

## CHAPTER 8

# SUMMARY OF INTERNATIONAL LINKAGES AND NATIONAL ACTIVITY

## Introduction

This chapter summarises the international and national coordination responsibilities and related activities associated with Australian involvement in the World Climate Programme (WCP) and other international climate-related programs. Bilateral arrangements relevant to the climate issue are also summarised and Australia's role in helping to foster WCP-related activities in surrounding regions is outlined.

## International Linkages and Activity

### Australian Counterparts to International Sponsoring Agencies

Australian agencies and coordinating bodies counterpart to the international sponsors of the WCP are identified schematically in Figure 8.1. Also identified are the United Nations Development Programme (UNDP) and Committee on Earth Observations Satellites (CEOS) links since,

while not formally sponsors of the WCP, both these bodies are substantially involved in its international implementation. Acronyms are elaborated in Appendix 1. Under the umbrella of UNDP, the Australian Agency for International Development (AusAID) is involved in implementing a number of WCP-related activities in the western Pacific and Asian regions. CEOS has a role in ensuring that satellite systems meet the needs of the WCP.

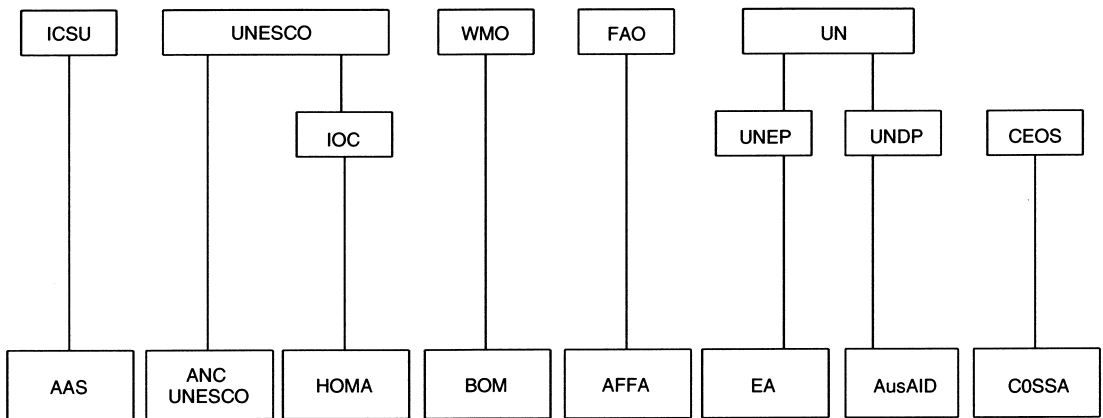
Principal contacts in Australia in respect of the international parent bodies of the WCP and the closely related Global Climate Observing System (GCOS), the International Geosphere-Biosphere Programme (IGBP) and the World Meteorological Organization (WMO)-United Nations Environment Programme (UNEP) Intergovernmental Panel on Climate Change (IPCC) and CEOS are:

ICSU Mr P Vallee (Executive Secretary),  
Australian Academy of Science  
(AAS)

UNESCO Prof K Wiltshire (Chairman)  
Australian National Commission  
for UNESCO. (Mr I Anderson,  
Secretary-General, ANC UNESCO,  
Department of Foreign Affairs and  
Trade (DFAT))

IOC Dr J W Zillman (Chairman) Heads  
of Commonwealth Marine Agencies  
(HOMA); Dr A D McEwan,  
Australian Representative to IOC  
and member of HOMA. ( Mr J  
Gillies, HOMA Secretariat, Marine  
Group, Environment Australia)

WMO Dr J W Zillman, Director of



*Figure 8.1 Australian counterpart agencies (bottom row) to the international sponsoring agencies of the WCP and related bodies. The full names of the Australian agencies are given in the text and in Appendix 1.*

	Meteorology and Permanent Representative of Australia with WMO, Bureau of Meteorology
FAO	Mr K Matthews, Secretary, Agriculture, Fisheries and Forestry - Australia (AFFA)
UNEP	Mr H Bamsey, Deputy Secretary, Portfolio Strategies Group, Environment Australia (EA). (Mr M Wilson, UNEP Secretariat, International and Intergovernmental Unit, Portfolio Strategies Group, EA)
UNDP	Mr P Callan, Director, Multilateral Agencies and International Health, Australian Agency for International Development (AusAID)
CEOS	Dr D L Jupp, Head, CSIRO Office of Space Science and Applications/ Earth Observation Centre (COSSA/EOC)

## National Coordination of the WCP and Related Programs

The Australian agencies and committees with national coordination responsibilities

for the component programs of the WCP, along with GCOS and IGBP and the three Working Groups of the IPCC, are identified schematically in Figure 8.2. The principal contacts for the Australian counterpart bodies are given below.

NCCGC	Dr G I Pearman, Chairman, AAS National Committee for Climate and Global Change (c/- CSIRO Atmospheric Research)
NCC	Ms M E Voice, Superintendent, National Climate Centre, Bureau of Meteorology
AGO	Ms G Andrews, Chief Executive Officer, Australian Greenhouse Office (AGO)
JWG	Dr D J Gauntlett, Chairman, Joint Working Group for GCOS/GOOS/GTOS. (Secretariat Dr P Riley, Executive and International Affairs Branch, Bureau of Meteorology)
BOM	Dr J W Zillman, Australian Principal Delegate to the IPCC (c/- Bureau of Meteorology. (Australian IPCC Secretariat Ms L Meisel, Climate Change International, AGO)
ACIHDP	Dr M Wasson, Co-Chair:

International Liaison HDP-Australia (c/- Australian Academy of the Humanities)

GOOS Expert Sub-Group (c/- Bureau of Meteorology)

Other related National Committees and working groups with direct or indirect links to the above include:

NCAOS Dr A D McEwan, Chairman, AAS National Committee for Atmospheric and Oceanic Sciences

ANCAR Prof G Paltridge, Chairman, AAS Australian National Committee on Antarctic Research (c/- Antarctic Cooperative Research Centre)

NCA Dr G Love, Chairman, National Committee on Agrometeorology (Secretariat Mr R Stringer, Services Policy Branch, Bureau of Meteorology)

CCST Mr J Spasojevic, Chairman, Coordination Committee on Science and Technology (Secretariat, Mr I Short, Science and Technology Advisory Section, Department of Industry, Science and Resources (DISR))

GSAC Prof D Green, Chairman, Greenhouse Science Advisory Committee (Secretariat, Dr A. Ivanovici, Greenhouse Policy Group, AGO)

GCOS ESG Dr M Manton, Chairman, GCOS Expert Sub-Group (c/- Bureau of Meteorology)

GOOS ESG Dr N Smith, Chairman,

## Participation on International Scientific and Technical Bodies

Australian scientists and institutions are represented on a wide cross-section of international climate related committees and working groups. A current listing is at Appendix 3.

## International Agreements and other Climate-related Cooperation

As well as specific cooperative projects between Australian scientists and institutions and their international colleagues, a number of bilateral and multilateral agreements at government or institutional level have been established which either focus on cooperation on climate issues or include climate as a key area of interest:

- Under the Memorandum of Understanding (MOU) between the Bureau of Meteorology and the China

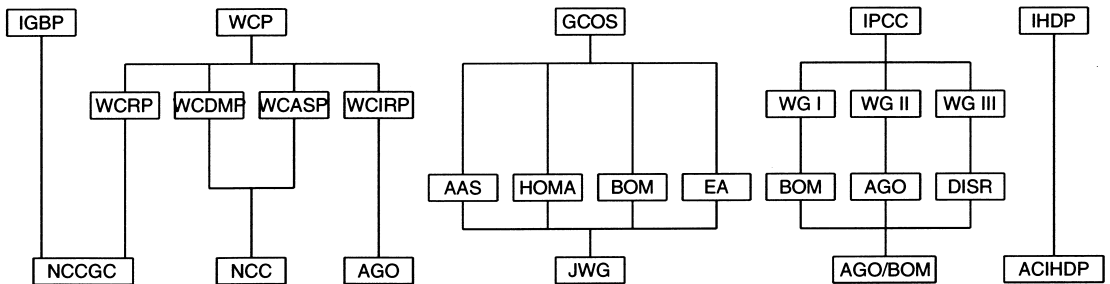


Figure 8.2 Australian agencies and national committees counterpart to the component programs of the WCP and the closely related IGBP and GCOS and the IPCC. The full names of the various committees and agencies along with principal contacts are elaborated in the text and consolidated in Appendix 1.

Meteorological Administration (CMA) of the Peoples' Republic of China (PRC) on Cooperation in Meteorological Science and Technology, Australia participated in the First Meeting of the CMA Climate Consultancy and Appraisal Committee, April 1997. A Joint Working Group meeting is scheduled for late 1999.

- The MOU between DoEH and the National Environmental Protection Agency of the PRC on Environmental Cooperation identifies climate change, including the prediction of regional climate change, studies on climate change impact and counter measures, and technology transfer as areas of mutually high priority.
- The MOU between DoEH and the Ministry of Environment of the Republic of Korea, signed on 15 January 1996, identifies activities which mitigate the effects of climate change as an area of cooperation.
- Seasonal and interannual climate forecasting is a key focus of the MOU between the Bureau of Meteorology and the Meteorological and Geophysical Agency of Indonesia.
- The Ministerial Statement of Intent between Australia and Indonesia on Cooperation in the Field of Environmentally Sound and Sustainable Development (1990) highlights climate change impact assessments and response strategies as aspects for regional cooperation.
- The MOU between the Republic of Singapore and Australia relating to Cooperation in the Field of Environmental Management and Protection (1992) includes global warming as a key issue for consultation.
- The MOU between the US National Centre for Atmospheric Research and the BMRC on long-term cooperation (1990) includes climate modelling as one of the highlights.
- The Agreement between Australia and Russia on Cooperation in the Field of Protection and Enhancement of the Environment (signed with the then USSR in 1990) has the study of global climate change as an important aspect of cooperation.
- Under the tripartite Australia-New Zealand-United Kingdom (ANZUK) Intergovernmental Agreement on climate change research, collaborative work on historical climate datasets for the southern hemisphere has been advanced.
- Australia and Japan have established an Exchange of Notes (treaty status) on the Geostationary Meteorological Satellite Program.
- A treaty Agreement on Scientific and Technical Cooperation was signed in February 1994 between Australia (through DISR) and the European Community to stimulate cooperative research and related activities in a range of fields, including climate. Relevant projects include Predicted Impacts of Rising Carbon Dioxide and Temperature on Forests in Europe at Stand Scale (ECOCRAFT) and Land Surface Processes and Climate Response.
- The MOU between the India Meteorological Department and the Bureau of Meteorology includes ongoing cooperation on meteorological satellites and monsoon studies.
- The MOU between the Australian Minister for the Environment and Germany's Federal Minister for the Environment, Nature Conservation and Nuclear Safety (1992) includes cooperation on major global environmental issues such as climate change.
- The Common Subsidiary Arrangement between the Minister for Environment and Nature Conservation of the German Land of Saxony-Anhalt and the Australian Minister for the Environment was established in 1994.
- Use of climate sensitive urban and building design techniques to improve

environmental quality, while maximising efficiency of urban operations and infrastructure, is a key element of the work of the Australian-Indonesian Centre for Sustainable Urban and Regional Development (CSURD). The Centre is undertaking a large collaborative project on housing and urban development under a MOU between the Indonesian Ministry of Public Works and CSIRO Building Construction and Engineering and the University of Melbourne.

- The MOU between the Hydrometeorological Service of Vietnam and the Bureau of Meteorology, signed in May 1999, includes climate monitoring and prediction as one of its areas of cooperation.

Australia is also an active participant in the governing and advisory bodies of several global and regional organisations that address climate issues as part of their overall mandates. These include:

- the UN Commission for Sustainable Development (CSD);
- the International Energy Agency (IEA);
- the Organisation for Economic Cooperation and Development (OECD);
- the Asia-Pacific Economic Cooperation Organisation (APEC); and
- the Australian and New Zealand Environment and Conservation Council (ANZECC).

In the Asia-Pacific region, Australia supports and participates in several key inter-governmental organisations including the South Pacific Regional Environment Programme (SPREP), the South Pacific Forum, IOC WESTPAC and WMO Regional Association V, all of which have a substantial involvement with regional climate issues. As part of its commitment, Australia provides assistance, managed by AusAID, through both government and private sector channels. Australia also contributes to the Montreal Protocol Multilateral Fund and the Global Environment Facility, both of which have

components addressing climate related activities.

Some of the projects that direct AusAID assistance has made viable include:

- the South Pacific Sea Level and Climate Monitoring Project, initiated in response to the concerns of Pacific Island leaders over the potential impact of climate change and sea level rise on Pacific Island Countries. The aim is to monitor sea level at some 13 sites in the Pacific to an accuracy that is capable of detecting variations as small as 1mm per year. The project, which is funded by AusAID and managed by the National Tidal Facility (NTF), contributes to the world wide sea level monitoring effort and also includes capacity building and public awareness components. The project is currently in its second five year phase and the aim is to achieve a twenty-year sea level data record;
- the WMO/ESCAP Project on Smoke Haze for the ASEAN countries, with total funding of \$A0.4 million, which commenced in 1998. This project is related to the impacts of climate variability (especially El Niño) in trans-boundary smoke haze;
- a draft Strategic Plan for the Development of Meteorology in the Pacific Region (2000-2009), which was prepared by SPREP and the WMO Subregional Office for the South-West Pacific in Apia with the assistance of the Bureau of Meteorology, and which was endorsed by the heads of National Meteorological Services of all 26 SPREP countries in July 1999, for presentation to the October 1999 South Pacific Forum;
- the Pacific Meteorological Services Project (PMSP), designed to produce high quality climatological data in developing South Pacific countries. The four-year project was undertaken by the Bureau of Meteorology with funding of \$A1.08 million, following the 1991 report 'The Changing Climate in Paradise' and in response to outcomes

of the 1992 United Nations Conference on Environment and Development (UNCED). The project was completed in 1997;

- establishment of the Global Change and Terrestrial Ecosystems (GCTE) Southeast Asian Regional Climate Impacts Centre with total funding of \$A2.6 million over the three years 1995-1998. The objective of this project is to serve as a resource base of scientific expertise for Brunei, Indonesia, Malaysia, the Philippines, Singapore, Thailand, Cambodia and Vietnam;
- training fellowships for meteorological services personnel from Pacific Island Countries and PNG; and
- assistance to SPREP in general climate matters.

As a consequence of a UNESCO Workshop on Pacific Water Sector Planning, Research and Training, held in the Solomon Islands, 1994, Australia is involved in several hydrology projects for the Pacific Island Countries. These include a fresh groundwater-lens recharge study in Kiribati that will help estimate more accurately the recharge of groundwater in an atoll environment.

Through WMO funding, the Bureau of Meteorology provides technical and conceptual advice and raises awareness of WMO climate related initiatives, such as CLIPS, to meteorological services of developing South Pacific countries. Bilateral operational and training support, co-sponsored by WMO and AusAID, is provided to meteorological services in the South Pacific, Indian Ocean and Southeast Asia regions and funding has also been provided under the WMO Voluntary Cooperation Programme for the provision of satellite equipment to a number of Pacific countries.

Expertise is also provided by the Bureau to various WMO initiatives aimed at the development of national meteorological services in Africa. As part of the effort towards Urgent Action for Africa under the International Convention to Combat

Desertification, Australia, in conjunction with the USA, contributed funding to implement an Internet link to the Drought Monitoring Centre in Nairobi. This followed a joint Australian-WMO study in 1995-96 which examined the feasibility of establishing an electronic communications network to interlink the Drought Monitoring Centre (DMC) at Harare, the DMC at Nairobi, and the African Centre for Meteorological Applications for Development (ACMAD) in Niamey. The Chairman of ACMAD's Scientific Advisory Committee visited the Bureau, CSIRO, ANU and AusAID in 1999 for discussions relating to support for ACMAD's activities. The Centre for Resource and Environmental Studies (CRES) at ANU has compiled a topographic and climate data base for the African continent at a spatial resolution of 0.025 degrees of latitude and longitude (approx 5 km). The data are being used to address pressing problems associated with improving food production, managing pests and diseases and preserving biodiversity.

The Asia Pacific Network for Global Change Research (APN) supports capacity building activity in the Asia Pacific region closely linked to the activities of the global research programs of WCRP, IGBP and IHDP. For some time a priority area for the APN has been on climate variability and change, with a particular focus on the Asian monsoon, the El Niño-Southern Oscillation and greenhouse gases. Australian researchers have worked with the APN in the development of indices of extreme climate events for the whole region.

## National Activity

As improved technology continues to make climate information more accessible, an increasing number of government agencies, research institutes and private concerns are applying this information to improve

understanding, sustainable management practices and productivity. As a Party to the UN Framework Convention on Climate Change, Australia is also committed to improving understanding of greenhouse science and its implications for our climate, and to developing suitable long-term climate change response strategies. The contact details of Australian organisations involved in climate activities related to the WCP and other international scientific climate programs are given in Appendix 2.

## Commonwealth Agency Involvement

The Commonwealth entities engaged in climate or climate change activities include:

- The Bureau of Meteorology (within the Department of the Environment and Heritage) which operates the national climate observing networks and National Climate Centre, maintains a computer and document archive of Australia's climatological database, provides a range of climate services on a national basis and maintains an ongoing climate research program.
  - The CSIRO has a substantial research program encompassing atmospheric, oceanographic, hydrological and biospheric aspects of the climate system and a range of climate impact and response areas, such as agriculture, forestry and energy technology. The focus for climate-related activities is provided through the Climate and Atmosphere Sector.
  - The Australian Greenhouse Office which relates to several government portfolios and reports to a Ministerial Council (Ministers for the Environment and Heritage; Industry, Science and Resources; and Agriculture, Fisheries and Forestry) coordinates Australia's domestic climate change policy and administers key greenhouse response programs including the National Carbon Accounting System, the National Greenhouse Gas Inventory and National Greenhouse Research Program.
- The latter contributes funding to greenhouse research undertaken by CSIRO, the Bureau of Meteorology, the National Tidal Facility and other organisations (including universities).
- Agriculture, Fisheries and Forestry - Australia (AFFA) which, through its research Bureaus (BRS, ABARE), the Research and Development Corporations (jointly funded by industry) and its various agriculture and water related programs, conducts or funds substantial climate and climate related research and applications, and the development and implementation of strategies to respond and/or adapt to climate variability and change.
  - Department of Industry, Science and Resources (DISR) funds and conducts programs relating to science, technology, R&D and industry aspects of the Government's climate change response, including through its Innovation and Science Division and through the Australian Surveying and Land Information Group (AUSLIG), Australian Government Analytical Laboratories (AGAL), Ionospheric Prediction Service (IPS) and ANSTO (see below).
  - The Australian Antarctic Division (AAD) runs a substantial research program in ice mass balance, sea ice dynamics, and palaeoclimatological reconstruction of ice cores, which contribute directly to the program of the Antarctic CRC. AAD scientists also undertake research on biological and upper atmospheric topics with direct relevance to its goals of understanding the role of Antarctica in the global climate system. The AAD also provides all the infrastructure and logistics to facilitate all climate studies in Antarctica, the sub-Antarctic islands and the Southern Ocean.
  - The Australian Nuclear Science and Technology Organisation (ANSTO) contributes to climate research in a variety of ways which draw on its unique expertise in identifying and tracking radionuclides. Jointly with CSIRO, Bureau of

Meteorology and other organisations ANSTO's research has enabled measurements of gaseous exchanges and refined dates in palaeoclimatic events.

- The Australian Institute for Marine Science (AIMS) conducts climate-related research and associated monitoring aimed at describing, understanding and modelling the influence of weather and climate on variability in shallow-water tropical systems.

Other Commonwealth portfolios are also involved with climate issues in various ways, such as through international negotiations and funding of projects related to the economics of climate change (Foreign Affairs and Trade) and funding of climate-related research in universities (Employment, Education, Training and Youth Affairs). The Natural Heritage Trust, which is jointly administered by EA and AFFA, has a number of programs, such as Landcare and Bushcare, which have a strong climate underpinning. It is difficult to provide an annual Commonwealth expenditure on climate activities because much of the work underpins or is aimed indirectly at climate issues, and is spread widely through agencies without always being identified specifically as climate-related. A summary estimate of expenditure for the major players, based on available documentation and agency estimates is given in Table 8.1.

Table 8.1 attempts to distinguish between expenditure directly on climate activity (ie. where climate is the primary objective of the expenditure, such as the Bureau of Meteorology and CSIRO climate research programs) and total climate-related expenditure (including indirect costs, such as the entire costs of that part of the Bureau of Meteorology's meteorological observing networks and data processing systems that provide the national climate record even though these also serve other purposes, such as operational weather forecasting). Also included under indirect expenditure are activities more closely aligned to greenhouse response strategies but with relevance to climate.

## Research and Development Corporations

Part of the Commonwealth funding is provided to the Research and Development Corporations, which have been set up by the Commonwealth Government and are funded jointly by industry. These corporations contribute to both climate variability (through the Climate Variability in Agriculture Program (CVAP) of LWRRDC) and climate change research relevant to primary industries. CVAP has received funding of over \$8 million from the Commonwealth since its inception in 1992. Rural R & D Corporations have contributed a further \$4 million for both generic research on, for example, improved seasonal climate forecasts and research on applications in specific industries. CVAP funding is directed to a range of state agencies, academic institutions, consulting firms, and Commonwealth agencies including CSIRO, BRS, and the Bureau of Meteorology. These agencies also contribute substantial matching funding to CVAP projects they undertake.

## State Agencies

The inherent variability of Australia's climate has a significant impact on state economies, the social well-being of rural communities and the sustainable use of natural resources. Over recent years, state agencies have increased their use of climate information in support of agricultural production and other weather sensitive industries, and in developing management systems for natural resources.

An indication of state agency involvement in applying climate information is shown in Table 8.2. While every attempt has been made to ensure this is a representative and current list, there may well be additional climate-related work being undertaken in other agencies or departments. No attempt is made here to estimate funding for these activities.

*Table 8.1 Indicative Commonwealth expenditure on climate-related activities, for the 1998/99 financial year key. The summary includes the main climate-related activities in the Commonwealth departments and agencies listed above, and is not definitive.*

Commonwealth Agency		Direct (\$M)	Direct + Indirect (\$M)
Department of Environment and Heritage	Bureau of Meteorology <sup>1,3</sup> (Research, Monitoring, Services, International)	21.5	77.9
	Australian Antarctic Division <sup>3</sup>	2.5	29.5
	Other (e.g. GBRMPA)	0.5	2.0
Australian Greenhouse Office <sup>2</sup>		5.5	7.9
Natural Heritage Trust		1.5	30.0
CSIRO	Climate and Atmosphere Sector <sup>3</sup>	15.0	15.0
AIMS <sup>3</sup>		2.5	3.3
AFFA	BRS	0.5	1.5
	CVAP	0.4	0.4
DISR	AGSO <sup>3</sup>	0.7	1.3
	ANSTO <sup>3</sup>	3.5	9.5
	other <sup>3,4</sup>	5.0	15.5
	TOTAL <sup>2</sup>	56.1	190.8

Notes:

1. To a large extent, the systems that provide climate-related observations are also required to support the Bureau's forecast and warning services. However, some facets of the monitoring and prediction program have a particular focus on the need for a long term, high quality climate record, such as the designated set of Reference Climate Stations. An element of the total cost of the Bureau's observing systems has therefore been included as a measure of the indicative direct cost of climate monitoring and the remainder is included in the indirect total.
2. Expenditure by the Australian Greenhouse Office includes grant funding to industry, as well local, state and Commonwealth government bodies. While this funding direct to Commonwealth bodies (\$3.0 m) has been included in the amounts cited for these entities, total indicative funding has been adjusted so that funds are not counted twice.
3. A component of this direct expenditure has been committed to in-kind and direct contributions to climate-related Cooperative Research Centres.
4. A significant component of indirect DISR expenditure relates to development of response strategies.

*Table 8.2 Some of the climate activities undertaken by state government departments and agencies.*

<b>STATE</b>	<b>AGENCY/DEPARTMENT</b>	<b>ACTIVITIES</b>
<b>Australian Capital Capital</b>	Department of Environment Land and Planning	State of the Environment Reporting, seasonal rainfall monitoring
<b>New South Wales</b>	Agriculture Department	Promotion of climate/seasonal information through workshops, publications etc. Drought monitor- ing, agroclimatic risk/opportunity management and tactical decision support
	Health Department, Environment Protection Agency	Health impacts of air pollution
	Department of Public Works and Services	Coastal monitoring and planning; climate impact mitigation
	Pacific Power	Wind studies for potential wind farms
	Sydney Organising Committee for the Olympic Games	Use of climate data in planning various aspects of the 2000 Games
<b>Northern Territory</b>	Department of Land Housing and Local Government	Climate change impact on coastal vulnerability
	Territory Health Services	Climate impacts on health
	Parks and Wildlife Commission	Sustainable management
	Power and Water Authority	Wind studies for potential wind farms
<b>Queensland</b>	Environmental Protection Agency	Climate change impact on coastal vulnerability, air pollution studies
	Department of Health	Climate impacts on disease vectors
	Department of Primary Industries, Department of Natural Resources, Queensland Centre for Climate Applications	Promotion of climate/seasonal information. Climate applications research, development and extension work in primary industries. Integrated impact assessment of climate change,

		greenhouse gas inventory studies. Development of drought and land and pasture degradation alert systems.
	Department of Public Works and Housing	Climate responsive building design
<b>South Australia</b>	Department of Natural Resources and Environment	Climate change impact on coastal vulnerability
	Primary Industry and Forestry South Australian Research and Development Institute (SARDI)	Promotion of climate/seasonal information and its use in decision support tools, development of seasonal response, crop planting strategies, evaluation of seasonal forecasting guidance, land use change
<b>Tasmania</b>	Department of Environment and Land Management	Climate change impact on coastal vulnerability, air pollution studies
	Rivers and Water Supply Commission	Water resource management
	Department of Primary Industries, Water and Environment	Promotion of climate information in property management planning
<b>Victoria</b>	Agriculture Victoria	Sustainable farming systems
	Energy Efficiency Victoria	Climate efficient design, energy usage patterns
	Department of Human Services	Climate and health
	Environment Protection Agency	Air pollution studies
<b>Western Australia</b>	Agriculture WA	Promotion of seasonal forecast applications. Development of climate risk management and decision support systems for crop farming and crop yield predictions. Assessing and managing vineyard disease risk. Managing water resources in a highly variable climate, promotion of renewable energy technology.

Department of Land Mangement	Climate change impact on coastal vulnerability
Ministry for Planning	Climate efficient design and planning
Waters and Rivers Commission	Water resource management
Department of Environmental Protection	Air quality studies

## Academic Institutions

Many Australian universities undertake climate-related research, as summarised in the following Table 8.3. While every attempt

has been made to ensure the list is representative, the list of departments shown in Table 8.3 and the identified areas of interest are not necessarily exhaustive.

*Table 8.3 Australian Universities engaged in climate-related activities*

<b>Institution</b>	<b>Department</b>	<b>Areas of Interest</b>
Australian National University	Centre for Resource and Environmental Studies	Analysis of spatial and temporal variability of cli- mate, bioclimatic model- ling, climatic hazards, impacts and adaptation response to climate change impacts on water resources, coasts and flood- ing.
	Department of Archaeology and Natural History	Sedimentary and Palynological analysis of medium-term climatic change in relation to human settlement.
	Department of Geography	Past global climate change, climate variability and change and global climate modelling
	National Centre for Epidemiology and Population Health	Health impacts.

	Research School of Biological Sciences	Global change, ecosystems, environmental biology, including bioclimatic modelling.
	Research School of Earth Sciences	Climate change on both human and geological timescales, sea level change, biological-climate interactions.
Curtin University	Remote Sensing and Satellite Research Group, School of Physical Sciences	Satellite monitoring.
Deakin University	School of Architecture and Building	External and internal climatic influences on built environments.
Flinders University of South Australia	Flinders Institute for Atmospheric and Marine Science	Global warming, natural climate variability, ocean circulation, air-sea interaction
	National Tidal Facility	Sea level/climate monitoring.
Griffith University	Faculty of Environmental Sciences	Climate change impacts on soil erosion.
James Cook University of North Queensland	Australian Institute for Tropical Architecture	Climate responsive design of built environments in the tropics.
	Centre for Disaster Studies	Social impacts of extreme tropical weather events.
	School of Computer Sciences, Mathematics and Statistics, and Physics	Tropical seasonal prediction
	School of Engineering	Coastal impacts of tropical extreme weather; building design and assessment of risk in high wind regions.

	School of Tropical Environment Studies and Geography	Palaeoclimates, palaeoenvironments and palynology; Late Pleistocene influences on the Australian monsoon.
	CRC for Tropical Rainforest Ecology and Management	Climate change impacts on rare marsupials.
Macquarie University	Climatic Impacts Centre	Climate impacts and response strategies, human and physical aspects of climate, climate variability and change, urban climates, global climate modelling, climate policy.
	Department of Physical Geography, School of Earth Sciences	Urban climates and air quality, human comfort, indoor climates, global and regional climate modelling, future climate change and variability, quaternary climate change, climate impacts
	Natural Hazards Reduction Centre	Relationship between natural disasters and climate variability/change.
Monash University	Centre for Dynamical Meteorology and Oceanography	Atmospheric dynamics, clouds and radiation, mesoscale processes, physical oceanography, geophysical fluid dynamics
	Cooperative Research Centre for Southern Hemisphere Meteorology	Climate dynamics, stratospheric dynamics and ozone, atmospheric transport modelling, climate change impact on forest fire danger
	Department of Mechanical Engineering	Wind studies, adaptation in building design

	School of Geography and Environmental Science	Surface fluxes and mesoscale motion, fire, air quality, global and regional climate change, palaeoenvironments
	CRC for Catchment Hydrology (also Melbourne University)	Hydrological cycle monitoring and modelling
Murdoch University	Australian Centre for Renewable Energy	Applications, response strategies
	School of Environmental Science	Climate and hydrological modelling, land atmosphere interaction, climate impacts and applications
	Institute for Science and Technology Policy	Climate change response strategies for natural ecosystems reserve management, transport systems.
Northern Territory University	School of Biological and Environmental Sciences	Climate change impacts on tropical ecosystems, modelling
	School of Mathematical and Physical Sciences	Atmospheric composition in tropical Australia.
Royal Melbourne Institute of Technology	Centre for Remote Sensing and Geographic Information Systems	Meteorological modelling and data analysis.
University of Adelaide	Department of Mechanical Engineering	Thermal comfort, response strategies.
	Department of Physics and Mathematical Physics	Climate dynamics, gravity waves, radar and optical remote sensing and dynamics.
	Department of Geographical and Environmental Studies	Climate change impact on coasts.

University of Melbourne	Centre for Environmental Applied Hydrology	Hydrological monitoring, modelling
	School of Earth Sciences	Global climate modelling, climate monitoring and data analysis, natural climate variability, climate trends, paleo-environmental record
University of New South Wales	Department of Water Engineering	Drought prediction.
	Building Research Centre, and the Solar Architecture Research Unit	Applications, response strategies in building design
	School of Biological Science	Biological-climate interaction, modelling.
	School of Mathematics	Atmospheric, oceanic and soil- moisture modelling, numerical weather prediction.
	School of Physics	Atmospheric aerosols: climatic impacts, satellite observations, remote sensing, chemical and physical modelling.
University of Newcastle	Department of Geography and Environmental Science	Air pollution, urban climate and meteorology, climate change, applied climatology, quaternary palaeoclimatology.
University of Queensland	School of Architecture and Planning	Climate applications.
	Department of Botany	Climate change impacts on forests.
	Department of Geographical Sciences and Planning	ENSO rainfall forecasting, drought, radar storm climatology, biometeorology
	Department of Mathematics	Modelling

University of Sydney	Coral Reef Research Institute	Climate impacts
	Department of Geography	Impact of and response strategies to climate change in coastal environments.
	Ocean Technology Group	Mitigation of carbon dioxide emissions, sinks.
University of Tasmania	Cooperative Research Centre for the Antarctic and Southern Ocean Environment (Antarctic CRC)	Climate modelling, radiation, Antarctic and Southern Ocean science, sea-ice monitoring and climatology.
	Institute of Antarctic and Southern Ocean Studies (IASOS)	Antarctic and Southern Ocean science, ultraviolet radiation in high southern latitudes, climatology
	Department of Geography and Environmental Studies	Radiation climatology studies: mapping of surface radiation from satellite data, estimation of ultraviolet radiation in the Southern Hemisphere
University of Technology, Sydney	Institute for Sustainable Futures	Air pollution in cities
University of Western Australia	Department of Microbiology	Climate impacts on vector-borne disease
University of Western Sydney	School of Agriculture and Rural Development	Climate risk management and decision support systems for cropping
	School of Horticulture	Climate change impacts
University of Wollongong	Quaternary Environments Change Research Centre	Quaternary environmental change
	Department of Chemistry	Surface-atmosphere trace gas exchange, solar radiation, isotopic measurement of greenhouse gases
	School of Geosciences	Climate data applications to bushfire management

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