**Statement of Research Interests**

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I often wish that animals had Instagram accounts, the ability to get an intimate and personal look at their lives would be fascinating. Personally, I would immediately follow a Great White Shark, and probably shiver in fear at their photos of unsuspecting surfers floating contentedly above them; I grew up in Southern California and often surfed off the coasts. Of course this is absurd but it ties together to of my research interests ecology and technology. Specifically, I am interested in utilizing marine bioacoustics and innovative technology to understand marine ecosystems.

**Research Goals**

*The U.S. Antarctic Program (USAP) supports scientific research in Antarctica and provides operational research support. The NSF Office of Polar Programs Antarctic Sciences Section (ANT) supports research to: 1) expand fundamental knowledge of the Antarctic region, 2) improve understanding of interactions between the Antarctic region and global earth systems, and 3) utilize the unique characteristics of the Antarctic continent as an observing platform. Antarctic fieldwork is supported for research that can only be performed or is best performed in Antarctica. ANT encourages research using existing samples, data, and models that do not require fieldwork. ANT encourages research that crosses and combines disciplinary perspectives and approaches.*

**My Background**

My interest in bioacoustics started during a graduate statistics class where I became friends with another graduate student who was doing research with Professor Klinck who was part of the CIMRS Bioacoustics Lab at Oregon State University. I had been searching for how to bring my background in statistical analysis, software and hardware development to the field of ecology and this research area grabbed my attention immediately. I began to speak with other faculty at Oregon State University and attended a Marine Biology Conference.

I completed my master’s degree in the Department of Nuclear Science and Engineering at Oregon State University. My research involved researching and designing software for radiation detection and was funded through the Nuclear Regulatory Commission and during this time I was nominated by faculty and received an ARCS Fellowship. Studying nuclear decay is different than researching the effects of anthropogenic noise and its role on killer whale prey but from a research perspective I find there are a lot of similarities that would allow me to excel at this role.

The first is the use of statistics to analyze and work with data through a number of programming languages and interfaces including Java, Python, SQL and REST APIs This included conducting regression analyses in R and Python. Second, I worked with a data analysis method called spectroscopy which is very similar to a spectrogram. Instead of analyzing hertz and time I analyzed energy deposition as a function of count rate.

**Research Goals**

I am very curious about the world around me and the more unknown and remote a place the more I am drawn to understand the ecosystem and the effects that humans have on these environments. This fasciation for me involves the ocean and remote corners of the world like Antarctica and the Artic.

I consider my short term research goals to be what I accomplish as a PhD Candidate. If selected for this opportunity it would be to analyze the effects of anthropogenic noise on killer whale prey. My goal would be to master these tools and methods in order to be able to apply them effectively to future research questions.

To become an effective researcher I plan to focus on building my ability to utilize tools and methodologies important to marine bioacoustics. There is a lot of research to be done in this field but I hope that my future research will allow me to work in Antarctica.

*Our specific project is focused on the effects of anthropogenic noise in the ocean soundscape on killer whale prey, specifically salmon. Methods will include acoustic analysis of soundscape data, field and laboratory experiments.*

*The Advances in Biological Informatics (ABI) program seeks to encourage new approaches to the analysis and dissemination of biological knowledge for the benefit of both the scientific community and the broader public. The ABI program is especially interested in the development of informatics tools and resources that have the potential to advance- or transform- research in biology supported by the Directorate for Biological Sciences at the National Science Foundation. The ABI program accepts three major types of proposals: Innovation awards that seek to pioneer new approaches to the application of informatics to biological problems, Development awards that seek to provide robust cyberinfrastructure that will enable transformative biological research, and Sustaining awards that seek to support ongoing operations and maintenance of existing cyberinfrastructure that is critical for continued advancement of priority biological research.*

*The new sensor suite will be tested during a four-week glider deployment, where it will conduct acoustic surveys to map distribution and abundance of multiple zooplankton taxa and silverfish during the austral summer along the Terra Nova Bay polynya ice shelf and in adjacent continental shelf waters.*

New York State Canal

System (NYSCS) to demonstrate the usefulness of

underwater sound monitoring in invasive species

studies.

**Anthropogenic noise and animals**

I am interested in working in the field of biology but bringing to it something of importance. Data.

I hope to utilize novel research methods by collaborating with other scholars in electrical and computer science and mechanical engineering.

I am particularly integrating and simplifying data analysis and collection and joint research developing novel research tools like ROSS which is an autonomous surface vessel used to study internal waves, turbulence and mixing at Oregon State University

If you look at my CV you will see a winding path that I hope to straighten and progress towards completing a doctorate and joining a research University as a tenure track faculty member. I have always had a love for innovation and technology.

I enjoyed the research and had a passion for innovation but was still searching for the right field where I could apply my software and data related background. **Short Term Research Goals**

I am really interested in marine megafauna, but I bioacoustics can be applied across species.

**Future Research Goals**

I hope to accomplish a lot as a researcher but one of my main goals is to allow for greater scientific research progress to be made through increasing access to research data, partnering with other faculty and creating new tools for working with data.

If selected to work in your lab it would be incredible to utilize hardware and software tools to study killer whale prey and the role that anthropogenic noise has on the environment. This research seems like the perfect start towards my goal of gaining my doctorate and becoming a tenure track professor.

I have worked with data for developing algorithms for five years and constantly work to simplify and build scalable and resuable code. I hope to technology to link more scientists and citizen data through developing standardized APIs. Things could change but I would like to use REST, JSON.

My background is unique but I am confident I could bring a unique component to your lab. Your recent research analyzing over 4,754.5 hours of data.

**OLD**

There is a tragedy though in that we pose a far greater risk to them then they to us. Next I Would follow This would allow me to follow my interests, an Apex Predator and an Artic Dweller. These accounts would allow us to learn a lot, but the joy would be tempered with a warning as we looked at species that have now gone extinct.

I am excited to be writing about my interest and passion for two distinct areas of research

As my research grows I hope to further understand our complex artic systems.

While this is a childish thought it helps shed a light on my interests which is the use of technology, statistics and data to solve ecological problems; specifically utilizing underwater acoustics to study marine life.

**Artic Research**

**Future Research**

I have over five years’ experience working with and analyzing large datasets. The tools

The foundational aspects of writing solid, modular and reusable code is crucial.

Temporal and spatial data of their lives.

Utilizing technology

Technology is fascinating and has changed

**Introduction**

**Current Research Interests**

My overarching interests for my career is that my research will benefit people and help to preserve the ecosystem in which we live. There are a lot of pressing problems facing our environment and I hope to use computational, technological and statistical methods to help work on these problems with other scientists and community members. My particular interests involve utilizing numerical modeling and data analysis to better understand physical oceanography processes. My master’s thesis in the Department of Nuclear Engineering and Radiation Health Physics at Oregon State University involved designing digital software for radiation detection and measurement. This really began my passion for the power of utilizing computational methods to work with and simplify large data sets and to solve complex and non-linear systems.

The numerical and observational projects you list are all appealing to me. The project looking into ray tracing through non-canonical wave fields was particularly interesting and I think that this could utilize my background working with electromagnetic waves. My research focused on high energy waves exhibiting wave particle duality, but I think that there would be some overlap of the physics and methodologies used to think about these phenomenon. I also was interested in potentially building upon Wendy Callendar’s work. The other area that stood out would be building upon the observational projects with the datasets you have. The data set relating to internal wave and turbulence from the continental shelf stood out as one that might be particularly interesting to work with.

I am currently meeting with faculty from the OSU Physical Oceanography Department and hope to get further up to speed on research. If I was able to work with you I would spend the summer reading research from your group and the Oceanography Department. I would also speak to the faculty I know at Oregon State University to put together a reading list for this summer so I could have a strong foundation to engage in the projects you list and bring some original research question ideas with me.

In the future I am interested in joining an Oceanography Department and hopefully being able to use my background in oceanography, physics and entrepreneurship to work on wave energy. The Northwest National Marine Renewable Energy Center recently received a $40 million grant and I know many of the faculty involved in this.

**A Brief Statement About my Academic Path**

My background is a little unique but I feel it has prepared me for a successful career in academia. I would be happy to discuss this journey in person with you as I have spoken to a number of faculty in the College of Earth Ocean and Atmospheric Sciences who have helped me narrow down my research goals and interests.