

Evidence of a fragile hydrological equilibrium in the western Amazon

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Deforestation is often seen as the main enemy of the Amazon rainforest. A recent study, however, shows evidence of an even more imminent threat: climate change. The researchers fear that, if climate scenarios are proven right, a permanent change in the western Amazon may start to take place within 10 years. Their article was published in *Geophysical Research Letters*.

In 2005, the Amazon forest experienced a strong drought, considered by experts the worst in 100 years. This event was followed by an even more severe drought in 2010, raising the red light among scientists and environmentalists. The impacts of these events have been broadly discussed, but a complete understanding of the consequences is still missing.

Now a new study led by researcher Eduardo Maeda from the University of Helsinki has put together a unique combination of satellite data and hydrological measurements to study the problem. The results are a reason for concern.

"What we see is that while some areas of the Amazon forest seem to be resistant to these extreme climatic events, other large areas show a fragile equilibrium. The problem is that when this equilibrium is broken, the impacts for the hydrological system and vegetation seem to be rather persistent, taking 3 to 4 years for the system to recover", says Eduardo Maeda.

This kind of disruption seems to be triggered only by rare extreme events, which occur in average every 20 years or more. This interval, in theory, would then be enough to allow a full recovery of the hydrological patterns and vegetation. But climate scientists are not so optimistic. Previous studies have shown that [climate change](#) may increase the frequency of droughts like the one occurred in 2005.

"Model simulations from previous studies by other groups indicate that, by 2025, the frequency of these events could be as high as 1 every 2 years", he says.

If these [climate scenarios](#) are confirmed, the study conducted by Maeda and collaborators indicates that the hydroecological system would no longer have time to recover. This would lead to serious consequences for a forest area almost 2 times bigger than Switzerland, causing massive tree mortality, and permanently change the face of the western Amazon.

More information: Eduardo Eiji Maeda et al. "Disruption of hydroecological equilibrium in southwest Amazon mediated by drought," *Geophysical Research Letters* (2015). [DOI: 10.1002/2015GL065252](#)

Provided by University of Helsinki

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