Scientists study warming in El Yunque

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Scientists are conducting research in Puerto Rico's El Yunque National Forest to help gauge the impact that climate change — particularly warming— is likely to have on the world's tropical forests.

Researchers from the U.S. Forest Service, which manages El Yunque, and the U.S. Geological Survey Tropical Response to Altered Climate Experiment (TRACE) research project, which is supported by the U.S. Forest Service with an additional three-year, $960,000 grant from the US Department of Energy.

Researchers from Michigan Technological University, the Puerto Rico Conservation Foundation, the U.S. Forest Service's International Institute of Tropical Forestry, the U.S. Geological Survey and the Lawrence Berkeley National Laboratory are taking part.

"This is the first field experiment of its kind ever done in a tropical forest," said Molly Cavaleri, a tree physiologist who studies how ecosystems are responding to climate change at Michigan Tech's School of Forest Resources and Environmental Science. "We will be manipulating the environment, warming the leaves and branches of the canopy as well as the smaller plants on the forest floor, not just observing."

Forests of all kinds help control greenhouse gases, particularly carbon dioxide, in the atmosphere because trees take in and store more carbon dioxide than they put out. But unlike forests in temperate climates, where temperatures vary widely from season to season and trees have adapted to those changes, tropical forests grow in consistently warm climates. The question is how or even if they can acclimate if those climates get hotter.

And they are getting hotter and will continue to do so, climate experts say. "Within 20 years, the new minimum temperatures in the tropics will be hotter than the current maximums," Cavaleri told Michigan Tech News.

Once they have warmed the trees and measured the changes, researchers plan to use the data to help develop better predictive models of the effects of climate change on tropical forests.

El Yunque National Forest was first established as a national site in 1903. It is the only tropical rainforest in the U.S. National Forest System. Despite the forest's relatively small 28,000-acre size, it is significant for its immense biodiversity and is popular with visitors for its year-round tropical climate. More than one million visitors from all over the world visit the forest each year to sample its eco-tourism pleasures while developing a greater understanding of its ecological importance by walking along the many beautiful trails.