

# Petra Kranzfelder, PhD

---

Dept. of Biology Teaching and Learning  
3-133 Molecular & Cellular Biology  
Minneapolis, MN, 55455

email: kranz081@umn.edu  
Phone: (763) 318-0840

## APPOINTMENTS

---

**Postdoctoral Associate** August 2017-Present  
University of Minnesota  
Department of Biology Teaching and Learning  
Postdoctoral advisor: Dr. Abdi Warfa

**Graduate Research & Teaching Assistant** August 2009-2017  
University of Minnesota  
Department of Entomology  
Advisor: Dr. Leonard C. Ferrington, Jr.

**Visiting Fulbright Scholar** August 2014-2015  
Norwegian University of Science and Technology  
Department of Natural History  
Advisors: Dr. Torbjørn Ekrem & Dr. Elisabeth Stur

## RESEARCH INTERESTS

---

Undergraduate STEM education and aquatic insect ecology

## EDUCATION

---

- PhD **University of Minnesota**, Entomology, 2017  
Dissertation: *Cumulative Effects of Coastal Watershed Land Use on Chironomidae Communities of Neotropical Estuaries*, Advisor: Leonard C. Ferrington, Jr.
- MS **University of Minnesota**, Entomology, 2012  
Thesis: *Comparison of Emergence and Taxonomic Composition of Chironomidae (Insecta: Diptera) in Tortuguero National Park, Costa Rica*, Advisor: Leonard C. Ferrington, Jr.
- BA **Colorado College**, Biology (major), Spanish & Central American Culture and Society (minors), 2009

## TEACHING EXPERIENCE

---

- 2018** **University of Minnesota**  
*Foundations of Biology for Biological Sciences Majors, Part I*  
Co-taught large enrollment ( $N = 165$  students) introductory college biology course. Specifically, taught the evolution units using team- and inquiry-based instruction.  
Instructor of Record
- Iceland: Landscapes, Natural Resources and Environmental Management*  
Co-taught small enrollment ( $N = 16$  students) upper level college environmental science course in Iceland that focused on the interactions between landscapes, natural resources availability, and environmental management.  
Co-Instructor

*Foundations of Biology for Biological Sciences Majors, Part I*

Taught large enrollment ( $N = 175$  students) introductory college biology course. Specifically, taught the topic of “Speciation” using team- and inquiry-based instruction.

Guest Lecturer

**2017**

**University of Minnesota**

*Environmental Science & Society*

Taught small enrollment ( $N = 10$  students) introductory college environmental science course. Specifically, taught about the history of USA water quality regulations and water pollutants using an interactive watershed game.

Guest Lecturer

**2016**

*Iceland: Landscapes, Natural Resources and Environmental Management*

Co-taught small enrollment ( $N = 16$  students) upper level college environmental science course in Iceland that focused on the interactions between landscapes, natural resources availability, and environmental management.

Co-Instructor

*Insects, Aquatic Habitats, and Pollution*

Taught small enrollment ( $N = 6$  students) upper level college entomology course. Specifically, taught on aquatic insect functional feeding groups and the river continuum concept.

Guest Lecturer

**2015**

**Northern State University**

*Entomology*

Taught small enrollment ( $N = 12$  students) upper level college entomology course. Specifically, taught about the differences of using morphological versus molecular tools for species identification of aquatic macroinvertebrates.

Guest Lecturer

*Aquatic Ecology & Watershed Management*

Taught small enrollment ( $N = 12$  students) upper level college ecology course. Specifically, developed a mock community meeting where students considered economical, societal, and environmental impacts of banana plantations on aquatic ecosystems.

Guest Lecturer

**2014**

**University of Minnesota**

Teaching Assistant for *Aquatic Insects* and *Environmental Science & Society*

**2013**

**University of Minnesota**

*Insects, Aquatic Habitats, and Pollution*

Taught small enrollment ( $N = 6$  students) upper level college entomology course. Specifically, taught on aquatic insect functional feeding groups and the river continuum concept.

Guest Lecturer

Teaching Assistant for *Environmental Science & Society, Forest & Shade Tree Entomology, Ornamental & Turf Entomology, and Veterinary Entomology*

**2012**      **University of Minnesota**  
Teaching Assistant for *Environmental Science & Society, Forest & Shade Tree Entomology, Ornamental & Turf Entomology, and Veterinary Entomology*

**2011**      **Saint Olaf College**  
*Invertebrate Biology*  
Taught small enrollment ( $N = 28$  students) upper level college biology course. Specifically, taught on the methods and results of study on chironomid emergence patterns from brackish waters.  
Guest Lecturer

**University of Minnesota**  
Teaching Assistant for *Forest & Shade Tree Entomology, Ornamental & Turf Entomology, and Veterinary Entomology*

**2010**      **University of Minnesota**  
*Freshmen Orientation to Environmental Science, Policy, and Management*  
Taught small enrollment ( $N = 20$  students) introductory college environmental science course. Specifically, taught a 6-hour field lab on aquatic macroinvertebrates field collection methods and basic stream ecology.  
Guest Lecturer

#### **REFEREED PUBLICATIONS (N=10)**

---

**2018:** Kranzfelder, P. and L.C. Ferrington, Jr. Chironomidae (Diptera) Species Diversity of Estuaries Across a Land Use Gradient on the Caribbean Coast of Costa Rica. *Revista de Biologia Tropical*. 66(3): 1118-1134.

**2017:** Kranzfelder, P., T. Ekrem, and E. Stur. DNA barcoding for identification of insect skins: test case on chironomid pupal exuviae. *Journal of Insect Science*. 17(6): 1-7.

**2016:** Kranzfelder, P., T. Ekrem, and E. Stur. Trace DNA from Insect Skins: A Comparison of Five Extraction Protocols and Direct PCR on Chironomid Pupal Exuviae. *Molecular Ecology Resources* 16(1): 353-363.

**2016:** Kranzfelder, P. and L.C. Ferrington, Jr. Temporal and Spatial Variability of Chironomidae (Diptera) Species Emergence in a Neotropical Estuary. *Freshwater Science*. 35(2): 631-643.

**2016:** Anderson, A.M., P. Kranzfelder, A. Egan, and L.C. Ferrington, Jr. The Chironomidae (Insecta: Diptera) of San Salvador Island: A Preliminary Survey and Look to the Future. *Proceedings of the 15<sup>th</sup> Symposium of the Natural History of The Bahamas*. p. 13-21.

**2015:** Kranzfelder, P., A.M. Anderson, A.T. Egan, J.E. Mazack, R.W. Bouchard Jr., M.M. Rufer, and L.C. Ferrington, Jr. Use of Chironomidae Surface-Floating Pupal Exuviae as a Rapid Bioassessment Protocol for Water Bodies. *Journal of Visualized Experiments (JoVE)* 101: e52558.

**2015:** Kranzfelder, P. and L.C. Ferrington, Jr. Characterization of Chironomidae (Diptera) Surface-Floating Pupal Exuviae Sample Sort Time from Coastal Tropical Aquatic Systems. *Environmental Monitoring and Assessment* 87(3): 1-8.

**2014:** Mazack, J.E., P. Kranzfelder, A.M. Anderson, R.W. Bouchard, and L.C. Ferrington, Jr. 2014. Survivorship and Longevity of Adult *Diamesa mendotae* Muttkowski, 1915 (Diptera: Chironomidae) at Controlled, Sub-Freezing Temperatures. *Aquatic Insects* 36(1): 35-42.

**2014:** Anderson, A.M., P. Kranzfelder, A. Egan, and L.C. Ferrington, Jr. 2014. A Survey of Neotropical Chironomidae (Diptera) on San Salvador Island, Bahamas. *Florida Entomologist* 97(1): 304-308.

**2013:** Anderson, A.M., P. Kranzfelder, R.W. Bouchard Jr., and L.C. Ferrington Jr. Survivorship and Longevity of *Diamesa mendotae* Muttkowski (Diptera: Chironomidae) Under Snow. *Journal of Entomological and Acarological Research*. 45:e6.

### **REFEREED PUBLICATIONS UNDER REVIEW**

---

Kranzfelder, P., A.T. Lo, M.P. Melloy, L.E. Walker, and A.R. Warfa. Instructional Practices in Reformed Undergraduate STEM Learning Environments: A Study of Instructor and Student Behaviors in Biology Courses. Under review for *International Journal of Science Education*.

Kranzfelder, P., J.M. Corcoran, L. P. Rampi, J.F. Knight, L.C. Ferrington, Jr. Land Use and Land Cover Change Detection of Six Watersheds on the Caribbean Coast of Costa Rica with Implications for Estuarine Monitoring. Under review for *Journal of Coastal Conservation*.

### **EXTENSION PUBLICATIONS**

---

**2015:** Kranzfelder, P. Is there DNA in Insect Skins? *Evolusjon - Evolution!* Museum of Natural History and Archaeology, Norwegian University of Science and Technology (<http://blogg.vm.ntnu.no/evolusjon/en/2015/01/30/is-there-dna-in-insect-skins/>).

**2012:** Kranzfelder, P. Identification Guide and Key to the Chironomid Pupal Exuviae of Tortuguero National Park, Costa Rica (English & Spanish). *Chironomidae Research Lab*, University of Minnesota (<http://midge.cfans.umn.edu/research/taxonomic-guides/>).

### **SCHOLARSHIPS, GRANTS, AND AWARDS**

---

<b>2018</b>	College of Biological Sciences Postdoc Award for Teaching and Mentoring College of Biological Sciences Postdoc Symposium, second place winner of the 3-minute lightning talk
<b>2017-2018</b>	Biology Teaching and Learning Professional Development Grant, \$2,500
<b>2016</b>	Morris and Elaine Soffer Rockstein Fellowship for Ph.D. students, \$2,000
<b>2015-2016</b>	Doctoral Dissertation Fellowship, \$23,000
<b>2015</b>	Systematics Fund Award, Society for Freshwater Science, \$600
<b>2014-2015</b>	Fulbright Exchange Program, Norwegian University of Science and Technology, \$16,000 Torske Klubben Graduate Fellowship, \$15,000
<b>2014</b>	Marion Brooks Wallace Graduate Fellowship, \$4,500 Thesis Research Travel Grant, \$1,550
<b>2013</b>	Alexander and Lydia Anderson Fellowship, \$3,000 Dayton-Wilkie Natural History Fund, \$1,500

- 2012** Master's, Professional, or Doctoral International Research Grant, \$7,200  
Dayton-Wilkie Natural History Fund, \$1,500
- 2011** Dr. Alan G. Peterson Fellowship, \$1,000

## **PROFESSIONAL DEVELOPMENT**

---

### *Facilitated*

**2018**

University of Minnesota, Biology Teaching and Learning  
Classroom Observation Protocol for Undergraduate STEM (COPUS) Training  
Facilitated training for international research team using WebEx video conferencing

University of Minnesota, College of Biological Sciences  
Pre-Semester Teaching Assistant (TA) Workshop  
Facilitated TA training on inquiry-based laboratories and inclusive-teaching practices

### *Attended*

**2018**

University of Minnesota, Boreas Leadership Program  
Speaking Science Improv Series Participant (Improving Science Communication)

Yale Center for Teaching and Learning  
Summer Institutes on Scientific Teaching Fellow

Society for the Advancement of Biology Education Research  
Data Science in R Workshop Participant

Society of Freshwater Science  
Inclusive and Accurate Approaches for Teaching Sex and Gender in Biology  
Workshop Participant

**2015-2018**

University of Minnesota, Center for Educational Innovation  
Teaching Enrichment Workshop Series Participant

University of Minnesota, Office of Equity and Diversity  
Equity and Diversity Certificate Program Participant

**2017**

University of Minnesota, Center for Educational Innovation  
Post-Doc Professional Development Program Participant

**2014**

Norwegian University of Science and Technology  
Norwegian for Foreigners Level 1 Course Participant

**2013**

Organization for Tropical Studies, La Selva Biological Station  
Latin American DNA Barcoding Applied to Aquatic Invertebrates Workshop  
Participant

University of Minnesota, Center for Educational Innovation  
Teaching and Learning in Active Learning Classrooms Certificate Program  
Participant

**2012**

University of Minnesota, Center for Educational Innovation  
Preparing Future Faculty Program Participant (Teaching in Higher Education)

## SELECT PRESENTATIONS

\*Presentation by undergraduate student mentored, †Invited presentation

---

- 2018** Society for the Advancement of Biology Education Research, Minneapolis, Minnesota  
*The Classroom Discourse Observation Protocol (CDOP) for Undergraduate STEM Classrooms: A New Instrument to Characterize Teacher Discourse Moves*
- Society for Freshwater Science Annual Meeting, Detroit, Michigan  
*Instructional Practices in Reformed Undergraduate STEM Learning Environments: A Study of Instructor and Student Behaviors in Biology Courses*
- University of Minnesota Undergraduate Research Symposium, Minneapolis, Minnesota  
*\*Teacher-Initiated Discourse Moves in Reformed Undergraduate STEM Learning Environments*
- University of Minnesota Undergraduate Research Symposium, Minneapolis, Minnesota  
*\*Instructional Practices in Reformed Undergraduate STEM Learning Environments: A Study of Instructor and Student Behaviors in Biology Courses*
- 2017** Carnegie Mellon Natural History Museum, Pittsburgh, Pennsylvania  
†*A Summary of Five Years of InvertNet at the University of Minnesota Insect Collection*
- Society for Freshwater Science Annual Meeting, Raleigh, North Carolina  
*Does Chironomid Species Diversity Differ Across a Land Use Gradient of Estuaries on the Caribbean Coast of Costa Rica?*
- 2016** St. Olaf College, Northfield, Minnesota  
†*From River to Sea: Impacts of Land Use on Water Quality of Estuaries in Costa Rica*
- Society for Freshwater Science Annual Meeting, Sacramento, California  
*Remote Sensing of Land Cover Change in Tropical Watersheds Predicts Differences in Water Quality along Caribbean Coast of Costa Rica*
- 2015** International Barcode of Life (iBOL) Conference, Guelph, Canada  
*Barcoding of Trace DNA in Chironomid Pupal Exuviae Reveals Quality Differences in DNA Extraction Protocols*
- Norwegian University of Science and Technology, Museum of Natural History and Archaeology, Trondheim, Norway  
†*Barcoding of Trace DNA in Chironomid Pupal Exuviae Reveals Quality Differences in DNA Extraction Protocols*
- 2014** Norwegian University of Science and Technology, Museum of Natural History and Archaeology, Trondheim, Norway  
*Small Species with Big Sensitivity: Using DNA Barcoding to Identify Chironomidae (Diptera) and Enhance Biological Monitoring*

Joint Aquatic Sciences Annual Meeting, Portland, Oregon  
*Variability of Chironomidae (Insecta: Diptera) Emergence and Species Richness in a Neotropical Estuary*

- 2013** Society for Freshwater Science Annual Meeting, Jacksonville, Florida  
*Identification Guide to Chironomidae Surface-Floating Pupal Exuviae in Tortuguero National Park, Costa Rica*
- 2013** University of Minnesota Undergraduate Research Symposium, Minneapolis, Minnesota  
*\*From River to Sea: Relationship of Salinity Gradients on Aquatic Insect Community Composition in Neotropical Estuaries*
- University of Minnesota, Department of Entomology, Saint Paul, Minnesota  
*Off to Sea: Ecology, Physiology, and Evolution of Marine Insects*
- 2012** University of Minnesota, Environmental Science, Policy and Management Honor's Thesis Presentation, Saint Paul, Minnesota  
*\*Integration of Environmental Education into Spanish Language Learning at the University of Minnesota: A Case Study*
- Society for Freshwater Science Annual Meeting, Louisville, Kentucky  
*Variability of Chironomidae (Insecta: Diptera) Emergence in Neotropical Brackish Waters of Costa Rica*
- First Latin American Macroinvertebrate Congress, San José, Costa Rica  
*†Comparación de emergencia y la composición taxonómica de Chironomidae (Insecta: Diptera) en Parque Nacional Tortuguero, Costa Rica (in Spanish)*
- 2011** North American Benthological Society Annual Meeting, Providence, Rhode Island  
*†Emergence Composition and Taxonomic Richness of Chironomidae (Insecta: Diptera) in Laguna del Tortuguero and Quebrada, Tortuguero National Park, Costa Rica*
- 2010** Tortuguero National Park Community Meeting, National System of Conservation Areas, Tortuguero, Costa Rica  
*†Que podemos aprender de un insecto? La vida sostenible en Tortuguero (in Spanish)*
- North American Benthological Society and American Society of Limnology and Oceanography Annual Meeting, Santa Fe, New Mexico  
*Survivorship and Longevity of Diamesa Mendotae (Diptera: Chironomidae) Buried in Snow Banks*

## **LEADERSHIP AND SERVICE**

---

- 2018** National Association of Research in Science Teaching  
Annual Meeting Proposal Reviewer
- University of Minnesota, College of Biological Sciences  
Nature of Life Focus Scientist

University of Minnesota, Office of Undergraduate Education  
Undergraduate Research Symposium Judge

- 2017-2018** University of Minnesota, Office of Undergraduate Education  
Undergraduate Research Opportunities Program (UROP) Proposal Reviewer
- 2016-2018** Society for Freshwater Science  
Long-Range Planning Committee Member  
Meetings Code of Conduct Committee Member
- 2013-2018** Peer-Reviewer for *Dugesiana*, *Freshwater Biology*, *Hydrobiologia*, *Molecular Ecology Resources*, *Neotropical Biodiversity*, and *Revista de Biología Tropical*
- 2012-2018** Society for Freshwater Science  
Student Presentation Judge
- 2017** University of Minnesota, College of Biological Sciences  
Grand Challenge Curriculum Reviewer  
Welcome Week Lab Tour Guide
- 2016-2017** Society for Freshwater Science  
Instars Mentoring Program Fellowship Reviewer
- 2011-2017** University of Minnesota, Chironomidae Research Group  
Laboratory Manager  
Website Manager
- 2015-2016** Society for Freshwater Science  
Student Representative to the Board of Directors
- 2015** Society for Freshwater Science  
Contributing Writer to *In the Drift* Newsletter
- 2014-2015** Society for Freshwater Science  
President of Student Resources Committee
- 2014** University of Minnesota, Bell Museum of Natural History  
Saturday with a Scientist K-12 Science Educator
- WCCO-TV/CBS  
Expert Local Aquatic Entomologist
- 2012-2014** Society for Freshwater Science  
Chair of Undergraduate Travel Awards Committee
- 2010-2014** University of Minnesota, Insect Museum  
Science Educator
- 2010** University of Minnesota, Teaching SMART  
Science, Math, and Research Technology Education Coordinator



**2009-2010** University of Minnesota, Department of Entomology  
Secretary of FRENATAE Graduate Student Club

## **MENTORSHIP EXPERIENCE**

---

### **Visiting sabbatical faculty mentorship**

Jennifer Bankers-Fulbright, Augsburg University, 2018  
Marcos Garcia-Ojeda, University of California-Merced, 2018

### **Undergraduate mentorship**

Sagal Mohammed, University of Minnesota, 2018  
Ian Johnson, University of Minnesota, 2018  
Marin Melloy, University of Minnesota, 2017-2018  
Vinit Vaghani, University of Minnesota, 2018  
Lindsey Walker, University of Minnesota, 2017-2018  
Alexander Lo, University of Minnesota, 2017  
Hanna Lisa Leffever, Federal Rural University of Rio de Janeiro, 2015  
Katherine Kemmitt, University of Minnesota, 2014  
Jenna McCullough, University of Minnesota, 2013  
Miranda Roberts, Oakland University, 2012  
Jessica Miller, University of Minnesota, 2011  
Catherine DeGuire, University of Minnesota, 2010-2012  
Amy Maas, University of Minnesota, 2010-2011

## **PROFESSIONAL SOCIETY MEMBERSHIPS**

---

Entomological Society of America (ESA)  
Latin American Chapter of the Society for Freshwater Science (SFS)  
Macrolatinos@ (Latin American Freshwater Macroinvertebrate Group)  
National Association for Research in Science Teaching (NARST)  
Society for the Advancement of Biology Education Research (SABER)  
Society for Freshwater Science (SFS)

## REFERENCES

---

### **Abdi Warfa, PhD**

Assistant Professor, Department of Biology Teaching and Learning  
University of Minnesota  
5-210E Moos Tower, 515 Delaware Street SE  
Minneapolis, MN, 55455, USA  
Phone: (612) 986-5613  
Email: awarfa@umn.edu

### **Anita Schuchardt, PhD**

Assistant Professor, Department of Biology Teaching and Learning  
University of Minnesota  
5-210H Moos Tower, 515 Delaware Street SE  
Minneapolis, MN, 55455, USA  
Phone: (612) 986-5613  
Email: aschucha@umn.edu

### **Leonard C. Ferrington, Jr., PhD**

Professor, Department of Entomology  
University of Minnesota  
219 Hodson Hall, 1980 Folwell Avenue  
Saint Paul, MN, 55018, USA  
Phone: (651) 226-8519  
Email: ferri016@umn.edu

### **Ralph W. Holzenthall, PhD**

Professor, Department of Entomology  
University of Minnesota  
219 Hodson Hall, 1980 Folwell Avenue  
Saint Paul, MN, 55018, USA  
Phone: (612) 624-7728  
Email: holze001@umn.edu