Sound Perspectives

Ask an Acoustician: Jennifer L. Miksis-Olds

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Meet Jennifer L. Miksis-Olds

In this issue, "Ask an Acoustician" features Jennifer Miksis-Olds from the University of New Hampshire (Durham). I always really enjoy Jennifer's talks at the Acoustical Society of America (ASA) meetings and was glad to get to know her better through this interview. Jennifer is very active in the ASA as a member of the Acoustical Oceanography and Animal Bioacoustics Technical Committees, the Finance Committee, the Publication Policy Committee, and the Women in Acoustics group. She recently published an article in *Acoustics Today* on ocean soundscapes (see bit.ly/371srp1). For other examples of Jennifer's research, see the **Bibliography**. I will let Jennifer tell you the rest of her story.

A Conversation with Jennifer Miksis-Olds, in Her Words

Tell us about your work.

I love my job, and I never get bored! I would label myself as an applied bioacoustician. I use both active and passive acoustic technology to study the ocean and the life within it. Because of my passion for sound and its utility in a myriad of applications, I have not been constrained to studying a specific animal group or topic over the course of my career. I've been involved in research programs that use and explore sound in innovative and interesting ways to learn more about the world around us, from the smallest zooplankton to the largest whales. I've engaged in projects related to information theory, animal behavior, ocean dynamics, and the impacts of sound on animals and the environment.

I am fortunate to be able to devote my time to follow the unexpected twists and turns of research because of my research faculty position. Being on the research track grants me the flexibility to pursue research full time, allowing me to participate in month-long research cruises and conferences throughout the year. Soft-money positions do come with the added stress of securing sufficient funds to not only cover my salary but also the costs of the research and graduate students. That means I spend a lot of time writing proposals. Soft-money research is less secure, but I feel the benefit of flexibility serves my personality and career aspirations well.

*Jennifer Miksis-Olds (**second from left**) with her family (**left to right**), Molly (12), MacKenzie (22), Madelyn (14), and husband Dave, in Madbury, NH.*

Being research faculty does not, however, remove me from the pursuit of knowledge. I embrace education through hands-on experience outside the formal classroom. My lab is full of opportunities

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for those just learning about science by participating in undergraduate research to those honing their skills at the postdoctoral level. I watch with great pride as my graduate students and postdocs enthusiastically mentor newer peers. Learning goes both ways because I learn so much from my students as they mature into independent scientists and become experts in their chosen topics.

Describe your career path.

In thinking about the ingredients that went into my career, three have contributed more than anything else: (1) working with excellent mentors, (2) relationships, and (3) saying yes to unexpected opportunities.

I was first introduced to acoustics as an undergraduate at Harvard University (Cambridge, MA) when I volunteered in a primate cognition lab as a research assistant. I worked with rhesus macaque vocalizations and through this work dipped my toe into signal processing when I was asked to test a beta version of an analysis software called SIGNAL. On graduation, I wanted to pursue my interest in marine mammal biology, and the combination of acoustics, behavior, and communication led me to accept a guest student position at the Woods Hole Oceanographic Institution (WHOI; Woods Hole, MA) with Dr. Peter Tyack. I wasn't sure I wanted to commit to an advanced degree, so this was an opportunity to see if research was right for me. The challenge was that the guest student position was unpaid. So by day, I worked in the lab, and by night, I waited tables and took on seasonal jobs. The relationships that I formed that year at WHOI were the catalysts that activated a chain reaction domino effect that evolved into my career, the most significant of which was meeting the man who would become my husband.

While at WHOI, I met two postdocs, Drs. John Buck and Richard Connor, who went on to become my MS coadvisors at the University of Massachusetts Dartmouth (UMass Dartmouth). From there, I was introduced to my future PhD coadvisors, Drs. James Miller and Percy Donaghay, at the University of Rhode Island (Narragansett Bay Campus). These wonderful advisors supported interdisciplinary research that allowed me to explore the combination of biology and acoustics by customizing my academic programs to include biology, oceanography, and the fundamentals of acoustics.

In 2003, Dr. Miller asked me to take notes during a National Oceanic and Atmospheric Administration (NOAA) workshop on underwater sound. It was there that I met my future supervisor from The Pennsylvania State University (Penn State; University Park), Dr. David Bradley. Four years later, at the end of my postdoc, again at UMass Dartmouth, I received an invitation from Dr. Bradley asking me to interview at Penn State. During my visit, I fell in love with the people and spent a wonderful decade there as a soft-money research scientist. The relationships that I developed at Penn State led me to the University of New Hampshire (UNH), where I am now. The overwhelming support from the UNH and New Hampshire state congressional leadership provided me with the resources to advance to the next step of my career. I was able to grow from single PI projects to management of a large multinational, multiinstitutional program called the Atlantic Deepwater Ecosystem Observatory Network (ADEON), with support from the Bureau of Ocean Energy Management, NOAA, and Office of Naval Research (ONR) through the National Oceanographic Partnership Program (NOPP). I was also provided the opportunity and resources to build the UNH Center for Acoustics Research and Education (CARE).

What is a typical day for you?

Thinking hard about it, the only thing that is typical about my days is morning tea with my next-door officemate, Dr. Anthony Lyons. Other than that, each day holds its own surprises. When I'm in the office, my time is spent divided among data analysis, writing journal articles or proposals, interacting with students, managing research teams on larger projects, and now working to build CARE. The order and priority of the tasks is ever-changing depending on urgency, deadlines, and the unexpected fires that pop up. Most days I'm just trying to keep all the balls I'm juggling in the air. When I'm not in the office, I am typically engrossed in fieldwork, attending conferences or workshops, and representing the university on national and international panels or committees. On travel, the work doesn't stop, and it is often a struggle to keep up with the daily demands back at the office.

How do you feel when experiments/projects do not work out the way you expected them to?

Any science endeavor that involves fieldwork or animals often does not work out exactly as you plan. I learned that early in my career during my MS work when one of my two captive bottlenose dolphin subjects at Mystic Aquarium (Mystic, CT) passed away at the very end of the experiment. There are always circumstances beyond our control or ability to plan for. Disappointment is the first feeling that comes to mind as

I reflect on past roadblocks. Taking a step back, objectively reevaluating, and making a plan to move forward is my solution to moving past the initial disappointment.

Do you feel like you have solved the work-life balance problem? Was it always this way?

Family first is and always will be the philosophy I live by. I achieve work-life balance by setting boundaries that adhere to this philosophy to ensure that both my family and my career get the best of who I am. To be successful in this endeavor, it has all come down to choices. First and foremost, I was blessed with a spouse who is 100% supportive of my career. One of his favorite sayings is, "Happy wife. Happy life." Second, I have chosen to accept only education or employment opportunities where my supervisors embrace my same philosophy. I had my first child as a graduate student, and my second as a postdoc. I interviewed for my first faculty position at Penn State when I was six months pregnant. We adopted our third daughter a day before her 18th birthday while I was at Penn State. I could never have succeeded in any of these positions without the full support of my advisors, mentors, and supervisors.

Everyday choices to maintain work-life balance come from personal boundaries. Those that collaborate and work closely with me know that I very rarely check or respond to email after working hours or on the weekends. I don't get work email on my phone. I feel that I give my all at work, and I want to give that same effort to my family when I am home. I also prioritize health and mental well-being. In doing so, it allows me to be more productive every day. You won't see me eating lunch at my desk. Most days I go home to walk my dog over the lunch hour. It is a good thing that I only live four miles from campus. Getting out of the office midday allows me to clear my head, get a little exercise, and jump into a productive afternoon.

What makes you a good acoustician?

Recognizing my weaknesses and surrounding myself with people who are smarter than I am. Acoustics is by nature an interdisciplinary field requiring you to have knowledge in physics, engineering, signal processing, and, depending on your specialty, biology, ecology, and oceanography (in my specific case). It is impossible to be an expert in all of these areas, and recognizing my strengths and weaknesses has allowed me to partner with collaborators that complement my unique set of knowledge. Surrounding myself with people who know more than me in different areas provides me the opportunity to learn and improve myself. Learning from others in different fields often means learning a new vocabulary that enables me to communicate more effectively and form new professional and personal relationships.

How do you handle rejection?

I am proud to say that I am an expert in failure. It has been one of the defining characteristics of my career. I was rejected from my graduate school of choice twice. I was rejected from two tenure-track and directorship positions. I was rejected from the ONR Young Investigator Program twice before I was finally accepted. I responded to each rejection with tenacity and a spiritual faith that things happen for a reason. After a brief period of mourning and self-pity, I pull myself up by the bootstraps and jump right back in the saddle saying, "What's next?" More often than not, it meant reviewing applications or proposals and consulting with others on how to make the next attempt stronger. At other times, it meant casting the net wider and being open to new and different opportunities. After every temporary failure, it was again the relationships I formed and my own ability to remain positive and open-minded that helped me turn a failure into a future success.

What are you proudest of in your career?

Being a positive role model for my three daughters makes me the most proud. A woman in science can still have it all: a rewarding and productive career, a supportive family, and an excitement for life. My family is an active participant in my career, and it brings me great joy to involve them in my career. For example, each summer, my dad and one of my daughters (we rotate through) accompany me to an international conference.

I feel my biggest contribution to the field of acoustics is training the next generation through mentoring/advising students and developing the Marine BioAcoustic Summer School (SeaBASS; see bit.ly/2O91Mhp). The success of my students and SeaBASS students is more rewarding than any combination of my own research publications, book chapters, or successful proposals.

What is the biggest mistake you've ever made?

I don't know about the biggest mistake I've ever made, but I can definitely pinpoint the loudest mistake I ever made. It happened early in my career while I was an undergraduate doing my thesis work on Cayo Santiago (Monkey Island) in Puerto Rico. I was performing acoustic playback experi-

ments with rhesus macaques. I mistakenly plugged the fully powered loudspeaker into my computer before turning the computer on. When the computer started up, the louder than life boom of the computer startup signal blared across the entire island. Every monkey scampered over the cliffs to hide. I stopped every research project on the island that day. I was extremely embarrassed and not a popular person at the time. In fact, I still feel that embarrassment as I answer this question. I've never made that mistake again.

What advice do you have for budding acousticians?

Talk to leaders in your field face-to-face. In this day and age, I find more young people gravitating toward email and other forms of electronic communication instead of developing personal and professional relationships through discussion. The ASA meetings are a great place to talk with people because almost everyone I know at these meetings is welcoming of students and young career acousticians. Take advantage of mentoring programs and lunches where you can listen to the stories of others. Out of session discussions are often the most productive parts of professional meetings for me, and it is often over dinner or drinks where new ideas take form and collaborations are made. If it is too intimidating for you to initially introduce yourself in person, break the ice by making contact with those you'd like to chat with before the conference. Set up a lunch or coffee break to meet and chat. Listen and share, and I'm sure you will walk away from conversations with new insights.

Have you ever experienced imposter syndrome? How did you deal with that if so?

I think one of the defining characteristics of any scientist is intellectual curiosity. It is understandable then that evaluation often turns inward in self-assessment and comparison to others leading to imposter syndrome. I am no stranger to this. I've found the most effective way to battle this unproductive thought process is to be productive. Volunteering or participating in professional societies, committees, and workshops fosters an atmosphere of teamwork where my contribution is valued among my peers. Follow-through on commitments also promotes a sense of accomplishment and value that is recognized by my partners and collaborators. I also remind myself that very little science these days is accomplished alone, and asking for help when needed is a sign of growth and strength to ensure success, not something to be looked down on.

What do you want to accomplish within the next 10 years or before retirement?

I want to play a role in elevating and celebrating the value of acoustics in ocean science and society in general. I'm trying to do this now by establishing CARE at UNH, inviting artists on ocean acoustic field cruises, and saying yes to as many outreach events as I can. New on the horizon for me will be conveying this message more nationally in the political environment by advocating for funding increases that benefit acoustics, ocean science, and education. More simply, I want to do good work that increases the visibility of acoustics in a positive light.

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