

MARIE J. ZAHN

Curriculum Vitae

School of Aquatic and Fishery Sciences
University of Washington
1122 NE Boat St, Seattle, WA 98105
(262) 497-9223 | mzahn@uw.edu | mariezahn.com



EDUCATION

University of Washington (UW) Seattle, WA
Ph.D. in Aquatic and Fishery Sciences and Data Science 2019 – 2023
Thesis title: *Quantifying features of Arctic odontocete echolocation and marine habitat variation in West Greenland*

Columbia University, Columbia College New York, NY
B.A. in Environmental Biology 2012 – 2016
Thesis title: *“Everything we do, it’s cedar”: First Nation and ecosystem-based foresters’ relationships and practices with western redcedar*

RESEARCH INTERESTS

Polar ecology, glacier ecology, marine mammal bioacoustics, physical oceanography at glacier-ocean boundary, effects of environmental change on high-latitude ecosystems

PUBLICATIONS

10. **Zahn, M. J.**, K. L. Laidre, M. Simon, K. M. Stafford, M. Wood, J. K. Willis, E. M. Phillips, I. Fenty. Seasonal hydrography and unique plume signatures from moorings at Northwest Greenland glacier fronts. *Journal of Geophysical Research: Oceans*. In review.
9. **Zahn, M. J.**, M. Ladegaard, M. Simon, K. M. Stafford, T. Sakai, K. L. Laidre. Accurate species classification of Arctic toothed whale echolocation clicks using one-third octave ratios. *Journal of the Acoustical Society of America*. In review.
8. Laidre, K.L., **M. J. Zahn**, M. Simon, M. Ladegaard, K. Stafford, I. Fenty, E. Phillips, T. Moon, H. L. Stern, B. Cohen. Narwhal (*Monodon monoceros*) associations with Greenland summer meltwater release. *Ecosphere*. In review.
7. Laidre, K. L., J. Ware, **M. J. Zahn**, P. Hegelund, J. Aars. (2023). First recorded ice entrapment of a beluga whale (*Delphinapterus leucas*) in East Greenland. *Polar Research*. In press.
6. **Zahn, M. J.** (2023). Quantifying features of Arctic odontocete echolocation and marine habitat variation in West Greenland. Ph.D. Dissertation. University of Washington, Seattle, WA.
5. **Zahn, M. J.**, J. Martin, E. Enns. (2022). “Paddle with the Tide”: Nuuchah-Nulth and western redcedar coevolution. In: Wall J (ed) *The Cultural Value of Trees: Folk Value and Biocultural Conservation (1st ed.)*. Routledge Earthscan, pp 88-102. <https://doi.org/10.4324/9780429320897>
4. **Zahn, M. J.**, S. Rankin, J. L. K. McCullough, J. C. Koblitz, F. Archer, M. H. Rasmussen, K. L. Laidre. (2021). Acoustic differentiation and classification of wild belugas and narwhals using echolocation clicks. *Scientific Reports* 11:22141. <https://doi.org/10.1038/s41598-021-01441-w>
3. **Zahn, M. J.**, K. L. Laidre, P. Stilz, M. H. Rasmussen, J. C. Koblitz. (2021). Vertical sonar beam width and scanning behavior of wild belugas (*Delphinapterus leucas*) in West Greenland. *PLoS ONE* 16(9): e0257054. <https://doi.org/10.1371/journal.pone.0257054>
2. **Zahn, M. J.**, M. I. Palmer, N. J. Turner. (2018). “Everything we do, it’s cedar”: First Nation and ecologically-based forester land management philosophies in coastal British Columbia. *Journal of Ethnobiology* 38(3): 314-332. <https://doi.org/10.2993/0278-0771-38.2.314>

1. **Zahn, M. J.** (2015). First Nation and ecosystem-based foresters' relationships and practices with western redcedar (*Thuja plicata*) in coastal British Columbia. Senior Honors Undergraduate Thesis, Department of Ecology, Evolution, and Environmental Biology, Columbia University, NYC.

PUBLIC DATASETS

3. **Zahn, M. J.,** M. Ladegaard, M. Simon, K. M. Stafford, T. Sakai, K. L. Laidre (2023). Catalogue of Arctic toothed whale click spectra and spectrograms from SoundTrap recordings (1.0.0). Zenodo. <https://doi.org/10.5281/zenodo.10076260>
2. **Zahn M. J.,** K. L. Laidre, M. Simon, I. Fenty (2023). OMG Narwhals oceanographic data from moorings, 2018-2020. Ver. 1. PO.DAAC, CA, USA. <https://doi.org/10.5067/OMGNW-MOOR1>
1. **Zahn M. J.,** K. L. Laidre, M. Simon, I. Fenty (2023). OMG Narwhals Shipboard Conductivity, Temperature, and Depth (CTD) profiles, 2018-2020. Ver. 1. PO.DAAC, CA, USA. <https://doi.org/10.5067/OMGNW-SHIP1>

PRESENTATIONS

- 2023 **Oral presentation** at Arctic Science Summit Week Science Symposium. Vienna, Austria. "Acoustic classification of belugas and narwhals using echolocation clicks with implications for passive acoustic monitoring."
- 2023 **Seminar** of Ph.D. research as visiting scientist at NASA's Jet Propulsion Laboratory. Pasadena, CA. "OMG Narwhals: Moored observations fill key knowledge gaps in ocean variability and ecosystem processes in northwest Greenland."
- 2022 **Invited speaker** for seminar at the International Arctic Research Center, University of Alaska Fairbanks. Fairbanks, AK. "Monitoring Arctic toothed whales and their coastal marine habitats in West Greenland."
- 2021 **Oral presentation** at the 181st Meeting of the Acoustical Society of America. Seattle, WA. "Acoustic differentiation and classification of wild belugas and narwhals using echolocation."
- 2021 **Oral presentation** at the at the School of Aquatic and Fishery Sciences Graduate Student Symposium, UW. Seattle, WA. "Acoustic differentiation and classification of wild belugas and narwhals using echolocation clicks."
- 2021 **Oral presentation** at NASA's Oceans Melting Greenland (OMG) Science Team Meeting. Online. "Subannual hydrographic variability in three Northwest Greenland fjords."
- 2021 **Oral presentation** at the Northwest Student Chapter for the Society of Marine Mammalogy spring meeting. Online. "Acoustic differentiation and classification of wild belugas and narwhals using echolocation clicks."
- 2020 **Oral presentation** at the 179th meeting of the Acoustical Society of America. Online. "Vertical sonar beam width and scanning behavior of wild belugas in West Greenland."
- 2019 **Oral presentation** at the School of Aquatic and Fishery Sciences Graduate Student Symposium, UW. Seattle, WA. "Differentiating belugas and narwhals using acoustic signatures."
- 2016 **Oral presentation** at Wood at Work Conference. New York, NY. "People of the cedar: First Nation and ecosystem-based foresters' relationships and practices with western redcedar."
- 2016 **Poster presentation** at Columbia University's Office of Undergraduate Admission's Science Research Symposia. New York, NY. "'Everything we do, it's cedar': First Nation and ecosystem-based foresters' relationships and practices with western redcedar."
- 2016 **Oral presentation** at the 39th Annual Conference of the Society of Ethnobiology. Tucson, AZ. "'Everything we do, it's cedar': First Nation and ecosystem-based foresters' relationships and practices with western redcedar."

SELECTED PROFESSIONAL EXPERIENCE

NOAA Hawaiian Islands Cetacean and Ecosystem Survey (HICEAS) Hawaiian Islands
Acoustician Nov. – Dec. 2023

- Acoustician on large-scale ecosystem survey led by NOAA Pacific Islands and Southwest Fisheries Science Center to assess the abundance and habitat of whale, dolphin, and seabird populations across the Hawaiian Islands with special interest in protected species.
- Conducted passive acoustic monitoring aboard NOAA Ship *Reuben Lasker* using towed hydrophone arrays and drifting recorders to detect and track animals in coordination with visual observers.

East Greenland Polar Bear Aerial Survey East Greenland
Polar Bear Observer and Data Manager Apr. – May 2023

- Visually identified polar bears and other marine mammals from Twin Otter aircraft in remote inshore and offshore locations of East Greenland.
- Direct assistant to project lead, Dr. Kristin Laidre, and data manager for all survey data. Ensured an organized workflow for data entry and quality control. Conducted exploratory analyses in the field to visualize results and inform survey decisions.
- Maintained survey equipment, fixed faulty instrumentation, and trained other observers.

Applied Physics Laboratory, UW Nome, AK
Marine Mammal Observer and Field Assistant on Research Cruise Sep. 2022

- Led marine mammal component (PI: Dr. Kate Stafford) for 10-day research cruise (Chief Scientist: Dr. Rebecca Woodgate) aboard R/V *Norseman II* in the Bering Strait and southern Chukchi Sea as part of the Bering Strait project funded by NSF-AON (Arctic Observing Network).
- Assisted in recovery and deployment of three seafloor-mounted ocean moorings carrying physical and biogeochemical oceanographic and whale acoustic instrumentation. Supported CTD rosette deployments along transects to measure water properties and collect water for future analysis.
- Conducted marine mammal surveys during transits, identifying cetaceans and pinnipeds in the area, and serviced mooring acoustic recorders.

Applied Physics Laboratory, UW Seattle, WA
Research Assistant Jun. – Sep. 2021

- Under the direction of Drs. Kate Stafford and Ana Širović, identified matching blue and fin whale calls between synchronous recordings on Sonobuoys and a High-frequency Acoustic Recording Package in Antarctica to estimate detection ranges.

University of Victoria Vancouver Island, BC
Field Research Assistant Aug. 2019

- Recorded echolocation and vocalizations of Southern and Northern Resident killer whales using a 21-hydrophone array (Reson TC-4013-5) on 22' rigid haul inflatable boat (RHIB) in collaboration with Max Planck Institute and Fisheries and Oceans Canada.

The Native Village of Eyak Cordova, AK
Field Research Technician May – Jul. 2019

- Conducted research for mark-recapture program in remote field camp on the Copper River.
- Applied TBA-PIT tags on and collected biometrics and genetic samples of large adult Chinook salmon from fishwheels. Implanted esophageal radio tags and collected telemetry data from a fixed receiver. Constructed, deployed, and maintained aluminum fishwheels.
- Trained in remote power systems and communication safety procedures, use of firearms as bear deterrent, and operation of powerboats (18-22') with outboard jet troubleshooting.

National Institute for Environmental Studies, Japan

Sarufutsu, Japan

Field Research Assistant

Apr. 2019

- Deployed and maintained five Oregon RFID antennas in a remote region of Hokkaido to detect PIT tagged Sakhalin taimen. Troubleshoot receiver issues, operated snowmobiles to field sites, and managed power supply to antennas.

US Antarctic Program, Long Term Ecological Research Project (LTER) Palmer Station, Antarctica*Field Science Leader*

Sep. 2018 – Feb. 2019

- Managed Dr. Oscar Schofield's lab (Rutgers University), studying primary productivity within the Palmer LTER program and long-term ecological changes of the West Antarctic Peninsula.
- Responsible for project oversight including lab and instrument setup and maintenance, supervision of research technicians, monthly reporting, outreach activities participation, and collection of samples and data using autonomous underwater vehicles (gliders), optical instruments, active acoustics, marine mammal surveys, and ring and metro net tows from small research vessels (34' RHIBs).
- Managed sample processing and analysis using chlorophyll *a* measurements, ¹⁴C uptake, FIRE fluorometry, an imaging flow cytobot, and krill biometrics.

US Antarctic Program, LTER Project

Palmer Station, Antarctica

Field Science Leader

Oct. 2017 – Mar. 2018

- Managed lab for Chief Scientist Dr. Hugh Ducklow (Lamont-Doherty Earth Observatory of Columbia University) at Palmer Station, collecting data for the microbial biogeochemistry component of the LTER Antarctic program.
- Deployed instrumentation from small research vessels (34' RHIBs and zodiacs), measured bacterial abundance using flow cytometry (BD Accuri C6) and bacterial production via ³H-leucine radioactive isotope analysis, filtered water samples, and ran equilibrator inlet mass spectrometer.

Prince William Sound Science Center

Cordova, AK

Biological Technician

Jul. – Sep. 2017

- Studied the interactions and impacts between hatchery and wild salmon in Prince William Sound, aboard M/V Auklet (58') under Drs. Pete Rand and Kristen Gorman.
- Conducted stream surveys, collected samples of otolith and DNA from spawned-out salmon carcasses, and documented all specimen measurements.

US Antarctic Program, LTER Project

Antarctica

Field Research Assistant on Antarctic Oceanographic Cruise

Dec. 2016 – Feb. 2017

- Conducted research for the microbial biogeochemistry component of the Antarctic LTER program aboard R/V *Laurence M. Gould* and under Chief Scientist Dr. Hugh Ducklow.

TEACHING AND MENTORING EXPERIENCE

2022 – 23 **Science mentor** for Evergreen high school student's STEM capstone project on beluga and narwhal acoustics.

2021 **Teaching Assistant** for UW's School of Aquatic and Fishery Sciences Marine Biology course (BIOL/FISH/OCEAN 250). Seattle, WA.

2021 **Invited lecturer** for FISH 464, Arctic Marine Vertebrate Ecology class at UW's School of Aquatic and Fishery Sciences. Seattle, WA. "Mysticetes of the Arctic."

2021 **Teaching Assistant** for UW's School of Aquatic and Fishery Sciences Arctic Marine Vertebrate Ecology course (FISH 464). Seattle, WA.

2020 **Invited lecturer** for Arctic Environmental Change class at Seattle University. Seattle, WA. "Arctic marine mammals and underwater soundscapes in a changing ocean."

AWARDS AND HONORS

- 2023 American Geophysical Union Ocean Sciences 2024 Early Career Travel Grant
2023 School of Aquatic and Fishery Sciences Finishing Fellowship, UW
2023 International Arctic Science Committee Arctic Science Summit Week 2023 Travel Award
2023 School of Aquatic and Fishery Sciences Winter Quarter Fisheries Interdisciplinary Network of Students Award, UW
2022 UW College of the Environment Student Travel Fund Award for conference attendance
2022 The Cooperative Institute for Climate, Ocean, and Ecosystem Studies (CICOES) Graduate Student Research Fellowship
2022 Animal Bioacoustics Technical Committee Best Student Paper Award for oral presentation at 181st Meeting of the Acoustical Society of America
2021 National Science Foundation Graduate Research Fellowship Program Honorable Mention
2021 Fisheries Interdisciplinary Network of Students Research Communication Award
2019 College of the Environment Top-Off Award, University of Washington
2019 School of Aquatic and Fishery Sciences Fellowship, University of Washington
2013 – 16 Dean’s List Honors Student, Columbia College, Columbia University

COMMUNITY ENGAGEMENT AND SERVICE

- 2021 – 23 **Open house committee lead** for the UW’s Students Explore Aquatic Sciences (SEAS) outreach program that seeks to increase access to science for underserved K-12 students in the Seattle area. Led planning and execution of annual open house. Led search committee to hire Open House Coordinator who controlled planning operations on the day of the event.
2021 – 23 **Board member** for SEAS outreach program.
2021 – 22 **Community networking committee member** for UW’s SEAS program.
2020 – 22 **Graduate student mentor** for SAFS’ Fisheries Interdisciplinary Network of Students (FINS) peer-mentorship program.
2021 **Session Chair** for the Analysis and Classification of Animal Bioacoustics Signals lecture session. 181st Meeting of the Acoustical Society of America. Seattle, WA.
2020 – 21 FINS autumn **graduate student retreat coordinator**. Seattle, WA.
2020 – 21 National Ocean Sciences Regional Bowl/Orca Bowl **Volunteer**. Seattle, WA.
2020 **Session Chair** for the Parameters and Features of Animal Bioacoustic Signals panel. Acoustical Society of America Virtual Conference (online).
2020 **Visiting Educator** for Pacific Science Center’s Climate Change/Curiosity Expo “Narwhal Mysteries” activity open to the public. Seattle, WA.
2018 **Invited speaker** to primary school students and faculty at The Prairie School: “Alaska to Antarctica: Science near the Poles.” Racine, WI.
2017 – 18 **Organized hand-written letter exchanges** between US primary school students and scientists in Antarctica.
2018 – 19 **Invited speaker** for video teleconferences with US middle and high school students to explain science conducted on Palmer Station, Antarctica.

TECHNICAL SKILLS

- Field skills* Wilderness First Responder (NOLS Wilderness Medicine); CPR certified; Valid US Driver’s and Motorcycle License; PADI Advanced Open Water certified diver; Bear and firearm safety; Proficient in use of power tools and operation of small boats.
- Software and Programming* R statistical programming, Python, Github, MATLAB (novice), QGIS, PAMGuard Passive Acoustics Software, Raven, Adobe Illustrator