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Growing up in a world of accelerating technological developments, I saw both the benefits and detriments of an evolving society. I felt concerned and disappointed when leaders disregarded wildlife and the environment for personal gain. After all, humans were the ones inhabiting their world. I was always helpless and could only read articles of the new dangers animals faced every day. Animal telemetry is a method using satellite systems to gather data on marine animals, including their location and movement. The Navy uses the data to protect marine life through policy implementation, such as the Marine Mammal Protection Act and Fur Seal Act, as well as divert human activity from groups of animals. Protection of the ocean is one of the duties of the Navy, and animal telemetry is extremely useful in aiding them with the protection of marine life. Without this technology, it would be difficult to relocate individuals and track their actions. Knowing that this technology exists is inspirational to not only me, but many others who feel the need to act for the company we have on our planet. Using real, raw data from the animals themselves can be instrumental in providing the protection that is growing in necessity day by day.

Monica DeAngelis is a scientist that is truly dedicated to her work. Although she did not especially love math in high school, her passion for marine life eventually led her to conducting research with the Navy. Her connection with and care for animals is inspiring in itself; few people possess dedication to the animal kingdom as we slowly distance ourselves from the more natural world. Not only are marine researchers working to improve conditions for the animals, but they are able to incorporate mathematics and science into their work to improve efficiency and accuracy. Monica's career has opened my mind to a possibility that I can do what I am good at while working for a cause I am passionate about. There is no doubt that there is still much work to be done for wildlife, and I believe scientists like Monica DeAngelis are instrumental in inspiring young STEM students to pursue a career like hers. As a student who enjoys learning both math and biology, I ought to think of ways that I can apply my skills and capabilities to tackle the technical and engineering challenges in the future.

In the field of tracking and protecting marine animals, there has been an abundance of scientific information collected through electronic telemetry in recent years. I cannot stop thinking about how to make sense of the huge amount of information collected and how to gain as much insight out of the data as possible. I propose that advanced research on statistical modeling and forecasting is much needed in order to better understand the impacts both the military activities and commercial industries (fishing, oil/gas, etc.) have had on the marine animals' migration patterns and movement behaviors. Through my self-study in the past few weeks, I have been intrigued by original modeling work using Bayesian model and hidden Markov model (HMM). With their deep domain knowledge and support from the Navy, mathematicians and scientists from the Navy should be able to develop additional novel statistical models and forecasting methodologies to help engage all the stakeholders so they can come up with a more comprehensive conservation and governance strategy. Accurate and insightful modeling and forecasting is also crucial for our public decision makers to adopt new policies as needed.

For me, one marine animal on the endangered species list is one too many. With all the commitment and investment from the Navy and Marine Corps, the hard work and efforts from scientists

and engineers like Monica, and increasing awareness by the commercial industries, I am hopeful that all marine animals will thrive in their natural habitat in 2040. It is my strong belief that our Navy will not only protect our nation from the enemies, but also play an important role in helping prevent marine animals from going extinct on this planet.

In general, satellite systems used in animal telemetry will most likely expand as we obtain more materials and funding. Hopefully, a more detailed group of satellites will further assist researchers to track even more species. As our population grows and our needs increase, we will no doubt have to move outwards into the ocean. The trackers attached to animals will improve in quality, and possibly could report even more data than they already are doing today. Technologies will most definitely improve in other fields besides animal telemetry. Today, pressing environmental issues include pollution, climate change, and habitat destruction, among many others. Transportation, manufacturing, and other human activities all play a tremendous role in the fast degradation of our world. Changes in cars, buses, or subways to curb emissions could all change our lives by 2040. New developments could change methods of waste collection, construction, and manufacturing, creating different jobs and shifting the economy in the future. Naval STEM advancements can help the military to be more efficient in locating enemies, surveying the seas, and of course, inspiring the next generation of scientists and engineers.