

Nature's East Coast classroom may benefit Tahoe

By Patricia Craig, Penn State

UNIVERSITY PARK, Pa. – Matt Hurteau spends a lot of time climbing trees. The assistant professor in the Department of Ecosystems Science and Management in the College of Agricultural Sciences, joined Penn State in July 2011, filling an Earth Systems Ecologist position jointly funded by PSIEE and the college.

“The position asked for someone who worked across disciplinary boundaries to tackle the kinds of questions I’m interested in,” Hurteau said. “And the thing that was abundantly clear to me when I came to Penn State was that ‘interdisciplinary work’ was not just an idyllic vision. It was reinforced that I was expected to work interdisciplinarily, which really piqued my interest.”

At the base of Hurteau’s work is the concept of carbon sequestration, particularly in forest systems. When trees photosynthesize, pulling in carbon dioxide from the atmosphere, they assimilate the carbon into wood.



Matt Hurteau rappells down a sugar pine.

Photo/Penn State

“In fact,” Hurteau said, “about half of all annual accumulated growth ring mass is carbon.” That carbon comes directly from carbon dioxide, therefore if we can encourage trees to grow more each year through an ecologically based approach, they can pull in and store more carbon from the atmosphere.

Hurteau leads the Earth Systems Ecology Lab, which includes a team of both undergraduate and graduate researchers and postdoctoral scholars. The two main undertakings of the lab are forest-based climate change mitigation and adaptation.

“The quality of people I have in my lab is absolutely integral to the work we – undergraduates, graduates and post-docs – are excited about what we are doing that really makes this fun,” said Hurteau.

One of his lab’s current projects is modeling the carbon implications of ecologically based forest management. Funded by the U.S. Department of Defense Strategic Environmental Research and Development Program (SERDP), Hurteau and his colleagues are working across three military installations to link a growth-and-yield model with a process-based model to quantify the carbon trade-offs between a range of forest management strategies.

“As the fifth largest landowner in the country, the Department of Defense has a lot of threatened and endangered species on their properties. We’re running model simulations to look at what could happen with regards to a number of different things: providing optimal habitat for a specific threatened or endangered species, changing forest structure as to minimize wildfire risk or sequestering as much carbon as possible.”

In another project funded by the U.S. Department of Agriculture’s Integrated Approaches to Climate Adaptation and Mitigation in Agroecosystems Program, the lab is investigating climate change mitigation and adaptation in fire-prone forests under different climate scenarios. Hurteau said this research

is particularly interesting because he is coupling the data with different variables, including future wildfire modeling and emissions modeling. The lab is also partnering with the Desert Research Institute to present their findings to stakeholders and natural resource managers in the Lake Tahoe area.

“One of the biggest rewards to this kind of work is doing research that has societal relevance,” Hurteau said. “While I always want to push the envelope on our understanding of things, I also try to step back and look at these problems in the context of the questions being asked now by the people in decision-making positions. How can we better inform them with the information we generate from this work?”

Beginning with his undergraduate studies, Hurteau has been thoroughly immersed in scientific research. At Northern Arizona University, he studied different Native American uses of fire for land management, specifically focusing on the Kaibab Paiute Indian Reservation in northern Arizona.

“I wanted to get a degree in something that would allow me to focus my attention on the natural world” Hurteau said.

And that is exactly what he did. After a stint with a pharmaceutical company, where he used vacation time to go backpacking, Hurteau went back to school and graduated with a bachelor’s degree in Forestry from Northern Arizona University in 2001 and a doctorate in ecology from UC Davis in 2007.

As a graduate student at Davis, Hurteau focused his research on forest systems, where he looked at understory plant communities in mixed conifer forests. Hurteau explained he was investigating “how changes in climate and changes in nitrogen deposition from pollution in California coupled with prescribed burning would influence understory plant diversity and productivity in that system.”

Beyond his research, Hurteau said he thoroughly enjoys

teaching, especially at the undergraduate level. Last fall, he taught his first undergraduate class: Forestry 201, Global Change and Ecosystems.

“We really seek to link the physical and natural worlds together,” Hurteau said, “and do so by focusing on the connections between our climate and terrestrial ecosystems.”

“I thoroughly enjoyed teaching that class. I had a really diverse group of students. Most of them weren’t from the sciences – a lot were in business or economics. And that challenges me even further to make sure my students have a firm grasp on the information,” he continued.

“At the end of the day, I want students to gain an appreciation for the complexities that are in the natural world, an understanding for how these things are interlinked, an appreciation for the fact that humans are such a dominant force on the planet – we can change and are changing the climate system – and ultimately to think critically about every piece of information they get.”