

# Pre-Columbus climate change may have caused Amazon population decline

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Climate change impacts felt in the Amazon rainforest prior to the arrival of European settlers after 1492 may have meant populations of indigenous people were already in decline before the 'Great Dying', new research has suggested.

Scientists studying fossil pollen and charcoal data from across the

Amazon say it appears to show that human management of the rainforest may have peaked around 1200 AD, before some sites were abandoned, allowing reforestation of these areas.

The new research, involving University of Reading scientists and published in the journal *Science*, challenges the prior assumption that the largest [population](#) decrease in the Americas—known as the Great Dying—did not start until after European settlers carried new diseases to the continent.

Professor Frank Mayle, a tropical palaeoecology researcher at the University of Reading, and co-author of the study, said: "Our analysis raises the possibility that climate change caused the decline of some Amazonian societies several centuries before the Europeans arrived, especially the more complex societies which may have been too rigid to adapt.

"Although the introduction of European diseases, such as small pox, is still likely to have been the reason for the major population decline subsequently seen in the Americas, the research is a warning of the threat climate change poses to society. Knowledge of how different types of ancient [society](#) responded to past [climate change](#) may provide valuable clues to understanding the fate of today's diverse societies under 21st century global warming."

The research was led by Professor Mark Bush at Florida Tech, and included a team of international collaborators who are investigating how pre- and post-European people modified and managed Amazonian forests.

Analysis of fossilised pollen and charcoal revealed that many previously deforested lands have been recovering for over 800 years, rather than the 400 years previously supposed, indicating a pre-European population

decline. The research team is now looking to assess the drivers and mechanisms of this population drop-off.

Finding signatures of initial forest regrowth following ancient human disturbance is important to ongoing discussions about the impact of Pre-Columbian people on Amazon rainforests and the extent to which modern forests exhibit legacies of past human activity.

This research also has implications for atmospheric and biosphere science. It was previously believed that the indigenous population collapse in Amazonia following European Contact, and subsequent reforestation, led to the sequestration of so much carbon dioxide that global atmospheric CO<sub>2</sub> levels decreased markedly, an event known as the 'Orbis Spike'. Yet the team found no evidence that the Orbis Spike was caused by Amazonian reforestation.

**More information:** M. B. Bush et al, Widespread reforestation before European influence on Amazonia, *Science* (2021). [DOI: 10.1126/science.abf3870](https://doi.org/10.1126/science.abf3870)

Provided by University of Reading

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