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Biomass combustion and emission processes in the northern Australian savannas

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Summary

The savanna woodlands of northern Australia contribute annually ~3% of Australia's net accountable greenhouse gas emissions. In recent years the development of fire management techniques based on the traditions of the Indigenous land owners has demonstrated that these emissions can be reduced by carefully planned and implemented prescribed burning. This led to the development of a certified methodology for claiming tradable carbon credits under Australia's Carbon Farming Initiative (CFI). The methodology was applicable only to savannas with a mean annual rainfall greater than 1000 mm. Greenhouse gas emission rates are determined by fuel composition; the fine fuels in this region are predominantly tree litter, with grasses dominating in only a few vegetation communities, and therefore the accounting methodology is suitable only for litter-dominated vegetation communities. However, there are extensive areas of the savanna woodlands in low rainfall regions where grasses dominate the fine fuels. Skilled fire management in these regions can also lead to reduced greenhouse gas emissions; however, quantifying the emissions reductions with the accuracy required for certifiable carbon credits requires the development of new accounting methodologies. A critical component of the process is evaluating the parameters of the accounting algorithm. This chapter reviews the procedures for assessing emission factors and the assumptions and pitfalls involved in assigning accurate values to a parameter set to produce project-based inventory methodologies suitable for emission accounting of low rainfall savanna fires.

Introduction

This chapter aims to recommend a set of savanna burning emission factors appropriate for the low rainfall savanna region of northern Australia. It extends the study in the high rainfall savanna in western Arnhem Land (Meyer *et al.* 2012) which underpins the high rainfall savanna accounting methodology (Russell-Smith *et al.* 2009; Commonwealth of Australia 2013).