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Chiefs of Staff, News Directors

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New logging link to global climate change

Researchers from the University of Tasmania and New Hampshire's Dartmouth College (USA) have found that logging previously unlogged forest gradually releases a substantial portion of the soil's carbon into the atmosphere, thus contributing to global climate change.

Recent reviews of the effects of logging on soil carbon have reported contradictory results, with some researchers suggesting that logging has no effect on the retention of carbon in soil.

However, University of Tasmania doctoral researcher and scientist Dr Christopher Dean, geographer and conservation ecologist Distinguished Professor Jamie Kirkpatrick and Dartmouth College environmental scientist/forest ecologist Professor Andrew Friedland argue there is a major effect of logging previously uncut forests on the amount of carbon in forest soils, which is only detectable after many centuries.

"This long-lived and substantial transfer of carbon from forest soils to the atmosphere has not yet been taken into account in global climate change models or national greenhouse accounts," Dr Dean said.

The findings relate to land under all intensively logged forests, where at least 40% of the above-ground tree mass is removed or burnt, including by clearfell/clearcut, aggregate retention, or heavy selective logging.

Soil carbon in forests is closely related to the long-term average weight of trees it supports, which is much greater in never-logged forest than in logged forest.

After a forest is logged for the first time, this weight can only return to the pre-logging level if left to grow for many centuries.

Forests that are recut at much shorter intervals have a lower average tree mass and a corresponding gradual emission of soil carbon.

“Models suggest that over a few hundred years, approximately one tenth of the original soil carbon is transferred to the atmosphere,” Dr Dean said.

“That fraction rises to approximately one half when modelling over a period of one and a half millennia.

“Forest managers, climate change modellers and environmental policy-makers need to assume a long-term net transfer of soil carbon to the atmosphere when primary forests are logged then undergo harvest cycles.

“This includes calculations for primary forests that were logged and converted from decades to millennia ago, and whose emissions are now contributing to current climate change.”

The findings suggest that logging, even of forests converted to plantations, is not sustainable if it is less than around 1,000 years since the first logging event on that land. The emissions are still ongoing— as the soil carbon is as yet not near its final long-term reduced level— and the process is not yet complete.

The emissions will be to some degree offset by soil carbon formed in some landfills from used wood products such as paper, but accounting for this would require additional investigation to account for recycling mill emissions, mechanical disturbance emissions, methane emissions and freight emissions.

“The good news is that it is possible to halt and maybe reverse these substantial carbon emissions by stopping the logging cycle, so the task remains to choose when and where this will be most effective,” Dr Dean said.

“The findings will also allow improved greenhouse footprint accounting for forest industries, and in turn, improved accounting for the global carbon balance.”

To read the full article in the publication *Global Change Biology*, click here: http://dx.doi.org/ 10.1111/gcb.13387

MEDIA OPPORTUNITY

Dr Christopher Dean is available for interview by phoning 0408 975 633.
Images are also available on request by emailing Media.Office@utas.edu.au

To read more about Professor Kirkpatrick and his work, click here: http://www.utas.edu.au/profiles/staff/geography-environmental/jamie-kirkpatrick

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