

# Planet's largest ecosystems collapse faster than previously forecast

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New research has shown that large ecosystems such as rainforests and coral reefs can collapse at a significantly faster rate than previously understood. The findings suggest that ecosystems the size of the Amazon

forests could collapse in only 49 years and the Caribbean coral reefs in just 15 years.

It is well known that [ecosystems](#) can transform rapidly when put under stress. Clear lakes can be transformed into green waters, [coral reefs](#) can become bleached and sparsely populated as algae disappears and rain forests can shift to savanna grassland as deforestation causes a change in humidity.

Scientists from the University of Southampton, the School of Oriental and African Studies and the University of Bangor studied data on the transformations of 40 natural environments on land and in waters. These varied in size from small ponds to the black sea aquatic ecosystem. This data had been compiled from [scientific publications](#), institutional reports and online databases about regime shifts and thresholds.

The team discovered that whilst larger ecosystems took longer to collapse—due to their sheer size—the rate at which the transformation occurred was significantly faster than the pace of change for smaller systems.

The findings, published in the scientific journal *Nature Communications*, can be explained by the fact larger ecosystems are made up of more compartments, or sub-systems, of species and habitats. This modular set up provides resilience against stress initially; however once a certain threshold has been passed, the same modularity causes the rate at which the ecosystem unravels to accelerate. This means that ecosystems that have existed for thousands of years could collapse in less than 50.

John Dearing, Professor in Physical Geography at the University of Southampton, who led the research said: "The messages here are stark. We need to prepare for changes in our planet's ecosystems that are faster than we previously envisaged."

The unravelling effects that Professor Dearing and his team have highlighted are probably illustrated by the rapid spread of bush fires recently seen in Australia and magnify concerns about the effects that the recent fires in the Amazon rainforest will have on its ability to withstand [climate change](#).

Professor Dearing concluded, "These findings are yet another call for halting the current damage being imposed on our natural environments that pushes ecosystems to their limits."

**More information:** "Regime shifts occur disproportionately faster in larger ecosystems" *Nature Communications*, [DOI: 10.1038/s41467-020-15029-x](#) , [www.nature.com/articles/s41467-020-15029-x](http://www.nature.com/articles/s41467-020-15029-x)

Provided by University of Southampton

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