



Not Up for Debate

TEACHING CLIMATE SCIENCE IN OREGON

By Denise Silfee

HELEN HABERMAN ASKS STUDENTS TO RECALL WHAT THEY'VE LEARNED ABOUT THE WATER QUALITY BEFORE THEY COLLECT SAMPLES TO ANALYZE BACK IN THE CLASSROOM

PHOTO BY DENISE SILFEE

Sarah Ruggiero has days when she listens to the news and feels unmotivated at work.

After hearing the dismal findings of the U.N. Intergovernmental Panel on Climate Change (IPCC) report released this past Oct. 8, she walked into the office she shares with Helen Haberman, feeling hopeless.

If anyone could understand Ruggiero's feelings, it's Haberman.

The pair have co-taught for 19 years in the Rachel Carson Environmental Science Academy at Churchill High School in Eugene. They share a classroom, an office and all of the responsibilities of teaching public high school science.

They also share a sense of urgency: They want their students to care about a world threatened by human-caused climate change, environmental degradation and the deregulation of endangered species protections and public lands.

On that fall day, Haberman could only say, "I don't want to talk about it."

Teaching climate science at a time when the president denies the veracity of his own administration's National Climate Assessment can feel futile. "It's gone from, 'If we don't do this, the oceans will rise and the forests will burn,'" Ruggiero says. "And now it's like, 'The oceans *are* rising and the forests *are* burning.' It's no longer a matter of 'if,' but, 'Now what?' I've been teaching through that transition."

She says it's exhausting, and it can feel like nobody was listening. But, Ruggiero says, "There are little things. If I was all jaded, I wouldn't be doing this."

Teaching climate science as fact is still not commonplace in all public schools. For many educators, climate science offers the political conflicts of teaching evolution and therefore best avoided or downplayed. As recently as 2017, states such as Indiana, Alabama and Florida, among others, passed bills limiting how topics like climate science, evolution and human cloning are talked about in public school classrooms.

Oregon is one of 19 states that have moved in the opposite direction. The Oregon State Board of Education adopted the Next Generation Science Standards in 2014. Churchill High School rolled out its implementation of the standards during the 2017-2018 school year. The standards mandate the teaching of climate science across all of the sciences.

Ruggiero sees the adoption of the standards as hope. "Finally, these last two years, it's backed by law that teachers have to teach climate science."

Preparing New Teachers

Ruggiero and Haberman teach climate science as fact. They do not give space to climate deniers in their curriculum, choosing instead to focus on the data.

Occasionally students ask if they are going to present material showing the other side. Ruggiero tells them, "This is a science class; I teach the science. If you can find something that's science-based, I am happy to preview it. Please, prove me wrong, I would be thrilled!"

Ruggiero and Haberman are still sensitive to the political divisions over teaching climate science. "We're both pretty explicit about how mainstream science accepts this as fact, but what to do about it is completely a political decision," Haberman says.

Adopting the standards is one step, training teachers is the next one.

Sarah Stapleton, assistant professor of education studies in the teacher education program at the University of Oregon, is an expert in science education. She also feels urgency around teaching climate science in public schools.

"Personally, I'm so troubled by climate change on a daily basis that I think we are almost irresponsible if we ignore it in any way," Stapleton says. "I'm starting to see it as the issue to beat all issues. Climate change exacerbates all social injustices and will cause unrest in ways never seen before."

Stapleton tells graduate students that when they enter the classroom as teachers they will be obligated to teach climate science under the new standards. When teachers

express a hesitancy to engage students in lessons about climate science for fear of political divisiveness, Stapleton tells them to follow the science and avoid debate-style discussions.

"I'm not trying to tell students what to believe or think, but my job is to help them understand the science and to look at the facts — to ask, 'What does scientific consensus mean?'" Stapleton says. A good place to start, she believes, is with how scientists first became aware of how carbon emissions increased due to human activity as early as the 1890s.

Relying on historical documentation and the data, science teachers can help students see the narrative of climate change and climate change denial. Stapleton wants teachers to help students see that the denier movement was based on political deregulatory principles, not science. While some of the people responsible for starting the climate denier movement in the 1980s were physicists, "they're not climate scientists, they're not based in their area of expertise, but on a political agenda," Stapleton says. Most deniers were politicians and corporate lobbyists.

After students understand the historical context, then teachers can use real-world problems to help students connect what they are learning to make it relevant. Not only will this help teachers avoid debating the fact of climate science, but it will connect students to age-appropriate ways they can address the big issues. Students can be empowered to feel like they can make a difference by taking action at home, such as turning off lights and water or by avoiding single-use materials, Stapleton says.

Instilling Wonder

Ruggiero and Haberman think that one of the unique aspects of the Rachel Carson Environmental Science Academy is the ability to make science relevant through hands-on experiences in the field.

First-year program students go outside every Tuesday to conduct fieldwork, volunteer on conservation projects or participate in field trips. This appeals to students who may have struggled in traditional science classrooms based in lecture and memorization.

It also fosters conversations about topics such as invasive plant species and changing weather patterns that directly link the classroom to the real world in a visible, tangible way. Haberman considers this a chance to inspire students to love and respect the natural world the way she does and the way the Academy's namesake did.

"Rachel Carson had that beautiful philosophy of instilling a sense of wonder in people, and then once you have that, of course you're going to think about your actions," she says. "Personally, outside is where I'm at peace and where I spend all the time I can, so to create experiences for students like that is really meaningful to me."

It's meaningful to students, too. Sullivan Friedman, a 2015 graduate of Churchill High School and the academy, is majoring in environmental studies at Lane Community College while working as an assistant manager at Fred Meyer in Springfield. Because of his experience in the academy, he took initiative to address ways the store could save energy by making sure lights are off at the right times and by starting a recycling program.

"Even if you don't follow an environmental science path through college, you learn what you can do at your level," Friedman says. "100 percent — all students should have to study climate science in high school."

The adoption of the Next Generation Science Standards in Oregon schools demonstrates the growing view that climate science is both legitimate and vital in order to grapple with the consequences of human impact on the planet.

"I believe that every person should understand environmental science because understanding how the earth works and how humans affect it is crucial to every other thing you could learn about in your life," Haberman says. "I just really believe that."