

LEANNA P. MATTHEWS, PH.D.

111 Snowmass Place, Longmont, CO 80504
leannapmatthews@gmail.com; (210) 857-7411

EDUCATION

- Ph.D. Syracuse University, Syracuse, NY May 2017
Biology
Advisor: Susan Parks, Ph.D.
Dissertation Title: *Harbor seal (Phoca vitulina) reproductive advertisement behavior and the effects of vessel noise*
- B.S. Baylor University, Waco, TX May 2011
Biology (Ecology), *summa cum laude*

PROFESSIONAL RESEARCH APPOINTMENTS

Sound Science Research Collective (Juneau, AK)

Research Associate

Sep 2018 – Present

- Plans and conducts research projects that use acoustic and behavioral data collection techniques to assess conservation concerns for marine and terrestrial systems
 - Investigating call function in Southeast Alaskan humpback whales
 - **Fieldwork:** *Hobart Bay, Southeast Alaska:* behavioral and acoustic array data collection, conspecific playback experiments (30 day field season)
 - Investigating the impact of the COVID-19 pandemic on global underwater acoustic habitats (Southeast Alaska, Iceland, and Stellwagen Bank, MA)
- Fundraising, grant writing, and public engagement

Syracuse University (Syracuse, NY)

Postdoctoral Researcher, Biology Department

Apr 2017 – Aug 2017

- Acoustic propagation modeling for three North Atlantic right whale critical habitat areas
- Technical writing and publication
- Advisor: Susan Parks, Ph.D.

Research Fellow, Biology Department

Aug 2016 – Apr 2017

- Planned and conducted playback experiments with captive harbor seals at the Oregon Coast Aquarium to test for female preference of male underwater vocalizations
- Designed and led multi-year marine mammal acoustic ecology project, including securing grant funding, managing 5-person field team, finalizing sampling techniques, and collecting and analyzing acoustic and behavioral data
 - **Fieldwork:** *Glacier Bay National Park and Preserve, Southeast Alaska:* humpback whale and harbor seal photo identification, land-based behavioral data collection for humpback whales, kayak-based behavioral data collection for

harbor seals (two hydrophone deployment and two hydrophone recovery cruises, 3 month field season)

- Technical writing and publication, undergraduate mentoring, and statistical modeling
- Designed and delivered public engagement and outreach activities
- Advisor: Susan Parks, Ph.D.

Research Assistant, Biology Department

Aug 2014 – Aug 2016

- Assisted multiple ongoing research projects focused on acoustic behavior of various species and the impacts of human-generated noise
 - North Atlantic Right Whale Mother/Calf Study: acoustic data analysis and dive behavior analysis using tag data
 - **Fieldwork:** *Southeastern United States (Florida/Georgia) and Cape Cod Bay, MA:* vessel-based behavioral data collection, deployed and recovered hydrophones, photo identification (total of ~14 days in the field)
 - National Ecological Observatory Network: acoustic data management for multiple years of continuous recordings from three locations, investigated the impact of airplane noise on acoustic biodiversity
 - **Fieldwork:** *Harvard Forest, MA:* multiple day trips to service acoustic equipment (total of ~5 days in the field)
 - Climate Change Impacts on Orthopteran Acoustic Behavior: designed and conducted experiments to document changes in calling behavior of orthopteran insect species as a result of increased temperature
 - **Fieldwork:** *Syracuse, NY:* multiple day trips throughout Central New York to collect cricket and katydid species for lab-based experiments (total of ~10 days in the field)
- Technical writing and publication, undergraduate mentoring, and statistical modeling
- Designed and delivered public engagement and outreach activities
- Advisor: Susan Parks, Ph.D.

Pinniped Cognition & Sensory Systems Lab, University of California (Santa Cruz, CA)

Research Assistant

May 2013 – Aug 2013

- Participated in ongoing sensory systems research about the in-air and underwater hearing capabilities of multiple pinniped species
- Performed daily animal husbandry tasks in a captive marine mammal facility, including preparing food, sanitizing animal areas, and participating in feeding and training sessions
- Assisted in outreach activities with local middle school students
- Advisor: Colleen Reichmuth, Ph.D.

Titi Monkey Project (Santa Cruz de la Sierra, Bolivia)

Research Assistant

Sep 2011 – Dec 2011

- Behavioral data collection of Bolivian titi monkeys, including documenting foraging, vocalizations, play, aggression, and parental care
- Constructed habitat maps
- Created a reference guide for foraging locations

- Performed fecal analysis to document dietary choices
- **Fieldwork:** daily behavioral data collection, fecal sample collection (90 day field season)
- Advisor: Kimberly Dingess

Baylor University (Waco, TX)

Research Assistant, Department of Biology

Aug 2010 – May 2011

- Assisted with dendrochronology research on various oak species in Central Texas
- Experience measuring sap-width, counting growth rings, and assessing fire scars
- Calculated growth efficiency to assess impacts of fire damage on deciduous forests
- Determined implications of performing localized fire treatments on forest sustainability
- Advisor: Joseph White, Ph.D.

USAF Research Lab and TASC Inc. (San Antonio, TX)

Research Assistant

May 2009 – Jan 2010

- Contracted with the Optical Radiation Branch of the USAF Research Lab
- Planned and conducted hyperthermia experiments with retinal pigmented epithelial cells to better understand protein production in response to heat shock treatments
- Became proficient in cell culture and sterile techniques
- Exposed to methods in protein extraction and analysis
- Advisor: Jeffrey Wigle, Ph.D.

TEACHING EXPERIENCE

2020-Present *Science Instructor*, Front Range Community College, Westminster, CO
Science of Biology with Lab (24 students)

2017-Present *Affiliate Faculty*, Metropolitan State University of Denver, Denver, CO
General Biology II (25 students)
General Biology Lab II (20 students)

2015 *Teaching Assistant*, Syracuse University, Syracuse, NY
Ocean Life (150 students)

2014 *Teaching Assistant*, Syracuse University, Syracuse, NY
Human Anatomy and Physiology Lab (24 students)

2013 *Teaching Assistant*, Syracuse University, Syracuse, NY
Conservation Biology (35 students)
Ocean Life (150 students)

2012 *Teaching Assistant*, Syracuse University, Syracuse, NY
Introduction to Biology (2 sections with 24 students each)

2011 *Supplemental Instructor*, Baylor University, Waco, TX
Modern Concepts in Bioscience (15 students)

PUBLICATIONS

- Matthews, L.P.** & Parks, S.E. In prep for *Journal of the Acoustical Society of America*. North Atlantic right whales (*Eubalaena glacialis*) vocalize at ideal depths for propagation.
- Matthews, L.P.**, Fournet, M.E.H., Gabriele, C.M., Klinck, H., & Parks, S.E. 2020. Acoustically advertising male harbour seals in southeast Alaska do not make biologically relevant acoustic adjustments in the presence of vessel noise. *Biology Letters*, 16: 20190795
- Matthews, L.P.** 2019. A review of North Atlantic right whale sound production and hearing capabilities. Report prepared for Fisheries and Oceans Canada.
- Fournet, M.E.H., **Matthews, L.P.**, Gabriele, C.M., Haver, S., Mellinger, D.K., & Klinck, H. 2018. Humpback whales *Megaptera novaeangliae* alter calling behavior in response to natural sounds and vessel noise. *Marine Ecology Progress Series*, 607: 251-268.
- Matthews, L.P.**, Blades, B., & Parks, S.E. 2018. Female harbor seal (*Phoca vitulina*) behavioral response to playbacks of underwater male acoustic advertisement displays. *PeerJ*, 6: e4547
- Fournet, M.E.H., **Matthews, L.P.**, Gabriele, C.M., Mellinger, D.K., & Klinck, H. 2018. Source levels of foraging humpback whale calls. *Journal of the Acoustical Society of America Express Letters*, 143(2): EL105-EL111.
- Matthews, L.P.**, Gabriele, C., & Parks, S. E. 2017. The role of season, tide, and diel period in the presence of harbor seal breeding vocalizations in Glacier Bay National Park, Alaska. *Aquatic Mammals*, 43(5): 537-546.
- Matthews, L.P.**, Fournet, M.E.H., Gabriele, C.M., Womble, J.N., Klinck, H., & Parks, S.E. 2017. Source levels and call parameters of harbor seal breeding vocalizations near a terrestrial haulout site in Glacier Bay National Park and Preserve. *Journal of the Acoustical Society of America Express Letters*, 141(3): EL274-EL280.
- Cusano, D.A., **Matthews, L.P.**, Grapstein, E., & Parks, S.E. 2016. Effects of Increasing Temperature on Acoustic Advertisement in the Tettigoniidae. *Journal of Orthoptera Research*, 25(1): 39-47.
- Matthews, L.P.**, McCordic, J.A., & Parks, S.E. 2014. Remote acoustic monitoring of North Atlantic right whales (*Eubalaena glacialis*) reveals seasonal and diel variations in acoustic behavior. *PLOS ONE*, 9(3): e91367.

RESEARCH PRESENTATIONS

- Fournet, M., **Matthews, L.P.**, Gabriele, C., Mellinger, D.K., Klinck, H. Oct 2017. Southeast Alaska humpback whales increase non-song source levels in higher natural or manmade ambient noise. Oral Presentation. Society of Marine Mammalogy Biennial Conference, Halifax, Nova Scotia, Canada.
- Matthews, L.P.**, Womble, J., Gabriele, C., Klinck, H., & Parks, S.E. Nov 2016. Source level of

harbor seal underwater reproductive advertisement displays. Poster Presentation. Fifth Joint Meeting of the Acoustical Society of America and the Acoustical Society of Japan, Honolulu, HI.

Matthews, L.P., Gabriele, C., Parks, S.E. Oct 2016. Harbor seal vocal behavior and the effects of vessel noise. Oral Presentation. National Park Service Centennial Science and Stewardship Symposium, Fairbanks, AK.

Parks, S.E., Denes, S.L., **Matthews, L.P.***, Varshney, P.K., & Fristrup, K.M. May 2016. Insights into airplane overflight effects on bioacoustic activity levels from long-term acoustic monitoring. Oral Presentation (*presenter). Acoustical Society of America Spring Conference, Salt Lake City, UT.

Matthews, L.P. & Fournet, M. Jul 2016. Acoustic ecology of Glacier Bay. Invited Talk at Glacier Bay National Park and Preserve, AK

Matthews, L.P., Gabriele, C., & Parks, S.E. Dec 2015. The effects of vessel passages on the vocal behavior of an aquatically breeding pinniped, the harbor seal (*Phoca vitulina*). Oral Presentation. Society of Marine Mammalogy Biennial Conference, December 14-18, 2015, San Francisco, CA.

Denes, S.L., Parks, S.E., **Matthews, L.P.**, Blair, H.B., Varshney, P., & Fristrup, K. May 2015. Continental scale acoustic monitoring program: One year of data. Oral Presentation. Acoustical Society of America Spring Conference, Pittsburgh, PA.

Matthews, L.P., McCordic, J.A., & Parks, S.E. May 2014. Using passive acoustics to investigate seasonal and diel trends in acoustic behavior of North Atlantic right whales (*Eubalaena glacialis*). Oral Presentation. Acoustical Society of America Spring Conference, Providence, RI.

GRANTS

2016	PLOS ONE Early Career Travel Award (\$500)
2016	Syracuse University Biology Department Travel Grant (\$350)
2016	Syracuse University Graduate Student Organization Travel Grant (\$500)
2015	National Park Foundation Alaska Coastal Marine Grant (participant; \$275,709)
2015	Society of Marine Mammalogy Travel Grant (\$200)
2015	Syracuse University Graduate Student Organization Travel Grant (\$225)
2015	Marine Mammal Commission Small Grant (Co-PI; \$9,111)
2014	National Geographic Society's Young Explorer's Grant (PI; \$5,000)

SCHOLARSHIPS AND FELLOWSHIPS

2016-17	Syracuse University, STEM Diversity Fellowship
2014-16	Syracuse University, Research Assistant Fellowship
2012-14	Syracuse University, Teaching Assistant Fellowship

ACADEMIC AWARDS

- 2017 Alexander Gourevitch Memorial Award in Biology, Syracuse University
Recognition of excellence in research
- 2014 National Science Foundation, Graduate Research Fellowship, Honorable Mention
- 2011 Baylor University Biology Department, Outstanding Senior in Biology
- 2011 Phi Beta Kappa Honor Society Induction
- 2007-11 Baylor University, Dean's List

MEDIA

- 2020 Lumieres Virtual Encounters Webinar: featured speaker and panelist
["Bioacoustics: Voices of the Ocean"](#)
- 2020 Syracuse University Arts & Sciences: featured research "[Underwater Rock Concert](#)"
- 2017 National Geographic: featured interview "[What to do when a wild seal hops on your kayak](#)"
- 2017 National Geographic: featured interview "[Seal pup rescued from fishing nets](#)"
- 2016 National Park Service, Outside Science Inside Parks: short film "[Underwater Conversations in Glacier Bay](#)"
- 2016 Alaska Public Media & Indie Alaska: short film "[We are Marine Acousticians](#)"
- 2016 National Park Service: video interview "[Notes from Strawberry Island](#)"
- 2015 National Park Service, Research Highlight: featured research "[Measuring the Effects of Vessel Noise](#)"
- 2015 Syracuse University Arts & Sciences: video interview "[Syracuse Student Receives International Research Grant](#)"

OUTREACH

Fall 2017 – Collaborated with National Geographic Learning to create a reading passage for elementary school students in the National Geographic Learning Panorama Program. The passage was written about my research in Glacier Bay National Park and Preserve, AK to allow students to practice making inferences and identifying how an author structures a text. The passage is available for students and teachers digitally in English and Spanish through an interactive online platform (MindTap for School).

Spring 2017 – Served as a judge for senior capstone projects at Wheat Ridge High School (Wheat Ridge, CO)

Summer 2016 – Collaborated with National Park Service Education Specialist Emma Johnson (Glacier Bay National Park and Preserve) to create an educational podcast for high school students. The podcast explains how scientists use math in the field and is accompanied by a worksheet with follow-up questions that focus on calculating rates and averages.

Spring 2016 – Served as a judge for senior capstone projects at Wheat Ridge High School (Wheat Ridge, CO)

Summer 2014 – Helped create lesson plans for the Syracuse University Summer Science Institute, where high school students visit various biology labs and participate in ongoing research.

Summer 2013 – Assisted in Ocean Explorers at University of California Santa Cruz, a summer program for middle school students that teaches them about marine biology. I worked with the Pinniped Cognition and Sensory Systems Lab to teach the students about captive pinnipeds and how researchers study how pinnipeds perceive the environment with their ears and vibrissae.