

TEACHING OCEANOGRAPHY BY ENGAGING STUDENTS IN CIVIC ACTIVISM

By Bruce C. Monger

I teach an introductory oceanography course at Cornell University that delivers the basic concepts found in most introductory oceanography textbooks, and also emphasizes, more broadly, the ocean's role in maintaining Earth's overall life support system. The class offers the opportunity to describe how climate change and other human-caused impacts are threatening this system with astonishing speed. The class has grown in popularity over the years, with an enrollment that now exceeds 1,000 students. It is held in the large concert hall on campus (Figure 1) and consistently ranks as the largest enrollment course at Cornell. Here, I share some of my thoughts as to why this class continues to attract so much student interest.

The semester initially progresses along the familiar path of presenting basic concepts in marine geology, physical oceanography, biological oceanography, and

marine chemistry. However, whenever possible, I pause to explain how a given aspect of the ocean is vital to the planet's—and the students'—well-being (e.g., heat transport by conveyor belt circulation or the biological carbon pump). Presenting these basic concepts consumes about two-thirds of the semester and builds a strong conceptual foundation. After a picture of the vital role the ocean plays in Earth's overall life support system comes into view, I begin to describe a wide range of human-caused threats facing the ocean. These threats include global warming, ocean acidification, ocean deoxygenation, coral bleaching, overfishing, and nutrient pollution. I explain that each of these threats has a solution and that it is a matter for our society, and especially government leaders, to implement these solutions.

I think the class is popular for several interrelated reasons. Course evaluations include a lot of comments about

my passionate teaching style, about how I make an emotional connection with students, and about how well-organized lectures are. But the thing that hooks students the most is that I ask them to rise up and become civically engaged with the global environmental issues of our time. This call to action gives students a sense of ownership for what they learn in the class. Instead of simply memorizing ocean facts to replicate on an exam, they are asked to take those facts and work toward making a better world.

The lectures include a lot of inspiring language, and this is especially true in the last third of the semester. As an example, after discussing the short timeline that we face to eliminate carbon emissions in order to limit global warming to 1.5°C, I will say, “Every so often a generation is called upon to do something extraordinary. In 1940, a generation was asked to rise up and fight a world war to save democracy. And now,

FIGURE 1. As this 2014 photo attests, Cornell's introductory oceanography class, taught by the author, is so large it takes place in Baily Hall, the university's concert venue. *Image credit: Kathie Hodge, Cornell University*



once again, a new generation, this generation, is called upon to do something even more extraordinary—to rise up and decarbonize the global energy system by mid-century to save all of humanity.”

During the concluding third of the semester, the lectures emphasize the need to raise our voices in collective social action to push government leaders to act on the global environmental threats we all face (Figure 2). I remind students that women in this country did not get the right to vote without campaigning for what was socially just. And African Americans did not get civil rights legislation passed without raising their voices for what was socially just. I go on to say that we will not get a sustainable planet that is socially just for this generation, and for future generations, unless we also collectively raise our voices.

I believe strongly in the idea that a democracy operates best with a well-informed citizenry. But a well-informed citizenry alone is not worth much if citizens do not also raise their voices to give government leaders their thoughts on how best to move the country and the world forward in a positive direction. In the case of college students, there is an extra, special obligation to raise their voices because they are among the best and the brightest our society can collectively produce. Consequently, their ideas and opinions on how best to move things forward have exceptional value to our society and, therefore, they urgently need to be heard.

I tell students in the oceanography class that they may have worked hard to get to Cornell, but that our society (both past and present, and international) also worked hard, and made significant sacrifices, to build a university that allows them an opportunity to reach their full academic potential. As a consequence, they are obliged to give something back to society. In my opinion, there is an unspoken contract between a society that builds a university and the students who attend that university. Students who enjoy the rewards of a college education and



FIGURE 2. Author Bruce Monger traveled with a busload of Cornell students to the March for Science protest in Washington, DC, in 2017.

achieve a high level of academic excellence owe the society their voices and opinions on how best to make the world better for everyone in the society.

To emphasize this point, students in the oceanography class have an end-of-semester assignment to write letters to their two United States senators and their congressional district representative in which they express their personal views about an ocean conservation issue of their own choosing. International students are encouraged to write letters to their own respective government leaders. The letter is graded based only on the sincerity of the writing and not on a particular stance the student takes. It is emphasized that the letter should be their own personal views and opinions and certainly not a classic end-of-semester term paper. In short, a student can say whatever is on his or her mind and get full credit. It is up to each student to decide later whether to go ahead and mail their letter. Many students do end up sending their letters. I often receive email after the class is over from an excited former student telling me of a senator’s or representative’s response—obviously a very empowering experience for a student. The letter writing assignment provides a tangible

example of raising your civic voice, and it gives students in the oceanography class something that I call “ownership” of the material they have learned in the class.

And I would argue that taking ownership elevates long-term retention of the class material. 📌

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