Hannah Weller

Research interests: relationships between appearance, form, function, and behavior; comparative life history analysis; evolutionary paths of least resistance.

Education

2019—Present **PhD candidate, Ecology and Evolutionary Biology**
Brown University (Providence, RI)
Thesis: How much functional morphology matter to the evolution of mouthbrooding?

2017–2019 **Transitional M.Sc., Ecology and Evolutionary Biology**
Brown University (Providence, RI)
Thesis: How do feeding adaptations influence the convergent evolution of mouthbrooding?

2012—2016 **Honors B.Sc., Biology**
University of Chicago (Chicago, IL)
Thesis: Winnowing in the eartheater cichlids

Peer-reviewed publications

Cohen, K.E., **Weller, H.I.**, and Summer, A.P. (2020) Functional homodonty: a statistical measure of tooth stress as it relates to shape. Journal of Anatomy (accepted).

Weller, H.I., Hooper, S., and Amelon, S. (2020) Creation and validation of the R-package countcolors for repeatable, objective quantification of the fluorescence emitted by *Pseudogymnoascus destructans* on the wing membrane of hibernating bats. Journal of Wildlife Diseases (accepted).

van Meer, N.M., **Weller, H.I.**, Manafzadeh, A.R., Kaczmarek, E.B., Scott, B., Gussekloo, S.W.S, Wilga, C.D., Brainerd, E.B., and Camp, A.L. (2019) Intra-oropharyngeal food transport and swallowing in white-spotted bamboo sharks. Journal of Experimental Biology. 10.1242/jeb.201426

Weller, H.I., and Westneat, M.W. (2019) Quantitative color profiling of digital images with earth mover's distance using the R package colordistance. PeerJ. 10.7717/peerj.6398

Weller, H.I. (2019) colordistance: Distance Metrics for Image Color Similarity (ver. 1.1.0). CRAN repository. https://CRAN.R-project.org/package=colordistance

Weller, H.I. (2018) countcolors: Locates and Counts Pixels Within Color Range(s) in Images (ver. 0.9.1). CRAN Repository. https://CRAN.R-project.org/package=countcolors

Weller, H.I., McMahan, C.D., and Westneat, M.W. (2016) Dirt-sifting Devilfish: Winnowing in the geophagine cichlid *Satanoperca daemon* and evolutionary implications. Zoomorphology. 10.1007/s00435-016-0335-6

Publications in preparation

Weller, H.I., Olsen, A., Camp, A.L., Hernandez, L.P., Manafzadeh, A.R., and Brainerd, E.L. (2020) An XROMM study of intra-oral transport and swallowing in catfish. Integrative Organismal Biology (in prep).

Capano, J. G., Cieri, R. L., **Weller, H.I.**, and Brainerd, E. L. (2020) Ribs All the Way Down: 3D-Rib Kinematics during Lung Ventilation in Boa constrictor (Reptilia: Serpentes), Comparison with Three Non-Serpentine Squamates, and Implications for Evolutionary Convergence (in prep).

Presentations

Weller, H.I., López-Fernández, H., McMahan, C.D., and Brainerd, E.L. (Jan. 2020) Talk: Does mouthbrooding constrain or complement feeding morphology? *Society for Integrative and Comparative Biology, Austin, TX.*

Weller, H.I., López-Fernández, H., McMahan, C.D., and Brainerd, E.L. (Oct. 2019) Talk: Does mouthbrooding constrain or complement feeding morphology? *Regional Division of Vertebrate Morphology (Northeast), Newton, MA.*

Weller, H.I., Olsen, A., Camp, A.L., Hernandez, L.P., Manafzadeh, A.R., and Brainerd, E.L. (Jan. 2019) Talk: 3D-Intra-oral Prey Trajectories Indicate Distinct Phases in how Channel Catfish (Ictalurus punctatus, Siluriformes: Ictaluridae) Swallow Food. *International Congress of Vertebrate Morphology, Prague, CZ.*

Weller, H.I., Cohen, K.E., Gibb, A., and Brainerd, E.L. (Jan. 2019) Poster: Using tethers to measure food transport in a flatfish. *Society for Integrative and Comparative Biology, Tampa, FL.*

Weller, H.I., Olsen, A., Camp, A.L., Hernandez, L.P., Manafzadeh, A.R., and Brainerd, E.L.(Jan. 2019) Talk: An XROMM study of intra-oral transport and swallowing in catfish. *Society for Integrative and Comparative Biology, Tampa, FL.*

Weller, H.I. and Brainerd, E.L. (Oct. 2017) Talk: How do fish swallow food? *Regional Division of Vertebrate Morphology (Northeast), Lowell, MA.*

Weller, H.I., McMahan, C.D., and Westneat, M.W. (July 2016) Poster: Dirt-sifting devilfish: winnowing in eartheater cichlids. *American Society of Ichthyologists and Herpetologists, New Orleans, LA.*

Awards and Fellowships

April 2019 — **Graduate Research Fellowship**
$138,000, National Science Foundation

Dec. 2018 — **Field Museum Visiting Scientist Scholarship**
$1,500, Field Museum of Natural History

May 2017 — **Presidential Fellowship**
$108,000, Brown University

June 2015 — **Jeff Metcalf Undergraduate Research Fellowship**
$5,000, Marine Biological Laboratory

March 2015 — **Elected to Phi Beta Kappa Society**

Sept. 2014 — **Best Presentation, Undergraduate Research Symposium**
$150, University of Chicago

June 2014 — **Elliott and Eileen Hinkes Research Fellowship**
$4,000, University of Chicago

Research experience

2017—Present — **Graduate student, Brainerd Lab**; advisor: Elizabeth Brainerd
Brown University, Dept. of Ecology & Evolutionary Biology
Comparative morphology, kinematics, and biomechanics of mouthbrooding fishes; XROMM fish feeding and transport.

Sept. 2013—July 2017 — **Research assistant**; advisor: Mark Westneat
University of Chicago, Dept. of Organismal Biology & Anatomy
Data mining pipelines; image processing and simple machine learning; quantitative color analysis; comparative 2D morphometrics; high-speed video kinematics.

June 2015—Sept. 2015 — **Jeff Metcalf Summer Research Fellow**; advisor: Roger Hanlon
Brown University, Dept. of Ecology & Evolutionary Biology
Hyperspectral imaging; image analysis pipelines; camouflage analyses.

June 2014—Sept. 2014 — **Summer Research Fellow, Westneat Lab**; advisor: Mark Westneat
University of Chicago, Dept. of Organismal Biology & Anatomy
Ontogenetic scaling; biomechanical model; geometric morphometrics.

Teaching and outreach

Sept. 2019–Present — **R User Group**, *Brown University, Dept. of Ecology and Evolutionary Biology* (Providence, RI)
* Organizing and running monthly R workshops for graduate and undergraduate students, focusing on techniques for biological analysis (e.g., data organization, statistics, and visualization).

Aug. 2019—Present — **Teaching assistant**, *Brown University, Alpert Medical School* (Providence, RI)
Human Anatomy (lecture and lab)
* Guiding medical students through cadaver-based human anatomy labs.

Dec. 2019	**Workshop: R for Biologists**, *Louisiana State University, Dept. of Entomology* (Baton Rouge, LA) * Organized and ran day-long workshop for data analysis and visualization in R.
Sept. 2018—Present	**Marine Science Club**, *Paul Cuffee High School* (Providence, RI) Collaborating with high school teachers for weekly science activities with high school students.
Sept. 2017—Dec. 2017	**Teaching assistant**, *Brown University, Dept. of Ecology & Evolutionary Biology* (Providence, RI) Diversity of Life (lecture)
Jan. 2015—April 2017	**Teaching assistant**, *University of Chicago, Dept. of Biological Sciences* (Chicago, IL) * Presenting and supervising lab experiments; writing and grading assignments; lecturing; leading paper discussions and review sessions; guiding dissection-based anatomy labs. Genetic and Developmental Biology (lab & lecture) Multiscale Modeling of Biological Systems (lecture) Molecular Biology of the Cell (lab) Comparative Vertebrate Anatomy (lab & lecture)
June 2013—Sept. 2013	**Animal care intern**, *New England Aquarium* (Boston, MA) * Daily animal care and maintenance; visitor outreach; collection trips.

Skills

Coding	R, Python (OpenCV, Scrapy, & BioPython libraries), MATLAB, UNIX, MEL
Software	Latex, Maya, FIJI/ImageJ, Horos, 3DSlicer, XMALab, Mesquite, Pandoc, Microsoft Office
Languages	English (native), French (intermediate)

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