

A new map reveals the causes of forest loss worldwide

Most forest loss occurring in the world leaves the possibility of trees growing back

BY LAUREL HAMERS 4:47PM, SEPTEMBER 13, 2018



DISAPPEARING TREES Forests like this one in Indonesia are being lost to industrial agriculture.

If a tree falls in the forest, will another replace it?

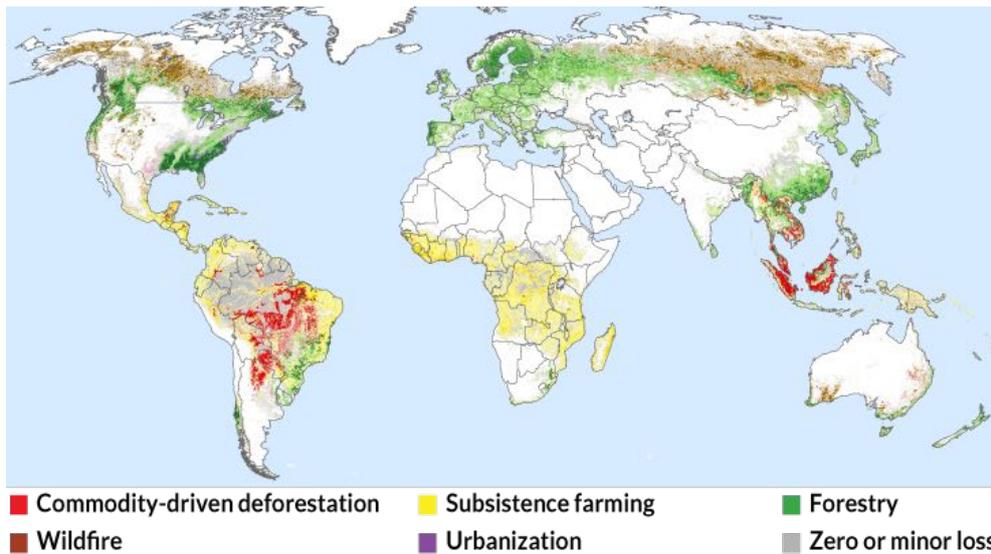
Of the roughly 3 million square kilometers of forest lost worldwide from 2001 to 2015, a new analysis suggests that 27 percent of that loss was permanent — the result of land being converted for industrial agriculture to meet global demand for products such as soy, timber, beef and palm oil. The **other 73 percent of deforestation** during that time was caused by activities where trees were intended to grow back, including sustainable forestry, subsistence farming and wildfires, researchers report in the Sept. 14 *Science*.

Understanding why forests are shrinking is important because the ecological impacts of permanent forest destruction are different from that of more temporary losses, says study coauthor Matthew Hansen, a remote sensing scientist at the University of Maryland in College Park.

The analysis dives deeper into data published in 2013 by Hansen and others, which **revealed global forest losses** without tracking what caused those declines. Here, scientists developed a computer program that analyzed satellite pictures to determine what was driving changes in forest size.

Tree museum

Scientists trained a computer program to analyze satellite images to determine what was causing global tree losses, and plotted the data on a map that reveals what's driving deforestation worldwide.



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Clearing many trees to grow commodities such as soy and palm oil was particularly a problem in South America and Southeast Asia. In land cleared for industrial agriculture, there's usually no intent for the forest to be replanted or to come back on its own, meaning that the habitat may be lost for good.

Tree loss in Europe and North America, however, occurred mostly in forests managed for timber resources, where new trees are planted to replace what's lost. And in sub-Saharan Africa, subsistence farming drove most tree disappearance. When these small farms pick up and move to new locations, trees can grow back over the old fields. These land use changes do have ecological effects — reduced tree diversity, for example — but tree cover will one day return.

Other scientists have linked local or regional deforestation to particular causes, but the new work “provides a measuring stick that's consistent across the planet,” says Robert Kennedy, a remote sensing expert at Oregon State University in Corvallis who wasn't involved in the work.

The researchers built a map that catalogs the causes of forest loss in 100-square-kilometer sections. Eventually, having data at a finer resolution would be helpful, Kennedy says. The current map blurs smaller-scale details — deforestation for palm oil plantations right next to subsistence farms, for example — and doesn't capture longer-term tree woes such as drought.

By revealing where and how forests are being destroyed, the data can be used to verify whether companies are sticking to commitments to protect forests while sourcing their products, says study coauthor Philip Curtis, a consultant with the Sustainability Consortium, a nonprofit organization based in Fayetteville, Ark., and Tempe, Ariz. Hundreds of multinational companies such as Nestlé S.A. and the Kellogg Company have pledged to source ingredients such as soy and palm oil sustainably, but verifying that the businesses are sticking to those claims has been difficult.

Understanding the causes of forest loss is also useful for tracking carbon cycling, says Pontus Olofsson, a remote sensing scientist at Boston University who wasn't part of the study. Since forests store large amounts of carbon, cutting down trees releases climate-warming carbon dioxide into the atmosphere (*SN: 10/28/17, p. 9*). But in places where trees eventually come back, the long-term impact on the planet is lessened.

Citations

P. Curtis et al. [Classifying global drivers of forest loss](#). *Science*. Vol. 361, p. 1108, September 14, 2018. doi:10.1126/science.aau3445.

M.C. Hansen et al. [High-resolution global maps of 21st-century forest cover change](#). *Science*. Vol. 342, November 15, 2013, p. 850. doi:10.1126/science.1244693.

Further Reading

L. Hamers. [When bogs burn, the environment takes a hit](#). *Science News*. Vol. 193, March 17, 2018, p. 20.

C. Gramling. [Tropical forests have switched from sponges to sources of carbon dioxide](#). *Science News*. Vol. 192, October 28, 2017, p. 9.