

Droughts threaten Bornean rainforests

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At 130 million years old, the rainforests of Southeast Asia are the oldest in the world and home to thousands of plant and animal species, some endemic to these forests. The rainforests also play important roles in modulating regional rainfall as well in the global carbon cycle.

However, since the 1960s, increased warming in the Indian Ocean and frequent El Nino events have reduced rainfall in the region by approximately 1 percent per decade. Further, the Intergovernmental Panel for Climate Change predicts that over the 21st century, Southeast Asia will experience higher land temperatures, more droughts, and increased seasonality -- wet seasons during the fall will get wetter, and dry seasons during the spring will get drier. However, few studies in the past have investigated how trees in the southeastern Asian rainforests respond to droughts and climate change.

In a new study, Kumagai and Porporato combine extensive field observations, historical records, and [global climate models](#) to investigate the potential impact of rainfall shifts and droughts on [tree mortality](#) in the Bornean rainforests of Southeast Asia. They find that as El Nino events become more frequent in the future in response to warming in the tropical oceans, even the species of trees that can adapt to drought conditions will be at increased risk of dying off. The small number of species that cannot adapt well to [drought conditions](#) will be at even greater risk of dying off.

Their study has implications for predictions of ecological changes, regional [rainfall patterns](#), and global climate as well as direct applications

for policies aimed at reducing additional human impacts on these ecosystems, which are not only vulnerable to climate change but also have the highest rates of deforestation in the whole world.

More information: Drought-induced mortality of a Bornean tropical rainforest amplified by climate change, *Journal of Geophysical Research-Biogeosciences*, [doi:10.1029/2011JG001835](https://doi.org/10.1029/2011JG001835) , 2012.

Provided by American Geophysical Union

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