**Gretchen A. Gerrish**

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**Education and Employment:**

2019 – present: Director Trout Lake Station at University of Wisconsin – Madison, WI

2016 – 2019: Associate Professor at University of Wisconsin - La Crosse, WI

2010 – 2016: Assistant Professor at University of Wisconsin – La Crosse, WI

2007 – 2010: Assistant Director of the University of Notre Dame Environmental Research Center (UNDERC) West Program. Notre Dame, IN

2001 – 2008: Ph.D. in Ecology and Evolutionary Biology at Cornell University: Ithaca, NY

1999 – 2001: M.S. in Natural Resources and Environmental Sciences at University of Illinois: Urbana - Champaign, IL

1994 – 1998: B.A. in biology with honors at Lawrence University: Appleton, WI

**Peer Reviewed Publications *(\*undergraduate and \*\* graduate student collaborators)*:**

\*\*Reda, N., J.G. Morin, E. Torres, V. Swaroch, A. Cohen, G. A. Gerrish, (accepted 2019) A new

bioluminescent ostracod genus in the Myodocopida (Cypridinidae), including one new species from Belize and six described species from Panama. Zoological Journal of the Linnean Society

\*\*Appel, D.S., G.A. Gerrish, E.J. Fisher, M.W. Fritts (accepted with revision 2019). Zooplankton

sampling in riverine systems: A gear comparison in the Upper Mississippi River. River Research and Applications.

\*\*Mello, H., G.A. Gerrish (revising for resubmission). Diversity of freshwater bryozoans in the

Upper Mississippi River watershed. American Midland Naturalist.

\*\*Hensley, N., T. Rivers, \*\*E. Ellis, G.A. Gerrish, T. Oakley (2019). Recent history of enzyme

identity and implementation shapes the evolution of bioluminescent courtship signals in sea fireflies. Proc. R. B. 286:20182621 doi.org/10.1098/ rspb.2018.2621

\*Conley, N, G.A. Gerrish (2018) Testing for multiple paternity in broods of *Photeros*

*annecohenae* (Myodocopida: Cypridinidae). Journal of Crustacean Biology. doi.org/10.1093/jcbiol/ruy101

\*\*Ryan, S., T. King-Heiden, C. Belby, R. Haro, \*\*J. Ogorek, G.A. Gerrish (2018) The role of

macroinvertebrates in the distribution of lead (Pb) within an urban marsh ecosystem. Hydrobiologia. doi.org/10.1007/s10750-018-3785-7

\*Olson, A., T. \*\*Cyphers, G.A. Gerrish, C. Belby, T. King-Heiden (2018). Using morphological,

behavioral and biochemical biomarkers in zebrafish to assess the toxicity of lead-contaminated sediments from an urban wetland. Journal of Toxicology and Environmental Health. doi.org/10.1080/15287394.2018.1506958.

\*McCloskey, M, \*J. Scheil, G. Sandland and G.A. Gerrish (2017) Display density variation in

luminscent syllid courtship (*Odontosyllis* sp.) across shallow marine substrate types. Gulf and Caribbean Research 28:40-45

Fleischner T.L, R.E. Espinoza, G.A. Gerrish, H.W. Greene, R.Wall-Kimmerer, E.A.

Lacey, S. Pace, J.K. Parrish, H. Swain, S. Trombulak, S. Weisberg, D.W. Winkler, and L. Zander (2017) Teaching biology in the Field: Importance, Challenges and Solutions. Current Biology 67(6):558-567.

Gerrish G.A. and J.G. Morin (2016) Living in sympatry: Multi-axis differentiation in

courtship behaviors of bioluminescent marine ostracods. Marine Biology 163-190. DOI 10.1007/s00227-016-2960-5

Belby C., C.R. Perez\* and G.A. Gerrish (2015) Understanding ecosystem change in

Upper Mississippi Rivr backwaters through geochemical and biological analyses of sediment cores. River Systems fast track at: DOI 10.1127/rs/2015/0102

Gerrish G.A., A. Sanderfoot, T. King-Heiden, M. Abler, and K.E. Perez (2015) Building

the impetus for change: an across curriculum initiative in Biology. Journal of College Science Teaching. 44(4): 28-35.

Gerrish G.A., J.G. Morin, T.J. Rivers and Z. Patrawala\*. (2009) Darkness as an

ecological resource: the role of light in partitioning the nocturnal niche. Oecologia 160(3): 525-536.

Gerrish G.A. and J.G. Morin. (2008) The life cycle of a bioluminescent marine ostracod,

*Vargula annecohenae* [Cypridinidae, Myodocopida]. Journal of Crustacean

Biology 28(4):669-674.

Rypien K.L., J. Anderson, J.A. Andras, R.W. Clark, G.A. Gerrish, J.T. Mandel, M.L.

Nydam and D.K. Riskin. (2007) Students unite to create State of the Planet course. Nature 447: 7146.

Gerrish G.A. and C.E. Cáceres. (2003) Genetic versus environmental influence on

pigment variation in the ephippia of *Daphnia pulicaria*. Freshwater Biology 48: 1-12.

Frost T.M, J.P. Descy, B.T. DeStasio, G. Gerrish, J. Hood, J.P. Hurley and A.L. St.

Amand. (2000) Evaluations of phytoplankton communities using varied techniques: a multimedia comparison of lakes in northern Wisconsin, U.S.A. Verh. Internat. Verein. Limnol. 27: 1023-1030

**Select Recent Presentations:**

2019 Gerrish G.A. Flashy speciation in bioluminescent marine ostracods. Invited speaker CSU Northridge, Northridge, CA (oral)

2018 Appel D., G.A. Gerrish, E. Fisher, M. Fritts. Comparison of zooplankton sampling gear in the Upper Mississippi River (oral)

2018 Fisher E., D. Appel, G.A. Gerrish, M. Fritts. Assessing zooplankton community dynamics in the Upper Mississippi River (poster)

2017 Gerrish G.A. Lights, Cameras, Sex and a Lawrence Alumni: Where Science and Media Collide. Invited speaker Lawrence University, Appleton, WI (oral)

2017 \*\*Reda, N., J.G. Morin, E. Torres, A. Cohen, G. A. Gerrish. A new bioluminescent ostracode genus (Myodocopida: Cypridinidae). International Symposium on Ostracoda, University of California Santa Barbara, Santa Barbara, CA (oral)

2017 \*Aguirre, A. G.A. Gerrish. Applying micro computed tomography (CT) imaging to the description of new luminescent ostracod species International Symposium on Ostracoda, University of California Santa Barbara, Santa Barbara, CA (poster)

2017 Gerrish, G.A., \*\*E. Ellis, E. Torres, \*\*N. Hensley, T. Oakley, T. Rivers, J.G. Morin. Comparative trait differentiation in the bioluminescent courtship displays of ostracods in time and space. International Symposium on Ostracoda, University of California Santa Barbara, Santa Barbara, CA (oral)

2017 \*Korger, S. G.A. Gerrish. Comparing population genetic structure of luminescent ostracods in sea grass vs. coral habitats. International Symposium on Ostracoda, University of California Santa Barbara, Santa Barbara, CA (poster)

2017 Torres, L., R.M. Serrano\*, G.A. Gerrish. Diversity of bioluminescent signaling ostracod crustaceans in Puerto Rico coral reef habitats. International Symposium on Ostracoda, University of California Santa Barbara, Santa Barbara, CA (poster)

2017 Bunbury, J., G.A. Gerrish, C. Belby. Freshwater ostracode response to anthropogenic disturbance inferred from a backwater lake of the upper Mississippi River, U.S.A. International Symposium on Ostracoda, University of California Santa Barbara, Santa Barbara, CA, (poster)

2017 \*\*Hensley, N., G.A. Gerrish, T.J. Rivers, T. Oakley. Illuminating genotype - phenotype connections in the bioluminescent mating displays of sea fireflies (Cypridinidae International Symposium on Ostracoda, University of California Santa Barbara, Santa Barbara, CA (oral)

2017 Gerrish G.A., E. Torres, \*\*E. Ellis, \*\*N. Hensley, T. Oakley, T.J. Rivers, J.G. Morin Comparative trait differentiation in the bioluminescent courtship displays of ostracods within and among species assemblages throughout the Caribbean. Gordon Research Conference : Speciation, La Barga, Italy (poster)

2016 King-Heiden, T., C. Belby, G.A. Gerrish. Persistent lead contamination in an urban

marsh: The legacy of lead shot. 7th SETAC World Congress, Society of Environmental Toxicology and Chemistry, Orlando, FL (oral)

2016 Gerrish G.A., C. Belby, T. King-Heiden, Impact of legacy lead contamination on an urban marsh. Mississippi Research Consortium, La Crosse, WI (oral)

2015 Belby C., \*C.R. Perez and G.A. Gerrish. Understanding ecosystem change in Upper Mississippi River backwaters through geochemical and biological analyses of sediment cores. International Society of River Systems: La Crosse, WI (oral)

2015 \*\*Ryan S., G.A. Gerrish, C. Belby, R. Haro and T. King-Heiden. The mobilization of lead from lead shot to macroinvertebrates in a riparian wetland. International Society of River Systems: La Crosse, WI (poster)

**Select Popular Media Contributions and Other Publications:**

2017 Invited Panelist – Making of *David Attenborough's Light on Earth* University of California Santa Barbara.

2016 *David Attenborough's Light on Earth* released on BBC in UK (May 2016) (Featured researcher and scientific consultant)

2016 You light up my world, *Photeros annecohenae*. Smithsonian Blog: No Bones. (Scientific consultant and image contribution)

2016 Into the Field. Orion Magazine. (Intellectual contributor and quoted)

2016 The organisms that glow brighter than any other. BBC Earth. (Scientific consultant and quoted)

2016 These creatures use glowing vomit to attract mates - and it's utterly beautiful. Richard Dawkins Foundation. (Image contribution)

2016 Take it outside: Students benefit from out-of-the-classroom experiences. UW-L College of Science and Health Newsletter. (Author)

2015 Students join illuminating research in the deep sea. UW-L College of Science and Health Newsletter. (feature)

2015 Diving In, Students join in illuminating research in the deep sea. UW-L Alumni Magazine the Lantern. (feature)

2014 Mayflies hatch in La Crosse. WKBT News 8000.com. (interview)

**Post-Graduate Funding Received:**

*External*

2018-2019 (PI) RET: Collaborative learning through field research on luminescent ostracods (National Science Foundation Supplement)

2018 (PI) WiscAMP, undergraduate research support for Brianne Theodore (National Science Foundation Supplement)

2018 (PI) WiscAMP, undergraduate research support for Bria Theodore (National Science Foundation Supplement)

2017-2018 (PI) WiscAMP, undergraduate research support for Nathan Conley (National Science Foundation Supplement)

2017-2019 (PI) Upper Mississippi River Watershed Asian Carps Early Detection and Rapid Assessment Surveillance Program: Collaborative Zooplankton Community Dynamics Graduate Research Program: (US Fish and Wildlife Service -)

2014-2019 (PI) NSF-DEB-Phylogenetics and Systematics: RUI: Collaborative

Proposal: Evolutionary origins of bioluminescence and complex mating signals: Phylogenomics of Cypridinidae (Ostracoda) (National Science Foundation)

2012-2015 (Co-PI) EPA Urban Waters Small Grant: Monitoring and Assessment of Legacy Lead Contamination in the La Crosse River Marsh (Co-PI)

2012 (PI) National Great River Research and Education Center: Resurrection ecology: measuring ecosystem recovery to disturbance using zooplankton egg banks (PI)

*Internal*

2018 (Co-PI) International Development Fund: Field Course Development in Moorea

2018 (Co-PI) Curricular Revision: Organismal Biology Lab Updates

2013-2014 (PI) Curricular Redesign Grant: Organismal Biology Redesign

2012 (Co-PI) UWL Rivers Studies Center: Mapping the distribution of lead contamination in the La Crosse River Marsh

2012 (PI) UWL Faculty Research Grant: Bioluminescent ostracod divergence: the role of habitat isolation

2012 (PI) UWL Development Fund: Marine Biology at UWL: you better Belize it!

2012 (Co-PI) Curricular Redesign Grant: Evolution across the biology curriculum

2011 (PI) UWL Faculty Research Grant: A systematic revision of bioluminescent Caribbean ostracods (Cypridinidae)

**Awards and Elected Positions:**

2016 President of the Mississippi Research River Consortium

2016 UW-L Student Employment Supervisor of the Year.

2016 State of Wisconsin Student Employment Supervisor of the Year

2015 Vice President of the Mississippi River Research Consortium

**Teaching Experience:**

Present: *Freshwater Invertebrates* 18 student lab/lecture course covering zooplankton, aquatic

insects,etc.

2015 - present: *Evolution* lecture contains 30-35 upper level students and helps students

resolve misconceptions and establish skills for interpreting ultimate and proximate tests of evolutionary mechanisms.

2011 - present: *Organismal Biology* lecture (and frequent lab) contains 72 first and

second year students/semester. Learning objectives include phylogenetics, evolution of development, data handling, and organismal diversity (plant, animal and fungal).

2008 - present: *Marine Biology* enrolls 20-35 upper level undergraduate or graduate

students and runs in spring semesters of odd years. It builds student knowledge of biochemistry, ecology and biodiversity within the marine system.

2008 - present: *Marine Symbioses* field course in Belize runs in even-numbered years

and enrolls 18 students. Students travel to Belize to get hands-on exposure to tropical forest and coral reef habitats. The 16 day trip emphasizes natural history and research. Students design and conduct small group research projects.

2010 - 2014: *General Biology* lecture (and occasional lab) contains 55-105 first year

students/semester and introduces students to cellular, organismal and ecosystem biology.

2010 - present: *Capstone* in Biology contains 20 senior students/semester and trains

students in critical thinking, paper writing, and professional presentation of science.

2007 - 2010: *Practicum in Field Research* enrolled 8 second or third year students. Students

conducted research at a field station in Montana and spent 10 weeks learning about forestry, aquatic science, grassland ecology, and Native American archaeology on the Salish and Kootenai Reservation.

2006 - 2007: *State of the Planet* at Cornell University enrolled 300+ students/semester. I

worked with peer graduate students to develop this course that brought in faculty from across departments at Cornell University to speak about threats to the planet. A description of the developmental process was published in Nature (2007)

1999 - 2006: TA in limnology, aquatic invertebrates, ecology, experimental design and

analysis (biological statistics), stream ecology, and non-majors evolution.

**Service and Synergistic Activities**

***Promoting Field Instruction***: I participated in a National Science Foundation working group entitled ‘Decline in Field Studies’ (April 2016: https://sites.google.com/a/ prescott.edu /decline\_in\_field\_studies\_ workshop1/home) hosted at Prescott College in Arizona to discuss strategies for perpetuating field studies into the future. Based on the outcomes of that workshop, I am collaborating to build resources, risk management documentation, instructional and organizational materials, and assessment tools to facilitate greater (and easier) faculty development of field instruction.

***Chaired the University undergraduate research committee:*** This committee is responsible for review and funding decisions of undergraduate research grants across all departments at the University.

***Outreach:*** I am involved at Summit Elementary School (which employs an environmentally focused curriculum) and have led multiple sessions at the local frog pond introducing students to the natural world. I also recently led a science outreach event where students presented work and implemented interactive displays with children at the local EcoPark for Earth Day.

***First Year Research Experience (NSF-FYRE) mentoring faculty:*** Through the McNair Scholars program, under-represented scholars entering the STEM fields at UWL have the opportunity to enter as a learning group. After spending time with the students prior to fall semester, the students are placed into my general biology lecture section. I worked closely with these students, their lab instructor and the McNair office as they progress through their first and second level biology coursework.

***Implementation of evolution across the curriculum teaching:*** In funded collaboration with colleagues in the UWL biology department, we transformed our core curriculum’s coverage of evolution content to be aligned with national standards for biology education. By integrating evolutionary content in a systematic way across our core courses, we emphasize the foundational aspect of evolution to the study of biology and ensure that all biology majors are taught the key concepts in evolutionary biology.

***Chaired the 200 level curricular redesign:*** I led a major departmental curriculum redesign from 2011-2013 in which we restructured our core classes to offer a single (instead of 3 option) path through the 200 level of our curriculum. All 200 level instructors (11 senior and junior faculty) were involved in generating the vision and materials for the new class. The course was first implemented in Fall 2013 and assessment indicates that we show gains on most of our targeted objectives.