

# 'LUNGS OF THE EARTH' COULD GET PUSHED TO 'TIPPING POINT'

Agribusiness is already fueling fire in the Amazon, and climate change could make fires kill even more trees.



Photo shows an intentional burn to get rid of trees to make way for agriculture has escaped into the adjacent forest. (Image: Jennifer Balch/Penn State)

Amazon forests — the "lungs of planet Earth" — could be pushed towards a "tipping point" as severe droughts converge with fires to bring about massive forest loss, a new study shows.

Climate change will likely increase regional temperatures while decreasing precipitation, and that means an increased likelihood of a perfect storm of conditions for causing massive tree-killing fires.

The team of researchers led by Paulo Brando of the Instituto de Pesquisa Ambiental da Amazônia, Carnegie Institution for Science and Woods Hole Research Center, did an 8-year study of three 50-hectare forest plots in southeast Amazonia to see how the trees within the plots responded to intentional burns.

One of the plots was left unburned, one was burned every three years, and the third was burned every year.

"Over the course of our experiment, 60 percent of the trees died with combined drought and repeated fire. Our results suggest that a perfect firestorm, caused by drought conditions and previous fire disturbance, crossed a threshold in forest resistance," said study co-author Jennifer Balch, assistant professor of geography at Penn State.

Included in their study was 2007, a year a severe drought took place. During droughts, not only is there less humidity but there is also more fuel in the way of fallen leaves and branches.

Lead author Brando explains, "Four times more adult trees were killed by fire during a drought year, which means that there was also more carbon dioxide released to the atmosphere, more tree species loss and a greater likelihood of grasses invading the forest."

In addition to pointing to future challenges exacerbated by climate change, the researchers write:

Insights from our fire experiment indicate that human-driven alteration of the Xingu landscape has already substantially modified the forest fire regime in this region and increased fire-related forest degradation.

That "human-driven alteration" is deforestation as a result of agribusiness. The study highlights how fragmented forests, which have more exposed areas and potentially more tinder-producing invasive grasses, are more susceptible to the impacts of droughts and fires.

"These smaller forest fragments have more edges than large blocks of forest, which exposes them to the hotter, dryer conditions in the surrounding landscape and makes them more vulnerable to escaped fires," said co-author Marcia Macedo of the Woods Hole Research Center.

Indigenous rights and environmental groups have long criticized the effects of agribusiness "land grabs," such as those that have occurred in Brazil, when huge swathes of forests that supported peoples and biodiversity are wiped out for large-scale monocultures like soybeans.

As nonprofit organization GRAIN has written:

Agribusiness is making a killing in the literal sense: it is killing the unique ecosystems of the region [Southern Cone] , and thereby the peoples who have cohabited with the forest for millennia.

In addition to emphasizing the importance of stopping deforestation, the authors say that previous models looking at the future health of the Amazon forests have left out fire's effects, thereby giving a false impression of health.

"This study shows that fires are already degrading large areas of forests in Southern Amazonia and highlights the need to include interactions between extreme weather events and fire when attempting to predict the future of Amazonian forests under a changing climate," Brando stated.

Source: <http://www.commondreams.org/news/2014/04/14/lungs-earth-could-get-pushed-tipping-point>