NUS National University of Singapore | Department of Biological Sciences, Faculty of Science

SEMINAR

Mon 14 Nov 2016 | 1.30pm | DBS Conference Room 1

Hosted by Dr Roman Carrasco

The capacity of forests to protect regional climate under global warming





By **Clive McAlpine**

and associates

Professor in Landscape Ecology, Conservation and Global Environmental Change at The University of Queensland

BioSketch:

Clive McAlpine is a Professor in Landscape Ecology, Conservation and Global Environmental Change at The University of Queensland. His research is multi-disciplinary, spanning the fields of biodiversity conservation, climate change and global environmental change. His research group work on the role of forests and savannas in the energy and water cycles, and their capacity to regulate regional climate. They are currently conducting land cover/land use-climate scenario modelling to quantify impacts of deforestation and afforestation on the climate of northern Australia and Southeast Asia under global warming scenarios. This research is evaluating the capacity of restoring forests to offset regional climate change to inform regional land use planning and climate mitigation and adaptation.

Leonie Seabrook is a Research Fellow in Landscape and Spatial Ecology at The University of Queensland. Her research interests are in modelling the drivers and spatial patterns of landscape change through time, examining species-habitat interactions, and predicting changes in species distributions under climate change. She is currently working on reviewing patterns and rates of deforestation in Southeast Asia. She is interested in applied research which can deliver successful outcomes in real-world social, economic and legislative conditions.

Dr Alvaro Salazar is a Postdoctoral Research Fellow in biophysical climate feedbacks at The University of Queensland. His PhD examined land surface-climate feedbacks through an evaluation of land cover change impacts on the climate and hydrology in southern South America using the CSIRO CCAM (Conformal Cubic Atmospheric Model) climate model and historical land cover maps. He previously worked on national and international research projects related to restoration ecology, conservation biology and spatial modelling. As a natural resources engineer he performed botanical and vertebrate surveys for conservation biology along the Andes, dryland vegetation of central Chile and the Atacama Desert.

Most people understand how deforestation can result in increased greenhouse gas emissions and how those emissions contribute to climate change. The relationship between forests and climate change is however much more complex. Deforestation also affects the climate through changes in the land-atmosphere heat exchange and the hydrological cycle. Evidence from the tropics suggests that the main effects are: an increase in surface temperatures, decrease in precipitation and increments in climate extremes such as droughts. These factors can enhance the negative effects of global climate change and impact human health, food and water security, and increase poverty.

We will discuss recent research on the biophysical climate benefits of restored savanna woodlands in Australia and current project funded by the Australian Research Council entitled, “The capacity of forests to protect regional climate under global warming: science and policy implications”. The current project seeks to understand the capacity of forests to offset the regional impacts of climate change in Southeast Asia and Northern Australia, evaluate the impacts of different landscape configurations on the functioning of biophysical climate services, and integrate the climate benefits and trade-offs of protecting and restoring forests and tree cover via scenario analysis into regional land use planning and climate mitigation, and adaptation strategies.

Artwork by Ann Nee, DBS, NUS