

New Member Profile: Christina Wells

By Ellen Strother, Environmental Landscape Specialist



Her love of nature and science is strong. As a child in York, PA she was forever peering under rocks and logs to see what marvelous creatures lived below. At age 15, she received a fellowship to help a professor at SUNY Stony Brook, on Long Island, with a fossil fish project. She found fossil fish monotonous but the research process stimulating. It was at Temple University, in Philadelphia, where she chose to specialize in plants.

At Temple, Wells was initially involved in medical research. After hours spent conducting rat autopsies, she used season passes to nearby Longwood Gardens. "I was so impressed by the complexity of plant form and function and decided that's where I wanted to go!" Longwood's vast ornamental gardens, both ornate and natural, attracted Wells. "You could see everything there from a liverwort to a bank of azaleas."

Within the plant world she has further refined her research to roots. "I've always enjoyed academics. My interest in the physiology of root systems is very broad." Wells credits her graduate school advisor, Dave Eissenstat, with turning her on to roots and root demography. He is one of the first people to study root demography, which is the study of when roots are produced, how long they live, and when they die. "Initially, I didn't take to it. It's labor intensive and definitely non-glamorous. But the more I got into it, I realized

that it provides a brand new kind of information. It began to intrigue me that the data we were collecting was so new." She received her Ph.D. in Plant Physiology from Penn State. Her dissertation is titled "Advances in the Root Demography of Woody Species."

While at Penn State, Wells received a grant from NASA to fund a portion of her research. NASA's interest in creating self-sustaining biospheres requires a detailed knowledge of the carbon cycle. "They funded some of my research because I was looking at a very poorly understood aspect of the carbon cycle: flux of carbon through the root system."

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As a postdoctoral fellow, Wells worked for the University of Nevada, Reno at the Nevada Desert FACE Facility located on the Nevada Test Site. FACE stands for Free-Air Carbon Dioxide Enrichment, and FACE technology allows researchers to elevate the atmospheric carbon dioxide (CO₂) level of large study plots to simulate how the atmosphere may change as a result of industrial CO₂ emissions. There are currently nine FACE projects around the country investigating the responses of plants and ecosystems to elevated CO₂.

Wells thrived in the cutting edge FACE environment and discovered the desert. "It was fun to be in a completely different environment. There, everything was structured by the lack of water." She took an airplane to her field site and could leave expensive equipment outdoors due to the high security at the nuclear test site. "Work at the Nevada FACE site indicates that desert plants will be more productive in the CO₂-rich atmosphere of the future – but only in years with high rainfall. In dry years there isn't likely to be much difference." She was further delighted by the incredible wildlife wandering through her research plots. Antelope and coyote, kangaroo rats, ravens and golden eagles were frequent visitors.

Christina Wells is also pleased to be working for Clemson and living in South Carolina. "I am so happy to see green again. Clemson is a beautiful small town, everyone's extremely friendly and it's a great place to live."

Wells is also pleased with the similarities between Clemson and her alma mater, Penn State. "I was really attracted because its horticulture department was very much like Penn State's. There's top quality basic research here and extremely relevant applied research. You can watch your research benefit people directly."

Wells' title is Assistant Professor of Horticulture. She has 50% research responsibilities and 50% teaching. She is teaching plant stress physiology to horticulture and forest resource students.



Her Clemson research will entail productive collaborations between horticulture, urban forestry, and arboriculture. She fully intends for her applied research to benefit the green industry. "There are so many treatments, such as bio-stimulants, water-holding gels, and mycorrhiza, that we apply to root systems. And yet we don't really know what impact they're having. I am in a good position to address which of these soil amendments should be

applied, when it should be applied, and which ones are a waste of money."

Wells is encouraged that her basic research interests will also have a home at Clemson. "There's such a strong molecular biology focus here, as evidenced by the new Biotechnology Complex. I am interested in investigating how roots grow old and die at the molecular level. If we can understand how roots die, we are then in a better position to alter root longevity to meet specific horticultural goals."

Wells is enthusiastic about interacting with South Carolina's green industry. "A lot of good science comes from people in the field. They can help us to identify new, productive research questions. I'd also like to hear about peoples' experiences with various soil amendments and their root experiences."

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