

Elska B. Kaczmarek

Postdoctoral Scholar

Department of Biological Sciences, Northern Arizona University

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Education & Professional Experience

- 2023 – pres. Postdoctoral Scholar, Northern Arizona University, Flagstaff, AZ
 Advisor: Christopher J. Mayerl
- 2023 Ph.D. Ecology, Evolution, and Organismal Biology, Brown University, Providence, RI
 Thesis: Biomechanics and evolution of air breathing and suction feeding in fishes
 Advisor: Elizabeth L. Brainerd
 Committee: Stephen M. Gatesy, Stacy C. Farina, Matthew J. Fuxjager
- 2017 B.S. Marine Science, University of Miami, Coral Gables, FL,
Summa Cum Laude and General Honors
 Majors: Marine Science, Biology; Minor: Ecosystem Science and Policy

Publications

* indicates co-first authors, ^ indicates undergraduate student mentee

6. **Kaczmarek EB**, Gartner SM, Westneat MW, Brainerd EL. 2022. Air breathing and suction feeding kinematics in the West African lungfish (*Protopterus annectens*). *Integrative and Comparative Biology*. (doi: 10.1093/icb/icac109)
5. Gartner SM, Whitlow KR, Laurence-Chasen JD, **Kaczmarek EB**, Granatosky MC, Ross CF, Westneat MW. 2022. Suction feeding of West African lungfish (*Protopterus annectens*): An XROMM analysis of jaw mechanics, cranial kinesis, and hyoid mobility. *Biology Open*. (doi: 10.1242/bio.059447)
4. Li EY^{*^}, **Kaczmarek EB**^{*}, Olsen AM, Brainerd EL, Camp AL. 2022. Royal knifefish generate powerful suction feeding through large neurocranial elevation and high epaxial muscle power. *Journal of Experimental Biology*. 225 (11). (doi: 10.1242/jeb.244294)
3. **Kaczmarek EB**, Gidmark NJ. 2020. The bite force-gape relationship as an avenue of biomechanical adaptation to trophic niche in two salmonid fishes. *Journal of Experimental Biology*. 223. (doi: 10.1242/jeb.223180)
2. van Meer NMME, Weller HI, Manafzadeh AR, **Kaczmarek EB**, Scott BR, Gussekloo SWS, Wilga CD, Brainerd EL, Camp AL. 2019. Intra-oropharyngeal food transport and swallowing in white-spotted bamboo sharks (*Chiloscyllium plagiosum*). *Journal of Experimental Biology*. 222. (doi: 10.1242/jeb.201426)

- Williams SA, Spear JK, Petrullo L, Goldstein DM, Lee AB, Peterson AL, Miano DA, **Kaczmarek EB**, Shattuck MR. 2019. Increased variation in numbers of presacral vertebrae in suspensory mammals. *Nature Ecology and Evolution*. 3. 949-956. (doi: 10.1038/s41559-019-0894-2)

Manuscripts in Progress

* indicates co-first authors

Kaczmarek EB, Brainerd EL. Buoyancy control and air breathing in royal knifefish (*Chitala blanci*) and a new hypothesis for the early evolution of vertebrate air-breathing behaviors. (In revision at *The Anatomical Record*.)

Mayerl CM, Capano JG, van Meer NMME, Weller HI, **Kaczmarek EB**, Chadam M, Blob RB, Brainerd EL, Wyneken J. Turtle girdles: Comparing the relationships between environment and behavior on forelimb function in loggerhead sea turtles (*Caretta caretta*) and river cooters (*Pseudemys scripta*). (In review at *Journal of Experimental Biology*.)

Kaczmarek EB*, Phillips JR*. Respiratory System. In *Comparative Vertebrate and Human Anatomy: Ecology, Evolution, and Function*, Private Academic Library Network of Indiana (PALNI) Press. (Invited peer-reviewed open access textbook chapter, in prep.)

Fellowships, Grants, and Awards

2020	Doctoral Dissertation Enhancement Grant , Bushnell Research and Education Fund, Brown University \$9,955
2018	Friday Harbor Labs Scholarship , University of Washington \$1,500
2017-2022	Graduate Research Fellowship , National Science Foundation \$138,000
2017	Outstanding Senior Award , Department of Biology, University of Miami \$200
2015-2017	Hollings Scholarship , National Oceanic and Atmospheric Administration \$28,000
2016	Steven Vogel Award for Best Student Presentation for the Division of Comparative Biomechanics, SICB Annual Meeting \$150
2015	Small Undergraduate Research Grant Experience , University of Miami \$665
2015	Research Experience for Undergraduates , National Science Foundation \$4,000

Teaching Experience

Teaching Positions

- 2021-2022 Co-Instructor, **Anatomy, Behavior, and Evolution in Fishes**, Summer@Brown, Brown University (Pre-college course)
- 2021 Teaching Assistant and Lecturer, **Human Anatomy II** (BIOL 3655), Warren Alpert School of Medicine, Brown University
- 2020 Teaching Assistant and Lecturer, **Human Anatomy I** (BIOL 3644), Warren Alpert School of Medicine, Brown University
- 2020 Teaching Assistant, **Human Anatomy II** (BIOL 3655), Warren Alpert School of Medicine, Brown University
- 2019 Teaching Assistant, **Human Anatomy I** (BIOL 3644), Warren Alpert School of Medicine, Brown University
- 2017 Teaching Assistant, **Diversity of Life** (BIOL 0210), Brown University (1 term)

Teaching Certificates

- 2021 **Graduate Certificate in Course Design**, Sheridan Center for Teaching and Learning, Brown University
- 2020 **Graduate Certificate in Reflective Teaching**, Sheridan Center for Teaching and Learning, Brown University

Invited Presentations

- 2024 Department Seminar, Department of Biological Sciences, Northern Arizona University
- 2023 **Kaczmarek EB**. Origin and evolution of lung and gas bladder ventilation in air-breathing fish. Symposium: Taking a breath: The mechanics and evolution of tetrapod ventilation. International Congress of Vertebrate Morphology. Cairns, Australia.
- 2017, '20, '23 'Brown Bag Seminar', Department of Ecology, Evolution, and Organismal Biology (EEOB), Brown University
- 2022 **Kaczmarek EB**, Gartner SM, Brainerd EL. Comparison of aquatic and aerial buccal pumping behaviors in African lungfish. Symposium: Lesser-known transitions: organismal form and function across abiotic gradients. Society for Integrative & Comparative Biology. Phoenix, AZ.

Diversity, Equity, and Inclusion Trainings

- 2023-24 **NAU STEM Faculty Academy: An equity-oriented, anti-racist Community of Practice** (1-year facilitated program), Multi-Institutional Transformation and Graduate Student Support Initiative, Northern Arizona University
- 2024 **Culturally Responsive Mentoring Workshop**, Minorities in Shark Science

- (MISS) Summit
- 2023 **Navigating Difficult Conversations Workshop**, Brown University
- 2020, 2021 **Graduate Certificates in Course Design** (4-part course) and **Reflective Teaching** (5-part course), Emphases on equitable and inclusive practices, Sheridan Center for Teaching and Learning, Brown University
- 2020 **Strategies for Responding to Harassment and Bullying Workshop**, ADVANCEGeo, Brown University
- 2019 **Integrating Active Learning Strategies to Engage Students, Promote Inclusion, and Maximize Learning in Vertebrate Anatomy**, Workshop at the International Congress of Vertebrate Morphology
- 2019 **Research Mentoring in Science** (5-part course), Initiative for Maximizing Student Development, Sheridan Center for Teaching and Learning, Brown University

Service

To the Professional Society

- 2023 **Mentor**, Broadening Participation Mentoring Program, Society for Integrative & Comparative Biology
- 2021 **Workshop Co-organizer**, Job hunting tips and tricks: A panel discussion on finding a faculty position in Ecology and Evolutionary Biology, Society for Integrative & Comparative Biology

To the Institution

- 2022 **Review Panelist**, Bushnell Doctoral Dissertation Enhancement Grant, Brown University
- 2020-22 **Seminar Series Founder and Co-organizer**, Non-Faculty Careers Seminars Series, EEOB, Brown University
- 2019, 20, 21 **Panelist**, EEOB Graduate School and Career Panel for Undergraduates, Brown University
- 2020-21 **GSA Vice President**, EEOB Graduate Student Association, Brown University
- 2020 **Preview Day Panelist**, EEOB, Brown University
- 2020 **Summer Brown Bag Organizer**, EEOB, Brown University
- 2019-20 **Graduate Student Peer Mentor**, EEOB, Brown University
- 2018 **Social Event Coordinator**, EEOB, Brown University

To the Community

- 2021 **Guest Lecturer**, Sigma Camp (an intensive science summer program for high school and middle school students)

- 2019 **Visiting Marine Science Instructor**, Wheeler High School
 2018 **Marine Science Club Co-leader**, Paul Cuffee High School
 2018 **After-school Math Tutor**, STEMS Program, Hope High School
 2017 **In-class Math Tutor**, Swearer Classroom Program, Fogarty Elementary School

As a Peer Reviewer

Journal of Morphology, Journal of Experimental Biology, Ecology and Evolution

Professional Affiliations

Sigma Xi, The Scientific Research Honors Society – International Society of Vertebrate Morphologists – Society for Integrative and Comparative Biology

Conference Talks

* indicates presenting author; ^ indicates undergraduate student mentee

- 2024 **Kaczmarek EB***, Steer KE, Sarmet M, Shideler HE[^], Fauveau AM[^], Smith AE[^], Wallace SM[^], Kennedy ME[^], Velasco AB[^], Stroud TH, Blilie ME, Mayerl CJ. A biomimetic bottle nipple impacts infant feeding performance, biomechanics, and physiology in an animal model. Dysphagia Research Society. San Juan, PR. (*upcoming*)
- 2024 **Kaczmarek EB***, Steer KE, Sarmet M, Shideler HE[^], Fauveau AM[^], Smith AE[^], Wallace SM[^], Kennedy ME[^], Velasco AB[^], Stroud TH, Blilie ME, Mayerl CJ. Feeding biomechanics and physiology of infant pigs raised on standard and biomimetic bottle nipples. Society for Integrative & Comparative Biology. Seattle, WA.
- 2023 **Kaczmarek EB***, Origin and evolution of lung and gas bladder ventilation in air-breathing fish. International Congress of Vertebrate Morphology. Cairns, Australia.
- 2023 **Kaczmarek EB***, Brainerd EL. Royal knifefish, *Chitala blanci*, breathe air using two functionally distinct breath types. Society for Integrative & Comparative Biology. Austin, TX.
- 2022 Li EY[^], **Kaczmarek EB**, Olsen AM, Brainerd EL, Camp AL. Muscle contribution in royal knifefish (*Chitala blanci*) during high and low power suction feeding strikes. Society for Integrative & Comparative Biology. Phoenix, AZ.
- 2021 Capano JG*, **Kaczmarek EB**, Lomax JJ, Turner ML, Brainerd EL, Ryerson WG. Reticulated pythons roll their hemimandibles and splay their quadrates to engulf enormous prey. Society for Integrative & Comparative Biology. Virtual.
- 2020 **Kaczmarek EB***, Li EY[^], Brainerd EL. XROMM analysis of air-breathing in the royal knifefish, *Chitala blanci*. Society for Integrative & Comparative Biology. Austin, TX.
- 2019 **Kaczmarek EB***, Brainerd EL. XROMM analysis of air-breathing in the royal knifefish, *Chitala blanci*. Northeast Regional Meeting of the Society for Integrative & Comparative Biology. Boston College, MA.
- 2019 Li EY[^], **Kaczmarek EB**, Olsen AM, Weller HI, Camp AL, Brainerd EL. How do skeletal

- kinematics differ across feeding strikes of varying suction power? Northeast Regional Meeting of the Society for Integrative & Comparative Biology. Boston College, MA.
- 2019 **Kaczmarek EB***, Camp AL, Olsen AM, Hernandez LP, Brainerd EL. Does the defensive role of the pectoral girdle inhibit mobility during suction feeding in channel catfish, *Ictalurus punctatus* (Actinopterygii: Siluriformes)? International Congress of Vertebrate Morphology. Prague, Czechia.
- 2019 Van Meer NMME*, Weller HI, Manafzadeh AR, **Kaczmarek EB**, Scott B, Gussekloo SWS, Wilga CD, Brainerd EL, Camp AL. Food capture, transport and swallowing in white-spotted bamboo sharks (*Chiloscyllium plagiosum*). Society for Integrative & Comparative Biology. Tampa, FL.
- 2018 **Kaczmarek EB***, Kolmann MA, Gear ME, Summers AP. Thorn on my side? Form, function, and evolution of defensive weaponry in doradid catfishes. Northeast Regional Meeting of the Society for Integrative & Comparative Biology. Brown University, RI.
- 2017 **Kaczmarek EB***, Brainerd EL. Pectoral girdle motion during suction feeding in ray-finned fishes. Northeast Regional Meeting of the Society for Integrative & Comparative Biology. UMass Lowell, MA.
- 2016 **Kaczmarek EB***, Moser ML, Summers AP. Investigating burrowing behavior in pacific lamprey ammocoetes. NOAA Science and Education Symposium. Silver Spring, MD.

Conference Posters

* indicates presenting author; ^ indicates undergraduate student mentee

- 2024 Shideler HE[^], **Kaczmarek EB**, Sarmet M, Steer KE, Stroud TH, Fauveau AM[^], Kennedy ME[^], Smith AE[^], Velasco AB[^], Wallace SM[^], Blilie ME, Mayerl CJ. Impact of dynamic changes in flow rate on infant feeding function in an animal model. Society for Integrative & Comparative Biology. Seattle, WA.
- 2024 Smith AE[^], **Kaczmarek EB**, Sarmet M, Steer KE, Stroud TH, Fauveau AM[^], Kennedy ME[^], Shideler HE[^], Velasco AB[^], Wallace SM[^], Blilie ME, Mayerl CJ. Impact of chronic use of viscous milk on infant feeding physiology: sucking. Society for Integrative & Comparative Biology. Seattle, WA.
- 2024 Kennedy ME[^], **Kaczmarek EB**, Sarmet M, Steer KE, Stroud TH, Fauveau AM[^], Smith AE[^], Shideler HE[^], Velasco AB[^], Wallace SM[^], Blilie ME, Mayerl CJ. Impact of chronic use of viscous milk on infant feeding physiology: swallowing. Society for Integrative & Comparative Biology. Seattle, WA.
- 2024 Wallace SM[^], **Kaczmarek EB**, Steer KE, Sarmet M, Smith AE[^], Shideler HE[^], Kennedy ME[^], Velasco AB[^], Stroud TH, Fauveau AM[^], Blilie ME, Mayerl CJ. Impact of a biomimetic, ducted nipple on infant feeding function through ontogeny in an animal model. Society for Integrative & Comparative Biology. Seattle, WA.
- 2024 Velasco AB[^], **Kaczmarek EB***, Sarmet M, Steer KE, Stroud TH, Fauveau AM[^], Kennedy ME[^], Smith AE[^], Shideler HE[^], Wallace SM[^], Blilie ME, Ceja-Navarro JA, Mayerl CJ. Consequences of chronic consumption of thickened milk on infants in an animal model. Society for Integrative & Comparative Biology. Seattle, WA.

- 2023 **Kaczmarek EB***, Gartner SM, Brainerd EL. First description of the air-breathing behaviors of Australian lungfish (*Neoceratodus forsteri*). International Congress of Vertebrate Morphology. Cairns, Australia.
- 2021 Stephens S*, Gabriel AN, **Kaczmarek EB**, Brainerd EL, Olsen A, Hernandez LP, Camp A, Farina SC. The role of cranial mechanical linkages in gill ventilation of dorso-ventrally and laterally compressed fishes. Society for Integrative & Comparative Biology. Virtual.
- 2020 Li EY[^], **Kaczmarek EB**, Olsen AM, Weller HI, Camp AL, Brainerd EL. The relationship between movement coordination and suction power during feeding in royal knifefish (*Chitala blanci*). Society for Integrative & Comparative Biology. Austin, TX.
- 2019 **Kaczmarek EB**, Kolmann MA*, Gear ME, Summers AP. Thorn on my side? Form, function, and evolution of defensive weaponry in doradid catfishes. Society for Integrative & Comparative Biology. Tampa, FL.
- 2019 Weller HI*, Cohen KE, **Kaczmarek EB**, Gibb A, Brainerd EL. Using tethers to measure food transport in a flatfish. Society for Integrative & Comparative Biology. Tampa, FL.
- 2017 **Kaczmarek EB***, Summers AP, Moser ML. Burying behavior in pacific lamprey ammocoetes. Society for Integrative & Comparative Biology. New Orleans, LA.
- 2016 **Kaczmarek EB***, Gidmark NJ. The force-length relationship of skeletal muscle as a biomechanical adaptation to trophic niche in salmonid fishes. Society for Integrative & Comparative Biology. Portland, OR. **Winner, Steven Vogel Best Student Poster Presentation in the Division of Comparative Biomechanics.**