



Research Directions

Office of Research Services

Nature's Carbon Trading Scheme

Professors' David Ellsworth, David Tissue and Jann Conroy from the Centre for Plant and Food Science (PAFS) are exploring how to predict the impact of increasing carbon dioxide (CO₂) emissions on plant growth, carbon storage and water loss in Australian eucalypt forests. This project has been assisted by the NSW Government through its Climate Action Grants Program.



'As climate change becomes a reality there is fierce competition for scarce water supplies' says Professor Conroy. 'Planting forests could further reduce these supplies because trees use more water than the vegetation they replace. This threatens the NSW Government's strategy for carbon sequestration (the capture, storage and usage of carbon dioxide gas), in forests. We will use the Hawkesbury Forest Experiment, a field-based carbon dioxide enrichment facility, to confirm that rising CO₂ in the atmosphere offsets water use by forests under Australian conditions. This would ensure that the government's strategy for forests remains an attractive investment for companies seeking to offset greenhouse gas emissions by planting forests.'

The Hawkesbury Forest Experiment is an established research facility of the University of Western Sydney to allow experimental modelling of the impact of rising CO₂, drought and mineral nutrition on eucalypts. The centre piece of the experiment is twelve 10metre tall closed chambers which enclose a single eucalypt in a sealed system where everything in and out can be measured and temperature can be controlled by the researcher. Using these chambers, the research team will carry out state-of-the-art cellular and chemical analysis techniques to determine carbon gain and water use at the leaf and tree level. The data collected will then be used to construct models that will allow researchers to make long-term predictions about carbon sequestration in forests and the impact of tree planting on water yields. Working with Forests NSW and the Cooperative Research Centre for Irrigation Futures, stakeholders from the forestry and irrigation industries will be identified and results will be communicated to them via workshops.

This research project and its associated communication strategy will ensure that outcomes of the investigation are passed on to the end-users to help them adjust to the impacts of change in climate and CO₂. It will also aid the NSW Government in achieving the objectives of its NSW Greenhouse Action Plan, and assist in understanding and preserving Australia's precious water resources.

Project Title: Trade off between carbon sequestration in forests and water yields under rising CO₂

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