



Northern Australia
Environmental
Resources
Hub

National Environmental Science Programme

Savanna carbon sequestration method

The Challenge

Northern Australia experiences frequent and intense fires. However, in many parts of the north there are insufficient resources available to support effective fire management. Under the Federal Government's Carbon Farming Initiative, the Emissions Abatement through Savanna Fire Management Methodology allows land managers to earn carbon credits by using controlled burning in the early dry season to minimise highly intense fires later in the season. Land managers earn credits by reducing the amount of methane and nitrous oxide released into the air. A new approach is however now needed to recognise the increased amount of carbon stored as a result of changed fire regimes. By reducing the area and intensity of a burn, more dead organic matter, such as woody debris and leaves, is left intact and the storage of carbon increases.

There is potential to increase the accountable greenhouse benefit by about three times by including the carbon stock of dead organic matter. However in semi-arid savannas (600-1000 mm rainfall), the methodology requires further work to ensure that the carbon stored is quantified robustly.

How will this research help?

This project aims to improve our ability to calculate the carbon benefit in dead organic matter from changed fire regimes in lower rainfall savannas across northern Australia.

By accounting for carbon stored in dead grass, leaves, twigs and coarser woody debris, as well as the non-CO₂ greenhouse gases, we can better quantify the value to greenhouse gas abatement of improved fire management. This has the potential to increase the incentive for land managers to adopt improved fire practices, by allowing them to earn additional carbon credits.



Controlled fires in the early dry season burn at a lower intensity than fires later in the season. Photo: Jaana Dielenberg

Top image: Coarse woody debris burning after the fire front has passed. Photo: Garry Cook



Research method

Researchers aim to develop a carbon budget for woody debris for low rainfall (600-1000 mm) savannas across northern Australia. This will involve quantifying two key parts of the carbon budget – the annual inputs from branch fall and tree death, and the annual decomposition of dead wood due to such processes as fungal attack and termite consumption. An accounting framework will be developed to ensure that these data provide useful inputs to both a carbon farming methodology and the national greenhouse gas inventory.



Garry Cook and Floriane Roson assessing tree stand structure. Photo: Jon Schatz
Top Image: Controlled early dry season burn. Photo: Jaana Dielenberg

Where is the research happening?

The research will improve parameterisation of carbon dynamics in northern Australian savannas in low rainfall areas in Western Australia, Northern Territory and Queensland.

Who is involved?

Principal Research Scientist Garry Cook from CSIRO leads the project. Dr Cook will be supported by staff from the CSIRO.

Contact

Garry Cook, CSIRO
garry.cook@csiro.au

Visit: www.nespnorthern.edu.au/nesp



National Environmental Science Programme



/NESPNorthern



@NESPNorthern

This project is supported through funding from the Australian Government's National Environmental Science Programme.