Combustion of dead wood, photo Barbie McKaige.

Northern Australia Environmental Resources Hub

National Environmental Science Programme

Supporting savanna fire management through carbon farming

Wrap-up factsheet

We can use carbon stored in dead standing trees to calculate carbon credits

The current (2018) methods for calculating carbon credits from managing savanna fires includes emissions avoidance and carbon stored as dead wood on the ground. Including the carbon stored in dead standing trees into these calculations could significantly increase the potential carbon credits resulting from fire management projects. This research aimed to quantify the carbon in dead standing trees across northern Australian savannas so that it could be included in future revisions of the 2018 method.

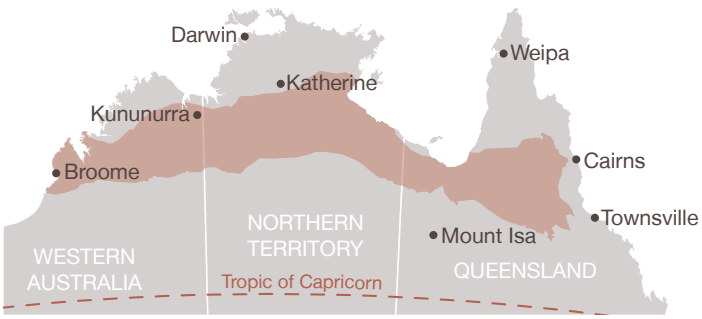
We compiled existing and newly collected data from 60 sites over 28ha to quantify the amount of dead standing trees in savanna vegetation and developed an approach to quantify how it would change under different fire regimes. Both field data and process modelling showed that the carbon stored in dead trees increased as fires became less frequent. We calculated that Australia's northern savannas hold 23 billion live trees, weighing about 3.6 billion tonnes. Each year, more than 2% of these trees die from various causes, creating dead standing trees that store carbon in the landscape usually until it burns. It is this carbon that has been newly quantified by this project.

These results are being published in a scientific paper, and the Australian Government's Department of the Environment and Energy could use this research to update the current carbon credit calculation method for land management projects.

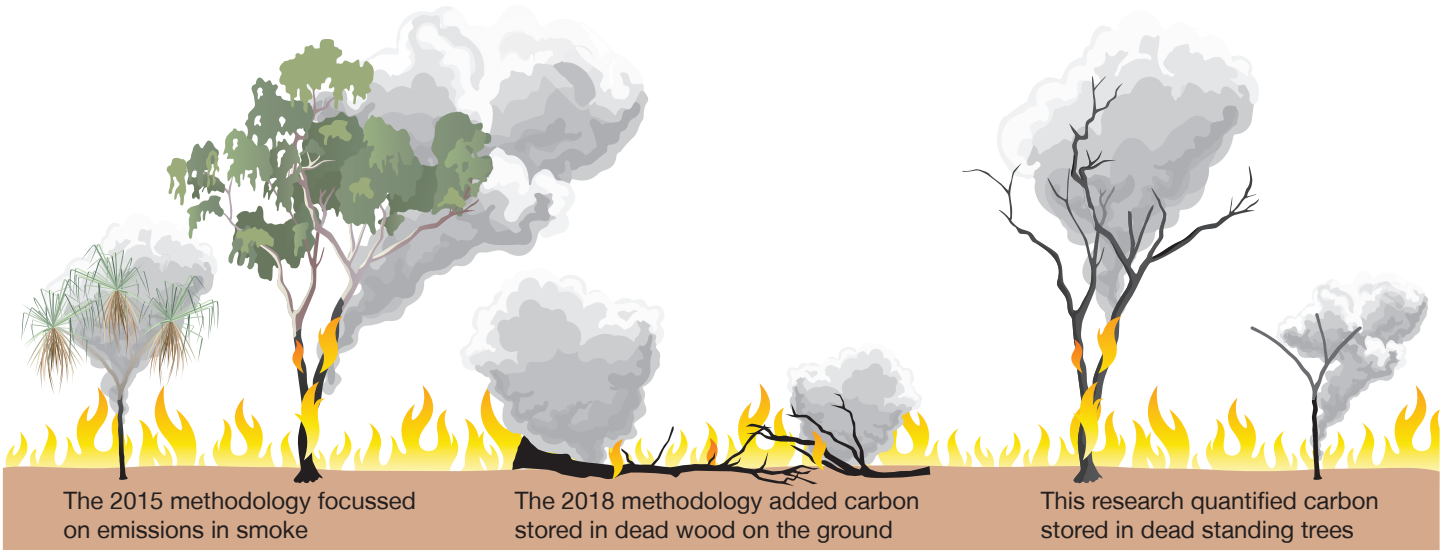
Key findings

This research found that:

- significant carbon is stored in dead standing trees across the north
- methods to calculate carbon credits for land management projects can be updated to account for this carbon
- LiDAR technology can be used to accurately measure trees and wood at the landscape scale.



The project focussed on low-rainfall (600–1000mm/yr) savanna areas (dark shaded area) across northern Australia but is also applicable to high-rainfall areas.



Future revisions to the carbon credit calculation method could include carbon stored in dead standing trees.

We needed changes to the way we calculate carbon credits

Scientists and Traditional Owners have worked together for more than a decade to improve their understanding of how to calculate changes in greenhouse gas emissions and carbon storage in savanna landscapes. The greenhouse gas emissions mainly come from bushfire smoke. Carbon stores (or sequestered carbon) include carbon stored in soil, live trees, dead wood lying on the ground or as dead standing trees.

The first savanna burning methodology that covered both high and low rainfall savannas required a change in fire management that aimed to reduce the amount of greenhouse gases emitted as smoke from savanna burning (emissions abatement). Further research allowed the carbon sequestered in dead wood lying on the ground to be considered. This led to the 2018 savanna burning methodology that includes both reduced greenhouse gas emissions and carbon storage. Other stores – such as the carbon in dead standing trees measured by this research – could be included in the future.

Technology to measure carbon storage

We have been exploring the use of LiDAR scanners to improve the quantification of the carbon stored in trees and dead wood in northern Australia's savannas. This technology has great potential for improving the understanding of how vegetative carbon stocks change over time and across landscapes.

Land managers can claim credits for carbon storage and emissions reductions

The 2018 savanna burning methodologies allow projects to claim both increased amounts of carbon stored in dead wood on the ground and reductions in greenhouse gas emissions in smoke, or just reductions in emissions alone, resulting from changed fire management. The increases in carbon storage and reductions in emissions are calculated against baseline periods. Projects are required to manage fires to reduce overall fire frequency and particularly the frequency of late dry season fires.

Claiming both carbon storage and emissions reductions leads to greater carbon credits, but projects need to commit to maintaining the carbon in the landscape for up to 100 years. If only emissions reductions are claimed, then projects can operate year to year, without a longer-term commitment.

Further information

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This factsheet and further information are available from the project webpage at nespnorthern.edu.au/projects/nesp/savanna-carbon-sequestration-method

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