The Antarctic Climate and Ecosystems CRC: a truly collaborative partnership

The Antarctic Climate and Ecosystems Cooperative Research Centre (ACE CRC), funded by its partners and the Federal Government from 2003 to 2010, is underway. This exciting CRC is the second to focus on Antarctic and Southern Ocean research and will build on the outstanding track record of its predecessor, the Antarctic CRC, that produced over 500 scientific publications, over 50 PhD students and significantly advanced our understanding of the Antarctic region.

The Cooperative Research Centres program was started in 1991 as an initiative to generate more focused, productive research and development from existing research infrastructure, rather than building whole new research agencies. CRCs are partnerships among universities, Commonwealth and State research agencies (such as CSIRO and the Australian Antarctic Division) and policy and industry sectors. The objective of these partnerships is to use the existing research infrastructure to target specific industry and community issues of national significance. Antarctica and its surrounding Southern Ocean is becoming recognised as a major engine room of global climate and oceanographic processes, having major effects on the rates of global warming, sea level rise and the processing of greenhouse gases such as carbon dioxide. Thus, the ACE CRC and its predecessor fit well into the national CRC Programme.

The ACE CRC is a joint venture between the Australian Antarctic Division, CSIRO Marine Research, CSIRO Atmospheric Research, the Commonwealth Bureau of Meteorology and the University of Tasmania as its core partners. Contributing Supporting Partners include the Australian Greenhouse Office, the Tasmanian Department of Economic Development (TDED), the Australian National University (ANU), Silicon Graphics Inc, the National Institute of Water and Atmospheric Research (NIWA, New Zealand), and the Alfred Wegener Institute (AWI, Germany). The ACE CRC research program involves collaborations and research partnerships with individuals and institutions in 13 countries, including Belgium, France, Germany, Italy, Japan, New Zealand, Norway, United Kingdom, China and the United States of America among others – a truly international partnership.

The ACE CRC involves five main research programs focused on Antarctic Marine Ecosystems, Climate Variability & Change, Ocean Control of Carbon Dioxide, Sea Level Rise, and Antarctic and Southern Ocean Policy. The research programs are supplemented with education, communication and extension and commercialisation programs.

Together, these programs will provide unprecedented understanding of just how the Southern Ocean and Antarctic sea ice moderate global oceanographic and climate processes in the face of human generated impacts elsewhere. For example, the Southern Ocean has the potential to be a major sink for excess carbon dioxide generated by industrialised societies, but the rate of carbon dioxide uptake by the ocean depends on the ocean's circulation and the status of the Southern Ocean ecosystem – which in turn will be affected by global warming. The rate of sea level rise also depends on the Southern Ocean circulation and its uptake of heat as well as changes in precipitation in Antarctica, and on the longer time scale the state of the Antarctic ice sheets. Unravelling the complexity of interactions between ocean circulation, carbon dioxide uptake, Antarctic marine ecosystems and global warming will require the synthesis of research across all of the ACE CRC research programs. This will be a challenging task because traditionally the different disciplines have tackled their science at different scales in space and time, and bringing these disciplines together will involve adjustments to those existing methods. Making those adjustments will be a key feature of the ACE CRC.

ANTARCTIC CLIMATE & ECOSYSTEMS
COOPERATIVE RESEARCH CENTRE

Another key element of the ACE CRC is the formal recognition of the importance of relating our scientific outputs to national and international policies about Antarctica, conservation of its ecosystems and the impacts of the global climate changes to which the Southern Ocean is so important. The ACE CRC Policy Program will provide a direct, focused avenue through which to give the predictions from science maximum effect nationally and internationally, allowing Australia to better anticipate the effects of global climate changes and adjust to those changes.

This is an exciting combination of research covering several science and political disciplines. Into this mix we will be sponsoring a host of post-graduate students, who will be the leaders in these fields in a few years. The multi-disciplinary and international nature of the ACE CRC provides an unequalled mix of post-graduate opportunities and it is our aim to support over 50 graduates by 2010. By that time, too, we will have contributed whole new insights to the functioning of the Southern Ocean and Antarctica and just how important they are to our future under a changing global climate.

Bruce Mapstone, CEO, ACE CRC

JOHN SMITH