

THE OFFICIAL MAGAZINE OF THE OCEANOGRAPHY SOCIETY

Oceanography

CITATION

Garrison, T. 2014. The oceanography classroom: A student bestiary. *Oceanography* 27(3):154–155, <http://dx.doi.org/10.5670/oceanog.2014.80>.

DOI

<http://dx.doi.org/10.5670/oceanog.2014.80>

COPYRIGHT

This article has been published in *Oceanography*, Volume 27, Number 3, a quarterly journal of The Oceanography Society. Copyright 2014 by The Oceanography Society. All rights reserved.

USAGE

Permission is granted to copy this article for use in teaching and research. Republication, systematic reproduction, or collective redistribution of any portion of this article by photocopy machine, reposting, or other means is permitted only with the approval of The Oceanography Society. Send all correspondence to: info@tos.org or The Oceanography Society, PO Box 1931, Rockville, MD 20849-1931, USA.

A Student Bestiary

BY TOM GARRISON

Ours is an open-door institution. Any high school graduate may apply for admission, and most requests are granted. Because California's community college tuition and fees are minimal, hundreds show up at the beginning of every semester—the parking lots are overflowing.

Marine Science attracts a large number of these students. Given our location and demographics (Orange Coast College is within five miles of superb surfing beaches and Newport Harbor, one of the world's largest concentrations of private yachts), it's no surprise that introductory oceanography has been the most popular class on campus for more than 25 years. We don't have much of a chance to get to know students in the large classes (enrollments often exceed 350). These enrollees select the oceanography lecture course to satisfy a science requirement for graduation or transfer.

But for students wishing to take a lab science (often a requirement for transfer to a senior institution), economy of scale allows our department to offer many small follow-on classes (for which the large general oceanography course is pre-requisite). It is in these small lab classes where we get to know our clientele. They are a fascinating and often surprising group. Here are some stereotypical examples, and how our faculty and staff assist them in mastering course content.

► *The "I've always wanted to be a marine biologist, but why this class is so hard?" student:* Most of our students are too young to remember Jacques Cousteau, but the proliferation of marine-oriented programs on the History Channel, the Science Channel, NatGeo, and others, has taken his place in convincing students that *absolutely nothing* would be more fun than being a marine biologist (and, of course, getting paid for it). High school career counselors don't help the situation much, often neglecting to ask about the candidates' mastery of math and basic science. Once seated in a lab class, they seem lost. Designing a reasonable experiment (much less writing a clear description of the results) stops them cold. The need for calibration, replication, and standardization is not apparent. Critical thinking is not their forte. They seem lost.

The fix: We never discourage students from trying. But when it becomes clear to student and prof that this story will not have a happy ending, we carefully explain that most marine

biologists have known they were headed for a career in science from (at least) middle school. They devoured books and magazines (not just watched "Shark Week" on TV), sought information from dependable Web sources, and followed inquiry beyond the superficial. They thought critically—arguments were examined for flaws and evaluated on the data. If our candidate pleads not guilty on these grounds, we invite exploration of another line of study.

► *The "I don't do math" student:* This subtype has also been fascinated by television programs featuring divers, coral reefs, and mermaids since being old enough to blow bubbles. He or she has explored marine science in print, has studied marine animals whenever possible, has paid attention on field trips, and has excelled in science since grade school. Ask why the sky is blue, or which way Earth rotates, and this person will have the answer. But math? Well, he or she has never been good at math—in fact, this student left high school having completed the absolute minimum of math and science courses. At this point, the necessary chemistry and physics courses are off-limits.

The fix: We have excellent remedial programs for students with math and science deficiencies, but when we make out a tentative schedule—a schedule that will take perhaps four years to complete before transfer—the wind is removed from their sails. Start back at square one? Here is a true test of dedication. Fortunately, our department abounds in clubs and activities and off-campus projects to help these students maintain focus during the period of remedial study. Our institution's self-paced math courses are a huge help for these students.

► *The "aquarium enthusiast":* Keeping a saltwater aquarium is a popular hobby, and some of our students come to us to expand their knowledge in this area. Not surprisingly, these students usually do well because they know how important chemistry and physics are in the marine sciences. Anyone capable of successfully balancing the hundreds of factors that contribute to a happily functioning marine aquarium is a good bet for continuing success. We offer special classes in aquarium management and maintain a large public marine aquarium on campus. Watching these students enthusiastically tackle the

taking down and rebuilding of a reef tank is inspiring to us all. One of our current students is even growing a mangrove forest in circulating runoff water to remove excess organics—an experiment that is going well so far.

The fix: None needed. These self-motivators will do just fine!

► *The “spoiler”:* This is the lab student we fear most. Under his breath, he is heard to mutter: “Well, that’s *stupid!* We just measured the temperature—why do we have to do it *again*. This is all busywork.” Or, “I know I was supposed to record the data and distribute it to the group, but I got busy and forgot.” Or, “I think I’ll just slip outside for a little break. Anybody want to come along?” Or, “I didn’t get my lab report finished. Will that affect my grade?”

This attitude can quickly poison the atmosphere at a lab table (we group students in fours). We and the TAs are very alert to this sort of behavior, and nip it in the bud.

The fix: A quiet, private chat with the spoiler often yields results. Explaining why multiple data points are required to minimize experimental error, or a private demonstration of the variance between the temperature readings of thermometers left on the lab table for a few hours (which, theoretically, should all register the same degree of heat), can sometimes solve the problem.

If that doesn’t work, we rearrange the seats to place all potential spoilers together!

► *The “Ewwwww!”:* Repelled at the idea of getting close to even a sand crab, the “ewwww” (named after the sound this student constantly makes) refuses to dissect, prod, hold, or otherwise learn from an actual animal. “Can’t we do this using video simulation? We had a frog dissection game in high school!” (No. No, you can’t.) “That plankton smells. I’m not touching it.” “Does that squid have suckers—do I have to touch them?” “Parasites? I have to leave the lab to throw up.”

The fix: This can be serious issue and one must never disparage these folks. I have found that the separation of a small part of an animal and close inspection with a dissecting ’scope (say, a single fish scale or a quiet copepod with feeding currents in operation or, yes, a single squid sucker) can be mesmerizing. The whole fish may evoke an “ewwwwww,” but the beauty of microstructure gets ’em every time! I’ve seen squeamish students dig into a fish cranium with both hands after an hour of stand-offish-ness.

► *The “convert”:* Our favorite! As the semester progresses, we can watch their interest and excitement grow. Their writing improves, their understanding of how science operates

expands, they hang around and talk to the TAs, they visit during office hours, they even decide to become real marine scientists, and they sign up for chemistry, physics, and math classes! We have them for a few years, watch them mature and go on, and check on them regularly. They make professoring the true joy it is.

The fix: None needed. Engage them in conversation at every turn. Buy them coffee. Loan them books and journals. Sit back and enjoy!

► *The “dream”:* Here’s the student we lust after. This man or woman is first into the lab, and last to leave. He or she asks good questions, helps students at the lab table understand difficult concepts, and listens for directions. This student intuitively understands the need for replication and standardization in experimental design, the nature of instrument error, and the importance of clear communication. Without really being told, this student seems to have an intuitive understanding of the process of science, and can write clearly and concisely. He or she even helps clean up the lab when most of the students have departed.

These kinds of students have known of their interest in marine science since grade school, have taken rigorous courses in high school, and have often attempted advanced placement coursework along the way. Their success comes from within. These are the folks we hire as teaching assistants and who begin their long careers beside dedicated instructors who protect and share them like the prizes they are.

The fix: Hire these students as teaching assistants! Take them to lunch! Meet their significant others! Invest in departmental scholarships for them! Visit them at their transfer institutions! Enjoy every minute—and remember, they carry a bit of you inside themselves wherever they go. 📧

So, the open door provides a great opportunity. At least students can try out different areas of study that interest them. Remember, though, that one of the best services a department can provide is to guide a student away from a long course of study that would not be suitable for the individual in the long run.

We favor success—but succeed or fail, providing understanding and assistance to all these categories of students allows both students and staff to win. 📧

Tom Garrison (tomgarrison@sbcglobal.net) is an instructor at Orange Coast College, Costa Mesa, CA, USA.