars and Keynote Presentations (Selected List)

- Bowes, R.E.** (2018). Too many dammed rivers: Dam removal in Scandinavia. International Research School in Applied Ecology (IRSAE), Freshwater. (*Keynote Speaker*)
- Bowes, R.E.** and O. Calles (2018). Too many dammed rivers: Dam removal in Sweden. Dam Removal Europe Workshop. Vilnius, Lithuania. (*Keynote Speaker*)
- Bowes, R.E.** (2017). Temporally analyzing river food webs. Dept. of Biology Seminar Series, Karlstad University.
- Bowes, R.E.** (2017). Temporal changes in river food webs. Ecology and Evolutionary Biology (EEB) Seminar Series, Kansas State University.
- Bowes, R.E.** (2016). Dissertation Defense: Temporal analysis of river food webs. Department of Ecology and Evolutionary Biology, University of Kansas.
- Bowes, R.E.,** J.H. Thorp, and M. DeLong (2016). Historical alterations in river hydrogeomorphic structure and the effects on food web structure. Department of Geology Colloquium Series, University of Kansas.
- Bowes, R.E.,** B. Martin, F. deNoyelles, and J.H. Thorp (2015). Benthic invertebrate depth distribution in lake with a deep metalimnetic photosynthetic community (DCM). Ecology Seminar Series, University of Kansas.
- Bowes, R.E.** and B.J. O'Neill (2012). Rectification of stable isotopes in an ecological context: Synthesizing various approaches to problems when using different tissues and life stages. Ecology and Evolutionary Biology Graduate Student Retreat, University of Kansas: Third Place Recipient.

Conference Presentations (Selected List; *= undergraduate presentation)

- Bowes, R.E.** (2019). Swedish nature survey. International Congress on Conservation Biology (ICCB2019), Kuala Lumpur, Malaysia.
- Bowes, R.E.** (2018). Social perspectives on dam removal. To be or not to be... Removed: Dam Removal Europe Conference, Hudiksvall, Sweden.



- Bowes, R.E.** (2018). Stabila isotoper, dammar och damnutrivning. Arbetsmöte FUG i Älvkarleby på temat: Fiskvägarnas funktion, Älvkarleby, Sweden.
- *Tyner, T.L., **R.E. Bowes**, E.R. Arsenault, and J.H. Thorp (2017). Carbon Sources in Lake Zooplankton. Governor's Conference on the Future of Water in Kansas, Manhattan, KS. (*Poster*): Outstanding Undergraduate Poster Award
- Bowes, R.E.** (2017). Using stable isotopes and system metabolism to assess river connectivity. International Freshwater Workshop, Karlstad University, Sweden.
- Bowes, R.E.**, and J.H. Thorp (2017). Carbon Sources in Riverine Food Webs: New Evidence from Amino Acid Isotope Techniques. Society for Freshwater Science Annual Meeting, Raleigh, NC.
- Bowes, R.E.**, and J.H. Thorp (2016). Hierarchical functioning of river macrosystems in temperate steppes – from continental to hydrogeomorphic patch scales. NSF Macrosystems Biology PI Meeting, Arlington, VA.
- Bowes, R.E.**, J.H. Thorp, and D.C. Reuman (2016). Multidimensional metrics for analyzing community properties. Association for the Sciences of Limnology and Oceanography Annual Meeting, Santa Fe, NM.
- *Bolin, S.L., **R.E. Bowes**, and J.H. Thorp (2015). Toxic microplastic pollution: how much is ingested by aquatic invertebrates. Governor's Conference on the Future of Water in Kansas, Manhattan, KS. (*Poster*): Outstanding Undergraduate Poster Award
- Bowes, R.E.**, J.H. Thorp, and M. Delong (2015). Historical changes in food web structure of the Mississippi and Ohio rivers in response to damming. Society for Freshwater Science Annual Meeting, Milwaukee, WI.
- *Martin, B., **R.E. Bowes**, F. deNoyelles, and J.H. Thorp (2015). Benthic invertebrate depth distribution in lake with a deep metalimnetic photosynthetic community (DCM). Society for Freshwater Science Annual Meeting, Milwaukee, WI. (*Poster*)
- *Martin, B., **R.E. Bowes**, F. deNoyelles, and J.H. Thorp (2015). Benthic invertebrate depth distribution in lake with a deep metalimnetic photosynthetic community (DCM). Governor's Conference on the Future of Water in Kansas, Manhattan, KS. (*Poster*): Outstanding Undergraduate Poster Award
- Bowes, R.E.** and J.H. Thorp (2014). Costs and benefits of amino-acid vs bulk-tissue isotope analysis: A laboratory food web experiment. Joint Aquatic Science Meeting, Portland, OR.
- *Lafferty, M.H., **Bowes, R.E.**, and J.H. Thorp (2014). Hunger Games: Isotope ratios in nutrient stressed fish. Joint Aquatic Science Meeting, Portland, OR. (*Poster*)
- *Lafferty, M.H., **Bowes, R.E.**, and J.H. Thorp (2014). Hunger Games: Isotope ratios in nutrient stressed fish. Governor's Conference on the Future of Water in Kansas, Manhattan, KS. (*Poster*): Outstanding Undergraduate Poster Award
- Bowes, R.E.**, Panhuis, T.P., and S.J. Hankison (2011). Mate preferences associated with MHC alleles in the sailfin molly, *Poecilia latipinna*. Joint Meeting of Animal Behavior Society and International Ethological Society (Behavior 2011), Bloomington, IN. (*Poster*)



PROFESSIONAL ACTIVITIES AND AFFILIATIONS

Symposiums, Workshops and Working Groups

National Science Foundation, Workshop: Understanding Freshwater Ecosystem Change through Analysis of Long-term Samples from Regional U.S. Fish Collections. Rocky Mountain Research Station, CO, USA. Invited Presentation and Participant (2019)

Society for Freshwater Science, International Coordination Committee (2018-2020)

Society for Conservation Biology Freshwater Working Group. Board Member, At-Large Representative, (2018-2020)

To be or not to be... Removed: Dam Removal Europe Conference. Hudiksvall, Sweden. Moderator and Conference Organizing Committee (2018)

International Research School in Applied Ecology (IRSAE), Freshwater. Evenstad, Norway. Summer School Field Trip Organizer and Keynote Speaker, (2018)

International Freshwater Workshop and PhD Course, Karlstad University, Sweden. Organizing Committee (2017)

Society for Freshwater Sciences Annual Meeting, Macrosystem Ecology Symposium and Special Session. Raleigh, North Carolina, USA. Moderator and Organizing Committee (2017)

National Science Foundation, Macrosystems Biology Principle Investigator Meeting. Washington D.C., USA. Invited Presentation and Participant (2016)

National Science Foundation, Workshop on Rivers as Macrosystems. University of Kansas, KS, USA. Invited Presentation and Participant (2015)

Synergistic Activities

KU Aquatic Ecology Lab website designer and content manager (2015-2017)

Head Judge, KU Undergraduate Research Symposium, Lawrence, KS (2014-2017)

Undergraduate Research Mentor Award Committee (2016)

EEB Graduate Student Organization, member (2011-2015)

Graduate Research Consultant, Center for Undergraduate Research, University of Kansas (2014)

SSI Open Water Scuba Diver Certified (2014)

Memberships

American Association for the Advancement of Science

Association for the Sciences of Limnology and Oceanography

Association of Women Geoscientists

Ecological Society of America

Sigma Xi (Scientific Research Society)

Society for Freshwater Science

Society for Conservation Biology

Reviewer

National Science Foundation, Division of Environmental Biology

Journal of Applied Ecology

Ecosphere

Freshwater Science

Hydrobiologia

Journal of Experimental Marine Biology and Ecology

Oecologia

Water



OUTREACH AND COMMUNITY SERVICE

YouTube Channel: SCB FWVG. Educational videos for general public (2018)
Webinar Producer and Creator, Dam Removal Europe: Sweden (2018)
Judge, Undergraduate Research Presentations, Society for Freshwater Science (2017)
Volunteer, Jefferson County Jail, Oskaloosa, KS (2017)
Prairie Park Elementary Science Discovery Day (2016-2017)
Science Saturday, University of Kansas Biodiversity Institute and Natural History Museum,
Lawrence, KS (2015-2017)
Head Judge, KU Undergraduate Research Symposium, Lawrence, KS (2014-2017)
Volunteer, First Step at Lake View (DCCCA), Lawrence, KS (2014-2017)
Volunteer, Douglas County Jail, Lawrence, KS (2013-2017)
KAW Eagle Valley Day, Lawrence, KS (2016)
Judge, Hillcrest Elementary School Science Fair, Lawrence, KS (2014-2015)
Judge, KU Undergraduate Research Symposium, Lawrence, KS (2013)
Women in science, Topeka, KS (2011-2015)
Environment and Wildlife Outreach, Ohio Wesleyan University, Delaware, OH (2008-2011)
Volunteer, West-Suburban Humane Society, Downers Grove, IL (2007-2010)

