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COMMENTARY

Citizen Science in a Maine Middle School Classroom

by Rhonda Tate

In 2011, after a two-day professional development experience focused on citizen science, I went back to school with a new mission for my middle school science program. We would do science, rather than learn science. When I presented this idea to my students, they were hooked. Six years later, we are still structuring our year around citizen science initiatives.

What began with a hunt for eastern hemlocks and basic tree identification skills evolved into the hunt for the invasive forest pest hemlock woolly adelgid. Along the way, we have enlisted the help of Maine foresters. We have included our school's kindergartners, who observe the forest side-by-side with a middle school buddy. We have waded through our stream to look for *rock snot* and attracted the attention of the Maine Department of Environmental Protection scientists who track that species in Maine. We have identified the invasive plant knotweed in our woods and researched ways to combat it (baking and eating knotweed muffins is our favorite mitigation technique). We have created a partnership with University of Maine researchers and graduate students to measure our stream health through the presence of caddisfly larvae, and we are helping them design opportunities for other citizen scientists to do the same.

These interactions have empowered my students to take on the role of scientist and the projects have become the backbone of my entire curriculum. Now, when we learn about the roles of decomposers in the ecosystem, it is not a worksheet or a kit lab, but a quick trip to the stream to check on our leaf bags to

measure decomposition and identify the insects present. Now, when we learn about pH, it isn't dipping strips of paper into lemon juice and milk, but checking our stream pH and how it varies with weather and stream depth. My students have begun to ask questions such as, "Do pine needles make this stream more acidic?" or "Do you think the salt they put on our road is why our stream's salinity is this high?"

Along the way, I have found various ways to assess the impacts of these experiences on my students' learning. I have worked with researchers from the University of Maine on assessments and invited professors of education and ecology into my classroom for feedback. I have tracked our state and national test scores. By all these accounts, this work is a success. The best measure of the efficacy, however, has been realized only recently. As my first citizen scientists have matriculated to college over the past two years, I have heard from many. A pattern of responses began to emerge—many were choosing majors in STEM fields: nursing, radiology, engineering, medicine, ecology, and education. As graduation day looms for those in my first class, I cannot wait to compile the dataset that shows students who become citizen scientists at a young age not only continue to be interested in these fields but also choose STEM fields for their careers.

Through this experience, I have connected with a network of teacher-peers with whom I have been able to share my experiences supporting students as citizen scientists while I tap into the knowledge of the other teachers. We have

shared resources, visited classrooms, and supported the development of best practices. My own teaching has been elevated through this collaboration, which can serve as a model for all rural schools. 🐟



Rhonda Tate, a middle school teacher in Dedham, Maine, has been teaching for 13 years. With a background in ecology and

environmental science, she brings real-world science to her students. Tate and her students have been citizen scientists for nine years and have formed successful collaborations with many researchers from the University of Maine, Vanderbilt University, and the Jackson Lab.