

Climate change affects ants and biodiversity

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Five meter-wide, open-top chambers on the ground of the forest. Air is circulated through the tubes and raised by blowers into the chambers.

(PhysOrg.com) -- Some people may consider them pests, but ants are key to many plants' survival.

In the eastern US, [ants](#) are integral to plant biodiversity because they help disperse seeds. But ants' ability to perform this vital function, and others, may be jeopardized by climate change, according to Nate Sanders, associate professor of Ecology and Evolutionary Biology at the University of Tennessee, Knoxville.

Sanders and his collaborators have received a grant for nearly \$2 million from the National Science Foundation to examine the cascading effects of climate change on ant communities and the ecosystem functions they

provide.

“Ants are critically important to most ecosystems,” Sanders said. “They eat other insects, circulate nutrients, increase turnover in the soil, and move seeds around.”

Sanders and his colleagues are testing the effects of climate change on ants by heating up patches of forest and tracking how the ants respond. Inside Duke Forest in North Carolina and Harvard Forest in Massachusetts lie twelve five-meter wide, open-top chambers. Air temperature is incrementally increased by half a degree Celsius in each chamber for a total of a six-degree changes and ant behavior observed.

The researchers, led by Katie Stuble from UT and Shannon Pelini at Harvard Forest, noticed dramatic changes in the ants’ daily activity in each chamber.

“If the temperature increases by just a half a degree Celsius, the most important seed-dispersing ants basically shut down,” said Sanders. “They do not go out and forage and do the things they normally do.”

Stuble observed that, on average, the ants foraged for about ten hours a day at normal temperatures. When temperatures were raised just a half a degree, the ants stayed in their nests underground and foraged just an hour.

The absence of ants’ seed dispersal and nutrient cycling could have profound influence on biodiversity. For instance, it is believed that more than half of the [plants](#) in the forest understory of the Great Smoky Mountains National Park rely on ants for seed dispersal. Ants are found in ecosystems everywhere but in Antarctica and Iceland.

The researchers’ goal is to provide information about the effects of

climate change on biodiversity and ecosystems.

“We know that climate change is happening,” Sanders said. “Lots of models make predictions about how biodiversity is going to respond. It will either respond by adapting, moving or going extinct. If you can’t keep up with [climate change](#), you will go extinct.”

Sanders and his team will collect data through 2015. He is collaborating with colleagues from Harvard University, North Carolina State University, and University of Vermont. The project began in 2007 with funding from the Department of Energy.

More information: web.utk.edu/~nsanders/

Provided by University of Tennessee, Knoxville

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