

Time, place and how wood is used are factors in carbon emissions from deforestation

May 13 2012

A new study from the University of California, Davis, provides a deeper understanding of the complex global impacts of deforestation on greenhouse gas emissions.

The study, published May 13 in the advance online edition of the journal *Nature [Climate Change](#)*, reports that the volume of [greenhouse gas](#) released when a forest is cleared depends on how the trees will be used and in which part of the world the trees are grown.

When trees are felled to create solid wood products, such as lumber for housing, that wood retains much of its carbon for decades, the researchers found. In contrast, when wood is used for [bioenergy](#) or turned into pulp for paper, nearly all of its carbon is released into the atmosphere. Carbon is a major contributor to [greenhouse gases](#).

"We found that 30 years after a forest clearing, between 0 percent and 62 percent of carbon from that forest might remain in storage," said lead author J. Mason Earles, a doctoral student with the UC Davis Institute of Transportation Studies. "Previous models generally assumed that it was all released immediately."

The researchers analyzed how 169 countries use harvested forests. They learned that the [temperate forests](#) found in the United States, Canada and parts of Europe are cleared primarily for use in solid wood products, while the [tropical forests](#) of the [Southern hemisphere](#) are more often cleared for use in energy and paper production.

"Carbon stored in forests outside Europe, the USA and Canada, for example, in tropical climates such as Brazil and Indonesia, will be almost entirely lost shortly after clearance," the study states.

The study's findings have potential implications for biofuel incentives based on [greenhouse gas emissions](#). For instance, if the United States decides to incentivize corn-based ethanol, less profitable crops, such as soybeans, may shift to other countries. And those countries might clear more forests to make way for the new crops. Where those countries are located and how the wood from those forests is used would affect how much carbon would be released into the atmosphere.

Earles said the study provides new information that could help inform climate models of the Intergovernmental Panel on Climate Change, the leading international body for the assessment of climate change.

"This is just one of the pieces that fit into this land-use issue," said Earles. Land use is a driving factor of climate change. "We hope it will give climate models some concrete data on emissions factors they can use."

In addition to Earles, the study, "Timing of carbon emissions from global forest clearance," was co-authored by Sonia Yeh, a research scientist with the UC Davis Institute of Transportation Studies, and Kenneth E. Skog of the USDA Forest Service.

Provided by Queen's University Belfast

Citation: Time, place and how wood is used are factors in carbon emissions from deforestation (2012, May 13) retrieved 2 May 2024 from <https://phys.org/news/2012-05-wood-factors-carbon-emissions-deforestation.html>

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