

Deforestation has big impact on regional temperatures, study of Brazilian Amazon shows

Research highlights benefits forests bring surrounding regions in terms of cooler air and more rainfall

Jonathan Watts

@jonathanwatts

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- The agricultural heartland of Mato Grosso will be 0.5C hotter by 2050 if deforestation continues at present rate. Photograph: Andre Dib/WWF/PA

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Deforestation has a far greater impact on regional temperatures than previously believed, according to a new study of the Brazilian Amazon that shows agricultural businesses would be among the biggest beneficiaries of forest conservation.

The research has important political implications because farmers in Amazonian states have, until now, led the way in forest destruction on the assumption that they will make money by clearing more land.

The new research highlights the other side of the picture. It shows the agricultural heartland of Mato Grosso, where crops are already suffering from drought and extreme heat, would be just over half a degree celsius hotter by 2050 if deforestation continued at the rapid rate of recent years.

The paper, **published on Monday in the Proceedings of the National Academy of Sciences**, demonstrated Amazon deforestation causes warming at distances up to 60 miles (100km) away. The greater the forest clearance, the higher the temperature. This is in addition to the wider climate impact of global heating.



'Our world hangs by a thread': Indigenous activist asks US agri giant to stop destroying Amazon rainforest

Dominick Spracklen of the University of Leeds said the average tree had a cooling effect equivalent to two to three 2.5kW air conditioners working at full power every hour of every day. This works through evapotranspiration, which he said was very similar to the sweat humans produce to lower body temperature. He said the effect spread wider than anyone had realised.

“We always thought this might be happening, but the extent is bigger than I would have thought,” he said. “More and more, we are demonstrating the big benefits the forests bring to surrounding regions. For farmers, they bring cooler

air and more rainfall. Hopefully putting numbers on these benefits will help to persuade a broader set of people to protect forest areas.”

An increasing number of peer-reviewed studies are proving the importance of the Amazon in maintaining a stable regional climate. Earlier this year, **a paper showed that forest clearance reduced rainfall up to 125 miles away**. More recently, research at a greater scale demonstrated that the Amazon was coupled with the South American monsoon and **that continued deforestation could reduce regional precipitation by 30%** with dire consequences for food production.

Until now, studies on the impact of forest clearance on heat have concentrated on local effects with a clear correlation between loss of tree cover and higher temperatures in the area where the trees were cut down. The new research went further by looking at whether there is also a warming effect over a wider area. Using satellite data and artificial intelligence, the authors found a 0.7C increase in temperature for each 10-percentage point loss of forest within a radius of 60 miles.

In areas that have been extensively cleared, the impact is considerable. As the paper concludes: “We show that regional forest loss increases warming by more than a factor of four with serious consequences for the remaining Amazon forest and the people living there.”

However, the lead author, Ed Butt, said this should be seen not as an alarm, but as a useful tool to incentivise the sustainable management of the forest. “If we could reduce deforestation, then we could avert a good amount of regional warming. I see that as a big opportunity. It demonstrates the big benefit of reducing deforestation for local farmers ... The most important thing is that states like Mato Grosso can follow different futures. This hands back control to regions and states. They could really reduce the amount of warming they will be exposed to.”