Welcome to the first biennial report of the ANU Climate Change Institute.

Climate change has become the defining challenge for humanity in the 21st century. Dealing with climate change demands new types of knowledge – every bit as demanding and rigorous as traditional academic knowledge but more integrated and connected, and more closely linked to practitioners searching for solutions to the climate change challenge.

The ANU is in an exceptionally strong position to contribute to the generation of these new types of knowledge. The University’s strength in climate change research is its breadth – from fundamental climate science to economics, governance and law – and the quality and depth in these and other areas.

The CCI’s vision is to build and support a cohesive, interactive community of climate change-related researchers and teachers at the ANU.

Our mission is to contribute to climate change solutions through innovative, interdisciplinary approaches to research and teaching, drawing on the wealth of expertise across the University’s seven colleges, and to connect our work to governments, the private sector and civil society.

In this report you’ll find a comprehensive account of what we’ve achieved in the first two years of our life. We focus primarily on our contributions to climate-related research and teaching at the ANU, with a description of the University’s core capabilities and accounts of the new and exciting interdisciplinary projects being developed under the auspices of the CCI.

The report also includes accounts of our initiatives in policy liaison and communication, describes the CCI product portfolio, and provides an outlook for the coming years. We acknowledge the very significant support from the ACT Government that has helped to make the ANU Climate Change Institute a reality.

For busy readers, the first section – the CCI highlights for 2009–2010 – gives a quick overview of our activities and achievements.

We hope that you find the report informative and enjoyable. We welcome your comments and suggestions on our work, and on its communication to the world both within and outside the ANU.

Professor Will Steffen  
Executive Director  
ANU Climate Change Institute
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Climate Change Institute in Brief: 2009–2010 Highlights

The ANU Climate Change Institute (CCI) was formally launched by Vice-Chancellor Professor Ian Chubb at the National Press Club in Canberra on 29 October 2008.

In his address, Professor Chubb emphasised the complexity of the challenge, “Climate change is perceived as a major long-term threat to the health of the planet by a large proportion of the population, but there is no simple solution to this problem. It is one that reaches across the boundaries of science, social sciences, health, economics, law, philosophy and more.”

In responding to this challenge, the CCI in its first two years has achieved a number of important milestones in bringing together expertise in climate from across the ANU to develop integrative research programs and innovative masters and professional courses. The Institute has also focused on international engagement, building on the University’s expertise in the Asia-Pacific region and enabling strong ANU participation in the international negotiation process aimed at achieving a global solution to the climate challenge. Another important milestone was the sod-turning ceremony for the new building that will house the CCI offices. The building, an addition to the Fenner School for Environment and Society complex, was made possible in part by a generous contribution of $2.5 million from the ACT Government to the CCI.

Research

Since its inception the CCI’s research effort has focused most strongly on building interdisciplinary programs that address high priority climate change issues. The initial effort has been aimed at two such programs, one built on a confluence of the University’s world class research expertise in the Asian region with the accelerating importance of China in the climate change arena; and the other designed to use Canberra and its region as a test bed for climate change adaptation and mitigation, drawing on knowledge and expertise across the ANU.

China and Asia in the 21st century: Climate Change and Development — an integrated approach to studying climate change in the world’s most dynamic region, from the impacts of climate change on China’s water resources and food production to the geopolitical implications for regional security and international negotiation strategies.

The program’s initial research project – China and the Third Pole – focuses directly on the impacts of climate change on the Hindu Kush-Himalaya-Tibetan Plateau region, the “water tower” of Asia, and on the consequences for water resources and food production around the region. This interdisciplinary project involves researchers from across the ANU campus, including the new China in the World Centre (lead unit), the National Centre for Epidemiology and Population Health, and the Fenner School of Environment and Society.

Integrated Climate Change Response Options for Canberra and the Region — working with our own community to design and implement knowledge-based solutions for reducing emissions of greenhouse gases and adapting to the unavoidable impacts of climate change. The program is being implemented in collaboration with the University of Canberra via the CURF (Canberra Urban and Regional Futures) initiative, a platform for information sharing and integrative research. The initial project Climate Vulnerability and Adaptation in the Australian Capital Territory and Region, carried out with support from the ACT government, was a synthesis of research already carried out to provide a baseline for the current state of adaptation research in the region. The project focused on four critical aspects of adaptation to climate change – water resources, fire regimes, health and social systems, and governance and policy aspects.
Underpinning these integrative research programs is a large pool of core disciplinary expertise, spanning all seven ANU colleges and including research areas such as understanding the dynamics of the climate system; determining the consequences of climate change for the Asia-Pacific Region; exploring approaches to mitigating and adapting to climate change; and searching for solutions through the human dimensions of climate change – law, ethics, culture and philosophy. The role of the CCI is to support and promote these core research capabilities across the ANU, and to facilitate their participation in the integrative research programs.

**Education**

Through its academic units, the University offers a wide range of courses covering a broad spectrum of climate-related topics – Earth System science, climate law, international climate policy, climate and fire, economic approaches for climate change mitigation and many others. Recent developments include the Green Information Communications Technology Strategies (Green ICT) course that teaches students how they can help reduce carbon emissions when using computers and telecommunications equipment, and climate-oriented degrees through innovative degree structures such as the Bachelor of Interdisciplinary Studies (Sustainability). The CCI has promoted these offerings through our website and other communication tools, aiming to increase in student enrolment in climate-related courses.

In addition, the CCI has contributed to the development of an interdisciplinary Master of Climate Change degree offered jointly from 2009 by the Fenner School of Environment and Society and the Crawford School of Economics and Government. Planning is now underway for a new Master of Energy Change degree. In collaboration with the Fenner School, the Institute has also contributed to a new professional short course on climate change offered to the staff of the Department of Climate Change and Energy Efficiency, Australian Government.

The CCI facilitates other creative approaches to education on climate change, for example, the participation of ANU students as observers at the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties in Bali (2007) and Copenhagen (2009). The latter was a particularly worthwhile educational experience, as 55 participants from the ANU – of whom 33 were full time students – attended the event and witnessed the negotiations in person.
Communication

Over the first two years of existence, the CCI has placed very high priority on developing a vigorous and effective communication effort. A mix of communication tools including a website, brochures, events, internal ANU e-news, a photo competition and media engagement have been used to create awareness of CCI activities, build strong networks and professional relationships and to promote the recognition of ANU as an international leader in climate change research and education.

One of the highlights during 2009 and 2010 was the rapid development of the CCI website and its quick rise to prominence as a source of information on climate change. Over the past two years CCI website visitors have come from 157 countries. Media engagement also grew strongly, with over 2000 climate-related articles and interviews during the two-year period, featuring a good balance of topics across science, economics, policy and energy.

In addition, the Institute pioneered live-streaming of public events such as the panel discussion "Too Hot To Talk About: Why is Australia Still Debating Climate Change", which filled the venue on campus and attracted an on-line audience from across Australia and as far away as Canada. On-line participants were journalists, students, teachers, NGOs and government officials.

Policy Liaison

In keeping with the charter of the ANU, the CCI maintains a strong policy interface with the Australian Government. The Institute’s Director serves as science adviser to the Department of Climate Change and Energy Efficiency, and the CCI promotes and facilitates the contributions of other ANU academics to the development of climate policy. In addition, the CCI has organised several public events on aspects of climate policy involving key experts from the University and from other national and international institutions. For example, in April 2009 the CCI, in association with the ANU China Institute and the Department of Climate Change, convened a high level forum for senior Chinese and Australian researchers and officials to explore areas of commonality and difference in the context of negotiations leading up to 15th Conference of the Parties (COP15) in Copenhagen.

Internationally, the CCI played a strong supporting role to Copenhagen University in organising the Copenhagen Climate Change Congress, held in March 2009 and co-hosted by International Alliance of Research Universities (IARU). The congress, attended by more than 2,500 delegates from over 80 countries, provided policy makers throughout the world with a synthesis of existing and emerging scientific knowledge on the latest climate change science, adaptation approaches, greenhouse gas emission reduction strategies, and other aspects of the climate change challenge. The congress report was presented to the Danish Prime Minister and circulated to all of the national delegations to the COP15 in December 2009.
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Vision, Mission and Strategies

The CCI’s vision is to build and support a cohesive, interactive community of climate change-related researchers and teachers at the ANU.

Our mission is to contribute to climate change solutions through innovative, interdisciplinary approaches to research and teaching, drawing on the wealth of expertise across the University’s seven colleges, and to connect our work to governments, the private sector and civil society.

The strategies we use to achieve our mission are:

› Building a collaborative community of climate change scholars across the University via seminars, symposia and other internal events;

› Developing research aimed at tackling critical climate change issues, through stimulating disciplinary work and enabling new interdisciplinary approaches, supported by significant new external funding;

› Working with academic areas to create exciting, innovative climate-oriented courses at undergraduate, post-graduate and professional levels;

› Providing policy-relevant advice to the Australian and ACT Governments, supported by our expertise, our ongoing research, and our role as the national university;

› Communicating the activities and outcomes of the ANU climate change community to a wide range of audiences locally, nationally and internationally.
ANU research spans the wide set of scales associated with the mitigation of and adaptation to climate change, from working with local communities to deal with the impacts of climate change to supporting ANU researchers who contribute to international efforts to understand the global climate system; and from generating information on the behaviour of the climate system in the past to exploring the perceptions of Australian citizens to the potential climate changes of the future.

The CCI’s strategy for supporting and enhancing climate-related research across the University is based on three components. First, the research is organized into core research capabilities – the basic building blocks of disciplinary research – and integrated research programs, which address complex, high-level climate questions by bringing together the basic building blocks in novel combinations.

Second, the Institute provides support, as appropriate and within the constraints of our resources, to existing research projects at the ANU. This support includes assistance with securing funding, development of a knowledge management system for ANU climate research, and communication of research results via the CCI website.

Third, the CCI aims to link ANU research into national and international networks, enhancing the profile of the University’s climate change research, and communication of research results via the CCI website.

The CCI’s integrated research programs cover a broad range of areas that address both domestic and international climate change questions. Since its inception, the CCI has established or supported five such programs:

› Integrated climate change response options for Canberra and the region
› China and Asia in the 21st Century: climate change and development
› Adaptation to climate change in rural Australia
› Climate-energy-water systems
› Society-climate interactions in the past

Table 1. Building integrated research programs from the University’s core capabilities

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Integrated Research Programs

Integrated climate change response options for Canberra and the region

Leaders: Barbara Norman (University of Canberra), Will Steffen, Bob Webb

Urbanisation, population pressures, the potential impacts of climate change and an awareness of the environmental and social impacts of urban growth are driving an increasing interest in research for evidence based decision-making on cities. The aim of such research is to find new pathways for more sustainable cities and regions.

Canberra, as a planned national capital largely developed since the 1950s, provides an excellent example of many of the issues facing post second world war urban settlements – car oriented and suburban in form. As a city-region on our doorstep, it presents an immediate opportunity to undertake original interdisciplinary research on ‘urban and regional futures’, particularly in the context of the climate change challenge.

The integrated research program is based on CURF (Canberra Urban and Regional Futures), a new platform for information-sharing across institutions as a well as a single, coherent portal for urban and regional research in the Canberra region in the context of sustainability and climate change. A joint initiative of the University of Canberra and ANU, CURF acts as a hub of excellence in urban and regional futures involving leading research activity, seminars, events, and student involvement in the Canberra region. It is a platform for innovation and exchange on critical issues facing the Canberra region including urban and regional planning, climate change, sustainability and many others.

A key feature of CURF is its emphasis on synthesis and integration of a large number of individual research projects. As an example, the Climate Vulnerability and Adaptation in the Australian Capital Territory and Region (ACTeR) Project has made an important contribution to climate change adaptation work in the region and has contributed to showcasing the ACTeR as a socially, economically and environmentally sustainable region. The Project focused on four critical dimensions of vulnerability to climate change in the region: water resources, fire regimes, health and social systems, and governance, policy and legal aspects. The project was based on two principal approaches:

- a partnership between the ACT and NSW governments and agencies and the University, aiming to involve civil society and the private sector in further work,
- participatory development of an integrated physical/climatic, social and economic research and analysis effort, based on identified vulnerabilities and adaptation to prior climate changes.
Another synthesis and integration project led by the ANU dealt with climate change impacts on the Canberra Nature Reserves, a report for the Commissioner of the ACT Office of Sustainability and the Environment (OCSE).

CURF was formally launched in November 2010 jointly by the two Vice-Chancellors, Professors Stephen Parker (University of Canberra) and Professor Ian Chubb (ANU). The launch followed a period of consultation and discussion among the research institutions and with the ACT and regional governments as well as private sector and community organisations. The major tool for communication of research is the CURF website, which was launched in early 2011.

The next steps in the development of the program are to populate the CURF website with research projects from the participating institutions and to design and carry out synthesis and integration projects on high priority topics. In addition, the membership of CURF will be expanded to include more research institutions within the region, and interaction with local governments and the business and community sectors will be strengthened.

China and Asia in the 21st century: climate change and development

Leaders: Katherine Morton, Lance Heath

The Asia-Pacific region is home to a majority of the world’s population and is without doubt the world’s engine of economic growth and transformation. China has experienced a very rapid rate of economic growth and is a significant player in the climate change area from almost any perspective, including emissions, impacts and international negotiations. Australia has much in common with China in terms of climate change challenges, creating unique collaborative opportunities for interdisciplinary research.

The CCI’s aim is to build a coherent research program from a number of individual ANU research activities based in China and the Asia region. Examples of such projects include:

› Climate Change and the Third Pole: This project focuses directly on the impacts of climate change on the Hindu Kush–Himalaya-Tibetan Plateau region – also known as the “water tower” of Asia or the “Third Pole” – and the consequences for water resources, energy security, regional governance cooperation and food production for the region (Principal investigator – Dr Katherine Morton).
Participants at the APN climate research synthesis workshop in Kobe, Japan. (Photo: APN Secretariat).

Urbanisation is a critical development-environment issue in China: The skyline of Hong Kong. (Photo: Carrie Steffen).

Monsoonal clouds cover the Himalayan Mountains, Nepal. (Photo: Lance Heath).

Climate Change and Health in South Asia:
Working with the WHO Regional Office and host governments of Cambodia and Vietnam, the climate change risks to human health in urban and rural areas have been assessed, and adaptation strategies formulated. Further work, funded by AusAID in those two countries, is exploring how communities respond to water stress and its health risks – an important consequence of climate change. Late in 2010 a similar health risk assessment project, funded by AusAID and the Department of Climate Change, began in Papua-New Guinea and Pacific Islands (Principal Investigator – Prof Tony McMichael).

Developing China’s Carbon Accounting Capacity:
This project consisted of an in-depth training program conducted in Perth and Canberra and a pilot study for Guangxi Province in southern China to demonstrate how Australia’s NCAS (National Carbon Accounting System) approach can be adapted to Chinese conditions and requirements. Project run jointly by CSIRO and ANU (Principal Investigator – Prof Michael Hutchinson).

The CCI is providing support to some of these projects, for example, Climate Change and the Third Pole, by bringing together scholars from a range of different disciplines from across the ANU with the aim of developing a truly interdisciplinary project which will examine the social, economic, health aspects and water/energy security problems created by climate change. To develop this project further in the region, the CCI contributed to a workshop in Kathmandu, Nepal, to bring together regional knowledge and research findings under the auspices of a truly multinational, interdisciplinary research framework for the Himalaya-Tibetan Plateau (HTP) region.

The next stage in the development towards a more coherent program is to organise the various ANU research projects around a small number of themes. Four such themes have been identified from preliminary work and in consultation with ANU Scholars:

1. Renewable Energy (Solar & Fusion Power)
2. Economic and Policy
3. Adaptation and Risk Reduction (Water and Agriculture)
4. History, Culture, and International Relations

As part of enhancing coherence, the CCI aims to develop a knowledge management system on climate research in the Asian region. A significant part of the system is the development of a comprehensive database on climate change research currently undertaken at the ANU.

The CCI is also committed to building research partnerships in the Asian region by developing close collaborative links with networking groups such as the Asia-Pacific Network for Global Change Research (APN). The CCI is currently involved in an APN synthesis activity based on 56 projects undertaken by the APN in climate-related research and capacity building over the last ten years. The synthesis has identified knowledge gaps and emerging issues relating to climate and climate change in the Asia-Pacific.
Finally, the CCI is committed to a multilateral approach to tackling climate change problems in the Asian region by connecting with institutions such as our IARU (International Alliance of Research University) partners Peking University, the National University of Singapore and Tokyo University, and with other important institutions such as the Monsoon Asia Integrated Regional Study (MAIRS) based in China.

Adaptation to climate change in rural Australia

Leaders: Tony McMichael, Helen Berry, Anthony Hogan

Australia’s rural communities are in the front line of climate change impacts. Long-term climatic changes will have far-reaching, mostly adverse, impacts on many sectors: economic productivity, employment, social structures, community wellbeing and cohesion, and human health. Studying and ameliorating these impacts cannot be effectively done in disciplinary isolation. A coordinated approach is needed across the inter-related sectors, in consultation with communities and stakeholders. The systemic nature of this disruption of rural production, livelihoods, community functioning and family and individual health necessitates a broad inter-disciplinary program of research that clarifies the relationships between these sectors and sub-systems.

The aim of this integrated research program is to assess recent and current consequences of drought and indicators of climate change, to elucidate their causal background, to estimate likely future impacts under climate change, and to develop preventive, supportive and remedial strategies for families, communities, and government. The program will draw on the University’s expertise in climate science, epidemiological and health science, institutions and governance, community functioning, ecology, hydrology and water resources, bushfire dynamics and economic analysis.

Several research projects are already underway that contribute directly to this program. These include an integrated assessment of climate change, acute and chronic risks to rural health; social and economic impacts of the Water Basin Plan (Murray Darling Basin Authority); an analysis of farmers’ climate-related decision-making; and contributions to the Climate Vulnerability and Adaptation in the Australian Capital Territory and Region (ACTeR) Project. In addition, the National Centre for Epidemiology and Population Health at ANU hosts the National Adaptation Research Network on climate change and human health in rural Australia.

Climate-energy-water systems

Leaders: Barry Newell, Deborrah Marsh*, Karen Hussey

Water and energy are indispensible inputs to modern economies; both are embedded in the production and consumption systems that support our societies. However, the issues of climate, energy and water are inextricably linked. Many large-scale energy-
conversion processes consume water, and most bulk water-supply processes require the expenditure of significant amounts of energy. Climate affects both the supply of, and demand for, energy and water – energy conversion and water extraction processes have the potential to contribute to climate change.

The aim of this program is to establish a new conceptual framework capable of supporting integrative policy making in the climate-energy-water system. The program, carried out in collaboration with the University of Technology – Sydney (UTS), consists of case studies, development of dynamical models and workshops and collaborative studies with policy makers and energy- and water-sector professionals. The case study projects are: the impact of carbon reduction policies on the water-energy nexus; policy inertia in the Australian climate-energy-water system; and crops and soils in the SE Australian climate-water-energy system.

A major outcome was the development of the modular software package NEMMOD, which is designed to simulate the dynamic interactions and feedbacks within the climate-energy-water system. Components of the model include an electricity market, electricity and water demand modules, a power generation system, rainfall and climate scenarios, and a water system module that has GIS information relating catchments to reservoirs from which the power stations draw water.

The initial operation of the model has been tested with limited data sets, and further developments of the NEMMOD modelling system are planned for 2011.

*University of Technology – Sydney

Society-climate interactions in the past

Leaders: Mike Smith*, Libby Robin

Historical narratives are traditionally cast in terms of wars, the rise and fall of civilizations and specific human achievements, ignoring the important ecological and climate contexts that shaped and accompanied such events. Climate change is now posing significant risks for contemporary society, making the integration of human history and Earth’s environmental history a timely and important task. Building collaboration among the many disciplines that contribute to human histories and to the study of the environmental past is essential for understanding the factors contributing to contemporary global change – both human and environmental – and for developing coping and adaptation strategies for the future.

The aim of the Integrated History and future Of People on Earth (IHOPE) program is to use new and existing data sources to produce an integrated historical account of changes in climate, ecosystem distribution, material and water cycles, species...
extinctions, land-use change, human settlement patterns, technologies, patterns of disease, patterns of language and institutions, conflicts and alliances and other variables. The overarching goal is to build a much richer understanding of the interactions between environmental and human processes in the past. The Australian component of this international program is the IHOPE-OZ integrated research program.

The IHOPE-OZ program is advancing on a number of fronts. The project "The Pulse: Life in a Land of Uncertain Extremes" focused on the variability of the Australian environment at a range of time scales and produced a monograph in 2009 at the conclusion of the project, a companion to *A change in the weather: Climate and culture in Australia*. A second project is centred on a synthesis of a very large amount of archaeological and climate data for the Australian continent, aiming to tease out aspects of the human-environment relationship in Australia’s pre-European past. *The Expertise for the Future* project, carried out in collaboration with the Stockholm Resilience Centre and other international institutions, focuses on the idea of environmental prediction, and the reception of predictions optimistic and pessimistic since the 16th century.

*National Museum of Australia*
Core Capabilities

The University’s core capabilities, which represent the disciplinary strengths that are the pillars of excellent research, span a broad spectrum of climate-related areas. The CCI draws on the wealth of core climate expertise across the University’s seven colleges to initiate and coordinate integrative research programs. In addition, the CCI supports more thematic or disciplinary research within the University’s colleges, schools and departments in a number of ways. Examples include:

› Contributions to the successful development of the ARC Centre of Excellence for Climate System Science, which aims to build a dramatic enhancement in the national capacity to understand and project the scale of future climate changes at the regional scale and thus achieve direct economic and social benefit by improving advice to Government on the scale, speed and timing of regional climate change.

› Assistance with the formation within the ANU of specialized climate change centres for law, institutions and governance, energy (the Energy Change Institute), and economics and policy.

› Support for individual research projects, such as the deliberative democracy study of public understanding and responses to climate change; a review of the risks of climate change to Indigenous communities in the tropical north; and an exploratory study of biochar production in nature and industry for carbon sequestration.

Below we highlight the five core capabilities in climate change research at the ANU, with a brief description of the themes within each capability along with one example of the type of research carried out within the capability.

Understanding the climate system

Themes: The University’s ongoing research into the climate system is fundamental to understanding processes that influence past, present and future climates. Such processes include the role of the carbon cycle in regulating the climate system, the fundamental fluid dynamics of ocean circulation, the ways in which the land surface influences climate, changing fire regimes, and the potential for ice sheet dynamics to alter sea level.

Example: Gravity Recovery and Climate Experiment (GRACE), Paul Tregoning, Research School of Earth Sciences

A good example of the University’s research into understanding the climate system is the Gravity Recovery and Climate Experiment (GRACE) satellite program, spearheaded by the ANU Centre for Gravitational Physics and the Research School of Earth Sciences. The GRACE system can measure subtle change in gravitational fields and is used to estimate the net mass gain or loss of the large polar ice caps, a critical issue in climate change research. It can also be used to monitor changes in groundwater and water storage in river drainage basins such as the Murray-Darling Basin. The laser component of the GRACE system is being developed by researchers from the ANU Centre for Gravitational Physics led by Dr Daniel Shaddock, while a team led by Dr Paul Tregoning from the ANU Research School of Earth Sciences will analyse the data from the new mission.
Human dimensions of climate change

**Themes:** The human dimensions of climate change – law, ethics, culture and philosophy – are becoming central elements in the search for global solutions to the climate change dilemma. ANU expertise across these disciplines is increasingly being applied to climate change questions, exploring the ways in which humans perceive their relationship with nature and define it in legal and ethical frameworks.

**Example – Visual Art, John Reid, Faculty of Arts and Fenner School of Environment and Society**

The impact of art and music on people’s psyche is an interesting and important field of research in its own right. Photographic images depicting humans and how they interact with the natural world is an important medium of expression in helping raise awareness of environmental problems. Visual artist, Mr John Reid from the ANU Environment Studio/Field Studies Faculty of Arts is very familiar with the creation of inspiration that comes from linking the visual arts with scientific research. Examples of his research include software development for remote supervision of field research and artist engagement with rural community management of natural resources (*Engaging Visions* Research Project).

Climate change & the Asia-Pacific region

**Themes:** An acknowledged world leader in research on Asia-Pacific affairs, ANU has a diverse group of scholars devoted to studying the social, humanitarian, economic, environmental, political, strategic and governance issues affecting our region. Supported by the CCI, this community of scholars is building strategic partnerships with its Asia-Pacific counterparts in climate change research.

**Example: Long-term ecosystem change on Pacific islands, Janelle Stevenson & Simon Haberle, Research School of Pacific and Asian Studies.**

Contemporary environmental change can often be better understood by placing recent change in a much longer term context. Drs Janelle Stevenson and Simon Haberle undertake analysis of long-term ecosystem change in the Pacific region. Their research is based on reconstructions of past environments and climates on Pacific islands through the study of fossil pollen and charcoal, leading to insights into the causes and impacts of environmental change through time.
Mitigation: energy, economics & institutions

Themes: There is now strong interest in economic instruments and institutional architectures needed to reduce greenhouse gas emissions, and in new sources of clean energy. ANU is at the forefront of research on emerging energy sources, from fusion power through solar to innovative chemical – and biological – based systems, as well as on the economics of climate change mitigation, including through emissions trading.

Example: Solar PV (PhotoVoltaic) research, Kylie Catchpole, College of Engineering and Computer Science

The University’s Centre for Sustainable Energy Systems is one of Australia’s leading research groups investigating ways of improving the efficiency of existing solar energy technologies. For example, Dr Kylie Catchpole’s research examines ways of improving the efficiency and reducing the cost of solar cells, and in particular, the scope of the emerging technologies of plasmonics and nanophotonics for achieving these aims. Nanophotonics, which draws on the science of nanotechnology, enhances the absorbive capacity of solar cells by developing nanostructures that effectively trap the light in solar cells. However, in order to improve its effectiveness further, there is a need to develop a greater understanding of the underlying physics involved in the process.

Adapting to the impacts of climate change

Themes: As the impacts of climate change become increasingly apparent, there is a growing need to develop and implement effective response strategies. ANU expertise spans a wide range of sectors, including human health, biodiversity, water resources, urban infrastructure, governance and institutional arrangements, natural hazards, and forestry.

Example: Responding to health impacts of climate change in cities, Katrina Proust, Barry Newell and Anthony Capon, National Centre for Epidemiology and Population Health, and the Fenner School of Environment and Society

Climate change is fast becoming a health issue in Australia and around the world. Dr Katrina Proust, Adj. A/Professor Barry Newell and Professor Anthony Capon are investigating the links between urbanism, climate change and health, and the need to develop a systems approach to health governance. Previous research has shown that complex problems such as climate change and obesity cannot be successfully addressed using conventional (linear) analytical approaches. Their work involves the application of a systems approach to the development of integrated policy and planning responses from government agencies, industry and communities.
Research Support

Apart from its role in forming interdisciplinary teams of researchers around integrative research projects, the CCI has also supported a number of individual research proposals including the funding for the next stage of the Gravity Recovery and Climate Experiment (GRACE) satellite program, which will include laser testing and results analysis at the University. The CCI has also assisted with other project proposals, such as the biochar commercialisation research proposal led by Dr Rowena Ball.

The CCI has also provided opportunities for ANU researchers to visit international institutions and has secured funding for ANU scholars to attend international symposia and workshops through a number of funding sources such as UNESCO and AusAID.
Climate-related Centres, Institutes, Networks and Programs

Within the core capabilities, several groups of researchers have formally organised into units to focus on particular aspects of the climate change challenge. Examples of such units are described below.

Centre for Climate Economics & Policy

**Director: Dr Frank Jotzo**

Housed in the Crawford School of Economics and Governance, the Centre for Climate Economics & Policy is a network of researchers and practitioners who work at ANU, other institutions in Australia, and at selected institutions around the world. The CCEP lies at the intersection between academic research, policymaking and the public debate. The Centre conducts policy-relevant research across the spectrum of climate change topics, often linking economic theory and application with public policy analysis. The CCEP takes its analysis to the public and to the policymaking community, with the aim of influencing policy decisions to achieve better outcomes.

http://ccep.anu.edu.au/

Energy Change Institute

**Director: Professor Ken Baldwin**

A shift to zero-carbon energy sources is fundamental to climate change mitigation. The ANU Energy Change Institute brings together leading research and teaching on the science, engineering, policy, law and economics of moving to a sustainable and dominantly renewable energy future. The ECI facilitates new research and teaching programs, and connects ANU energy research to policymakers and the wider community. A wide spectrum of energy technologies (solar thermal and photovoltaics, biofuels, fusion power, artificial photosynthesis, nuclear science, enhanced oil and gas extraction, carbon capture and storage, hydrogen fuel cells) are linked through the ECI with energy economics and policy and energy regulation and governance.

http://energy.anu.edu.au

Centre for Climate Law and Policy

**Director: Professor Tim Bonyhady**

Located in the College of Law, the Centre is at the forefront of both research and teaching in relation to the intersection between climate law and policy. After producing the first major book about climate law in Australia, the Centre has played a similar lead role in relation to adaptation to climate change and is now also at the forefront of work in relation to disaster law.


Photo: Harriet Riley.
Climate and Environmental Governance Network

**Leaders: Professor Neil Gunningham and Dr Kyla Tienhaara**

Located within the Regulatory Institutions Network in the College of Asia and the Pacific, CEGNet is a group of interdisciplinary social scientists concerned with issues of environmental regulation and governance. In particular, it engages in theoretical, empirical and interdisciplinary research on institutions of regulation and governance (for example, property rights, markets, trade regimes, treaties, national laws) and organizational actors (for example, states, governments, international organizations, corporations, NGOs). In doing so its principal concern is to examine the ways in which relationships and influences amongst such institutions and organizational actors affect the capacity of societies to respond to environmental change and crisis.

http://cegnet.anu.edu.au/

ARC Centre of Excellence for Climate System Science

**ANU Chief Investigators: Drs Andy Hogg and Michael Roderick**

Our capacity to assess the threat of climate change is undermined by an unacceptable level of uncertainty in the understanding and modelling of regional scale climate. The Centre of Excellence will undertake world-class research targeting identified weaknesses in the physical, chemical and biological components of the climate system. It will engage and nurture graduate students and postdoctoral fellows through a program of graduate training and mentoring to permanently transform our understanding of, and capacity to project, regional-scale changes in climate. The key outcome will be a dramatic enhancement in the national capacity to understand and project the scale of future regional changes.

Note: The Centre of Excellence is headquartered at the University of New South Wales, with additional nodes at ANU, the University of Melbourne, Monash University and the University of Tasmania.

http://www.arc.gov.au/ncgp/ce/climate_system_science.htm

Environment, Climate and Health Research Program

**Leader: Professor Tony McMichael AO and team, National Centre for Epidemiology and Population Health (NCEPH)**

A major, though under-recognised, consequence of global climate change will be a weakening of nature’s life-support systems and, hence, a range of risks to human population health and survival.

The research team (10 academic staff and 7 PhD students) at NCEPH conducts empirical studies of the relationships between climatic conditions and various health outcomes – including the direct effects of extremes of temperature, the physical and mental health risks from extreme weather events (disasters), impacts of increased exposures to aeroallergens (pollens, spores) and other climate-related air pollutants, changes in the range and patterns of various infectious diseases, and the effects on community morale, mental health, food-and-nutrition, and physical health in at-risk rural and remote communities. The results of such research provide an evidence base for the modeling-based estimation of the range of risks to health from scenarios of future climate change in Australia.

The NCEPH team hosts the National Adaptation Research Network for climate change impacts on health, and participates in research on how best to adapt to climate change, particularly to lessen the risks to vulnerable communities. Various members of the team have worked with WHO and other regional agencies (including AusAID) in assessing the health risks from climate change in Southeast Asian countries and, more recently, the Pacific region. The team has strong international collaborations and engagements with the World Health Organization (Geneva), the UN Environment Programme, the International Science Council (ICSU), and the International Energy Association.

Website: http://nceph.anu.edu.au/Research/index.php
ANU offers a wide range of courses covering a broad spectrum of climate-related topics – Earth System science, climate law, international climate policy, climate and fire, and many others including integrative degree structures such as the Bachelor of Interdisciplinary Studies (Sustainability) and The Green Information Communications Technology Strategies (Green ICT) course that teaches students how they can help reduce carbon emissions when using computers and telecommunications equipment.

The CCI facilitates and supports a number of education activities such as the Department of Climate Change Short course and Master Degree courses such as the Master of Climate Change. This degree offers students unique breadth and diversity in addressing the many dimensions of climate change through access to world-leading experts in climate science and policy.

The Climate Change Institute facilitates other creative approaches to education on climate change – for example, the participation of ANU students as observers at the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties in Bali (2007) and Copenhagen (2009).

Master of Climate Change Program

From 2009, the Fenner School of Environment and Society and the Crawford School of Economics and Government at the ANU are drawing on the depth of expertise across the University to offer the Master of Climate Change graduate program.

Students can tailor the degree to their individual interests and skills, and study within a variety of fields including:

›› Climate change science
›› Climate change impacts and vulnerability in, amongst others, water resources, biodiversity, natural resource management, human health and urban systems
›› Non-fossil fuel energy technologies and policies
›› Integrated approaches to risk and vulnerability assessment
›› The economics of climate change adaptation and mitigation
›› Legal dimensions of climate change; and
›› Politics, policy and governance perspectives on climate change.

Graduates will be prepared for careers in climate change risk assessment, adaptation and mitigation strategy development, and regional, national and international policy formulation.

The program meets ANU strategic and operational goals to be a leading research and teaching institution in the climate change arena, both in Australia and globally.
Department of Climate Change Short Course

During 2009, the CCI ran a short course on the science of climate change, the implications for policy development, and emerging strategies to address our vulnerability to climate change.

The short course consists of three themes:

› Theme 1: What is climate change, and why is it important? Australia’s climate and its variability are examined in the context of the global climate system, providing a background for investigating the nature, causes and detection of climate change, both natural and human-caused (anthropogenic). Recent trends in climate and the impacts of extreme events (e.g. tropical storms, droughts) are a focus for analyzing perceptions of climate change. Future climate scenarios for Australia and the associated impacts on a number of key sectors are considered, e.g. human health, biodiversity, water, agriculture and urban systems.

› Theme 2: How are the vulnerabilities and risks associated with climate change shaping the policy response? Global and Australian vulnerabilities to climate change, and the associated risks, are examined in the context of climate change impacts and future scenarios. Concern for the security of key sectors in Australia lies behind current developments in domestic climate change policy. The evolution of climate change policy and the role of science-policy interaction, both internationally and in Australia, are examined using examples including the United Nations Framework Convention on Climate Change and the Kyoto Protocol.

› Theme 3: What are the economic and legal considerations associated with climate change policy, and how are societies responding to climate change? Current policy strategies developing to address the need for adaptation to and mitigation of climate change include a range of economic instruments and legal frameworks. Several economic strategies are discussed, including carbon taxes and emissions trading schemes, against the background of current and proposed mitigation targets. The relationship between emerging policy based on the need for adaptation and mitigation and the legal structures required to facilitate implementation and response is also considered. Societal responses to climate change are discussed.
Student Activities

Young Scholars Conference

In keeping with CCI’s mission of supporting climate change education, the Institute convened a young scholars conference on the ANU campus between 19 and 22 July 2010. The conference brought together young scholars from the physical, natural and social sciences/humanities working on aspects of climate change; provided an opportunity for students to showcase their research through selected presentation and poster sessions; enabled young scholars from around the world to engage with key Australian based scholars working on various aspects of climate change; exposed the students to representatives of the climate change policy community; and provided young scholars with a forum to enhance their networking opportunities and career paths.

UNFCCC field trips

Following the participation of a cohort of ANU students at the UNFCCC COP13 meeting in Bali in 2007 supported by the Climate Change Institute’s predecessor, the Institute continued the tradition of strong involvement by the ANU community in international climate negotiations through the participation of more than 50 ANU students and staff at the pivotal COP15 meeting in Copenhagen in December 2009. The ANU contingent included students from the Fenner School’s undergraduate course on climate science and policy, a number of PhD scholars, and several of the University’s academic staff; the delegation was led by CCI Executive Director Will Steffen.

A highlight of the event was the opportunity for ANU students to witness the complex and contentious negotiations firsthand, and to have access to daily briefings from the official Australian and other delegations. The plethora of side events and booths inside the Bella Centre, venue for the COP15, as well as the chaotic demonstrations in the wintry weather outside of the Centre, gave students a broad range of experiences associated with such an important international event. The ANU booth, organised with IARU partners Yale University and the University of Copenhagen, received considerable attention throughout the conference as a focal point for the ANU delegation.
Objectives and strategies

A strong communication effort is essential to the operation of the CCI. The primary communication objectives are (i) to build awareness of the depth and breadth of ANU research and education, (ii) promote and support a more cohesive, interactive community of climate change scholars and teachers within the University, and (iii) connect them to the outside world. The Institute thus places a strong emphasis on supporting the interaction of ANU climate change scholars with the public, ensuring ANU climate change research is widely accessible and creating community awareness of current climate change related research.

The strategies for achieving these objectives are described in the CCI Communications Plan, which provides a framework for identifying and deploying the tools and tactics needed to implement the strategy. In addition, the Plan identifies a wide range of audiences for the CCI communication effort, ranging from the students through to the Chancellery within the ANU community, and extending to a wide range of community, business and government audiences within the Canberra region as well as national and international stakeholders.
Key messages

A small number of key messages guide the overall communication effort and keep our various tools and approaches working together in a consistent and coherent way:

› Through its depth and breadth of expertise, ANU research on climate change is top quality and world class.

› ANU works closely on climate change with other research and education institutions throughout Australia and around the world.

› The University’s research contributes to an understanding of how the climate system is changing and the risks and opportunities these changes pose for Australian society and for our ecosystems.

› To help meet the climate change challenge, ANU research emphasises solutions that enhance lifestyles, support health and well-being, and build innovative, thriving economies.

Website

The CCI website is a major communications tool for the Institute. It profiles climate change research and news from across the campus, promotes ANU climate change events and public lectures, and provides links to ANU climate change podcast and YouTube lectures. The CCI website has the capacity to calculate and monitor CCI event audience attendances, providing useful information regarding audience demographics.

The website has been the central communication tool for several major events that the CCI has organised. For example, exceptionally high web traffic surrounded the China-Australia Climate Change Forum held in April 2009 and the post IARU Copenhagen Climate Change Science Conference (March 2009) presentations from ANU experts who played major roles at the conference.
The CCI places a strong emphasis on profiling ANU research and expertise in both the print and electronic media. Strategies include direct media targeting through the distribution of media alerts, releases, and backgrounders for specific CCI activities and report releases, as well as responses to the daily requests from print, television, internet and radio media. In addition to the Institute’s executive director and three deputy directors, who all make regular appearances in the media, ANU staff with expertise in health, water, law, governance, energy and economics have been profiled in the media by the CCI.

The ANU has also achieved an international media presence on climate change via CCI efforts. For example, during the major climate change negotiations in Copenhagen in December 2009 (the UNFCCC COP15), the ANU exhibition booth, shared with Yale University and the University of Copenhagen, was a popular venue for international media to conduct interviews for radio and television. There was also strong international media interest in the 2009 IARU Copenhagen Climate Change Science Congress, with several ANU academic staff interviewed by European TV and radio networks as well as a live broadcast from Copenhagen TV studios to the ABC Lateline program in Australia.

During 2009 and 2010 the CCI conducted many well attended public events at ANU on a wide range of climate-related topics. For example, the panel discussion "Too Hot To Talk About: Why is Australia Still Debating Climate Change" not only achieved a capacity live audience but was also live-streamed over the internet to an on-line audience across Australia and as far away as Canada. On-line participants were journalists, students, teachers, NGOs and government officials.

In addition to public events, the CCI organises internal ANU events designed to enhance interdisciplinary collaboration across the University, and has co-hosted, with ANUgreen, the annual Earth Hour at ANU, an event that promotes friendship and collegiality within the University.

Other events include high-level round table meetings and workshops, sometimes co-sponsored by international embassies or by community and business groups in the Canberra region. An example of the latter was the Switch to Green conference held in 2009, co-sponsored by the United Nations Association (Canberra), the Australian Business Council, the Australian Property Council and the ACT Government. The Institute is also involved in community dialogue events, such as the Canberra Conversations, a series of events co-sponsored by the CCI, the Chorus of Women and the ACT Government.
Lectures, seminars, podcasts

The Institute hosted, co-hosted, promoted and supported over 30 lectures and seminars on a broad range of climate-related topics across the University in 2009 and 2010. Many of these events were podcasted and uploaded onto the ANU and CCI websites. A few examples show the breadth of topics covered:

› EU emissions trading: A model to follow or one to avoid?
› Between polar bears and bushfires
› Requiem for a species – Why we resist the truth about climate change
› Democratizing climate governance
› Coal: The elephant in the room
› Powering the planet: The challenge for science in the 21st century
› Law and policy to advance renewable energy: A comparative colloquium
› Uncertainty, ethics, and the economics of climate change
› The water tower of Asia under threat from climate change

1 Web cast and public briefing on the COP15 outcomes. Panel includes students and academics from the ANU. (Photo: Darren Boyd).
2 ANU Vice-Chancellor Professor Ian Chubb launches the Climate Change Institute at the National Press Club, October 2008, Canberra. (Photo: Darren Boyd).
3 The CCI booth at the COP15, Copenhagen 2009. (Photo: Lance Heath).
Liaison with the Australian Government

In keeping with its charter, the CCI maintains a strong policy interface with the Australian Government. Since 2004 CCI Executive Director Will Steffen has served formally as science adviser to the Department of Climate Change and Energy Efficiency on a 20% basis, and in October 2010 was invited to join the Prime Minister’s Multi-Party Climate Change Committee (MPCCC) as an independent expert adviser.

Other ANU academic staff provide advice to the Australian Government on a range of climate-related issues. ANU researchers played a central role in developing the Australian negotiating position for the Kyoto Protocol in 1997, and have continued to play a strong role in providing advice to the Government, with special expertise in economic and regulatory approaches to mitigating climate change.

Contribution to the Garnaut Climate Change Review

In 2007 the Garnaut Climate Change Review Secretariat commissioned the CCI to make an important contribution to the Garnaut Review process, with Dr Frank Jotzo, a CCI Deputy Director, and Professor Stephen Howes leading the University’s input. Consequently, the design of the proposed emissions trading scheme has benefited from economic expertise at the ANU, and the University, through the contribution of Dr Jotzo, is making a strong contribution to the update of the Garnaut Review as part of the MPCCC process.

Advisory Board Memberships

ANU academic staff also contribute to national policy development through membership on the advisory boards of national institutions involved in climate research and policy. For example, Will Steffen was a member of the Bureau of Meteorology Advisory Board from 2006 to 2008, and from 2009 he is serving as Chair of the Antarctic Science Advisory Committee.
Local and regional policy liaison

Given the strong support that the ACT Government has provided to the Institute, liaison with the Territory Government on a wide range of climate-related issues is a high priority for the Institute. Over the past two years, staff of the Institute have held discussions or briefings with a number of Territory Government Departments; these include the Chief Minister’s Department; the Department of Environment, Climate Change, Energy and Water; the ACT Planning and Land Authority; and the ACT Land Development Agency. Institute Executive Director Will Steffen has also served as a champion for the Canberra 2003: Time to Talk consultation process. The CCI is also represented on the ACT Electric Vehicle Council, which was established in 2009 to generate political and business support for electric vehicles with a coordinated approach through the council’s academic, corporate and Government representatives.

Substantial links with the Office of the Commissioner for Sustainability and the Environment have also been developed. A particularly strong connection is with the OCSE’s State of the Environment Report, where ANU staff have contributed both through membership on the advisory board and expert contributions to the report itself.

Through our role as a co-sponsor of CURF, the Institute is increasingly connected with jurisdictions around the region in relation to climate issues, particularly adaptation to climate change.

International Links

The Institute made a major contribution to the organisation and hosting of the Copenhagen Climate Change Congress, held in March 2009 in the lead-up to the COP15 in Copenhagen. The March 2009 Congress was organised by the International Alliance of Research Universities (IARU). The ANU is a member of the 10-university global alliance.

The main objective of the Congress was to provide policy makers throughout the world with a synthesis of existing and emerging scientific knowledge on the latest climate change science, the latest understanding on the challenges of adaptation, the approaches to reducing greenhouse gas emissions, and the interaction of climate change with other issues such as development. The Congress was attended by more than 2,500 delegates from over 80 countries.

Preliminary messages from the event were delivered by the Congress’ scientific writing team at the final session of the event. A key product arising from the Congress was a synthesis report *Climate Change: Global Risks, Challenges & Decisions*, which was presented to the then Danish Prime Minister Mr. Anders Fogh Rasmussen. The Danish Government, which hosted the UNFCCC COP15 in December 2009, provided the UN and all national delegations with a copy of the Congress synthesis report.
Other Policy Related Events

China–Australia Forum

In April 2009 the CCI, in association with the ANU China Institute and the Australian Government Department of Climate Change, convened a high level climate change policy forum for senior Chinese and Australian researchers and officials to explore areas of commonality and difference in the context of negotiations leading up to COP15 in Copenhagen. The forum was well received, with around 300 participants from academia, non government organisations, and government representatives from six Australian Government Departments and two ACT Government Departments in attendance. The then Minister for Climate Change and Water, Hon Penny Wong, was the forum’s keynote speaker. The event was televised live by the Australian Public Affairs Channel (APAC).

Parliament House climate science briefings

During 2009 the CCI was involved in two climate science briefings at Parliament House. In October 2009 CCI Executive Director Will Steffen was a member of the Climate Scientists Australia group that met with around 50 Parliamentary members and senators. Later in October the Hon Greg Hunt MP invited a group of three distinguished scientists – Professor Ove Hoegh-Guldberg from the University of Queensland, Dr Mark Stafford Smith from CSIRO and Will Steffen – to address the Coalition Policy Committee on Environment & Water.

In December 2010 Professor Katherine Richardson of the University of Copenhagen, and Chair of the Danish Climate Change Policy Committee, and Professor Johan Rockström of Stockholm University held a CCI-sponsored press conference at Parliament House to brief Parliamentarians and media on efforts in Denmark and Sweden to reduce greenhouse gas emissions.
Community-building within the ANU

One the primary objectives of the CCI is to help build a more cohesive community of climate-related researchers at the ANU. Many of the activities described earlier in the report have a played a role in community building. In addition, the CCI has sponsored roundtable discussions on various climate change topics, bringing together researchers from the various colleges to explore common interests and opportunities for collaboration. Topics for which roundtables were organised include climate impacts and vulnerability in the Pacific Islands, emerging and alternative energy sources and systems, and climate change and development in China.

In addition to these activities, the Institute has supported groups of ANU researchers in their bids for external support. The CCI facilitated the ANU contribution to the successful ARC Centre of Excellence on Climate System Science. The CCI has also worked with researchers across three academic units to build an integrated proposal for the China and Third Pole project, which aims to explore the vulnerability of water resources in the Himalaya and Tibetan Plateau to climate change.

Profile-raising outside of the ANU

Over the past few years climate change has risen to become the pre-eminent social, economic and environmental issue facing contemporary society. As a result there has become a vast wealth of knowledge which has been created and which has been published in many peer reviewed papers and reports.

Another important CCI contribution is its podcasts of the year’s seminars, workshops and public lectures. Some of CCI’s lectures and seminars are also streamed live via the internet.

Syntheses, Assessments and Reports

Syntheses and assessments are critical products for improving our understanding of climate science and impacts, and for communicating climate information to a broad range of audiences. CCI staff are often involved in producing assessments, syntheses and reports on various aspects of climate change. Below are our products for 2009-2010.
Climate science publications

Climate Change 2009. Faster Change and More Serious Risks
This review and synthesis is focused on developments in climate science since the publication of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) in 2007, with an emphasis on rapidly changing areas of science of direct policy relevance.

Australia’s Biodiversity and Climate Change
This comprehensive assessment, carried out over two years, outlines the vulnerability and potential for adaptation of Australia’s biodiversity, as well as consideration of the societal – governmental, policy, institutional – changes that might sustain Australia’s biodiversity in a climate changing world. A technical synthesis and a summary for policymakers were also produced as part of the project.

Implications of Climate Change for Australia’s World Heritage Properties
This comprehensive report outlines the impacts climate change will have on Australia’s World Heritage estate. Sea level rise, reduced rainfall and higher temperatures are expected to threaten the resilience of our World Heritage properties, exacerbating issues such as habitat loss and degradation, spread of invasive species and changing fire regimes. The report also outlines the impacts of climate change on Australia’s cultural heritage.

Australian Capital Territory & Region: Climate Change Vulnerability and Adaptation Project
This scoping report represents Phase 1 of the longer-term project. This synthesis report drew on existing research to carry out an assessment of the vulnerability of the ACT and the region to climate change in three key sectors/issue: water, health, and bushfires. A set of recommendations provide the basis for future action and research to respond to vulnerabilities and improve the knowledge base on adaptation to climate change.

This synthesis report, based on the IARU (International Alliance of Research Universities)- organised climate change conference in Copenhagen, presents an up-to-date overview of a broad range of research relevant to climate change – including fundamental climate science, the impacts of a changing climate on society and environment, and the many tools and approaches available to deal effectively with the challenge of climate change.

Workshop Reports

APEC Climate Change Symposium, Canberra, October 2009. Support: AusAID
The aim of the symposium, which included delegates from China, the Philippines, Republic of Korea, Japan and Viet Nam, was to discuss impediments to, and find solutions for, efficient technology exchange. Key recommendations included (i) enhancing transparency of governance frameworks through better technologies, capacity building and more effective compliance and reporting frameworks; and (ii) improving, promoting and disseminating decision support systems and tools.

The primary aim of the workshop, which attracted delegates from over 20 countries, was to bring together regional knowledge and research findings towards building a truly multinational, interdisciplinary research framework for the Himalayan-Tibetan Plateau (HTP) region and to assess and document the current research status and projects from each country/region. It was agreed that a knowledge management system for researchers be developed with the capacity to provide, in the first instance, basic metadata on research activities and data/results (who is doing what and why) in the region.
Outlook for 2011–2012

Research

The CCI will continue to develop its current, high priority integrative research programs. The program “Integrated climate change response options for Canberra and the region” will be further developed through the CURF (Canberra Urban and Regional Futures) initiative. The CURF website will provide a portal for information on ANU research on Canberra and the region, a major regional symposium will be held mid-year. In addition, a synthesis study on an integrated transport system for Canberra and the region will be initiated in 2011 as an ANU contribution to CURF.

The program “China and Asia in the 21st century: climate change and development” is planning a number of initiatives in 2011–2012, including a combined government-academic forum organised jointly with the Australian Government Department of Climate Change and Energy Efficiency, an internal roundtable within ANU to enhance the cross-University contributions to the program, and further development of international collaboration with scholars from China and the Asian region.

The CCI will, during 2011–2012, initiate the development of an Indigenous and climate change study program. Initial work in this area has identified a number of themes including climate change and indigenous enterprises. Possible collaborators in the program include the Australian Institute of Aboriginal and Torres Strait Islander Studies Centre and James Cook University’s Centre for Sustainable Indigenous Communities based in Cairns.

The CCI will also contribute to the development of an Earth Systems Science community in Australia through its contributions to the National Committee for Earth System Science of the Australian Academy of Science. Following the first Outlook Conference for Earth System Science held in December 2010, a number of activities are being planned to promote this growing area of science. The CCI is supporting ANU contributions to this effort, for example, by building a collaborative effort with CSIRO to develop integrated models for the human-Earth System.

Education

The CCI will continue to support development of climate-related courses at the ANU, with a focus over the next two years on the continued development and completion of the energy change portfolio. Planning is now underway for a new Master of Energy Systems, with student enrolments commencing in 2011. Course subjects will include the physical sciences, engineering and economics.

The short course on climate change developed to serve the Australian Government Department of Climate Change and Energy Efficiency has proven to be very popular. As part of the CCI’s ongoing interaction with the Australian Government, the short course is now being extended to serve other Australian Government departments, with appropriate modifications to serve the specific interests of the various audiences.

As climate change grows in importance as a major societal issue in the 21st century, a rapidly growing number of PhD scholars are undertaking climate-related topics for their studies. The CCI will strengthen its role as a clearinghouse for information on ANU research strengths to provide prospective scholars with up-to-date information on possible supervisors and collaborators in the University.
Communication

In 2011 the Institute will enhance its communication effort through upgrading our technological capability via Web2, which includes live streaming and online two-way interaction. Web2 technology provides the opportunity for policy makers, journalists, students, the public and other researchers to connect with the CCI from all over the world. There are four planned events for live-streaming in 2011:

›› Australian Climate Policy in an International Context
›› Emerging Energy Solutions
›› Climate Change in Canberra and the Region
›› China and Asia: Climate Change and Development

Much of the CCI communication effort to date has focused on the nature of the climate change challenge – the fundamental science of the climate system and the economic, policy and institutional challenges that climate change poses. Over the next two-year period, the Institute will place more emphasis on communicating the solutions to the climate change challenge, in terms of new energy and transport systems, ways of adapting successfully to a changing climate and integrated mitigation-adaptation approaches that enhance lifestyles, support health and well-being, and help to build innovative, thriving economies.

Climate Policy Initiatives

The establishment of the Australian National Institute for Public Policy, a strategic collaboration between the Australian Government and the ANU, provides further opportunities for the University to play a major role in the formulation of climate policy. In particular, the CCI has had preliminary discussions with the H.C. Coombs Policy Forum, which aims to enhance the policy learning cycle by building a fast and effective pathway to access knowledge and data resources at the University. Sustainable environment and climate change and secure and sustainable energy, water and food are two of the thematic priorities for the Forum.

The ANU has a rich array of expertise on climate change policy, spanning at least six academic units and including specialized centres such as the Climate Change and Law Centre, the Climate and Environmental Governance Network, and the Centre for Climate Economics and Policy. During the next two years, the CCI aims to strengthen its cross-University role in providing a common platform at the ANU for debate and discussions on climate change policy and communication, incorporating the expertise and broad range of views from all of these units.
Appendix Staff, Finances, and Support

CCI Staff

Professor Will Steffen  
Executive Director

Will Steffen has a long history in international global change research, serving from 1998 to 2004 as Executive Director of the International Geosphere-Biosphere Programme (IGBP), based in Stockholm, Sweden, and before that as Executive Officer of IGBP’s Global Change and Terrestrial Ecosystems project. Prior to taking up the CCI Directorship in 2008, Steffen was the inaugural director of the ANU Fenner School of Environment and Society. From 2004 he has served as science adviser to the Department of Climate Change, Australian Government.

Steffen’s interests span a broad range within the field of sustainability and Earth System science, with an emphasis on the science of climate change, approaches to climate change adaptation in land systems, incorporation of human processes in Earth System modelling and analysis, and the history and future of the relationship between humans and the rest of nature.

Dr Lance Heath  
Project and Business Development Manager

Lance has 15 years experience in water resource management, renewable energy technologies, international research collaboration and technology commercialisation. He was Technical Manager for the Environment Industry Development Network (administered by the former CRC for Waste Management and Pollution Control) from 1994 to 2000. From 2004 to 2006 he was a Postdoctoral Fellow at the Centre for Resource and Environmental Studies (CRES) at the ANU and Project Officer for the ANU Institute for Environment from 2006 to 2008.

Lance has extensive experience in hydrological modelling and in the development of decision support systems for policy makers. He is also a leading specialist on Australian environmental technologies with particular emphasis on developing international links between Australia and other Asia-Pacific economies in the area of environmental technology exchange. He has managed numerous aid and economic development programs for several developing economies in the Asia-Pacific region.

Ms Roz Smith  
Communications and External Relations Manager

Roz has worked in the communications profession for 25 years. She commenced her communications career at the Network TEN news bureau in Sydney. After working in news Roz moved to a production manager position in the Production Department, followed by a public relations role in the Publicity Department where she managed major national and international televised special events.

Throughout her career Roz has held senior communications positions in a variety of industries including the medical profession, the IT profession, pharmaceutical industry and the university sector. At ANU Roz has worked at the Centre for Environmental Studies (CRES), The Fenner School of Environment and Society, The Institute for Environment and The Climate Change Institute.
Dr Bob Webb
Visiting Fellow

Bob came to the ANU Climate Change Institute in 2009 after a senior executive career in the public and private sectors including Deputy Commissioner roles in the ATO, and General Manager positions in the Australian Trade Commission and in the national and international resource and manufacturing sectors. His initial education and postgraduate research was in physics and he has had a long standing interest in global and local sustainability issues and strategies.

With the Climate Change Institute he has focussed on climate adaptation issues, including leading a project on climate change vulnerability for the ACT and Region on behalf of the ACT government (in collaboration with the NSW government), and several more specific local issues, including most recently a report for the OCSE on the Canberra Nature Reserves. He has also initiated work (jointly with the National Climate Change Adaptation Research Facility) to distil adaptation experience from a wide range of urban and regional adaptation projects being progressed around Australia, in order to develop and communicate key learnings, issues and best practices.

Ms Trina Merrell
Executive Assistant

Trina Merrell was employed at the Climate Change Institute from December 2008 until December 2010 in an administrative support capacity. Trina came to the CCI with several years experience at the ANU, originally as Departmental Administrator at Department of Theoretical Physics, Research School of Physical Sciences and Engineering, then various roles in human resources, grant administration and meeting and conference management.

Ms Colette Gilmour
Project Manager, Australia-China Forum

Colette Gilmour was Project Manager for the Australia China Climate Change Forum held in March 2011. The Forum was carried out in collaboration with the Department of Climate Change and Energy Efficiency, Australian Government, and with the Chinese Government. Colette has 20 years experience as a senior officer in project and policy management with the Australian Government from 1990 to 2010.
Budget and Finances

Annual Report 2009

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<td>*Contingency</td>
<td>10,746</td>
</tr>
</tbody>
</table>

Total Expenditure: 540,000

* Carry over expenses to support Young Scholars Conference 2010

Annual Report 2010

<table>
<thead>
<tr>
<th>Income</th>
<th>$ AUD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Funds</td>
<td>540,000</td>
</tr>
</tbody>
</table>

*Contingency (Carry over 2009 for Young Scholar Conference): 10,746

Total Income: 550,746

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>$ AUD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries and Related Costs</td>
<td>441,269</td>
</tr>
<tr>
<td>Secretariat Operating Expenses</td>
<td>42,000</td>
</tr>
<tr>
<td>Communications Activities</td>
<td>19,628</td>
</tr>
<tr>
<td>Website &amp; IT</td>
<td>4,380</td>
</tr>
<tr>
<td>Integrated Climate Change Response Options for Canberra Region</td>
<td>10,000</td>
</tr>
<tr>
<td>China and Asia in the 21st Century: Climate Change and Development</td>
<td>10,000</td>
</tr>
</tbody>
</table>

*(includes carry over from 2009 for Young Scholar Conference): 20,000

**Contingency for 2011: 3,469

Total Expenditure: 550,746

* Carry over expenses to support Young Scholars Conference 2009
** Carry over expenses to support research and education program 2011
## Support Grants

### Support Agency - Capital Works

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Government (Special Building Fund)</td>
<td>2,500,000</td>
</tr>
</tbody>
</table>

### Support Agency - Project Grants

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Climate Change and Energy Efficiency</td>
<td>249,610</td>
</tr>
<tr>
<td>ACT Government</td>
<td>106,718</td>
</tr>
<tr>
<td>Australian Agency for International Development (AusAID)</td>
<td>93,100</td>
</tr>
<tr>
<td>ANU Exchange &amp; Alba Pty Ltd</td>
<td>30,000</td>
</tr>
<tr>
<td>US Embassy</td>
<td>11,560</td>
</tr>
</tbody>
</table>

### Grant Income

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grant Income</td>
<td>490,988</td>
</tr>
</tbody>
</table>

### Total Grant Income

| Total Grant Income                          | 2,990,988 |

### Sources of project grant income

- Department of Climate Change and Energy Efficiency
- ACT Government
- Australian Agency for International Development (AusAID)
- ANU Exchange & Alba Pty Ltd
- US Embassy
Governance

Deputy Directors

Prof Ken Baldwin
Research School of Physical Sciences & Engineering
College of Physical Sciences

Assoc Prof Janette Lindesay
Fenner School of Environment and Society
College of Medicine, Biology and Environment

Dr Frank Jotzo
Crawford School of Economics and Government
College of Asia and the Pacific

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Facilities and Services/ANU Green

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Australian Conservation Foundation

Admiral Chris Barrie
Strategic and Defence Studies Centre
The Australian National University

Mr Tony Coleman
Director
Lonergan Edwards & Associates

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ACT Commissioner for Environment and Sustainability

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Minister for the Environment, Climate Change, Energy and Water
ACT Government

Mr Michael Costello
Chief Executive Officer
ActewAGL

Prof Mick Dodson
Director
ANU National Centre for Indigenous Studies

Dr Susannah Elliott
Chief Executive Officer
Australian Science Media Centre

Prof Amanda Lynch
Head of Climate Program
Monash University

Mr Blair Comley
Secretary
Dept of Climate Change and Energy Efficiency