

Committee Secretary
Senate Education, Employment and Workplace Relations Committee
Department of the Senate
PO Box 6100
Parliament House
Canberra ACT 2600

**Submission to the Senate Inquiry into the Effects of Climate Change on Training and
Employment Needs
by the Universities Climate Consortium**

Background on the Universities Climate Consortium (UCC)

The UCC is a consortium of four major Australian universities, Australian National University, Monash University, the University of Melbourne, and the University of New South Wales, that are undertaking significant climate research and have integrated their research and education programs to provide a world-class, strategic, team-based climate science capability for Australia. The Universities Climate Consortium provides national leadership; sustained outstanding research; integrated undergraduate and postgraduate education programs; and advice to key policy, economic, environmental and resource sectors on the threats and opportunities of climate change. In collaboration with the Bureau of Meteorology, CSIRO, and colleagues from other universities, the UCC ensures that Australia continues to be a contributor of global significance in climate change research and education.

"Our strength is the collective capacity we bring to all aspects of the climate challenge."

UCC contacts

Australian National University: Prof Will Steffen (will.steffen@anu.edu.au)

Monash University: Prof Amanda Lynch (Amanda.Lynch@arts.monash.edu.au)

The University of Melbourne: Prof David Karoly (dkaroly@unimelb.edu.au)

The University of New South Wales: Prof Andy Pitman (a.pitman@unsw.edu.au)

Submission

This submission concentrates on one aspect of the terms of reference, the ability of universities to contribute to developing Australia's capacity in the area of climate change, including their ability meet current and future demand for climate change professionals. Climate change has a number of different meanings and we assume that the meaning intended by this inquiry is that used by the UN Framework Convention on Climate Change, that "climate change" means a change of climate which is attributed directly or indirectly to human activity that increases the concentrations of greenhouse gases in the global atmosphere.

Climate change is a very broad, multi-disciplinary subject encompassing the science of climate change, impacts of climate change on natural and human systems, adaptation to those impacts, and mitigation of climate change through reducing human sources of greenhouse gases or increasing natural uptake. The most comprehensive assessment of the many different aspects of climate change is provided by the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), released in 2007. The breadth and complexity of climate change is illustrated by the size of the IPCC Fourth Assessment Report, with its four volumes and nearly 3000 pages.

Developing Australia's capacity in the area of climate change requires building current capacity in the many individual disciplines relevant to climate change, as well as building cross-disciplinary linkages. The wide range of relevant disciplines includes agricultural science, architecture, atmospheric science, botany, chemistry, climate science, computer science, ecology, economics, engineering, geography, hydrology, mathematics and statistics, oceanography, physics, psychology, sociology, urban planning, zoology, and many others. Cross-disciplinary topics span many of these disciplines, including earth system science, biogeochemistry and the many interactions between social sciences and physical sciences.

Almost all Australian universities claim to have expertise in climate change and have developed institutes, centres or program in climate change. However, few of these have the critical mass of a number of academic staff in core climate science disciplines to underpin their claimed expertise in other disciplines. There is no department of climate science or atmospheric science at any Australian university. The Universities Climate Consortium was developed to establish such a critical mass in climate change science in the Australian university sector and to encourage collaboration to build capacity for research and education in climate change science. Each of the four universities that are members of the UCC have nationally significant research and undergraduate and postgraduate education activities in climate change science, but together they provide the means to develop a program comparable to the very best anywhere in the world.

The only other Australian university group that is developing a critical mass in climate change is the National Climate Change Adaptation Research Facility, established in 2008 and based at the University of Queensland. Unfortunately, the roles of that facility do not include education and training.

Australian universities are unable to meet current demand for climate change professionals. Climate change researchers often have to be recruited from overseas by CSIRO and Australian universities and climate change professionals often have to be recruited with limited climate change expertise by Australian businesses. Australian universities will only be able to meet future demand with significant expansion in the size and range of education and training programs available.

Meeting the future demand for climate change professionals in Australia will involve:

- 1) *Increasing resources for university-based research training in climate change science and related disciplines, including climate change impacts, adaptation and mitigation.* At present, almost no funding is provided through the Federal Government's Australian Climate Change Science Program to universities to support research and research training, with almost all the funding provided to CSIRO and the Australian Bureau of Meteorology. The cross-disciplinary nature of climate change means that the discipline-specific assessment panels used by the Australian Research Council have more difficulty in assessing climate change research grant applications compared with single discipline proposals. This may limit research funding for climate change through ARC competitive research grants.
- 2)
 - (a) *Provision of professional postgraduate coursework programs at Masters and Graduate Diploma level relevant to different aspects of climate change.*
 - (b) *Provision of short course programs relevant to different aspects of climate change.*The growing demand from industry, local government and state government for climate

change professionals can be met in part by providing appropriate short course and professional degree programs to train existing staff. Such programs are already being developed in many universities and are unlikely to need additional encouragement, given the demand, although some form of quality assurance may be required.

- 3) *Provision of undergraduate degree courses and subjects on climate change.* Given that there is no department of atmospheric science, climate science or climate change at any Australian university, there is no undergraduate degree offered with a major in climate change at any Australian university at present. However, all four universities in the UCC offer undergraduate degrees with majors in atmospheric or climate science that provide the foundations needed for climate change professionals. In addition, they also provide individual subjects on climate change available to the broader university student community to provide an introduction to climate change. The critical mass of expertise in climate change science available at each of the UCC universities is crucial to being able to provide a high quality undergraduate or graduate coursework program in climate change. Additional Commonwealth-supported places for undergraduate degrees in climate change would greatly encourage the provision of such degrees, but comprehensive guidelines on the content and requirements for such degrees would be needed to ensure the highest quality.

Any of the UCC leads at the four universities would be happy to meet with the committee to expand on this submission and to answer questions.

Prof David Karoly
Uni. of Melbourne
ph: 03-8344 4698

Prof Amanda Lynch
Monash Uni.
03- 9902 0394

Prof Andy Pitman
Uni. of NSW
02-9385 7075

Prof Will Steffen
Australian National Uni.
02-6125 4588