

## Heather R.L. Lerner

Joseph Moore Museum Director, Associate Professor of Biology

### Education

August 2007 **Ph.D.** Ecology and Evolutionary Biology, University of Michigan, Ann Arbor  
 April 2003 **M.S.** Ecology and Evolutionary Biology, University of Michigan, Ann Arbor  
 May 1999 **B.A.** Biology, Magna cum laude, Bryn Mawr College; Bryn Mawr, PA

### Work Experience

2019–present **Research Fellow**  
*Knology (Formerly New Knowledge), New York City, NY*  
 NSF–Funded sabbatical research on the role of informal STEM learning centers as agents of social change.

2018–present **Museum Director, Associate Professor of Biology and Museum Studies**  
*Joseph Moore Museum, Earlham College, Richmond IN*

2011–2017 **Museum Director, Assistant Professor of Biology and Museum Studies**  
*Joseph Moore Museum, Earlham College, Richmond IN*

2017 **National Association of Interpretation Certified Interpretive Guide Trainer**

2016 **National Association of Interpretation Certified Interpretive Guide**

2016 **Recertification International Environmental Education Curriculum “Project Wet”**

2007–2011 **Postdoctoral Research Associate**  
*Smithsonian Institution, Washington D.C. and University of Maryland, College Park*  
 Co-advisors: Rob Fleischer and Helen James  
 Project: Molecular phylogenetics of Hawaiian songbird radiations

2007 **Bird Division Collections Assistant**  
*University of Michigan Museum of Zoology, Ann Arbor MI*

2006 **Genomic Diversity Laboratory Manager**  
*University of Michigan Museum of Zoology; Ann Arbor, MI*

2003–2006 **National Institutes of Health Genome Science Training Grant Trainee**  
*Center for Statistical Genetics, University of Michigan; Ann Arbor, MI*  
 Training at the interface of mathematics and biology, focusing on the use of computational methods for solving biological problems through coursework and seminars [Link](#)

1999–2001 **Wildlife and Wetland Biologist**  
*Wetlands Research Associates; San Rafael, CA*

1999 **Naturalist and Environmental Educator**  
*San Francisco Estuary Project; Oakland, CA*  
 “Project Wet” (environmental education) certified instructor

### Earlham Courses

**Biology and cross-listed Courses:** Ecological Biology with lab (BIOL 111); Evolution with lab (BIOL 451); Marine Biology Seminar (BIOL 471); Hawaiian Islands Biodiversity May Term (OFFC 399); Natural History Museum Curation with two labs (BIOL 240); Advanced Natural History Museum Curation with lab (MUSE 473, BIOL 342); Natural History Museum Collection Management with lab (BIOL/MUSE 123); Introduction to Natural History Museum Interpretation with lab (BIOL/MUSE 113); Museum Methods (BIOL

282); Education in Informal Settings with lab (BIOL/MUSE 133); Museum Preparation (BIOL 481); Independent Research (BIOL 486); Ford-Knight “Comparative Genomics of Harpy Eagles and Other Raptors” (BIOL 484)

**Museum Studies Courses (not cross-listed with BIOL):** Engaging Audiences with lab and National Association for Interpretation (NAI) certification (MUSE 214/215); Scientific Illustration (Art 481/MUSE 285); Advanced Web Communication for Natural History Museums (MUSE 243); Museum Studies Independent Study (MUSE 385); Museum Studies Internship (MUSE 481); Outreach Programming Independent Study (MUSE 485); Museum Marketing and Communication (MUSE 210)

**Museum Studies Applied Groups (4–20 students per team, weekly 3 hour meetings with additional 3 hour lab sessions):** Museum Fabrication Lab (2014-2018), Museum marketing and Communications (2013-2018), Live Animal Care (2012-2018), Collections Care (2012-2013), Outreach (2015-2018)

### Publications (\*undergraduate co-authors)

- Sorrows, E.\* and Lerner, H. R. L. (in prep). A Comparative Analysis of the Ecological Record of Indiana and Illinois from Avian Specimens. *Indiana Academy of Sciences*
- Xenikoudakis, G., Ahmed, M., Harris, J., Wadleigh, R., Paijmans, J., Hartmann, S., Barlow, A., Lerner, H.R. L., Hofreiter, M. (in press) Ancient DNA reveals twenty million years of aquatic life in beavers. *Current Biology* D-19-03123
- Lerner, H. R. L., Christidis L., Gamauf A., Griffiths C., Haring E., Huddleston CJ, Kabra S.\*, Kocum A., Krosby M., Kvaloy K., Mindell D., Rasmussen P., Rov N., Wadleigh R.\*, Wink M., Gjershaug JO (2017) Phylogeny and new taxonomy of Booted Eagles (Accipitriformes: Aquilinae). *Zootaxa* 4216:4 [[open access](#)]
- Lerner, H. R. L. (2011) Phylogeny and Taxonomy of Bonelli’s Eagle. In: Bonelli’s Eagle (ed. Hernandez VJ). SEO/BirdLife, Madrid
- Lerner, H. R. L., Meyer, M., Hofreiter, M., James, H. F., Fleischer, R. C. (2011) Multilocus resolution of phylogeny and timescale in the extant adaptive radiation of Hawaiian honeycreepers. *Current Biology* (cover, [F1000 recommended](#))
- Lerner, H. R. L. (2011) Eagle watchers: observing and conserving raptors around the world (Invited Book Review). *The Wilson Journal of Ornithology* 123:2
- Lerner, H. R. L. and Fleischer, R. C. (2010) Prospects for next-generation sequencing in avian studies (invited reviewed commentary). *Auk* 127(1):4-15 [[open access version](#)]
- Gjershaug, J. O., Lerner, H. R. L., and Diserud, O. H. (2009) Taxonomy and Distribution of the Pygmy Eagle Aquila (Hieraetus) weiskeii. *Zootaxa* 2326: 24-38 [[pdf](#)]
- Lerner, H. R. L., Johnson, J. A., Lindsay, A. R., Kiff, L. and Mindell, D. P. (2009) Mitochondrial genetic diversity and differentiation among Harpy eagles (*Harpia harpyja*). *PLoS ONE* 4(10): e7336. doi:10.1371/journal.pone.0007336 [[open access version](#)]
- Lerner, H. R. L. (2009) Raptor Research and Management Techniques (Invited Book Review). *The Wilson Journal of Ornithology* 121 (1): 216-225. [[open access version](#)]
- Lerner, H. R. L., Klaver, M.\* and Mindell, D. P. (2008) Molecular phylogenetics of the buteonine birds of prey (Aves: Accipitridae). *Auk* 125: 304-315 [[pdf](#)]
- Johnson JA, Lerner H. R. L., Rasmussen PC, Mindell, DP (2006) Systematics within Gyps vultures: a clade at risk. *BMC Evolutionary Biology* 6:65 [[open access version](#)]
- Lerner, H. R. L. and Mindell, D. P. (2005) Phylogeny of eagles, Old World vultures and other Accipitridae based on nuclear and mitochondrial DNA. *Molecular Phylogenetics and Evolution* 37 (2): 327-346 [[pdf](#)]

Bunce, M., Szulkin, M., Lerner, H. R. L., Barnes, I., Shapiro, B., Cooper, A. and Holdaway, R.N. (2005) The evolutionary history of New Zealand's extinct giant eagle revealed by ancient DNA. *PLoS Biol* 3(1):e9 [[open access version](#)]

**Grants (2011 to present, \$1,428,819 granted, \$1,961,1075 including pending)**

- 2020 **Improving Pedagogy at the Joseph Moore Museum, Museums for America Program \$532,256** (collaborator, decision anticipated Sep 2020)  
Institute of Museum and Library Services. Undergraduate student training in outreach and education and faculty support for mentoring expanded student corps
- 2020 **What are the Environmental Causes of Population Variability of Highly Mobile Animals, ROA with Dr. Alice Boyle \$67,258** (co-PI)  
National Science Foundation. Stable isotope analysis of migratory birds at Konza Prairie
- 2019 **Informal STEM Learning Capacity Building for the Joseph Moore Museum, ROA with Knology (formerly New Knowledge) \$31,724** (co-PI)  
National Science Foundation. Research on the role of informal STEM learning centers as agents of social change.
- 2019 **Collections Stewardship, Museums for America Program \$480,543** (collaborator)  
Institute of Museum and Library Services. Undergraduate training to digitize, inventory and rehouse our museum's insect collections and faculty collections manager position
- 2018 **Collections Assessment for Preservation \$7,800** (collaborator)  
Institute of Museum and Library Services. Assessment of museum collections conditions.
- 2015 –18 **Stamm-Koechlein Foundation \$60,500 (~\$15,000 annually)**  
Major revision to undergraduate student training in interpretation and informal education, part-time community engagement director
- 2012 –18 **Borman Family Foundation \$110,000 (\$10,000 to \$18,000 annually)**  
Faculty salaries and supplies for science outreach, collections care & research
- 2016 **Building with Biology \$1,200**  
Boston Museum of Science. Development and implementation of a public forum entitled *Should we Bioengineer the Mosquito?*
- 2016 **Rotary Club \$1,500**  
Outreach program summer camp scholarships and development of science kits
- 2016 **Indiana Faculty Immersion Grants \$2,780**  
Certified through the National Association of Interpretation
- 2016 **NASA Out-of-school Learning Grant \$750**  
NASA. Development and implementation of 30+ hours of space and engineering outreach programs to be offered outside of school hours
- 2014 **Collections Stewardship, Museums for American \$310,636**  
Institute of Museum and Library Services. Digitize, inventory, and rehouse our museum's vertebrate collections, make collections database available to the public
- 2014 **CC\*IIE Campus Design: Network Infrastructure for Improved Science Discovery and Education co-PI, \$347,228**  
National Science Foundation. Upgrade the science complex cyber infrastructure
- 2014 **Libraries/ITAM/Writing Center Digital Video Grant \$600**  
Earlham College. Develop a digital video assignment for communicating science to the public in Care & Use of Collections (MUSE/BIO 240); top-ranked videos were shared on the Joseph Moore Museum's social media sites

## 2013 SEED Grant co-PI, \$3,300

Earlham. Service-learning projects in sustainable aquaculture, agriculture, and marine resource management as part of the Hawaiian Islands May Term.

## 2012 Museum Assessment Program, American Association of Museums

## 2012 Mellon Foundation SEED grant \$3,000

Undergraduate experiential education at JMM, development of an exhibit featuring the interdependence of humans and insects based on primary scientific literature

### Collaborative Exhibits (2011 to present)

Climate *UnFair* (2017 JMM)

*With >140 student and faculty station leaders from all four academic divisions*

New Museum exhibit featuring student artwork and associated community activity day featuring student work from six classes, two applied groups, two student groups and >300 event attendees

## Community Climate Change (2015, JMM)

*with faculty members Jamey Pavey and Michael Lerner, and ~50 EC students*

Museum exhibit and associated event (with Jamey Pavey) featuring community-solicited artwork, event participation by >50 students in two classes and four applied groups, event attendance by >200 (½ from EC)

## Mammals, Birds, Reptiles, Pleistocene, Ancient DNA Lab (2013-2018, JMM).

*With EC students, Carol Stocksdale, Ann-Eliza Lewis*

Renovation of major permanent exhibits.

## Insects (April 2013, JMM)

*With >15 EC students, Carol Stocksdale and Chris Smith*

Renovation of major permanent exhibit featuring primary scientific research and EC faculty (i.e. Chris Smith and Walt Bistline) focused on the interdependence of humans and insects

## Beyond the Glass Case (Spring 2012, JMM)

*With three EC students and Carol Stocksdale*

Eight experiential learning centers installed on both floors of the museum

## Evolution of the Hawaiian Honeycreepers (January 2012, JMM).

Designed museum exhibit featuring my molecular specimen-based research about Hawaiian Honeycreeper diversification. Included specimens on loan from the Smithsonian Institution.

### Presentations \*Undergraduate Authors

Lerner, H.R.L. (2019) The Power of the Campus Museum for Connecting Students, Faculty and the Community at Large. **SENCER Summer Institute**. August 3, Case Western University (*Invited Symposium Speaker*)

Lerner, H.R.L., Cayard-Roberts R., and M. Tong (2018) Talking about Science. **Earlham College**. January 18, Richmond, IN (*Invited Panelist*)

Lerner, H.R.L. (2019) Unlocking the Collections Vault with Museomics. **Pymatuning Laboratory of Ecology**. University of Pittsburgh. June 20, Linesville, PA (*Invited Speaker*)

Lerner, H.R.L. and Sorrows, E.\* (2017) Current and historical avian biodiversity patterns from digitized specimens from Indiana and Illinois: identifying strengths and gaps for future work. **Indiana Academy of Sciences Annual Conference**. April 2017, Indianapolis, IN (*Invited Symposium Speaker*).

- Lerner, H.R.L., Reavis, R. and M. G. Lerner (2017) Teaching Students to Deeply Understand Primary Scientific and Social Science Literature Using the Paper Box. **Earlham College Faculty Forum**.
- Lerner, H.R.L. (2017) Promoting Research and Outreach that Uses Collections by Teaching Undergraduate Collections-based Courses and Supporting Outreach Modules within Existing Classes. **Society for the Preservation of Natural History Collections**. June 22, Denver, CO (*Invited Symposium Speaker*)
- Lerner, H. R. L., (2016) Introducing the Paper Box to increase student understanding of primary literature. **Evolution Meetings**. June 18, Austin, TX (*Poster*)
- Bartlow, K.M., H. Lerner, B. Mechlin. (2015) Students teaching students: Brain awareness week as a co-curricular addition to an undergraduate neuroscience program. **Society for Neuroscience National Conference meeting** (*Oral Presentation by Dr. Bartlow*)
- Lerner, H.R.L., (2014–2018) Museomics: unlocking the mysteries of museum specimens using emergent technologies. **Earlham College Alumni Weekend Sample Class**.
- Lerner, H. R. L., (2013) Phylogeny and Diversification of Hawaiian Honeycreepers. **Purdue University Biological Sciences Department Invited Seminar Speaker**.
- Lerner, H. R. L., Kabra, S.\*, Wadleigh, R\*. and Gjershaug, J. O. (2013) Supermatrix phylogeny and new taxonomy of the booted eagles (Accipitriformes: Aquilinae). **American Ornithological Union Meeting**. Aug 15, Chicago, IL (*Poster*)
- Lerner, H. R. L., Lock, J. and R. Fleischer (2012) Next generation sequencing for population and phylogenetic studies: reference-free mitochondrial genome sequencing across the avian tree of life. **North American Ornithologists Conference**. Aug 15, Vancouver, Canada (*Oral Presentation*)
- McLinn, C. and H. R. L. Lerner. (2012) Teaching Phylogenetic Thinking Using Physical and Digital Museum Specimens. **Society for College Science Teachers Conference**. March. (*Oral Presentation*)

### Community Service and Partnerships

- 2016–present **Academic Advisory Committee**, Earlham College
- 2014–present **Joseph Moore Museum Science Communication Award Coordinator**, Earlham College Natural Sciences Division Poster Conference
- 2012–present **Museum Studies Program Convener**, Earlham College
- 2015–2017 **Sustainability Advisory Committee Member**, Earlham College
- 2015–2017 **National Science Foundation Panelist and External Proposal Reviewer**
- 2015–2016 **RHS HOSA**
- Co-Hosted Valentine’s Event at JMM
  - Co-Hosted Summer Camp Biomed, *Where fun is contagious*
- 2015 **Faculty Network Member of Quantitative Undergraduate Biology Education and Synthesis (QUBES)**
- One of 10 faculty participants at Ecological Society of America workshop
  - Developed materials for teaching data-rich quantitative biology concepts
- 2015 **Advancing Integration of Museums into Undergraduate Programs (AIM-UP)**
- Workshop attendance
  - Developed materials for teaching and assessing undergraduate course modules using museum collections
- 2015 **Creative Leadership Institute (CLI) class member and presenter**
- Hosted CLI at the Joseph Moore Museum
  - Presented on growth of the museum as a community resource
- 2015 **Neuroscience Program**
- Hosted Brain Explorers public event at the Joseph Moore Museum

- Worked with Neuroscience students and Professor Kat Bartlow to develop interactive activities to share with the public
  - Co-authored poster presentation of effects on undergraduates of participation in the event
- 2014     **Math Department and Veach's Toy Store**
- Hosted Celebration of the Mind public event at JMM
  - Worked with Math faculty to advertise and hold a public math event
  - Invited Veach's Toy Store to hold a magic show and feature math games
- 2012–present     **Cope Environmental Center**
- Co-hosted Jim Fowler in Spring 2012
  - Developed joint JMM-Cope field trips for elementary schools
- 2012–present     **Wayne County Tourism Bureau**
- Created "Enchanted Fairy Trail" tourist attraction
- 2011     **Reid Hospital**
- CT scanned Ta'an, an Egyptian Mummy housed by the JMM

### Earlham College Undergraduate Student Research Mentees

Mayeesha Ahmed (2014-2017) class of EC 2017

Elisabeth Sorrows (Spring 2017, Spring 2016) class of EC 2017

Maren Schroeder (Summer 2016), class of EC 2018

Emily Buttrum (Summer 2016, Fall 2016) class of EC 2017

Rachel Wadleigh (2013 - 2016) class of 2016

Jacob Harris (Summer 2015, Fall 2015) class of EC 2018

Bailey Heinzen (Fall 2013, Spring 2014) class of EC 2015

Ashley Hedrick (Fall 2013) class of EC 2015

Sonia Kabra (Summer and Fall 2013) class of EC 2016