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Sharks and Miami Lawyers

I have taught undergraduates and graduate students for over 20 years. And just as a parent would never admit to a favorite child, I am loath to favor one set of students over the other. However, I will admit to being particularly fond of a characteristic trait of undergraduates rarely displayed by graduate students—namely, the willingness to ask unfiltered questions. Graduate students routinely ask me about mixing parameterizations, flow instabilities, Lagrangian dynamics, and most anything else within a comfortable reach of a physical oceanographer. And then there are the questions from undergraduates. Last week, in my class, *Ocean and Atmosphere Dynamics*, I was describing recent changes in Arctic summer sea ice when a hand shot up. Clearly engaged with the material, the student asked, “I heard from a friend that the increased incidence of shark attacks off the North Carolina coast this summer was due to the cooling of waters at the poles. Is this true?” See what I mean by unfiltered? And yet, I relish these questions as they give me a toehold of interest with which to work. I like to unpack these questions and see where they take the class discussion, which is usually in a direction I had not anticipated at the start of class.

I enjoy these unfiltered questions for another reason: they illustrate a curiosity about the ocean and an awareness that the ocean is changing. But they also highlight considerable confusion about what is changing and why. Since I started teaching undergraduates, there has been a steady increase in the news coverage on the ocean. Articles or news releases focused on ocean issues such as sea level rise, plastics, the great ocean garbage patch, sea ice loss, and acidification have been fairly commonplace for a decade or more. But even though the news is commonplace, it does not mean the information has been clearly communicated or understood. As a case in point, consider the question about the sharks off the North Carolina coast.

To simultaneously capitalize on student interest and provide context on the modern challenges facing the ocean, oceanographers around the country have been revamping how they introduce students to the study of oceanography. I have been particularly impressed by a course that a colleague of mine here at Duke, Nicolas Cassar, has been teaching for a few years: *The Changing Oceans*. This course takes a problem-based, rather than a disciplinary, approach to the study of ocean sciences. But what interests me the most about this course is that Nicolas has the students interview, via Skype, authors of recent articles

focused on how the ocean is responding to human impact. The students select the topics and the articles, and they ask the questions during the interview. Rather than learning oceanography from a disciplinary framework, this course introduces oceanography through the lens of curiosity. As I have learned through the years, that curiosity rarely has disciplinary constraints. As an added bonus, the class content and format, according to Nicolas, have provided “fuel for interactive learning and critical thinking.”

The unfiltered questions from undergraduates are also interesting to me because they allow a window into how the general public perceives our changing ocean. This perception never ceases to surprise me. Last spring at a reception for Duke alumni, a Miami lawyer explained to me that he absolutely believed sea level was rising, but he did not believe any of the “nonsense” about global warming. When I asked him why he thought sea level was rising, he quickly responded, “Because ice is melting.” Deciding to stick with that line of reasoning, I asked him why he thought the ice was melting. After a long pause, he told me he would have to get back to me on that one. I am still waiting. But I am also still wondering why the link between warming and sea level rise was not obvious to this individual and whether as a community we can do a better job of communicating these linkages.

The story about shark attacks and the one about the Miami lawyer (a juxtaposition completely unintended but now appreciated) converge with a suggestion for how TOS might facilitate communication to students and the general public on ocean issues. I would like to suggest that TOS’s website serve as a repository for the interviews conducted in Nicolas’s class and any other such interviews of oceanographers both in the United States and abroad. I also suggest that TOS create an FAQ page on commonly asked questions about the ocean. With TOS’s interest in engaging early career scientists in our professional society, we might consider this initiative a means for these scientists to educate the public about ocean sciences. At least it would be a start. And for the perfect kickoff question, I have one about sharks!

If either of the two ideas above interest you, let me know (susan.lozier@duke.edu). I am open to suggestions.



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