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Ecology moves from the field to the screen

by Julie Grant, in Canton, NY

Jul 31, 2013 — People who dream about being ecologists – and studying the environment for a living – might want to get comfortable sitting at a computer. More and more data are being collected and analyzed online, and that's changing what it means to be an ecologist.

A team of undergraduate students at Clarkson University in New York has been getting up at four in the morning nearly every day this summer and heading into the field. They're counting golden winged warblers, a species that's been dropping dramatically in numbers.



Many chickadees responded to the students' bird calls.

The students play pre-recorded calls from a computer, which draw out real birds from a thick layer of shrubs.

Junior Kathryn Lawson is struck by the natural beauty of the warbler's habitat. Her partner, sophomore **Shelby Julia, Rangel Class of 2012**, had a bad fall one day. She also faced allergies in the 94-degree heat.

"I was like, I'm in so much pain, this is not fun at all. But we did it. I was having so much fun the other days we'd come out. And when we actually would see a bird. They would come up, just a few feet away from us. That made it worth it."

Many career ecologists remember being bit – not just by bugs – but by their love of studying nature.

Bradley Cardinale is an ecologist at the University of Michigan. He loves being outdoors, but he's become a part of the change that has many researchers spending a lot of time at their desks.

Cardinale helped set up a program for NEON – the National Ecological Observatory Network. NEON is setting up more than 100 monitoring stations across the U.S. to gather ecological data in real time.

"We're trying to improve our ability to forecast change in the future by making sure we have really high-quality data coming to our computers right now in real time so that we can develop predictive models."



Clarkson University students Shelby Julia, Kathryn Lawson, and Amy Hait study the habitat of Golden Winged Warblers.

Cardinale says it will help ecologists predict sea level rise, temperature changes, and disease outbreaks.

There's another major program that's standardizing data that's already been collected in field studies around the country. It's known as NCEAS, the National Center for Ecological Analysis and Synthesis. It helps researchers find larger patterns of what's happening in the environment.

Cardinale says both programs are important to the study of ecology.

"But both of them, whether you're talking about NCEAS or NEON, ultimately have the consequences that you are essentially getting rid of field biologists, people who would go out into nature, study it, do experiments themselves, and instead you're setting up a system where those researchers are now behind their desks, looking at data on their computer, perhaps talking to each other, but we're all analyzing nature in the safety of our offices."

Even the biggest supporters of standardizing data understand the risks involved. Mark Schildhauer is director of computing at the NCEAS program. He says firsthand observation is still irreplaceable. But standardizing the data makes studies relevant beyond each professor's lab.

"And it's not just isolated researchers doing their things. It's groups of researchers using one another's data, bringing to the table what they call micro-expertise to get a much more synthetic and general understanding of natural phenomenon."

Even people who want these centralized systems are not ready to declare the end of field work. They say nature is continuously changing, so ecologists still need to get out, get their boots dirty and keep their eyes open.