



Carbon dynamics in savanna landscapes

The Issue

About one third of Australia's terrestrial carbon stocks resides in the tropical savannas of northern Australia. The savannas offer great potential as a sink for carbon, to offset greenhouse emissions, but the size of the sink is highly dependent on land use. Grazing, clearing and fire all have the potential to affect the store of carbon in savanna landscapes, and the amount of carbon emitted to the atmosphere. Thus, there is a need to understand the size of the carbon pools, both above and below ground, the fluxes - the movement - of carbon between soil, vegetation and the atmosphere, and the ways in which various land uses affect these stocks and fluxes.

CSIRO Research

CSIRO research commenced in 2001 in partnership with Charles Darwin University, the Northern Territory Department of Business, Industry and Resource Development and other agencies involved with the Tropical Savannas CRC.

The key questions are:

- What are the stocks of carbon in the savannas, both above and below ground, in both mesic and semi-arid savannas?
- What methods are best used to estimate these stocks?
- Are the savannas a net source or sink of carbon?
- How does land use affect the stocks and fluxes of carbon?

Preliminary estimates for the various pools of carbon (trees, grasses, roots and soil organic carbon) have been made using direct harvest for sites in the Darwin, Katherine and Victoria River District regions. Equations have been developed that relate carbon stocks to tree size and tree density. Examination of the fluxes of carbon between the landscape and the atmosphere indicates that the savannas are a net sink for carbon, but that the size of the sink is affected by land uses such as tree clearing, grazing and fire.

Carbon trading may become a feature of the nation's economy in the coming years, and the results from this project will increase our understanding of how native ecosystems may contribute to the emerging carbon economy.

Research Staff

Dr Dick Williams - Plant ecologist
Dr Adam Liedloff - Ecological modeller
Mr Robert Eager - Remote-sensing ecologist

Collaborators

NT Government, Charles Darwin University,
Tropical Savannas CRC

Contact

Dr Dick Williams. CSIRO Sustainable Ecosystems
Phone. 08 8944 8426. dick.williams@csiro.au

