



Melding Conservation Ecology with Quantitative Analysis Using Acoustic Propagation Modeling and Digital Signal Processing

Nov. 23rd (Tuesday): 4-5pm ET

Dr. Kerri Seger



Dr. Kerri Seger will discuss an overview of a few ongoing projects that combine biology/ecology and conservation efforts with quantitative analysis and signal processing techniques. Impact volumes are regions of the ocean over which a species or hearing group of animals could be negatively affected by noise levels generated from human sources. Dr. Seger has worked on quantifying these impact volumes from pile driving in preparation of wind farm development along the East Coast of the United States, and is working on impact volume models of simulations from possible shipping lane configurations if a megaport were to be built on the Pacific Coast of Colombia. The acoustic propagation model used in this work is the parabolic equation (Collins, 1993). The flip side of propagation modeling and simulation in marine mammal research is processing acoustic data to track and better understand animals in ecosystems of interest. Technology advancements have provided terabytes of data where manual analysis remains the most accurate way to process it. Signal processing techniques are rapidly expanding to analyze these data more quickly. Dr. Seger will present some ongoing work in applying Mode Decomposition algorithms (EMD and VMD) from the wireless communication field to semi-blindly detect and classify signals from marine fauna to process acoustic data more efficiently.

Dr. Kerri Seger graduated from the Ohio State University with a combined degree in zoology, ecology, and music education, followed by a PhD at the Scripps Institution of Oceanography. Her dissertation focused on soundscape parameterization in grey and humpback whale habitats from Alaska to Mexico, density estimation of humpback whales using the sound pressure levels of their songs, and documentation of the social sound repertoires of humpback whales. Dr. Seger continued her research as a post-doc at the University of New Hampshire, and then as a Fulbright Scholar in Colombia, where she established a passive acoustic monitoring station and taught at the Universidad Pontificia Javeriana. She is now the lead bioacoustician at Applied Ocean Sciences.

Hosted by the [Soft Math Lab](#).

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