

Climate change is expected to increase deadwood decomposition globally

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Climate change could increase the release of greenhouse gases from insect-driven forest decay, a new study has found.

Griffith University researchers were part of the international study published in *Nature*, that for the first time quantified the contribution of deadwood [decomposition](#) to the global carbon cycle and the role that insects play in forest decomposition.

"We have known for a long time that living trees capture and absorb carbon from the atmosphere," said Dr. Marisa Stone from the Centre for Planetary Health and Food Security.

"But until now, little was known of the role that dead trees played in the carbon cycle.

"We found that decaying wood releases over ten gigatons of carbon every year, which is equivalent to 115% of carbon emissions from fossil fuels."

Professor Lindenmayer, a co-author from the Australian National University, said that the decomposition of wood and the recycling of those nutrients is a critically important process in forests.

"We also knew that deadwood decomposition can't happen without wood-boring insects such as termites and wood-boring Longicorn beetles," said Dr. Marisa Stone.

"But what we didn't know was how much they can accelerate decomposition and how much they contribute to carbon release globally.

"Insects accounted for 29% of deadwood carbon release each year. However, their role was disproportionately greater in the tropics and had little effect in regions of low temperatures."

The global research project encompassed 55 forest areas on six continents.

The research team studied wood from more than 140 tree species to determine the influence of climate on the rate of decomposition. Half the deadwood studied was placed in mesh cages to keep out insects, allowing the researchers to study the insects' contribution to the decomposition.

"We found both the rate of decomposition and the contribution of insects was highly dependent on the climate, and will increase as temperatures rise," Professor Lindenmayer said.

"Higher levels of precipitation accelerate the decomposition in warmer regions and slow it down in lower temperature regions."

Tropical forests contribute 93 percent of all carbon released by deadwood, due to their high wood mass and rapid rates of decomposition.

"Although the amount of carbon emitted from decomposing deadwood is relatively high, a far greater amount remains locked up in deadwood each year, particularly in cooler climates," said Mr. Kurtis Nisbet, a co-author from Griffith University.

"These estimates are the first step in predicting role of deadwood in the carbon cycle."

"Our results show deadwood is an important factor in the global carbon cycle that needs to be considered for climate protection in forests."

The study was led by Dr. Sebastian Seibold from the Technical University of Munich.

"At a time of global change, we can see some dramatic declines in biodiversity and changes in climate," Dr. Seibold said.

"This study has demonstrated that both [climate change](#) and the loss of insects have the potential to alter the decomposition of wood, and therefore, carbon and nutrient cycles worldwide."

Provided by Griffith University

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