



Disentangling environmental and human drivers of carbon dioxide uptake and release on land

Thursday 20 February 2020, 11:30-12:30 (AEDT)

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Uptake of carbon by land-based ecosystems is critical to the Earth's climate. The natural land carbon sink currently absorbs approximately 25 per cent of human-induced greenhouse gas emissions, significantly mitigating climate change.

In the wake of the Paris Agreement and the target to stabilise the climate system below 2°C above preindustrial levels, there is a pressing need to better understand land carbon dioxide (CO₂) exchange as human-induced land mitigation is a key requirement for keeping the climate system below 2°C of warming. Understanding the contribution of the natural carbon sink and net emissions from human land-use and land management activities is particularly important for informing mitigation decisions, policies and activities.

To do this, questions first need to be answered around how the land will affect future atmospheric CO₂ concentrations and therefore climate, and what the impacts of human land-use on atmospheric CO₂ are compared to those of the natural carbon cycle. Global land models are used by researchers to better understand the land carbon cycle and answer these questions.

Earth Systems and Climate Change Hub researchers have extended the CABLE (Community Land Atmosphere Biosphere Exchange) land surface model to produce a tool specifically tailored for disentangling the human-induced and natural carbon sources and sinks. The extended model, CABLE-POP (Populations Order Physiology), is one of a new generation of state-of-the-art international global land models that contribute to the annual assessment of the Global Carbon Budget through the international [Global Carbon Project](#).

In this webinar, Dr Vanessa Haverd from CSIRO will provide an overview of the land carbon cycle, including the natural and human-induced sources and sinks. She will describe the role and performance of CABLE-POP in the terrestrial biosphere model ensemble that informs global carbon cycle assessments. Dr Haverd will also present results from the CABLE-POP model, focussing on the contributions of CO₂ fertilisation versus land-use change to the net land carbon sink.



Dr Vanessa Haverd is a model developer within the Australian and Global Carbon Assessment Team in the ACCESS Group of the CSIRO Climate Science Centre. She is a Deputy Chief Investigator of the Earth Systems and Climate Change Hub [Project 5.6: The carbon budget of continental Australia and possible future trajectories](#). Dr Haverd has 13 years of experience of carbon cycle assessment that integrates modelling with observations, for the Australian continent and the globe.

The Earth Systems and Climate Change Hub science webinars are open to anyone interested in finding out more about the Hub's research (noting that the content may assume some understanding of climate change science and the fields being discussed).