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Delores E. Fisher Award 2005

**1000-word Essay:**

*"It is the time for a new ocean ethic.*
*The time to seize the day."*

While at the conference entitled "Seas the Day," the marine biologist/ environmental science advocate Dr. Jane Lubchenco made the above poignant statement, which embodies my own philosophy and passion for the ocean. It is time for a universal ocean ethic-one in which people recognize the eminence of the ocean for all kind and the implications of disrupting the delicate balance of marine ecosystems. In an age where anthropogenic forces are pervasive in shaping the ocean environment, it is imperative that we understand how marine organism will adapt to human-induced as well as other naturally occurring changes. I desire to make a difference in the world through my passion for marine research that will delineate if a diverse array of marine organisms will be able to cope with such environmental perturbations as thermal stress. My passion for the oceans also compels me to go beyond scientific research and become an ocean advocate, much like Jane Luchenco, by writing for a broader audience than the scientific community as well as activism through education.

During my undergraduate career, from an array of courses in physiology, marine biology, ecology, and toxicology I became intrigued by the mechanisms of marine animal adaptation to the environment. However, prior to college my scientific knowledge was very narrow, as I am from rural North Carolina where schools lacked strong science programs. I had to work hard to catch up with my peers, but loved the challenge. My studies in the classroom were reinforced through research experiences, fueling my passion to further explore the field of marine biology.

My passion to more thoroughly understand the ocean environment was first incited while studying Tropical Reef Ecology at Heron Island Research Station (HIRS) located on the Great Barrier Reef. This experience opened my eyes to the vast opportunities for research in the marine biology field. My previous studies in Zoology came to life at Heron Island and the abundance of diverse life forms in the ocean was astounding to a young biologist from North Carolina. While at Heron, I also had the opportunity to assist in a study by researchers from the University of British Columbia on the deep-diving physiology in the green sea turtle, *Chelonia mydas*. The focus of the study was on the process of thermal acclimation as an environment adaptation. However, a second interest of mine developed unexpectedly, as the research discovered a juvenile sea turtle that died due to ingestion of plastics. I was intrigued that pollutants could invade this national marine refuge, but learned that even more may be at stake for sea turtles due to xenobiotic exposure, as proper environmental conditions are vital for sea turtle sex ratio determination and hatchling success.

From this experience, I sought research projects exploring my fascination with the mechanisms of marine organism adaptation in Functional Genomics at NCSU, Crustacean Physiology at the University of Alaska-Southeast, and Environmental Toxicology at the United States Environmental Protection Agency. I am currently utilizing the skills from my broad-based undergraduate research as a National Science

Foundation Graduate Research Fellow in the Biological Sciences PhD Program at Stanford University. Under the direction of renowned ecological physiologist Dr. George Somero, I desire to make a difference in the world by further elucidating the physiological effects of environmental change on marine organisms. Research characterizing the facets of the cellular stress response in organisms from microbial species to pelagic fish has implications that extend from a better understanding of marine animal physiology to ecological dilemmas, such as the effects of global climate change and xenobiotic exposure on marine ecosystems.

While study of the oceans is my foremost passion, I want to extend beyond research as both an educator and a writer. One of my foremost goals is to teach at the college level. I desire to be a Professor that not only teaches the basic concepts of Marine Biology, but provides students with the opportunity to experience the ocean environment as I did in the Tropical Reef Ecology course. More undergraduate students should have access to opportunities like this field course that allow them to explore science outside of the classroom as well as to corroborate their abilities as a future scientist through such research experiences. Through involving undergraduates in my own research and leading field courses like Tropical Reef Ecology or Polar Biology in Antarctica, I hope to facilitate passion for the oceans in students analogous to how my own developed.

I also believe that integration of scientific research and education should begin well before college and will continue my previous involvement with programs to spark interests in the marine sciences and other ocean studies at younger ages. As an undergraduate Goldwater Scholar and graduate National Science Foundation, I have spoken to several high school science classes on the possible avenues for marine-related research during college. I also had the opportunity to teach science at the high school level through involvement with the North Carolina Model European Union (NCMEU). The NCMEU was fun and engaging for students as they actively debated EU policy, such as declines in marine biodiversity and the Common Fisheries Policy, while learning about the science behind the policy.

My dual undergraduate degree in Science Journalism has fostered a desire to relate science to the public. As an undergraduate, I had the opportunity to take courses in Science Writing and intend to publish an article in *Environmental: E-Magazine* on the discovery that endocrine disrupting compounds (EDCs) can have androgenic modes of action in fish species. Scientists have known about estrogenic EDCs for over 30 years, but only recently have scientists found that “environmental androgens” are in the soup of industrial contaminants from pulp and paper mills. EDCs are rapidly becoming a hot topic in science news, and the general public needs to be aware of what is happening in this field, due the implications for human health as well as for the overall health of the ocean and its inhabitants.

Through research, teaching, writing, and advocacy, I desire to use my passion for the oceans to facilitate a new ocean ethic, as related by Dr. Lubchenco, one involving a greater clarity of how vital the oceans are for animals (including humans), the environment, and the world.