# **Amazon deforestation reduces rainfall in South America**

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**Body**

Specialists have been talking for decades about the cause-and-effect relationship between the logging of the ***Amazon*** and the reduction of rainfall periods in flow and frequency. When miners, loggers and ranchers cleared the rainforest at record rates, scientists were already warning of the consequences. However, researchers are still learning about the effects that human actions in the forests have on the balance of local and global climate.

British scientists provided what they called "compelling evidence" about these actions for the first time. They have been able to demonstrate a link between ***deforestation*** and declining rainfall in the tropics as a whole. "Local people living near deforested regions often report a warmer and drier climate after forests are cleared. But until now this effect has not been seen in rainfall observations," explained study co-author and project supervising professor Dominick Spracklen from the School of Earth and Environment at the University of Leeds, U.K. "Our paper shows the critical importance of tropical forests in maintaining rainfall.

The study, just published in Nature, established this crucial link by looking at satellite data on ***deforestation*** and rainfall in three key tropical forest regions: the ***Amazon***, Congo and Southeast Asia. All of these regions had experienced significant ***deforestation*** between 2003 and 2017, the period observed by the scientists.

The researchers analyzed rainfall records in both deforested areas and where the forest had remained unlogged. In their analysis, they found that deforested sites were drier, even during the dry season, when every drop of rain counts. In the rainy season, rainfall fell as much as 0.6 millimeters per month for every percentage point of clearing.

The study authors also looked at how far the impacts of ***deforestation*** would reach, on a scale of 25 to 40,000 square kilometers. In that analysis they found that the effects increased with the greatest amount of land included, with no discernible effects within 10 square miles (16 square kilometers) of ***deforestation***, but with a reduction in monthly precipitation of 0.25 millimeters per percentage point of forest cleared within 25,000 square kilometers.

Although the study does not prove that ***deforestation*** is causing the decline in precipitation, it provides evidence for a long-standing hypothesis that forest loss reduces precipitation because it means there is less evapotranspiration, the word that describes what happens when water from leaves ascends into the atmosphere. If true, this could have serious consequences for both tropical forests and the people and animals that depend on them.

"Tropical forests play a critical role in the hydrological cycle by helping to maintain local and regional rainfall patterns," said the study's lead author and PhD researcher at the University of Leeds, Callum Smith. Reduced rainfall caused by tropical ***deforestation*** will affect people living nearby through increased water scarcity and reduced crop yields."

The conclusions of this study are also not good for the forests themselves. "Loss of precipitation can trigger other ***deforestation*** feedback loops, such as increased risk of forest fires, as well as hindering the forests' ability to store carbon and damaging their biodiversity," Smith added. The team also analyzed the potential future of Congo's rainforest and found that, if current rates of ***deforestation*** persist until 2100, rainfall in the region could decrease by 8 to 10 percent.

However, there is a silver lining: the evidence that ***deforestation*** leads to local rainfall loss also makes an important short-term case for forest conservation. For every percentage point of rainfall reduced, crop yields can fall by 0.5 percent. Given that agriculture is the driver of nearly 90 percent of global ***deforestation***, these findings may raise doubts among farmers about cutting down trees.

"Demonstrating the local benefit of keeping tropical forests standing for the people who live nearby has important policy implications," Smith said. I hope our work will provide a strong incentive for policy and decision makers within tropical nations to conserve tropical forests to help maintain a cooler and wetter local climate, with benefits for agriculture and people nearby," he concluded.

J. C. A. Baker, another member of the University of Leeds team, also participated in the research.

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