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Interview with Old Town High School Student Emma Hargreaves

by Ed Lindsey

From 2013 to 2016, Old Town High School students augmented the work of University of Maine School of Marine Sciences researchers Paul Rawson and Sara Lindsay to learn more about a marine worm that is a pest of oysters. This species, *Polydora websteri*, burrows into the shell of oysters to nest, leaving muddy blisters that reduce the marketability of oysters. To design research projects that could potentially assist Maine oyster growers, the students took their cues from Jesse Leach and Eric Moran, owners of the Bagaduce River Oyster Company in Brooksville, Maine. To share their findings, students wrote papers and presented their work to audiences of researchers, oyster farmers, and the interested public.

Emma Hargreaves tested a hypothesis that a subpopulation of *Polydora websteri* could be reproductively isolated from the main population within the same estuary by reproducing in the winter rather than the summer. The following interview was recorded on October 18, 2007, at Old Town High School.

EL: Can you tell us a little bit about the citizen science project you were involved in?

EH: We worked with a parasitic worm, in oysters from the Bagaduce River. We found the project through Jesse Leach, who was looking for help from scientists at the University of Maine with his oysters, which had gross-looking black blisters because of this parasitic worm. It was getting worse and he needed scientists to help learn more about the worms and to find solutions to the problems they were causing. The UMaine scientists and Jesse Leach let us high school students help with the research.

EL: What kinds of things did you learn from doing a citizen science project?

EH: We started the year fairly broadly, just figuring out the basics about the worm: getting acquainted with how to remove them from the oysters, what they look like in their burrows and out of their burrows. I learned a lot about the process of reading about a subject then moving

on to actually looking at the subject in front of you. It makes dry textbooks a whole lot more fun to watch the worms move and to work with them in real life.

The second half of the year, we went more in depth with a particular research question we were most interested in. Here, I learned a lot about taking an idea from start to finish. I also learned how hard it can be to communicate what you've learned. Because what I was working on was so specific, it was hard for me to talk about it with other people and explain it to them. I have developed a real appreciation for scientists who can do these really in-depth, long-term projects and then communicate their findings with people who've never even thought about that subject.

I was surprised by the fact that I actually found out something new or had new ideas, and that made science more fun and more interesting.

EL: What surprises, if any, did you encounter in doing citizen science?

EH: I don't think I expected to be helpful. I was a freshman when I did this project and bottle science was what I had experienced so far—experiments that had been done in classrooms a million times before that just show us how something worked. Whereas in this project, I was figuring out how something worked myself, and my teacher was good at giving us the freedom to find it out ourselves rather than showing us. So I was surprised by the fact that I actually found out something new or had new ideas, and that made science more fun and more interesting.

EL: Did the experience change how you think about science and scientists?

EH: Yes! I think that scientists have more fun than I previously thought. It was especially fun when we went out to the Bagaduce River and helped Jesse Leach with his oyster cages. It's really great to throw yourself whole-heartedly into hands-on experiences. Science is something that you can have real passion for, and it's also something that really helps the world. So, it's kind of the best of both worlds, and I hadn't experienced that before.

EL: When you think of science as a human enterprise, did the project change how you think about the way science works?

EH: One hundred percent! It was so interactive: you ask the question, you find the answer. It was much more immediate and creative than I thought. I hadn't thought of science as a creative field before this project. But it really is creative to find solutions and to find different ways to pursue your interests. So yes, science is less dry than I expected it to be.

EL: Does extending the range of people who participate in science from professional scientists to include citizen scientists have any political or cultural impact?

EH: Definitely. Again, I think it's that difference between a scientist who has been working on something for years and a citizen who has never spent any time with it. If we can narrow the gap between professional scientists and citizens and citizens can better understand what scientists are talking about, I think there will be a lot less suspicion when it comes to scientific studies or any new information that we find out about our world. When we don't understand the information that someone is telling us, we can't make good decisions about it. So if we understand more of what scientists are saying, I think we'll be less afraid of it and be better able to think for ourselves. Interpreting science will become easier if we are all a little bit more like scientists. 🐙

Emma Hargreaves is a junior at Old Town High School. In her freshman year, she tested a reproductive isolation hypothesis within a species of marine worm and presented her findings to researchers and graduate students at the University of Maine, as well as at the 2017 Maine State Science Fair, where she won the "Reach Award" for stand-out enthusiasm. She is a gymnastics coach in her spare time, as well as a soccer and track athlete. She plans to go on to college but is undecided on a major.