

SPOTLIGHT ON:

USF RESEARCHERS

Teaching Out of the Box—Not Just Out of a Textbook



USF faculty are making a global impact

through their research: from understanding the impact of [climate change on sea life](#), to documenting [endangered species in Laos](#), to helping developing countries build [sustainable economies](#).

A unique aspect of the USF learning experience for students is that faculty engage students in their research, providing them the opportunity to gain real-world field experience, as well as bring their research experiences into the classroom, bringing concepts alive.

*Professor Seth Wachtel
(center, blue t-shirt) and team
review plans in Nicaragua.*

Deneb Karentz: Using Science to Support Policy

[Deneb Karentz](#), USF Professor of Biology and Environmental Science, is researching the ecological implications of [climate change in Antarctica](#).

With support from the National Science Foundation and the US Antarctic Program, Karentz's team is working to identify how phytoplankton at the base of the marine food web are responding to climate changes that are occurring in the Antarctic environment. "Due to photosynthesis, phytoplankton produce most of the oxygen that we breathe, so they're quite important for us," explained Karentz. Her research provides USF students the unique opportunity to gain experience conducting fieldwork in an extreme environment. Students also gain a global perspective on climate change and its impacts on the marine ecosystem. Currently on campus, undergraduates are analyzing samples brought back from the Antarctic and processing environmental data that are continually being collected by remote sensing.



Bethany Goodrich '11 (left) and Austin Gajewski '13 collecting phytoplankton samples from a hole they cut in the ice covering the Antarctic Ocean.

Karentz wishes people knew more about climate change. "It is often misunderstood by the public. I think it's important for people to realize that humans are actually changing the environment and doing it faster than evolutionary processes can allow organisms to adapt," she shared. In addition to teaching and her research, Karentz is also the science advisor for the State Department. Every year she travels to the Antarctic Treaty Meetings where the Committee for Environmental Protection decides international management policies for the area. Karentz explained her role as advisor, "I provide science support to the policy makers." Karentz has even had a [lake named after her](#) in Antarctica, in honor of her contributions to understanding the world's southernmost continent.

Gretchen Coffman: Engaged Learning

Students studying with [Gretchen Coffman](#), Professor of Environmental Management and Environmental Science at USF, benefit from her research. "I bring my years of research experience as a restoration ecologist into the classroom, both in California and internationally. I feel that my students really connect and enjoy learning about environmental science and ecology

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through a more personal experience," Gretchen explained. "I feel that USF professors focus on incorporating research into our teaching, and not just teaching out of a textbook." Students gain applied skills that help them land jobs immediately after graduating, something Coffman is proud of.

"We don't just study theory. We take action. We are restoring ecosystems using a hands-on approach," stressed Coffman. Her research focuses on restoration of local dune ecosystems, as well as working in developing countries, such as Laos, Cambodia and Vietnam and South Africa, preserving and restoring endangered ecosystems. Coffman's [current research](#) is located in a remote village in Laos where she is studying a critically endangered swamp cypress tree species that is on the verge of extinction in the wild. Awarded a prestigious [grant from National Geographic](#), she is leading a team of students and researchers, conducting botanical surveys in order to understand the biology and ecology of the trees and identify strategies to help restore the species. Robin Hunter, a graduate student in the Masters of Science in Environmental Management Program, added, "It was an amazing opportunity to work with Professor Coffman in Laos. I was able to take skills I learned in the classroom and apply them to a real-world conservation issue. I learned a great deal about organizing and implementing a field expedition. It was an honor to work with world experts on conifer conservation, as well as local villagers."

Coffman is teaching students the science of restoration ecology, but also integrating the real-world challenges of promoting sustainable development in developing countries, where the short-term economic gains can threaten ecosystems. Villagers build their homes out of these trees and build rice paddies in forested wetland ecosystems where they grew. On her expedition in Laos, the researcher also became a diplomat, educating the local villagers about their significance. "We need to understand the importance of these trees and how they fit in the entire ecosystem to save them," she said as she shared her story about her negotiations with the locals to get their support, so her research could continue.

Seth Wachtel: Using Development to Enhance the World

[Seth Wachtel](#), Chair of the Department of Art + Architecture, is passionate about community design and helping students gain skills and experience that can be used to enhance the world. Seth's work focuses on using locally

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Gretchen Coffman, PhD and masters student Robin Hunter sample endangered swamp cypress tree in Laos' Nakai-Nam Theun National Protected Area with botany students from the National University of Laos, a botanist from Pha Tad Ke Botanical Garden, government foresters and local villagers.

Photo: David McGuire

sourced materials and working with local communities to utilize the skills they already have to make their communities stronger.

He explained, "What I'm trying to do at USF is get students engaged with real hands-on projects that build professional skills for the fields that they're pursuing, while at the same time building a strong desire and belief in helping undeserved communities." An education at USF extends beyond the campus. Students have the opportunity to work with Wachtel on projects that span the globe, including India, Colombia, Haiti, Israel, Mexico, Morocco, Nicaragua, Tanzania, Zambia, and the San Francisco Bay Area. One of his current projects in Nepal is designing and building tea and coffee-bean processing factories in partnership with a local NGO that will help rural subsistence farmers find ways to produce cash crops. Wachtel explained, "These farmers have had no history of income at all and now for the first time they have an income and their kids can go to school."

He passes onto USF students his philosophy that development can be used to enhance the world, teaching them that there are ways to build projects that help communities live better, without degrading their environment or lessening the cultural heritage of a place. Eric Douville '10, a past student of Wachtel's, detailed, "Instead of focusing on creating more 'paper architecture,' Seth aptly takes more polished students at the end of their four years to apply what they know around the globe, while teaching students the most applicable skills I learned in all my architectural education – project process, understanding client needs, surrounding cultural and built context, and appropriate design development." He continued, "While most programs teach students to match designs seen in magazines, Seth's profound vision teaches us how to improve lives and the world around us."



Seth Wachtel (center) tying steel in Nicaragua.

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