Teaching Statement

Teaching and education have been fundamental to my entire professional life. Prior to turning to intensive study of biology and ecology in graduate school I was a public high school math teacher for six years in the San Francisco area at schools with diverse student bodies, and before that I worked in the experiential education field in Utah, New Mexico, South Carolina, New England, Washington state and internationally. Since then, I have been an adjunct professor of marine biology at the University of San Francisco (where I developed new curriculum for a marine biology field course), and volunteered my time as an educator both locally (e.g., as a tutor at Corvallis High School during my master's degree) and afar (e.g. as a volunteer English and environmental science teacher in Madagascar). My recent projects have included the creation of a 40-hr online workshop attended by more than 60 scientists from around the world with the purpose of sharing a series of bio-logging tools I've been developing since 2014. This workshop was run at no cost for participants but raised >$8000 from volunteer donations to fund paid internships for the Salinas High School-Hopkins Marine Station high school internship program – a program I started in 2016 in graduate school that pairs high school students from a local agricultural region with mentor researchers at Hopkins Marine Station. Less formally I have led a variety of short workshops and seminars, constructed curriculum with the American Museum of Natural History, directly supervised several undergraduate student researchers, and helped craft curriculum for a week-long high-school marine mammal program.

Throughout these experiences and others, my aim has been to provide students from all backgrounds with rigorous and rich academic challenges and the right combination of supports to meet those challenges. I work hard to differentiate my curricula so that regardless of whether students have struggled academically all their lives or are among the most academically talented undergraduates, students receive instruction that challenges and inspires them. My most fundamental teaching principle is that all students can learn, all can be challenged, and all have the capacity to construct broad intellectual connections between the task at hand and the world at large. I am highly qualified to teach a variety of ecology and physical science courses – including specialty subjects like behavioral ecology, oceanography and mammalogy, and field-based courses like bio-logging, geology and astronomy – as well as a variety of courses in computer programming, mathematics and statistics. I typically look to integrate real world research and field experiences into these courses to provide an experiential education lens that can make course topics more relevant and interesting. I have two decades of experience crafting standards-based, backwards-planned, experiential curricula, so the opportunity to craft undergraduate and graduate level ecology courses would be very rewarding.

As an active researcher at the intersection of biomechanics, physiology, ecology, engineering, signal processing and oceanography, I have found that, in addition to issues of access and equity, two critical recurring barriers that inhibit young researchers are quantitative competence and verbal and written communication. As a science educator, then, a guiding principle in all of my classes, including field and other "non-technical" classes, is to provide students with the opportunities and support to develop these essential skills. I am a strong believer in cross-disciplinary instruction, as science is a cross-disciplinary endeavor requiring the synthesis of a diversity of skill sets. From my experience as a math educator constructing year-long learning sequences in heterogeneous classrooms, I am adept at differentiating instruction for students who learn at different speeds and have varied preparation and educational priorities. In a science course, differentiation often looks like presenting students with research problems that can be solved in a variety of ways, each requiring an integrated quantitative challenge that meets standards at various levels of proficiency. I also require students to communicate their ideas orally and in writing for formal and informal audiences, and I give structured notes and demonstrations on how to do so, coupled with specific feedback. My professional experience has taught

me that experiential education is tremendously valuable as a foundation for personal investment in outcomes, as well as synthesis of content knowledge and skills. By building simulations and connections to real science and policy, students gain both familiarity and acuity in a field they may later be inspired to join as professionals. Some of my favorite activities involving using familiar tools in unique ways. For instance, the accelerometers and magnetometers that tell smartphones which direction they are facing are the same instruments we use in bio-logging tags, and I've constructed a variety of activities where students log and interpret their movements based on the same principles we use in animal tracking studies.

One of the advantages of bringing my research into the classroom are the clear connections between a system with intrinsic interest (how does a blue whale feed?) and quantitative skills useful in a a variety of disciplines. For instance, I use trigonometry nearly every day in my research, and the large data sets we use require proficiency in programming languages. Activities to strengthen these skills in students can then be brought into the classroom in an authentic manner. In 2016, for instance, I co-constructed and co-taught a bio-logging course for undergraduates that utilized real data and research principles to strengthen students' quantitative research abilities. Because of the strength of these connections at multiple skill levels, I have worked with the American Museum of Natural History and youcubed.org to design data science curriculum for younger students based on our research.

I teach my classes through a lens of cultural competence and equity. When they work as intended, undergraduate classes can be launchpads for individuals who have not before been exposed to a topic. Indeed, inspiring teachers have been the impetus for many scientific journeys, including my own. My teaching style is characterized by differentiated and rigorous instruction that seeks to meet students where they are and hold them to high standards, while at the same time capitalizing on the multiple intelligences that each student brings to the classroom. This manifests in my teaching in a number of ways, including by capitalizing on and valuing existing student assets, and facilitating access to science. When I teach classes with a large proportion of bilingual and bi-national students, for instance, it can be beneficial to recognize that many students are in great positions to navigate both international and community-based projects with care and awareness of local issues. I strive to utilize and highlight bilingualism and multiculturalism in science, and typically invite a diverse suite of guest lecturers into the classroom (which could be via video or other curricular choices) to draw attention to a variety of pathways into the field.

Finally, I believe that one of the most important roles of a professor is direct guidance and mentorship of students, striving to create a robust learning environment for students from all backgrounds. A good primary advisor can level the playing field for students who come in without societal advantages, while providing opportunities for both their direct supervisions and other students in the department. My goal is to help students foster their individual skills, while promoting strong scientific ethics and producing robust, hypothesis-driven science. I also truly enjoy working on a team of educators and am always looking to build my department's capacity in that vein. I would look forward to constructive dialog with colleagues about how to continually improve our instructional outcomes and reputation as a leader in higher learning, building off the successful institutions, ideas and principles that already exist.