

Virgil Orr Junior Faculty Award 2022

Dr. Julia E. Earl

Assistant Professor (2017-present)

School of Biological Sciences, College of Applied and Natural Sciences

I am honored to be selected as a finalist for the Virgil Orr Junior Faculty Award. I am finishing my 5th year as an Assistant Professor and have worked hard to uphold the mission of Louisiana Tech University through high quality teaching, research, and service. My primary goals are 1) to help students gain the skills they need to critically evaluate and solve problems here at Louisiana Tech University and in their future careers and 2) to increase knowledge, awareness, and actions towards environmental sustainability to promote a healthy environment for people and ecosystems on campus, in our community, and the planet. My primary goals are in line with Louisiana Tech University's core mission. I do both of these through hands on, interactive teaching and research training, as well as service to the university, community, and my profession. I hope you will see all the passion and hard work I put into my primary goals throughout this packet.

Belief in Teaching, Research, and Service to Serve the Mission of the University

Louisiana Tech University values a high-quality learning environment that promotes diversity and the formation of new knowledge. I share these values and work towards them directly through my teaching and research and support them through my service work. I believe that learning and science are best when they are interactive and support a broad range of people that could provide a new perspective or idea, which is essential to both learning and research.

I make my courses interactive to help students think through ideas and connect different types of knowledge together. A big way I do this is through reading and discussion. In lower level classes, I have students read their textbook, watch educational videos, and/or read from a popular nonfiction book and then discuss what they think about ideas presented, their opinions, and how individuals, institutions, and society might go about solving the problems related to that issue. In upper level and graduate classes, students engage with the primary literature by reading scientific papers and then discussing them. In one course, I even teach students how to lead discussions in an inclusive way, which they then practice throughout the quarter. This is a skill they can use in leading meetings throughout their careers. I also have students collect data through a variety of methods, such as sampling streams, doing building energy audits, and even learning to request online climate data through federal data centers. I also teach students experimental design, how to work with data, and present it to other scientists and the public. One of my students in their last quarter here said that my lab sampling aquatic insects at Lincoln Parish Park was the most fun thing he did in class during his entire college career. I tried to maintain this level of engagement even while teaching online through zoom discussions and threaded discussion on Moodle. One of my students from spring 2020 said, "Dr. Earl did a fantastic job with how this course was affected this quarter. It was a very interactive class and she kept it that way even though we were not meeting for class. I was very impressed with how involved she stayed."

My most interactive type of teaching is mentoring and training students in my research lab. I view mentoring relationships as collaborations and make sure students are able to steer the research direction to reflect their interests and allow them to take ownership of the project. I

generally act as a facilitator but step in to teach concepts that are more difficult for students: often statistical analysis, experimental design, water quality analyses, and aquatic insect identification. I try to maintain a collaborative environment and involve undergraduates in critiquing other students' draft presentations and sometimes even drafts of my manuscripts. Students often can find areas where something isn't explained well enough that my graduate students or myself can't see. Knowing that their opinion and feedback is valued helps us work as a team, support collegiality, and make the students more invested in their work.

I also try to maintain a supportive atmosphere in my lab and the classroom. A core value of mine is to show empathy and understanding to my students. Many students face great challenges emotionally, financially, and in just finding their purpose in a world with such diverse options, especially in the midst of a pandemic. Supporting my students often means listening. I spend time every quarter listening to students tell me about the challenges they face. This often occurs during advising or during meetings with my research students, but often also includes impromptu meetings with students that work in other labs or that took my courses in past quarters. During these meetings, I offer the support and advice I can and recommend other resources on campus when appropriate. I also try to give students grace when they need it by extending deadlines. I am still firm about my expectations though, because students will not be prepared for the working world or graduate school if they do not earn their grades. I also spend time supporting students as a member of the Behavioral Standards Committee, where I also listen and try to assess situations objectively but with empathy. I try to balance the mission of the university to maintain a safe learning environment across campus with identifying resources and tactics that will help the students appearing before the committee get back on track to earn their degree.

I feel that the investments I've made have made to support students through research, teaching, and service have been key to my success and the success of my students. These things are all key facets of the mission of Louisiana Tech University. Below, I have listed my teaching, research and service activities, most of which show my devotion to our students but also in representing Louisiana Tech University well on a national and international scale through research and service activities to scientific societies.

Teaching Activities

Given my level research activity, my teaching load is 3-4 credit hours per quarter. I teach fewer total students per year than some faculty, but I use that to increase the hands-on activities, writing, and personal attention to my students. I have created three new 3-credit courses that now have permanent course numbers. My innovative teaching was recognized in 2020 with the **Teaching award for 100/200 Level Courses** from the College of Applied and Natural Sciences.

Course Number	Course Title (Number of Credits)	Sections Taught	Total Enrollment	Avg. Instructor Rating
BISC/ENSC 212	Conservation and Management of Natural Resources (3)	5	288	3.73
BISC 433/533	Global Change Ecology (3)	3	42	4.00
BISC 213	Environmental Sustainability (3)	4	75	3.85
BISC 432/532	Freshwater Ecology (3)	2	46	4.00
BISC 450/516	Amphibian Declines (1)	1	16	3.85

BISC 450/516	Statistics in R (1)	1	11	N/A
BISC 535	Statistical Model Ranking (1)	1	7	N/A
BISC 360/530	Special Problems (various)	N/A	14 (77 total credits)	N/A

Research Activities

Part of my appointment is to have an active research lab, where I train undergraduate and graduate students. Through this, I teach students lab and field techniques, statistical analysis, how to critically evaluate the scientific literature, and how to write about and present their results. At Louisiana Tech University, I have trained 5 graduate students and 15 undergraduate students, who have collectively presented 13 presentations at Louisiana Tech, regional, and national meetings, **winning 7 student awards.**

Research Type	Students
Master's Thesis	Rebekah Magee, Simon Boycott, Joseph Aubert (In progress), Daniel Edwards (In Progress)
Master's Nonthesis	Rebecca Cram
Undergraduates Trained	15

Publications (Underlined are students I mentored outside of Louisiana Tech by serving as an informal co-advisor and external member of their graduate committees.)

- Earl, J.E.**, S.M. Blomquist, E. Harper, D.J. Hocking, M.L. Hunter Jr, J.R. Johnson, M.S. Osbourn, D.A. Patrick, V.D. Popescu, T.A.G. Rittenhouse and B. Rothermel. 2022. Amphibian biomass export from geographically isolated wetlands: Temporal variability, species composition, and potential implications for terrestrial ecosystems. *Diversity* 14: 163.
- Anderson, T.L., **J.E. Earl**, D.J. Hocking, M.S. Osbourn, T.A.G. Rittenhouse, and J.R. Johnson. 2021. Demographic effects of phenological variation in natural populations of two pond-breeding salamanders. *Oecologia* 196: 1073-1083.
- Earl, J.E.** 2021. Leaf litter input to ponds can dramatically alter amphibian morphological phenotypes. *Oecologia* 195: 145-153.
- Bampoh, D., **J.E. Earl**, and P.A. Zollner. 2021. Simulating the relative effects of movement and sociality on the distribution of animal-transported subsidies. *Theoretical Ecology* 14: 57-70.
- Peterson, J.M., **J.E. Earl**, S.D. Fuhlendorf, D. Elmore, D.A. Haukos, A.M. Tanner, and S.A. Carleton. 2020. Effects of anthropogenic features on lesser prairie-chicken (*Tympanuchus pallidicinctus*) long-distance movements. *Ecosphere* 11(9): e03202.
- Earl, J.E.** 2019. Evaluating the assumptions of population projection models used for conservation. *Biological Conservation* 237: 145-154.
- Bampoh, D., J.E. Earl, and P.A. Zollner. 2019. Examining the relative influence of animal movement patterns and mortality models on the distribution of animal transported subsidies. *Ecological Modelling* 412: 108824.
- Duffus, A., T. Garner, R. Nichols, J. Standridge, and **J.E. Earl**. 2019. Modelling ranavirus transmission in populations of common frogs (*Rana temporaria*) in the United Kingdom. *Viruses* 11(6): 556.
- Smith, L.L., A.L. Subalusky, C.L. Atkinson, **J.E. Earl**, D.M. Mushet, D.E. Scott, S.L. Lance, and S.A. Johnson. 2019. Biological connectivity of seasonally ponded wetlands across spatial and temporal scales. *Journal of the American Water Resources Association*

55(2):334-353.

10. **Earl, J.E.**, S. Nicol, R. Wiederholt, J.E. Diffendorfer, D. Semmens, D.T.T. Flockhart, B.J. Mattsson, G. McCracken, D.R. Norris, W. Thogmartin, and L. Lopez-Hoffman. 2018. Quantitative tools for implementing the new significant portion of the range definition for the Endangered Species Act. *Conservation Biology* 32(1):35-49.
11. Bieri, J., C. Sample, W.E. Thogmartin, J.E. Diffendorfer, **J.E. Earl**, R.A. Erickson, P. Federico, D.T.T. Flockhart, S. Nicol, D. Semmens, T. Skraber, R. Wiederholt, and B.J. Mattson. 2018. A guide to calculating habitat-quality metrics to inform conservation of highly mobile species. *Natural Resource Modelling* 31(1):e12156.
12. Sample, C., J. Fryxell, J. Bieri, P. Federico, **J.E. Earl**, R. Wiederholt, B.J. Mattsson, D.T.T. Flockhart, S. Nicol, J.E. Diffendorfer, W.E. Thogmartin, R.A. Erickson, and D.R. Norris. 2018. A general modeling framework for describing spatio-temporal population dynamics. *Ecology and Evolution* 8(1): 493-508.

Manuscripts in Revision at Journals (* indicates Louisiana Tech MS student.)

Magee-Christian, R.E.*, and **J.E. Earl**. In Revision. Effects of leaf litter species on Cope's gray treefrog oviposition site selection. *Ichthyology and Herpetology*.

Earl, J.E., R.A. Cram*, and R.E. Magee-Christian*. In Revision. Effects of leaf litter species and chemistry on aquatic insect habitat selection. *Freshwater Science*.

Grants- To date, I have been Principal Investigator on extramural grants totaling **\$181,423** with **\$82,000** of that going directly to graduate and undergraduate students. I have also brought in \$23,333 in donations from a donor who greatly values the work done in my research lab. I have applied for an additional 7 grants that were not funded, but the reviews have provided valuable feedback for me to revise future proposals.

Funded Extramural Proposals

Louisiana Board of Regents RCS Grant (**\$108,711**): 2021-2024

“Effects and mechanisms of biological diversity on community assembly” [PI]

LDWF State Wildlife Grant (**\$72,712**): 2018-2021

“Status of Southern Crawfish Frogs in Louisiana” [PI, D.B. Shepard co-PI]

Pending Extramural Proposals

NSF EAGER (\$197,023): to be submitted May 27, 2022

“Effects of Leaf Diversity on Aquatic Insect Colonizer Diversity” [PI]

Selected Unfunded Proposals

NSF CAREER (\$791,386): submitted July 2021 (will be resubmitted in 2022)

“Does diversity beget diversity? Effects and consequences of species, functional, and phylogenetic diversity during community assembly” [PI]

LDWF State Wildlife Grant (\$156,038): submitted March 2019

“Assessment of Management Practices on Restoration of Shortleaf Pine-Oak-Hickory Habitat Using Multi-Taxa Monitoring” [co-PI, with T. Maness as PI and H. Adams, N. Clay, and D. Shepard as co-PIs]

Selected Service Activities

I enjoy my time doing service to the university, community, and profession. My service activities all relate to student success, environmental sustainability, and/or supporting diverse and inclusive educational and research communities both at Louisiana Tech and across the country.

Time	Activity
<i>University</i>	
Sept. 2017 - Present	Served on 10 Master's committees and 1 Honor's Thesis committee for Louisiana Tech students and as an external committee member on 1 master's committee for Oklahoma State University and 1 PhD committee for Purdue University.
Oct. 2017 – Feb. 2020	Created Environmental Movie Night, where I showed an environmental documentary on campus once a month with popcorn. (This was paused due to COVID.)
2018 - Present	Served on Environmental Science Curriculum Committee and the Louisiana Tech Sigma Xi Travel award committee
Sept. 2019 - Present	Served on Behavioral Standards Committee.
Sept. 2019 - Present	Faculty advisor for student group Students for Environmental Action.
2019 - Present	Meet with Environmental Science and Biology prospective students and their parents.
2019, 2022	Judged student posters at ANS Day.
2022	Served on Zumwaldt Scholarship Committee, evaluating applications
<i>Community</i>	
2018 - Present	President of Green Ruston, local environmental organization.
2018	Submitted comments on new proposed rule for the Endangered Species Act.
2018	Proposal for a Louisiana Environmental Education Commission teacher training was accepted.
2019 - Present	Science Olympiad- developed tests, administered and graded Division B and C events. 2019: Herpetology, Water Quality; 2020: Water Quality; 2022: Green Generation, Dynamic Planet.
2019 - 2020	Pen pal to a middle school science student as part of the Letters to a Prescientist program.
<i>Profession</i>	
2017 - Present	Reviewed journal articles for 27 papers in 16 different journals in my field and 4 National Science Foundation proposals.
2017-2021	Served on the Board of Governors for the American Society of Ichthyology and Herpetology
2018 - Present	Served as judge for student presentation awards at International and Regional Meetings: the Siebert Award in Conservation (oral) at the Joint Meeting of Ichthyology and Herpetology (2018, 2019), the Buell/Braun Award (oral) for the Ecological Society of America (2018), Best Student Poster for the Southeastern Partners in Amphibian and Reptile Conservation (2020).
2018 - Present	Served on the committee for Diversity, Equity, and Inclusion for the Herpetologists' League.
2020 - Present	Serve as a Review Editor for the journal Frontiers in Ecology and Evolution.
2022	Reviewed and provided comments for the graduate student EE Williams research grant, Herpetologists' League.