

OERA Student Research Travel Program Summary Report

SesBASS Bio-acoustics Training

Hosted by: Penn State University – Acoustics Research Laboratory (ARL)

Held at: The National Conference Centre, Leesburg, Virginia, USA

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Travel Purpose: Bio-Acoustics Summer School (SeaBASS)

Trip duration: 15 June – 21 June 2014 (7 days)

Destination: National Conference Centre, Leesburg VA

Purpose:

Several critical knowledge gaps have emerged within the marine renewable energy sector in Nova Scotia, including near field behavioral and direct interaction questions related to fish, marine mammals, and large debris (i.e. logs, sea ice). Marine renewable energy developers and regulators require that these knowledge gaps be filled, and a diverse suite of acoustic methods are being sought to provide data to support decision-making. To address the research needs of the marine renewable energy industry in Nova Scotia, particularly in the Bay of Fundy, Dr. Anna Redden is seeking to develop a bioacoustics laboratory at Acadia University.

Collaborative relationships have been established between Acadia University and US institutions (University of Maine, University of Washington), to build upon past experience and to facilitate transfer of the growing knowledge and experience base within the marine renewable energy sector. Thus, it is critical for Acadia University to further enhance research capacity through development of highly qualified personnel (HQP) toward meeting Nova Scotia's emerging research needs and to provide valuable contributions to existing and future international collaborations.

Experience:

Acceptance to attend the SeaBASS program was competitive. It was acknowledged by the course organizers that having secured external travel support from the OERA made my application more competitive. Attending SeaBASS provided a unique opportunity to learn about the most recent technologies and topics in bioacoustics (Table 1), while building a network of contacts of both experienced bio-acousticians and MSc/PhD students from around the world (Figure 1). Of 40 student attendees, myself and fellow Acadia Student Peter Porskamp, were the only representatives from Canada. Given that the SeaBASS program attracted students from a number of international countries including Peru, Brazil, Poland, Italy, and Australia we felt very privileged to have been selected to represent Canada, Nova Scotia, Acadia University, and the OERA.

SeaBASS was the first formal training I have had in bioacoustics. The course provided exactly what I needed, including a broad exposure to the principles of underwater acoustics, followed by specific topic lectures in various sub-disciplines of bio-acoustics. The material was covered at a brisk pace permitting coverage of a comparable amount of material that might be contained within a full semester university course.

While I enjoyed all of the sessions and speakers, I benefitted most from the thorough coverage of the principles of underwater acoustics and propagation session. This session helped to reinforce concepts and terminology commonly used in the field. This session help build my confidence in acoustic principles and has made me more comfortable in discussing and writing about complex acoustic concepts. Given my underlying interest in fisheries acoustics applications, I was also very interested in the active acoustics session which focused on fisheries assessment and monitoring. Discussions of study design and calibration considerations were very useful. I also enjoyed the session on density estimation which delved into the statistical applications and approaches to bioacoustics data. The SeaBASS program also exposed me to a number of software tools which will be of use in future projects.

Past experience conducting acoustic monitoring studies within Minas Passage has highlighted many of the challenges associated with working in such as dynamic high-flow area. It was beneficial to learn that other researchers have or are currently struggling with similar

issues. Discussion of these real-world problems faced by other researchers, and strategies for overcoming such issues was another useful outcome of the training.

Overall benefits of OERA Travel support:

The acceptance and attendance of two students from Nova Scotia who's travel was supported by the OERA and who are also involved in OERA funded research programs certainly raised awareness of the OERA and its mandate, and also highlighted the quality and diversity of research activities occurring within Nova Scotia to the larger bioacoustics community.

Knowledge and experiences gained from this training will make an immediate impact on the quality of current and future active/passive acoustic research projects undertaken by the Acadia University and the Acadia Centre for Estuarine Research, and will also help strengthen ideas and concepts in final preparations of my MSc. thesis. Acadia's interest in further development of established relationships with UMaine and UWashington will be supported by the knowledge and experience gained during this training. Beyond these existing relationships, this training program provided opportunities to make diverse international contacts and increases the potential for collaborative relationships between universities and individuals that could benefit future research projects.

It is expected that remaining questions related to marine renewable energy, and specifically tidal energy, will require the use of acoustic tools. The opportunity afforded by the OERA to attend this training program has made an important investment in expanding the knowledge and skills base of HQP in Nova Scotia. Investment in HQP development, particularly those who desire to develop careers and stay in Nova Scotia, will greatly benefit the province by increasing research capacity and expertise retention.

As a side note, it is worth highlighting that one of the programs primary organizers, Dr. Jennifer Myksis-Olds (Penn State), was already familiar with the OERA prior to our involvement in this training. Dr. Miksis-Olds was an invited expert participant during a 2011 workshop on Fish Behavior in Response to Seismic Sound held in Halifax, NS and sponsored in part by the OERA (then OEER).

Table 1. SeaBASS 2014 itinerary of formal training sessions and networking activities.

SCHEDULE						
	Sunday June 15	Monday June 16	Tuesday June 17	Wednesday June 18	Thursday June 19	Friday June 20
7:00-8:00		Breakfast and Welcome	Breakfast	Breakfast	Breakfast	Breakfast
		A. Frankel	M. Halvorsen		H. Klinck	S. Van Parijs
8:00-12:00		Introduction to Acoustics & Propagation	Hearing and Measurement	A. Rice Fish Acoustics and Behavior	Passive Acoustic Monitoring - marine mammals	Communication and Behavior
12:00-13:00		Lunch	Lunch	Lunch	Lunch	Lunch and closing remarks
	Software Installation workshop (14:00-20:00)	J. Warren	L. Kloepper	J. Miksis-Olds	T. Marques	S. Parks
13:00-17:00		Active Acoustics	Educational	Hot Topics in Biosoums	Passive Acoustic Monitoring - Diversity Estimation	Effects of noise on marine mammals
18:00-19:30	Dinner	Dinner	Dinner	Dinner	Dinner	Adjustments
19:00-22:00	Participant Introductions and social	Poster Session and Social		Informal career discussions with presenters and sponsors	Evening boating event	



Figure 1. SeaBASS 2014 participants (students, presenters, and sponsors) at the National Conference Centre, Leesburg, Virginia.