Marine Bioacoustics Summer School

Course Program

Syracuse University

Syracuse, New York

June 29- July 3, 2026

Organizers

Jennifer Miksis-Olds[1] & Susan Parks [2]

1- Center for Acoustic Research & Education, University of New Hampshire

2- Biology Department, Syracuse University

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Office of Naval Research

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University of New Hampshire

Syracuse University

The Acoustical Society of America

FORWARD

Welcome to the tenth biennial marine **B**io**A**coustics **S**ummer **S**chool program. The goal of the SeaBASS program is to provide the opportunity for graduate students interested in pursuing careers in marine bioacoustics to develop a strong foundation in marine animal biology and acoustics, foster technical communication across disciplines, and to develop professional relationships within the field. Experts within the field of marine animal bioacoustics will provide half day seminars that describe fundamental aspects of underwater sound and marine animal behavior, summarize the present state of the field, identify current obstacles and challenges, and discuss important "hot topics" areas. Each seminar will include introductory lectures followed by group discussions or group projects to gain a more in-depth understanding of the issues.

We hope that SeaBASS will be more than a short course introducing students to the fundamental aspects of the field. We want the opportunity for close interaction that will allow all of the participants, presenters and students alike, to develop lasting professional contacts that will help develop the next generation of marine bioacousticians.

Jennifer Miksis-Olds & Susan Parks

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SCHEDULE

	Sunday June 28	Monday June 29	Tuesday June 30	Wednesday July 1	Thursday July 2	Friday July 3
7:00-8:00		Breakfast	Breakfast	Breakfast	Breakfast	Breakfast
8:00-12:00	Check-in at Ernie Davis Hall (8:00am-6:00 pm)	**R. Cohen** *Introduction to Acoustics & Propagation*	**D. Mann** *Passive Acoustics*	**Morning outing to Rosamond Gifford Zoo 9:30-12:00**	**I. Jones** *Fish & Invertebrate Acoustics*	**D. Harris** *Acoustic Density Estimation*
12:00-13:00		Lunch	Lunch	Lunch	Lunch	Lunch and closing remarks
13:00-17:00		**J. Warren** *Active Acoustics*	**J.Miksis-Olds** *Sound sources, Soundscapes, Ambient Noise*	**R. Dunlop** *Communication and Behavior*	**J. Reidenberg** *Marine mammal communication anatomy*	**D. Nowacek** *Noise Impacts*
17:30-18:30	Dinner at Ernie Davis Hall	Dinner	Dinner	Dinner	Dinner	Adjourn at 17:00
18:30-20:30	Software Installation workshop @ Ernie Davis Hall Lounge	Speed Talk Session (18:30-19:30) and Social	Hot topics (18:30-19:30)	Informal career discussions with presenters (18:30-20:00)	Open evening	

PARTICIPANT DIRECTORY

Presenters

Rebecca Cohen (r.cohen@cornell.edu)
Dr. Rebecca Cohen is a postdoctoral fellow at the Cornell K. Lisa Yang Center for Conservation Bioacoustics. She completed a BS in Biology (CUNY Brooklyn College), followed by an MS in Marine Biology and a PhD in Biological Oceanography at the Scripps Institution of Oceanography (University of California San Diego). Her dissertation focused on using passive acoustic data to investigate the ecology of pelagic toothed whale species in the western North Atlantic, building from deep learning tools for acoustic detection and classification to statistical modeling of spatiotemporal patterns in presence and associations with environmental variables. Since joining the Yang Center, Dr. Cohen has partnered closely with U.S. federal and state agencies to address targeted monitoring and management needs, from noise modeling and vessel noise characterization to detecting spawning sounds of critically endangered Atlantic sturgeon. Her work has been funded by NOAA, the National Park Service, the Department of Defense, and the New York State Department of Environmental Conservation, among others. Her research interests span computational methods for analyzing big passive acoustic data (both digital signal processing and machine learning based), marine mammal ecology and biogeography, and acoustic propagation modeling, with an emphasis on operationalizing passive acoustic approaches to support monitoring and management. Prior to this career phase, Dr. Cohen completed a BA in Italian Literary and Cultural Studies (University of Connecticut) and worked as a professional pastry chef.

Rebecca Dunlop (r.dunlop@uq.edu.au)
Originally from Ireland, Rebecca Dunlop completed her BSc (Honours) degree in Environmental Biology followed by her PhD in fish neuroethology, both from The Queen's University of Belfast. She migrated to Australia in 2004 to undertake a post-doc in humpback whale social communication at UQ. This research resulted in a number of highly cited papers, solidifying her international reputation as a leader and expert in large whale communication and social behaviour. She then began lecturing in the School of Veterinary Science in 2010, mainly in animal physiology and moved to the School of the Environment

in 2021 to take up a lecturing position in animal behaviour and physiology. Rebecca's research interests are in animal physiology, behaviour, and communication. She mainly works on humpback whales, though has worked on bottlenose dolphins, beaked whales, pilot whales, and false killer whales. Her lab focuses on four main research areas: cetacean acoustic communication, hearing, and behaviour; the effects of noise on humpback communication, behaviour, and physiology; humpback whale social behaviour; and endocrine physiology in cetaceans. Her past and current PhD students and honours students all work within these core research areas. She has been a P.I in several large collaborative projects aimed at determining the effects of noise on large whale behaviour and hearing in large whales. Understanding underwater noise impacts on marine mammals is a scientific area that is growing due to interest from the Navy, Oil and Gas companies, the vessel industry and from other ocean stakeholders such as whale watching companies. As part of this, she led the first humpback whale hearing experiments funded by the U.S Navy. Her current work relates to offshore wind farm developments and their potential effects on recovering marine mammal populations, developing a reliable acoustic whale deterrent device for shark and fishing nets, and assessing, and mitigating for, the collision risk between migrating humpback whales and shipping.

Danielle Harris (dh17@st-andrews.ac.uk)

Dr. Danielle Harris is a Senior Research Fellow at the Centre for Research into Ecological and Environmental Modelling (CREEM) at the University of St Andrews, with a multi-disciplinary background involving biological, statistical and acoustical analyses. Her BSc. was in Marine and Environmental Biology (2005, University of St Andrews) followed by a Masters in Environmental Biology (2007, Universities of St Andrews and Dundee). Her BSc and M.Res research projects provided an introduction to the fields of marine mammal acoustics and population monitoring methods, by studying bottlenose dolphin whistles during her BSc and analysing visual survey data during her M.Res. Both topics were then combined during her PhD (2012, University of St Andrews), which focussed on cetacean density estimation using acoustic data (supervised by Prof. Len Thomas and Prof. John Harwood). Subsequent post-doc projects have focused on investigating cost-effective approaches to cetacean density estimation using acoustic data, by exploring existing opportunistic datasets and new technologies. Projects have been worldwide, including current work in the Atlantic, Indian and Antarctic Oceans and have involved a range of species, from harbor porpoise to blue whales. Specific examples of projects are (1)

exploring blue and fin whale density estimation using Ocean Bottom Seismometers (funded by the US Office of Naval Research and Living Marine Resources Program) and (2) using underwater gliders to study harbor porpoise, beaked whales and fin whales (projects funded by the UK Research Council & Department for Environment, Food and Rural Affairs, and ONR). Dr. Harris was also a visiting Research Fellow at Cornell University between 2018 - 2020.

Ian Jones (ian.t.jones@unh.edu)
Ian T. Jones, PhD, is a Marine Bioacoustician and Research Assistant Professor in the Center for Acoustics Research and Education (CARE), and Interim Director of CARE at the University of New Hampshire. He specializes in characterization of underwater soundscapes from the perspectives of marine fishes and invertebrates (including measurements of acoustic particle motion), and occasionally of marine mammals. He received his B.S. in Marine Sciences with Marine Biology concentration from the University of Maine, Orono (2016), and PhD in Marine Biology from the Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program in Oceanography/Applied Ocean Science and Engineering (2021, advised by T. Aran Mooney). His PhD work involved laboratory-based studies on behavioral impacts of pile driving noise on longfin squid behavior and field-based study of coral reef soundscapes of St. John, U.S. Virgin Islands. Afterward, he spent his post-doc investigating variability in offshore deep-water soundscapes expressed in both particle motion and sound pressure (advised by Jennifer Miksis-Olds). Throughout his research he enjoys exploring baseline trends in soundscape data and how biological, geological, and human factors control soundscape variability, as well as applied research questions on how anthropogenic noise influences detection of sounds by and the behavior of marine animal taxa. Beyond science, he has a strong affinity for electronic dance music and moonlights as a DJ in the greater Boston area.

David Mann (dmann@loggerhead.com)
David Mann, PhD, is the President and founder of Loggerhead Instruments, a company dedicated to the development and manufacture of autonomous acoustic recorders and specialized hardware for both marine and terrestrial bioacoustics applications. Dr. Mann received his B.S. in Neurobiology and Behavior from Cornell University (1988) and earned his Ph.D. from the MIT/Woods Hole Oceanographic Institution Joint Program in Biological Oceanography (1995). Following his doctoral studies, he completed a postdoctoral

fellowship focused on fish audition at the University of Maryland under Arthur Popper. He held a faculty position at the University of South Florida College of Marine Science from 2001 to 2013, where he instructed graduate courses in biological oceanography, ichthyology, and signal processing, while supervising research on the sensory physiology of various marine taxa. His primary research interests involve the characterization of sounds produced by marine animals and the evolution of acoustic communication and hearing in fishes, sea turtles, and marine mammals. Throughout his career, he has investigated the bioacoustics of diverse species such as manatees, groupers, and dolphins, with a particular emphasis on developing innovative instrumentation for field-based observations. More recently, he developed Haikubox, a consumer device that uses convolutional neural networks to identify bird species by their songs, extending bioacoustics into the consumer space and helping scale acoustic monitoring through a distributed network of listeners. He is now developing a marine version of Haikubox for the Sarasota Bay listening network, in collaboration with the Sarasota Dolphin Research Program.

Jennifer L. Miksis-Olds (J.MiksisOlds@unh.edu)
Dr. Jennifer L. Miksis-Olds is the Director of the Center for Acoustics Research & Education and Research Professor at the University of New Hampshire. Dr. Miksis-Olds was the Vice-Chair of the Board of Trustees for the Consortium for Ocean Leadership (2020-2021). She is a member of the Scientific Committee of the International Quiet Ocean Experiment Program and serves as a Scientific Advisor to the Sound and Marine Life Joint Industry Programme. Dr. Miksis-Olds was the recipient of an Office of Naval Research Young Investigator Program award in 2011 and the Presidential Early Career Award in Science and Engineering in 2013. She is a Fellow of the Acoustical Society of America. Her primary research interests are patterns and trends in ocean soundscapes, animal behavior and communication, and the impact of environmental change on marine life. Dr. Miksis-Olds received a A.B. cum laude in Biology from Harvard University, M.S. in Biology from the University of Massachusetts Dartmouth, and Ph.D. from the University of Rhode Island. She is currently chairing the National Research Council panel on Ocean Acoustics Education and Expertise through the National Academy of Sciences.

Douglas Nowacek (doug.nowacek@duke.edu)
Nowacek is a University Professor in the Nicholas School of the Environment and the Pratt School of Engineering at Duke with his lab based primarily at the Duke University Marine Laboratory in Beaufort, NC. He earned his bachelor's degree from Ohio Wesleyan

University in 1991 and his Ph.D. from the Massachusetts Institute of Technology and the Woods Hole Oceanographic Institution in 1999. Nowacek has focused on the bioacoustics and behavioral ecology of marine mammals, primarily cetaceans, for over 30 years, and his work also includes technology development for marine conservation research. In his joint appointments in the Schools of Environment and Engineering, Nowacek works to bring new technologies to compelling marine science and conservation research questions. One of the current marine conservation issues that is an emphasis of his work is ocean noise and its impacts on marine animals, particularly mammals but also fish and turtles. The ocean noise work spans sound sources from shipping to offshore energy development to sonar, and the work involves stakeholders from all sectors. Nowacek has authored or co-authored more than 150 papers in the peer reviewed literature, publishing in top journals such as *Science*, *Nature*, *Proceedings of the Royal Society*, and the *Journal of Experimental Biology*.

Susan E. Parks (sparks@syr.edu)

Dr. Susan E. Parks is a Professor in Biology at Syracuse University where she leads the Bioacoustics and Behavioral Ecology Lab. Prior to her position at Syracuse University, she was a Senior Research Associate and Associate Professor of Ecology and Acoustics at the Applied Research Laboratory at the Pennsylvania State University. Her primary research interests are the behavioral function and evolution of sound production in animals, their perceptual abilities, and the impact of noise on their ability to communicate. She has been involved in animal bioacoustics studies since 1995, first as an undergraduate working on whale acoustic census data and studying male frog calling behavior, then as a graduate student focusing on acoustic communication of the North Atlantic right whale. Her primary research focus has been on the endangered North Atlantic right whale, which she has studied for the past 26 years. Her awards during her career include the Office of Naval Research Young Investigator Award and a Presidential Early Career Award for Scientists and Engineers from the White House. Dr. Parks is a member of the Acoustical Society of America, the Animal Behavior Society, and the Society for Marine Mammalogy. She earned her A.B. in Biology from Cornell University and her Ph.D. in Biological Oceanography from the Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program in Oceanography. She has served on the Committee on Offshore Science and Assessment for Ocean Energy Management for the U.S. National Academy of Sciences, as chair of the North Atlantic Right Whale Consortium, and as an Associate Editor for the journals Marine Mammal Science and Behavioural Ecology and Sociobiology.

Joy S. Reidenberg (joy.reidenberg@mssm.edu)

Joy S. Reidenberg, Ph.D. is a comparative anatomist, specializing in comparative anatomy. She is a Professor in the Center for Anatomy and Functional Morphology at the Icahn School of Medicine at Mount Sinai, NY, USA. Her degrees are from Cornell University (B.A. 1983) and Mount Sinai's Graduate Program in Biomedical Sciences (M.Phil. 1986, Ph.D. 1988). Dr. Reidenberg also held appointments as Guest Investigator at Woods Hole Oceanographic Institution, and Associate Scientist at National Museum of Natural History (Smithsonian Institution). She is a Fellow of the American Association for Anatomy, and an inaugural Fellow of the Society for Marine Mammalogy.

Dr. Reidenberg teaches Human Gross Anatomy, Histology, Embryology, Imaging to medical and graduate students, and participates in several anatomy courses for surgeons. Her international reputation for teaching excellence is evident from her many teaching awards, including the Basmajian Award for Outstanding Teaching and Research, the Science Communication and Public Engagement Award, and the Henry Gray Distinguished Educator Award (all from the American Association for Anatomy). She regularly engages with the public through outreach educational programs (e.g., two TED talks, numerous television documentaries). Dr. Reidenberg is best known on television as the comparative anatomist for the BAFTA award winning documentary series *Inside Nature's Giants*. She is the lead scientist (comparative anatomist) in many national and international science documentaries (e.g., PBS, BBC, SBS, NatGeoWild, Discovery Network, Science Channel). Most recently, she was featured in several new documentaries: *Lost Beasts Unearthed* (12 episodes) on SBS (Australia) and National Geographic (US), *When Whales Could Walk* on PBS NOVA (US), and *The Mystery of the Walking Whale* on CBC (Canada).

Dr. Reidenberg does research in comparative anatomy of animals adapted to environmental extremes, particularly focusing on marine mammals (e.g., underwater sound production mechanisms). Studying such "natural experiments" helps uncover basic biomechanical relationships that affect all animals, including humans. She hopes to mimic these adaptations to develop protective/preventive technologies or new medical treatments for injuries and diseases. Her work has been funded by: ONR, DOD, NOPP, NOAA. Dr. Reidenberg is often sought out as a whale expert for interviews in scientific and popular press (e.g., Nature, New York Times-Science Times, O the Oprah Magazine). She is an active member of U.S. national whale stranding necropsy teams. Dr. Reidenberg has written over 100 publications, guest-edited three special issues of the Anatomical Record,

created digital and video media projects, and continues to present at multiple scientific and educational conferences annually.
https://profiles.mountsinai.org/joy-s-reidenberg
https://www.linkedin.com/in/joy-s-reidenberg/
https://www.facebook.com/ReidenbergTV/

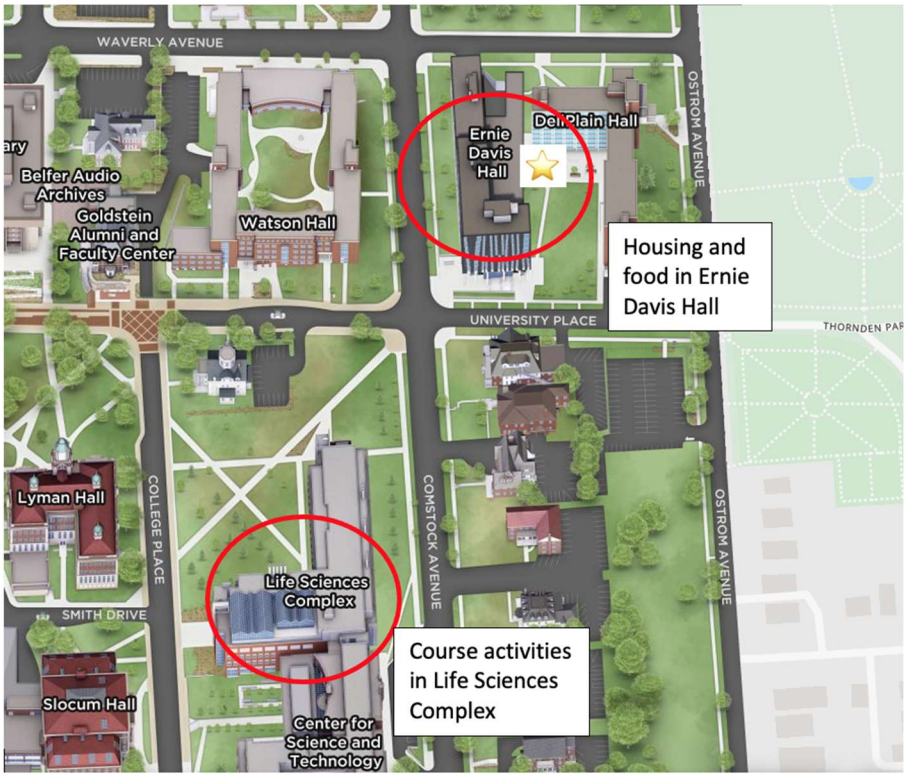
Joseph D. Warren (joe.warren@stonybrook.edu)
https://you.stonybrook.edu/warren/
@warren-lab.bsky.social (Bluesky) @warren.bioacoustics.lab (IG)
@warren_lab (Twitter)
I am a Professor in the School of Marine and Atmospheric Sciences at Stony Brook University. I was an undergraduate engineering major and discovered underwater acoustics as a summer student at WHOI working on acoustic measurements of sediment transport. I quickly realized that animals are more interesting than sand grains and began using active acoustics to measure zooplankton populations in the Gulf of Maine for my PhD. The majority of my lab's field work involves acoustic surveys of fish, zooplankton and other nekton populations and my research interests include: improving our ability to get "biologically-meaningful" information from acoustic echosounders, development of acoustic scattering models for different types of scattering processes, and examining predator-prey relationships between zooplankton and their charismatic (and less pretty) consumers. I dabble in passive acoustic studies involving: fish, marine mammals, seabirds, eelgrass meadows, and bats; as well as animal-borne tag studies examining sea turtle behavior and habitat use. I enjoy being at sea (as of this year, I have worked in every ocean except the Arctic) and have earned Shellback, Red Nose, and Imperial Order of the Golden Dragon status across my various voyages. I have studied small zooplankton in freshwater lakes which allows me to claim that I've used an underwater echosounder at a higher elevation (> 7000 ft above sea level) than anybody else in the world.

MAP OF CAMPUS:

A link to the full campus map can be found here:https://dhknapp.expressions.syr.edu/nafme/wp-

content/uploads/sites/5/2021/11/main-campus-map_07-29-202116-19-31-2.pdf with an interactive map here: https://www.syracuse.edu/map/. All course activities will be in the Lundgren Room, **Room 106**, on the ground floor of the **Life Sciences Complex Building**.

Housing & Dining: The best entrance is marked with a star. Housing and Dining will be in Ernie Davis Hall on Syracuse University Campus. Check-in for SeaBASS with housing staff is available anytime after 8am on Sunday, June 28th. The entrance for check-in is located from the center green space between DePlain Hall and Ernie Davis Hall, marked with a star on the map.



Other Campus Resources:

There are dining locations around campus, and you can access menus for the Ernie Davis Dining hall here: https://campusdining.syr.edu/

There is coffee available for purchase on campus at Dunkin' Donuts in the Shine Student Center building from 8am to 2pm Monday through Friday. Slightly farther on Marshall Street, you can find coffee at Collegetown Bagels (7am-6pm) or Salt City Coffee (7am-4pm weekdays; 8am-2pm weekends).

Worldcup soccer matches can be viewed on a large screen on the lower level of the Shine Student Center.