

Centre for Resource and Environmental Studies  
**The Australian National University**

# **Annual Report**

## **2004**

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# Summary of achievements

## 1. *Key Achievements*

CRES has an international and national reputation for high quality research on important natural resource and environmental issues, developing leading-edge research methods, promoting inter- and trans-disciplinary research, and linking research to policy formulation.

The highlights of CRES research during 2004 are listed under our main research themes:

### **Water Resources**

- Publication of an analysis of the impact of Canberra's 2003 bushfire on water quality in Canberra's main water supply dam.
- Publication of a major study on collaborative learning and coastal stewardship in estuarine floodplains.
- Publication of reports and studies on groundwater management in atolls and small islands and the use of multi agent systems in equitable groundwater use.
- Determined regions where the groundwater and river systems are in hydraulic connection within the Namoi Catchment, NSW.
- Completion of a major research project on biodiversity of Channel Country rivers.
- Established a Bayesian decision network approach for assessing the ecological impacts of salinity management.
- Measured fluxes of nitrogen oxide gases, methane sulfur dioxide and hydrogen sulfide from acidified coastal sulfidic soils as a new, significant, non-anthropomorphic source of these gases.

### **Conservation / Landscapes**

- Completion of an eight year ARC funded research project on the evolutionary/conservation biology of eclectus parrots on Cape York Peninsula.
- Major breakthroughs were made in assessing the value of restored and remnant woodland vegetation for biodiversity in south-eastern Australia.
- Completion of major field studies of selected fauna in Bolivia, Western Australia and New South Wales.
- Publication of a major paper on salvage harvesting.
- Completed a major research project on biodiversity of Channel Country rivers.

### **Spatio-temporal Analysis**

- Completion of an analysis of high resolution airborne laser scanned data to produce a new high resolution digital elevation model (DEM) for the Cotter catchment of the ACT.
- Development of a new biquadratic smoothing spline method for very large spatial data sets.
- Development of a new multivariate spatial analysis method for analyzing spatially varying dependences of surface climate data.

- Publication of the first laboratory verification of chemical stabilization mechanism first proposed for Venus' atmosphere in early 1980s.
- Production of a new stream and catchment reference system for Australia.
- Published a major contribution on terrestrial climate data assimilation for the synthesis of Biospheric Aspects of the Hydrological Cycle (BAHC), a Core Project of the International Geosphere-Biosphere Programme (IGBP).
- Established spatial patterns of trends in pan evaporation over the Australian continent over the last 50 years.
- Published intercomparison of stratospheric aerosol properties derived from satellite measurements for years following Mt Pinatubo eruption.

#### **Economics of the Environment**

- Completed a major research project on flexible targets for controlling greenhouse gas emissions, funded by Hewlett Foundation through Stanford University, USA.
- Completed survey of water policy makers and interest groups.
- Published three articles on the theory of sustainability economics, which should become significant reference points in literature.

#### **Public Policy and Institutions**

- Produced maps of natural resource management (NRM) problems and capacity by local government (LG) area – nationwide and by state. Used these to identify 28 LGs (four from each state) facing multiple, serious NRM problems, and to recruit those LG into a project to improve rural LG NRM capacity.
- Completed a major international study of noteworthy whole-of-government and -society responses to the emerging sustainability policy agenda.
- Published a major study of forest policy for sustainable commodity production in Australia.

#### **Ecological Humanities**

- Launched 'Ecological Humanities Corner' section of the Australian Humanities Review, a peer-reviewed interdisciplinary electronic journal.
- A number of major books by CRES researchers were published in 2004:
- "Understanding the Environment: Bridging the Disciplinary Divides" (UNSW Press, Sydney), R.Quentin Grafton, Libby Robin and Robert J. Wasson. A major collaborative, interdisciplinary work that brings together the deliberations of four major workshops over three years. Chapters were written by twelve CRES members and two other ANU contributors. The Foreword was contributed by Dr Will Steffen, Executive Director of the International Geosphere-Biosphere Program, Stockholm. The book was formally launched by the ACT Commissioner for the Environment, Dr Rosemary Purdie, and the Vice Chancellor in December.
- "Institutional change for sustainable development" (Edward Elgar Publishing, Cheltenham), R. Connor and S. Dovers (2004). A major international study of noteworthy whole-of-government and -society responses to the emerging sustainability policy agenda.
- "Trees and Biodiversity: a Guide for Australian Farm Forestry", D. Salt, D. Lindenmayer and R. Hobbs. This book focuses on how farm forestry might be applied to protect and enhance biodiversity in agricultural landscapes.

- “Strata: Deserts past present and future”, Mandy Martin, Libby Robin and Mike Smith. A major collaborative environmental art project on Australian desert knowledge with the financial support of Land and Water Australia and the Australian Research Council.
- “Reports from a Wild Country: Ethics for Decolonisation” (UNSW Press, Sydney), D.B. Rose. Explores some of Australia’s major ethical challenges. The focus is on reconciliation between Indigenous and ‘Settler’ peoples, and with nature.

A number of CRES researchers were appointed as honorary fellows, or awarded visiting fellowships, at international institutions including:

- University of Glasgow, Scotland;
- Scott Polar Research Institute, St John’s College, Cambridge, UK; and
- A visit sponsored by the National Science Council of Taiwan to two of Taiwan’s National Universities.

CRES maintained our commitment to undergraduate education through contributions to 12 courses in areas as diverse as environmental history, water resource management and hydrology, and human and urban ecology.

## **2. Honours and awards**

Professor David Lindenmayer won the Australian Natural History Gold Medal.

Professor David Lindenmayer was recognized as the 2004 Outstanding Principal Investigator by the Earthwatch Institute.

Dr Libby Robin was appointed to the Australian Academy of Science National Committee for the History and Philosophy of Science.

Dr. Su Wild River won a University Medal for outstanding service to the campus community as a member of ANU Green Team.

## **3. Significant Outreach Activities**

ANU

- CRES public lunchtime seminar series.
- Convenorship of Environment and Resource Management Graduate Studies Field.
- National PhD workshop in Environmental History (Co-convenor with Dr Tom Griffiths), CRES, Canberra, October 25-29 2004. (Brought together PhD students from all over Australia, with support of the National Institute for Environment, CRES and RISS (History).
- Active participation in National Institute for Environment activities.

- Membership of various ANU committees including: Academic Board, University Scholarship Committee, University Audit Committee, University and Divisional Research Committees, Divisional Education, Information and Planning Committees, and Environment Management Planning Committee.

#### Media

- Local and national radio and television interviews on issues ranging from privatization of NSW softwood plantations, Antarctica history, water and sustainability, to conservation of endangered birds, forest wildlife management and nature conservation.
- Local and national print media articles on issues ranging from research on dugongs, waterbirds in desert wetlands to sustainability and institutional reform issues.

#### Interaction with Policy Makers

- Produced a video for Dept Environment and Conservation for use by Australian and international communities dealing with issues of land/water degradation and waste management
- Evidence given to the Senate Rural and Regional Affairs and Transport References Committee, subsequent report, Australian Forest Plantations: A Review of Plantations for Australia: The 2020 Vision, September 2004.
- Seminar: Bureau of Rural Sciences (BRS), ‘Science for Decision Makers’ seminar series, “Linking Our Rivers and Aquifers: Case Studies from Australia”.
- Seminar: Dept of Environment and Heritage, Bunker Briefing Series, "Institutional and policy change for sustainable development".
- Presentation to ACT Chief Health Office staff, "Emergency management, sustainability and public health: cognate policy fields?".
- Presentation to Department of Environment and Heritage staff, “Landscape restoration – and opportunities for future woodland biodiversity conservation”.
- Presentations to the Wreck Bay Board, Jervis Bay, “Field progress on a large-scale fire experiment” and “Large-scale fire and ecological monitoring”.
- Seminar: ACT Department of Urban Services, "The potential for water trade between the ACT and NSW in the Murrumbidgee catchment".
- Liaison, recruitment, interviews, information exchange with 28 Local Governments across Australia, and the agencies they work with, on Natural Resource Management issues.
- Field workshop for logging contractors, Victorian Government staff, conservationists in Marysville, Victoria, “Implementation of a Variable Retention Harvest System in Victoria’s Mountain Ash forest”.
- Presentation to Parks Victoria executives, “Long-term monitoring and ways forward in sustainable management of Victorian forests”.
- Seminar: AusAID, “Water Issues in the Pacific: Challenges for Small Islands”.

## Community Engagement

- Collaborative work with the Ikuntji Arts Centre, Haasts Bluff and environmental artist, Mandy Martin, has brought the history of ideas about Australian deserts to a wider popular audience. “Strata” is part of the program offered at the National Museum of Australia in association with its major exhibition: Extremes: Survival in the Great Deserts of the Southern Hemisphere. There is also an exhibition of the artwork scheduled for the Araluen Art Centre, Alice Springs in 2005.
- Various Earthwatch field camps at Jervis Bay, NSW and Maryville and the Central Highlands of Victoria.
- Presentations to National Landcare Council and talks with Landcare groups in rural NSW on issues such as new visions of landscape restoration in agricultural landscapes and Conservation in farm and plantation landscapes.
- Various interactions with Birds Australia and the Canberra Ornithological Group from specific presentations on birds including the Swift Parrot and the Superb Parrot to implications of large scale landscape restoration projects.

CRES staff and students continue to be sought as speakers at national and international events.

- Seminar: Institute of Bolivian Forestry Research and visiting staff and students from three US universities, Santa Cruz, Bolivia.
- Presentation: Annual meeting of the Society for Conservation Biology, New York, USA
- Seminars: California Institute of Technology, USA
- Presentation: International Society for Ecological Economics, Montreal, Canada
- Invited participant: Rosenberg International Forum on Water Policy, Ankara, Turkey.
- Presentation: Asia Pacific Association of Hydrology and Water Resources, Singapore.
- Lecture: National Committee for Earth System Science of the Academy of Science, Canberra.
- Presentation: Canberra Press Club.

CRES members are active participants in a range of government and non-government research groups, committees and boards, these include:

Professor Michael Hutchinson

- Chair, Reference Group for the Australian Water Availability Project for the Department of Agriculture, Fisheries and Forestry.
- Member, Scientific Oversight and Access Committee (SOAC) for the Arafura Timor Research Facility (ATRF).

Professor Tony Jakeman

- President, Modelling and Simulation Society of Australia and New Zealand
- President, International Institute of Environmental Sciences and Environmental Computing

Professor Henry Nix

- President, Birds Australia
- Co-Chair, Science Council for Wild Country
- Visitor, Cooperative Research Centres (Coastal Zone, Rainforest, Cotton)

Adjunct Professor Paul Perkins

- Chairman, Cooperative Research Centre – Contamination Assessment and Remediation of the Environment (CRC-CARE)
- Project Director, of AusIndustry's Water Roadmap Project.
- Chairman, National Environmental Education Council.
- Chairman, the Barton Group (Environment Industry Action Agenda)
- Member, ACT Sustainability Expert Reference Group (SERG)
- Member, ACT Natural Resource Management Committee
- Member, Banksia Environmental Foundation Board
- Member, NSW Expert Water Panel (EWP)

Professor I White

- Chairman, Oyster Research Advisory Committee (NSW Fisheries)
- Board Member, Arafura Timor Research Facility
- Member, Ministerial Scientific Advisory Council, NSW Department of Primary Industries
- Member, National Committee for Coastal Acid Sulfate Soils (Environment Australia)
- Member, UNESCO World Commission on Ethics in Science and Technology Sub-Committee on the Ethics of Water Use.
- Member, UNESCO International Hydrologic Programme VI, Technical Advisory Board, Water and Society
- Member, Editorial Board UNESCO-Cambridge University Press International Hydrology Series
- Member, STAR Water Working Group, South Pacific Applied Geoscience Council, Fiji
- ARC Reviewer

#### **4. *Key directions for 2005***

A significant contribution will be required from CRES to the establishment of the ANU Institute for the Environment. The aim of the new Institute is to develop and enhance the ANU's environmental research and education programs and to increase their national and international impact. CRES will undertake an audit of current environmental and educational activities to inform the activities of the new Institute and to provide a baseline for assessing its success. It is already making the major contributions to a survey of water related research and education across the ANU



In addition, CRES will continue to foster cross campus collaboration through research initiatives including:

- research on biogeochemistry of inland sulphidic sediments with the Department of Earth and Marine Science and CRC LEME
- a bid for an ARC Centre of Excellence in Earth System Science with RSES, RSBS and SRES, with external partners AFFA, CSIRO and Macquarie University and
- jointly organizing with APSEG the 2nd Economics and Environment Network Annual Workshop to be held at the ANU in May 2005.

Major new research initiatives for 2005 include:

- A major new project - a joint research and policy learning exercise - in collaboration with agencies in all Australian jurisdictions, reviewing mechanisms for integration of environmental, social and economic concerns in public policy.
- A new research program on climate change and sociality in Australian Birds.
- The development of new insights and key new knowledge for temperate woodland management and large-scale vegetation restoration in eastern Australia.
- The development of a major woodland management experiment in north-eastern ACT.
- A new research program for recovery planning for endangered Cocos Buff-banded Rail.
- A new research program on photochemistry of the middle atmosphere of Venus.
- A new research program to assess sustainability of coastal catchments

CRES researchers will also continue with established research efforts on:

- Restoring hydrological connectivity of surface and groundwaters: biogeochemical processes and environmental benefits for river landscapes (Widden Catchment, NSW)
- Titi monkey conservation, Crimson and Star finch conservation, primate behavioral ecology and the impact of Chytrid fungus on microhylid frogs in Bolivia.
- An “ecological synthesis” to integrate and synthesise existing data and information resulting from various existing projects.
- Acid sulfate soil and sulfur reduction research, modelling and quantifying salinity within the Hunter Valley.
- Restoring hydrological connectivity of surface and ground waters: Biogeochemical processes and environmental benefits for river landscapes.
- Surface-ground water interactions and increasing salinity in the upper Hunter River.
- The history of people, science and the Australian environment.

# Annual report details

## ***Key achievements/research highlights***

Dr S. Beavis.

- Developed 2nd year hydrology course in summer intensive delivery with Prof Ian White (SRES2008 Hydrology for Natural Resources Management), and further developed SRES3005 Water Resources Management as a research focussed 3rd year course that actively links undergraduate learning and stakeholders in catchments with complex environmental problems.

Ms C.J. Blackmore

- Discovered dispersal patterns which may explain the decline of the grey-crowned babbler

Ms L.M. Gibbs

- Honorary Research Fellow, Department of Geography and Geomatics, University of Glasgow, Scotland. February - July 2004.

Mr. B. Gilna

- secured \$80 000 grant from Land and Water Australia for research project: "Landscape Biotechnology - a future beyond food and fibre"

Dr L Heath

- The APEC Education Foundation announced its second call for grant proposals in July 2003, focusing on the projects designed to enhance the capacity of small and micro enterprises through the effective use of information and communication technology (ICT). In response to the call, over 100 institutions and consortia from 17 member economies and several non-member economies submitted grant applications. Each proposal was carefully examined and evaluated according to the general criteria of the Foundation. APEC VC (Australia) was one of seven grant recipients [http://www.apecef.org/grant/grant\\_recipients.asp](http://www.apecef.org/grant/grant_recipients.asp) and was awarded a US\$150,000 grant to undertake Human Capacity Building for Small & Micro Environmental Businesses operating in China, Chile, The Philippines and Vietnam.

Dr. R. Heinsohn

- Completed 8 year ARC funded research project on the evolutionary/conservation biology of eclectus parrots on Cape York Peninsula

Ms B. Hince

- Accepted a short-term visiting fellowship at St John's College, Cambridge, to spend 8 days research time at the Scott Polar Research Institute, towards her PhD 'An environmental history of the subantarctic islands'.

Professor M.F. Hutchinson

- Published a major contribution on terrestrial climate data assimilation for the synthesis of Biospheric Aspects of the Hydrological Cycle (BAHC), a Core Project of the International Geosphere-Biosphere Programme (IGBP).

- Completed an analysis of high resolution airborne laser scanned data to produce a new high resolution digital elevation model (DEM) for the Cotter catchment of the ACT.
- Professor M.F.Hutchinson and Dr P.A.Hancock. Developed a new biquadratic smoothing spline method for very large spatial data sets.
- Professor M.F.Hutchinson and Dr J.J.Sharples. Developed a new multivariate spatial analysis method for analyzing spatially varying dependences of surface climate data.
- Professor M.F.Hutchinson, Dr J.J.Sharples and Dr J.L.Kesteven. Established spatial patterns of trends in pan evaporation over the Australian continent over the last 50 years.

Professor A. Jakeman

- Convened and developed the stars.net.au network initiative for research in sustainability of terrestrial, aquifer and riverine systems. This involved around 60 organisations.

Dr A.D. Manning

- Setup study of faunal responses to post bush fire recovery and forest rehabilitation in the lower Cotter catchment in the ACT. This research was jointly funded by ANU, ACT Forest, the ACT Government's Shaping Our Territory Implementation Group.

Prof D. Lindenmayer

- David Lindenmayer was lead author on a major paper in *Science* on salvage harvesting
- ARC and Land and Water Australia funding was received for major meta-analysis project on biodiversity conservation responses in large-scale landscapes in south-eastern Australia.
- Major breakthroughs were made on the value of restored and remnant woodland vegetation for biodiversity in south-eastern Australia.

Dr. F.P. Mills

- Published first laboratory verification of chemical stabilization mechanism first proposed for Venus' atmosphere in early 1980s

Adjunct Professor P.J. Perkins

- Chairman, Editorial Panel & Chapter Co-Author, 'Water Innovations: A New Era for Australia' published by CL Creations Pty Ltd
- Chairman of the recently successful Cooperative Research Centre, Contamination Assessment and Remediation of the Environment (CRC-CARE)
- Project Director, of AusIndustry's Water Roadmap Project, a strategic blueprint for sustainable water industry development.

Dr J.C.V. Pezzey

- Completed major research project on flexible targets for controlling greenhouse gas emissions, funded by Hewlett Foundation through Stanford University, USA (joint with Mr F. Jotzo, my PhD student)

Mr J. Reid

- Completed major research project on biodiversity of Channel Country rivers.

- Completed minor research project for CSIRO on how scaling affects the relationship between woodland bird diversity and amount of vegetation.
- Completed minor research project on aerial survey of waterbirds in the Coongie Lakes and Goyder Lagoon wetlands, SA.

Dr L. Robin

- Edited (with Professors Quentin Grafton and Robert Wasson), a major collaborative book *Understanding the Environment: Bridging the Disciplinary Divides* (University of New South Wales Press). This brings together the deliberations of four major workshops over three years. Chapters were written by twelve CRES members and two other ANU contributors. The Foreword was contributed by Dr Will Steffen, Executive Director of the International Geosphere-Biosphere Program, Stockholm. The book was formally launched by the ACT Commissioner for the Environment, Dr Rosemary Purdie, and the Vice Chancellor in December 2004.
- Edited (with Tim Sherratt and Tom Griffiths, from RSSS) *A change in the weather: climate and culture in Australia* (National Museum of Australia Press). This is the culmination of an interdisciplinary collaborative project that began as a forum sponsored by the four learned academies in 2002, the Commonwealth Bureau of Meteorology, and the National Museum of Australia and the Australian Research Council (LP0347378).
- Completed *Strata*, a major collaborative environmental art project on Australian desert knowledge. With the financial support of Land and Water Australia and the Australian Research Council (DP0208361), this has been published as a book and website: <http://cres.anu.edu.au/strata>

Dr L. Robin and Dr D. Rose

- Launched Humanities Corner, *Australian Humanities Review*, as part of the Ecological Humanities in Action initiative.  
See: <http://www.lib.latrobe.edu.au/AHR/archive/Issue-April-2004/rose.html>

Dr D.B. Rose

- Launched the 'Ecological Humanities' corner of the *Australian Humanities Review*. This section of the journal is edited by Libby Robin and myself. *Australian Humanities Review* is a peer-reviewed interdisciplinary electronic journal. Edited by Elizabeth McMahon with assistance from an Editorial Board, AHR also receives funding from the Australia Council.  
<http://www.lib.latrobe.edu.au/AHR/>
- Convened a symposium on 'Desecration', with Dr Peter Read (CRES, May 14). Papers will be published in *Cultural Studies Review* in 2005.

Ms D. Saunders

- Successfully implemented the Swift Parrot recovery program for the 2004 migratory season.

Mr G. Sanecki

- Determined suspended sediment loads for a number of tributaries in the Murrumbidgee River Catchment.

Ms J.L. Stein

- Produced a new stream and catchment reference system for Australia

Professor I White

- Measured fluxes of nitrogen oxide gases, methane sulfur dioxide and hydrogen sulfide from acidified coastal sulfidic soils as a new, significant, non-anthropomorphic source of these gases.
- Analysed and published the impact of Canberra's 2003 bushfire on water quality in Canberra's main water supply dam.
- Published a major study on collaborative learning and coastal stewardship in estuarine floodplains.
- Published reports and studies on groundwater management in atolls and small islands and the use of multi agent systems in equitable groundwater use.

Dr S. Wild River

- Produced maps of natural resource management (NRM) problems and capacity by local government (LG) area – nationwide and by state. Used these to identify 28 LGs (four from each state) facing multiple, serious NRM problems, and to recruit those LG into a project to improve rural LG NRM capacity.
- Continued to develop the Comparative Environmental Risk Assessment Method (CERAM). Ran the CERAM graduate course award twice, with 27 students representing the ANU, CSIRO, Brisbane City Council two universities and the Queensland Government. Launched CERAM website. Repaid \$5,000 start-up grant from National Institute for Environment.

### ***Prizes, honours or awards (staff and students)***

Ms B. Hince

- Awarded Australian Antarctic Division Arts Fellowship 2004 one-month voyage February-March aboard the Aurora Australis to Casey station, Antarctica, and Macquarie Island.

Professor M.F.Hutchinson

- Appointed Chair of the Reference Group for the Australian Water Availability Project for the Department of Agriculture, Fisheries and Forestry.

Professor A. Jakeman

- Given inaugural Fellow award for the International Environmental Modelling and Software Society

Professor D. Lindenmayer

- Winner. 2004. Australian Natural History Medal - Gold Medal.
- Winner. 2004. Earthwatch Institute Outstanding Principal Investigator

Dr L. Robin

- Appointed to the Australian Academy of Science National Committee for the History and Philosophy of Science.

Dr D.B. Rose

- Awarded the position of Visiting Scholar in Taiwan, sponsored by the National Science Council of Taiwan, with lectures at the National Dong Hwa University, the National Taitung University, and the National Park Division of the Construction and Planning Agency, Ministry of Interior.

Dr. S. Wild River (member of ANU Green Team)

- University Medal for outstanding service to the campus community.

### ***Key outreach activities***

Dr S. Beavis

- ongoing development of SRES3005 Water Resources Management, in liaison with stakeholders (State Agencies and Local Government) in Kempsey, Coffs Harbour and Port Macquarie, by which key environmental issues/knowledge gaps relating to coastal water and land degradation are identified, and used as the basis for developing undergraduate research projects. Outputs delivered to stakeholders on completion.
- video for Dept Environment and Conservation 'City to Soil' project for use by Australian and international communities dealing with issues of land/water degradation and waste management

Ms C.J. Blackmore

- 'Strange birds in the Pilliga', Coonabarabran Times article, 19 February 2004.
- 'Only part of the story', Coonabarabran Times letter to the Editor, 22 July 2004.

Dr J. Clarke

- First 2 recommendations of the Senate Rural and Regional Affairs and Transport References Committee report Australian Forest Plantations: A Review of Plantations for Australia: The 2020 Vision, September 2004 drew heavily on my evidence to the Committee
- Presentation to Save Forests and Jobs Forum, Parliament House Sydney, 11 May 2004.
- ABC radio interviews on privatising NSW' softwood plantations. My analysis used extensively in 'Gunn Fight at the old growth corral' by Nick Tabakoff, The Bulletin 2 Nov pp. 50-1.
- Convenor of the CRES public lunchtime seminar series.

Ms P. Dixon-Jain:

- Seminar presentation titled "Linking our Rivers and Aquifers: Case Studies from Australia" at the Bureau of Rural Sciences for the Science for Decision Makers seminar series.
- Submission of abstract and poster on PhD research at the 8th Australasian Environmental Isotope Conference & Inaugural Australasian Hydrogeology Research Conference.

Dr S. Dovers

- "Institutional and policy change for sustainable development", Bunker Briefing Series, Dept of Environment and Heritage, Canberra, 24 March; and "Emergency management, sustainability and public health: cognate policy fields?", ACT Chief Health Officer Seminar Series, Canberra, 9 November.

Mr A Felton

- Gave seminar to staff of IBIF (Institute of Bolivian Forestry Research) and to the visiting staff and students from three US universities while in the Department of Santa Cruz, Bolivia.
- Worked with Richard Speare from the Rainforest CRC to determine the prevalence of Chytridiomycosis fungus in microhylid frogs. This work will result in a scientific publication in 2005.
- Worked with the Wildlife Conservation Society Bolivia on the release of data regarding a new species of Titi monkey that we co-discovered in 2003. This will result in a scientific publication due early in 2005.
- Worked with Steven Garnett of Charles Darwin University to produce a scientific paper that we have now submitted to the journal Emu entitled "The feeding ecology of the Star Finch *Neochmia ruficauda clarescens* at Princess Charlotte Bay, Cape York Peninsula in the early wet season." Garnett, S. T., Clarkson, J. R., Felton, A., Harrington, G.N. and Freeman.

Ms A.M. Felton.

- Educational seminar regarding effects of logging on wildlife, Instituto Boliviano de Investigacion Forestal, Bolivia, August 2004.

Mr J. Fischer

- Presentation at the annual meeting of the Society for Conservation Biology 2004 in New York

Mr J Gillen

- Written, photographic and graphic contribution to publication "Strata: Deserts Past, Present and Future" An environmental art project about a significant cultural place. (Funded by Land and Water Australia and ARC)
- Speaker at Seminar – "Communicating with stakeholders". Provided background on communication with Pitjantjatjara language speakers

Mr. B. Gilna

- "Landscape Biotechnology - are we ready for this?" paper delivered to 8th Biennial Scientific Conference, International Society for Ecological Economics, Montreal July 11-14, 2004
- Significant contributions to the online conference "GMOs in the Management of Animal Populations", hosted by the Biosafety Clearing House, Convention on Biodiversity, 18 October-15 November 2004.

Dr L Heath

- The HCBEB Project was showcased at the 4th APEC Science Ministers' meeting held in Christchurch, New Zealand, 9 - 12 March 2004. Over 1000 delegates attended the event, including the Australian Minister for Science, the Hon Peter McGauran.

Dr. R. Heinsohn:

- Research on dugongs covered by popular press including The Australian, Sydney Morning Herald, The Age, Courier Mail, and Canberra Times

Ms B. Hince

- 'Something's missing down there: Antarctica's disappearance from the map'. ABC Radio talk, Ockham's Razor, 10 October 2004.

Professor M.F.Hutchinson,

- Invited lecture on spatial temporal trends in pan evaporation across Australia at a Workshop for the National Committee for Earth System Science of the Academy of Science, 22-23 November 2004.
- Professor M.F.Hutchinson, Member Scientific Oversight and Access Committee (SOAC) for the Arafura Timor Research Facility (ATRF).

Ms K.M Ivkovic

- Participated in Cotton Research and Development Corporation funded Namoi-Gwydir Decision support system client briefing meetings in Moree (October 2003) and Narrabri (September 2004). This was followed by further reconnaissance of the catchment and meetings in Tamworth with the Department of Infrastructure, Planning and Natural Resources (DIPNR). Presentations were made of PhD progress to date.
- Ms KM Ivkovic, Ms P Dixon-Jain and Mr R. Brodie (all CRES PhD students) presented Bureau of Rural Sciences Seminar (BRS) entitled: Linking Our Rivers and Aquifers: Case Studies from Australia.

Professor T Jakeman

- President, MSSANZ and iEMSs, Editor-in-Chief of Environmental Modelling and Software journal

Mr F. Jotzo

- Presented ten seminars on current climate policy research to audiences in the United States, Europe and Australia.

Professor David Lindenmayer

- Speaker at 17 radio interviews and 4 TV programs during 2004
- Landscape restoration – and opportunities for future woodland biodiversity conservation. Invited presentation. Department of Environment and Heritage, Canberra. November 2004.
- Field progress on a large-scale fire experiment. Presentation to the Wreck Bay Board, Jervis Bay, New South Wales, November 2004.
- Australia Burning – Earthwatch field camp and presentation at Jervis Bay, New South Wales, November 2004.
- 21 years of work in Victorian wet forests. Acceptance presentation for the Australian Natural History Medal, Melbourne. November 2004.
- Keynote panel member. Biodiversity conservation in Australia. Invited presenter and expert panel member. October 2004.
- Landscape restoration – and opportunities for future woodland biodiversity conservation. Invited presentation. Crookwell, October 2004.
- Landscape restoration – field camp – Canberra Ornithologists Group. Gundagai/Holbrook/Albury. October 2004.
- Long-term biotic responses to fire – field camp – Canberra Ornithologists Group. Jervis Bay. September 2004.
- Key future issues in forest management. Lecture to Forest Policy class at SRES, ANU, August 2004.
- The Variable Retention Harvest System in Victorian forests. Lecture to silviculture class at SRES, ANU. August, 2004.



- Opportunities for new visions of landscape restoration in agricultural landscapes. Invited presentation to Australian National Landcare Council. Canberra. August, 2004.
- Integrating farm management into farm management. Talk to Landcare groups. Adelong, NSW. August 2004.
- Implementation of a Variable Retention Harvest System in Victoria's Mountain Ash forest. Field workshop for logging contractors, Victorian Government staff, conservationists. Marysville, Victoria. June, 2004.
- Conservation in farm and plantation landscapes. Talk to Landcare groups and local landholders in the Holbrook and Gundagai regions. June 2003.
- Major presentation to the Environmental Working Party (ANU) – Environment @ ANU and ways forward for enhanced environmental teaching and research. May 2004.
- Long-term monitoring and ways forward in sustainable management of Victorian forests. Presentation to Parks Victoria Executives, Melbourne, Victoria. May 2004.
- Long-term monitoring and ways forward in sustainable management of Victorian forests. Presentation to Parks Victoria Staff, Woori Yallock, Victoria. May 2004.
- Earthwatch Field Camp. Jervis Bay, New South Wales. April, 2004.
- Earthwatch Field Camp. Central Highlands of Victoria. March, 2004.
- Keynote address to Wreck Bay Community Board. Large-scale fire and ecological monitoring. Jervis Bay, March 2004.
- Earthwatch Field Camp. Jervis Bay, New South Wales. February, 2004.
- Implementation of a Variable Retention Harvest System in Victoria's Mountain Ash forest. Field workshop for logging contractors, Victorian Government staff, conservationists. Marysville, Victoria. February, 2004.
- Australian gliders – a natural history. Public lecture to Wildcare. Queanbeyan, NSW. February, 2004.
- Earthwatch Field Camp. Marysville Victoria. January 2004.

Mr P. Pagan

- "The potential for water trade between the ACT and NSW in the Murrumbidgee catchment", Seminar at ACT Department of Urban Services to staff from a range of ACT Government agencies, 29 October 2004.

Dr A. Manning:

- Invited talk: A multi-scale study of the Superb Parrot: implications for landscape scale ecological restoration. Canberra Ornithologists Group. 14 April 2004.
- Invited talk: A multi-scale study of the Superb Parrot: implications for landscape scale ecological restoration. Birds Australia SNAG - AGM and Parrot Seminar. 3 April 2004.

Dr. F.P. Mills

- 'CO<sub>2</sub> Extinction and Photodissociation in the Venusian (and Martian) Atmospheres', invited seminar, California Institute of Technology, 17 Aug 2004
- 'Impact of Extreme Temperature and/or Ultraviolet Radiation on Grape Cultivation', invited seminar, California Institute of Technology, 17 Aug 2004.

Adj Prof PJ Perkins,

- Various radio, television and print media interviews and commentaries on sustainability, water and institutional reform issues.  
Official invitation
- Invited participant at the Rosenberg International Forum on Water Policy, Ankara, Turkey (Sep 04).

Mr J.Reid

- 'Waterbirds in Desert Wetlands', articles about my research in Sydney Morning Herald, p. 9, and The Age, p. 7, both May 29-30 2004

Dr L. Robin

- National PhD workshop in Environmental History (Co-convenor with Dr Tom Griffiths), CRES, Canberra, October 25-29 2004. (Brought together PhD students from all over Australia, with support of the National Institute for Environment, CRES and RISS (History)).
- Collaborative work with the Ikuntji Arts Centre, Haasts Bluff and environmental artist, Mandy Martin, has brought the history of ideas about Australian deserts to a wider popular audience. Strata is part of the program offered at the National Museum of Australia in association with its major exhibition: Extremes: Survival in the Great Deserts of the Southern Hemisphere. There is also an exhibition of the artwork scheduled for the Araluen Art Centre, Alice Springs in 2005.

Dr D.B. Rose

- The 'Ecological Humanities' corner.
- Interview with 'Bush Telegraph', ABC, 23 June, 2004
- Book tour in the USA, promoting *Country of the Heart: An Indigenous Australian Homeland* (2002, Aboriginal Studies Press), funded by the Arts Council, the Australian Institute of Aboriginal and Torres Strait Islander Studies, the Kluge-Ruhe Aboriginal Art Collection, the University of Virginia Book Fair, and others.

Mr A. Sadoddin,

- 'Research Progress Report', Gorgan University of Agricultural Sciences and Natural Resources-Iran, November 2004

Ms D. Saunders

- An article about swift parrots on the south coast and participation in the recovery program was published in the "Coastal Custodian" newsletter for Aboriginal communities on the south coast of NSW.
- Promotion of volunteer Swift Parrot surveys/ monitoring through the Threatened Bird Network activities calendar.
- Articles and photographs in a local newspapers on the south coast, southern tablelands and south west slopes of NSW about the endangered Swift Parrot and the recovery program for this species.
- An article on Local action for a nationally endangered species - the Swift Parrot" was published by the Threatened Bird Network
- Birds Australia Sydney Forum - Parrots and Cockatoos in NSW and beyond - audio visual presentation on the success of volunteers in the Swift Parrot Recovery Program.
- Bird Routes of the South West Slopes Forum poster presentations titled "Swift Parrot Conservation and You", "Swift Parrots on the Western Slopes of NSW"

- and “Coastal habitats for Swift Parrots”. Gave a brief presentation to Canberra Ornithological Group to encourage participation in the development of the bird routes of the SW slopes and to acquire species lists for hot spots.
- Birds Australia South East Queensland Forum - Birds, Brigalow and Biodiversity - poster presentations “Swift Parrot Conservation and You”, “Swift Parrots on the Western Slopes of NSW” and “Coastal habitats for Swift Parrots”.
  - Ecological Society Annual Conference, audio visual presentation for the Conservation Challenges of Dispersive Fauna titled "History Always Repeats - migration, site fidelity and conservation of the endangered Swift Parrot"
  - Encouraged NSW NPWS Discovery Ranger Program to become involved with the Swift Parrot recovery program. Provided outline of activities that people can get involved in and contact details for participation in surveys and/or more information. Information will be published in the rangers newsletter By The Way - a newsletter for 200 NPWS tour guiding staff.
  - Regular meetings with the NSW NPWS Community Programs section, NSW DEC Threatened Species Education Officer and Grassy Box Woodland Conservation Management Network (GBW CMN) to build collaborative relationships with a broader range of the community in NSW.
  - ABC radio Bush Telegraph live interview regarding conservation of Australian birds with specific reference to the endangered Swift Parrot.

Mr G. Sanecki

- Presentation to the Australian Institute of Alpine Research.
- Newspaper article *Canberra Times* December 20 2004.

Dr J Sharples

- Attended Australia and New Zealand Climate Forum and presented paper entitled ‘*Spatio-temporal trends in pan evaporation over Australia 1970 – 2003*’.
- Attended Australian Academy of Science National Committee meeting on Pan evaporation: An example of the detection and attribution of trends in climate variables. Co-author of presented paper ‘*Spatio-temporal trends in pan evaporation and contributing variables over Australia*’.

Ms C. J. Smith

- Determined suspended sediment loads required for model calibration of SedNet in collaboration with CSIRO Land and Water.

Ms J.L. Stein

- Poster Presentation, 'A new Australian stream and catchment reference system', 4th. Australian Stream Management Conference, Launceston, October 19-22, 2004.
- Participant National Forum: 'Protecting Rivers of High Conservation Value', Canberra, April 1, 2004

Ms J.K. Weir

- 'Negotiating with the Murray Lower Darling Rivers Indigenous Nations', the Land and Water Postgraduate Workshop, 7 July 2004, and 'Communicating with Indigenous communities in southeast Australia', National Institute for the Environment workshop Communicating with Stakeholders, 25 August 2004.

Professor I White

- Sustainable development of water resources in small island nations of the Pacific,

- Proceedings of the 2nd Asia Pacific Association of Hydrology and Water Resources Conference, Singapore 5-8 July 2004, Vol. II pp 345-356.
- Why should the ACT buy water? Letter to Canberra Times, 22 Oct 2004
- Global Issues in Water. Launch of: Water Innovation: a new era for Australia.
- Canberra Press Club, 22 October 2004
- Small island water supplies and sanitation as the “epitome” of sustainability, Water Sensitive Urban Design 2004 Adelaide, 22-23 Nov 2004.
- Water Issues in the Pacific: Challenges for Small Islands: AusAID Invited Seminar, 15 Dec 2004.
- Interactions between sulfur, nitrogen, and iron cycles in the sustainable management and use of acid sulfate soils with Dr .O.T. Demead (CSIRO), Assoc.Prof. M.D. Melville (UNSW), Prof T.D. Waite, Dr B.C. Macdonald (UNSW), Mr M. Tunks (Tweed Shire Council) and Mr R. Beattie (NSW Sugar Industry).
- Hydraulic properties of swelling clay-gel soils: electrolyte and temperature effects with Dr D.E. Smile (CSIRO) and Prof. T. D. Waite (UNSW).
- A negotiation support system for groundwater management in small islands with Dr P. Perez (CIRAD, France).
- Equitable Groundwater Management for the Development of Atolls and Small Islands with Dr P. Perez (CIRAD, France), Mr. A. Falkland (Ecowise Environmental), Mr. T. Meteutera (Public Utility Board, Kiribati), and Mr E. Metai (Public Works Department, Kiribati).

Dr. S. Wild River

- ‘Later year students and what they wished they knew’ National Institute for Environment, Environmental Knowledges forum.
- With B. Gilna, ran 5 Environmental Futures Search Forums with ANU staff and students, for ANU Environment Review.
- Liaison, recruitment, interviews, information exchange with 28 LGs across Australia, and the agencies they work with on NRM issues.
- Presentation on CERAM to Chinese Delegation – 5/5/04 – for Office of Deputy Dean (Marketing and Development) Faculty of Science.
- Guest lecture to class at College of the ANU on student experiences at the ANU.
- Organised CRES stall at ANU World Environment Day Market Day.

## ***Publications***

Adnan, H., (2004) “Sustainability Indicators System and Policy Processes in Malaysia: A Framework for Utilisation and Learning”, *Journal of Environmental Management*, Vol 73, Issue , pp 357-371, (Ref type Journal article)

Adnan, H., Hasan, M., (2004) “Management Framework for Sustainable Development Indicators in the State of Selangor, Malaysia ”, *Ecological Indicators*, Vol 4, Issue , pp 287-304, (Ref type Journal article)

Baker, G., Cunningham, R., Murray, W., (2004) “Are red-footed boobies *Sula sula* at risk from human harvesting on Cocos (Keeling) Islands, Indian Ocean?”, *Biological Conservation*, Vol 119, Issue 2, pp 271-278, (Ref type Journal article)

Beavis, S., (2004) “Creating an open system in resource management: a study of waste minimisation in the prison system”, *Australian Journal of Environmental Management*, Vol 11, Issue 2, pp 150-155, (Ref type Journal article)

Belovsky, G., Botkin, D., Cowl, T., Cummins, K., Franklin, J., Hunter, M., Joern, A., Lindenmayer, D., MacMahon, J., Margules, C., Scott, J., (2004) “Ten suggestions to strengthen the science of ecology”, *BioScience*, Vol 54, Issue 4, pp 345-351, (Ref type Journal article)

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Clark, J., (2004) “Forest policy for sustainable commodity wood production: an examination drawing on the Australian experience”, *Ecological Economics*, Vol 50, Issue , pp 219-232, (Ref type Journal article)

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Cruse, L., Pagan, P., Dollery, B., (2004) “Water markets as a vehicle for reforming water resource allocation in the Murray-Darling Basin of Australia”, *Water Resources Research*, Vol 40, Issue , pp W08S05, (Ref type Journal article)

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## **Grants**

- A Multi Scale Study of the Supurb Parrot, (*Polytsllis Swainsonii*), Implications for Landscape-Scale Biodiversity Conservation, Dr A. Manning
- Advisor to the integration investment plan 2003-2006, Dr S. Dovers
- Australian City and Regional Network, Prof I. Troy
- Australian Water Research Facility; Research Scoping, Prof I. White
- Australia-wide system for Protection of Rivers, River Reaches and Estuaries of High conservation value  
Ms J. Stein
- Biodiversity Conservation Vegetation Restoration and Landscape Design,  
Prof D. Lindenmayer
- Biogeography of avian mating systems in Cape York & PNG Electus Parrots,  
Dr R. Heinsohn
- Board of Directors & Research Committees, Prof. I. White
- Breeding Biology and behaviour of a Near Threatened Species; The Grey Crowned Babbler,  
Ms C. Blackmore
- Breeding Biology and behaviour of a Near Threatened Species; The Grey Crowned Babbler, Ms C. Blackmore
- Climate Variability and Surface ultraviolet radiation, Dr F. Mills
- Collaborating to Maximise Benefits From Local Govt Natural Resource Management Projects, Dr S. Wild River
- Conservation of a Nationally Threatened Reptile, The Green Python, *Morelia Viridis*,  
Dr R. Heinsohn, Mr D. Wilson
- Consultancy – Research into Kinship with the Natural World, Dr D. Rose
- Coordination Research during the Rehabilitation of Burnt Areas in the Lower Cotter Catchment, Dr A. Manning
- Cotter/Googong ALS Surface Development & Products, Prof M. Hutchinson
- Co-understanding places people and water in Central Australia, Dr L. Robin
- Declining and Threatened Woodland Birds in the Wheat/Sheep Belt of NSW, Mr J.Reid
- Development Guidelines for Delivery of Conservation Incentives by Regional Organisations, Dr D. Hazell
- Development of a constructed wetland for improving water quality in sugarcane drainage, and ensuring that its community acceptance and industry adoption,  
Mr B. Macdonald
- Dynamic Livestock Modelling, Mr A. Clark

Ecology and Conservation of the Green Pythons on Cape York,  
Dr R. Heinsohn, Prof I. Wilson

The effects of habitat fragmentation on dispersal, population structure and reproductive success in cooperatively breeding white-winged choughs (*Corcorax melanorhamphos*), Dr R. Heinsohn, Ms N. Beck

The effects of prescribed fire on biota in a diverse range of managed vegetation communities, Prof D. Lindenmayer

Equitable Groundwater Management for the Development of Atolls and Small Islands (phase 2), Prof I. White

Estimates of Waterbird Abundance and Breeding in the Coongie Lakes Ramsar Wetlands and Goyders Lagoon, Lake Eyre Basin, SA, Mr J. Reid

Extending audit outcomes to enhance rural local Government environmental capacity, Dr S. Wildriver

Extreme Event Return Frequency, Mr A. Worthy, Prof R. Wasson

Flock Modelling Opportunities Scoping Study, Mr A. Clark, Prof M. Hutchinson

Habitat Fragmentation in Alpine and Sub Alpine Regions of Australia  
Prof D. Lindenmayer, Mr G. Sanecki

Hydrolic Properties of Swelling Clay-Gel Soils: Electrolyte and temperature Effects,  
Prof I. White

ICLARM Workshop, Prof. R. Wasson

Implications of Stream Acidity in High Rainfall Catchments, Prof I. White

Improving Effectiveness of Conservation Research and Its Uptake, Prof D. Lindenmayer

Institutional Constraints on Water Trading in the ACT PHD Scholarship, Mr M. Worthy

Institutional Strengthening for Integrated Water Resource Management in Thailand,  
Prof A. Jakeman

Integrated Natural Resources Management Project, Dr S. Dovers

Integrated Water Management in the Lower Richmond Catchment, Prof I. White

Integration of Biodiversity into Regional NRM Planning Projects Steering Committee,  
Dr D. Hazell

Interactions between sulfur, nitrogen, and iron cycles in the sustainable management and use of acid sulphate soils, Prof I. White

Junior Research Fellowship Technical Assistance Grant, Mr A. Clark

Landscape Biotechnology: The Future Beyond Food and Fibre,  
Mr B. Gilna, Dr S. Dovers

The long-term Population Dynamics and Conservation of a Poorly known Australian mammal, Prof D. Lindenmayer

Monitoring Populations of Forest Vertebrates in the Central Highlands – VIC  
 Prof D. Lindenmayer

Monitoring Populations of Forest Vertebrates in the Central Highlands – Victoria,  
 Prof D. Lindenmayer

Nature and National Sciences, Environment and National Identity in Australia,  
 Dr L. Robin, Dr D. Rose

New approaches and methods for Ecological and Conservation Synthesis across studies,  
 Prof D. Lindenmayer

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 Prof D. Lindenmayer

PHD Research Scholarship, Ms P. Dixon-Jain, Prof A. Jakeman

PhD Scholarship: Social and Institutional Implications of Landscape and Land Use  
 Change, Ms J. Stanley

PhD Scholarship: Wheat / Sheep Landscapes Perceiving the Past, Present and Future,  
 Dr G. Main, Dr L. Robin

PhD Scholarship: Federalism and Natural Resource Management: Water in the Murray –  
 Darling Basin, Dr L. Robin, Mr D. Connell

PhD Scholarship: Urban Environment  
 Prof R. Wasson / Ms Q-H Pu

Postgraduate Research Scholarship – Lowe Improving NRM Program and Project  
 Design, Implementation and Evaluation, Ms A. Lowe, Dr S. Dovers

Postgraduate Scholarship – Enhancing R&D capacity – The regulation of Indigenous  
 rights through Environmental Legislation, Ms J. Weir, Dr D. Rose

Recharge of Artesian Groundwaters in the Coonamble Embayment of the Great Artesian  
 Basin, Midwestern NSW, Prof M. Hutchinson

Reduced Impact Logging and the Conservation of Insectivorous Understory Birds in a  
 Bolivian Lowland Tropical Forest, Mr A Felton

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Research Fellowship in Urban Water and Energy Studies, Prof P. Troy

Research Initiative on the Environment, the Economy and Sustainable Welfare, Mr F.  
 Jotzo, Dr J. Pezzey

Research on superb parrot, Dr A. Manning

Rules for Interstate Water Trading by ACT, Dr J. Pezzey, Mr P. Pagan

Science Quality in Natural Resources, Mines & Energy, Prof H. Nix

Social Determinants of Domestic Energy & Water Consumption, Prof I. Troy

Soil Acidification, the Environment and Production, Dr B. Macdonald

Spider Monkey Conservation and Reduced Impact Logging, Ms A. Felton

Study on Sources of Turbidity in Bendora Dam, Prof R. Wasson

Understanding the Human Context of Biotechnological Fox Control in Australia,  
Mr B. Gilna

Update monthly climate surfaces and investigations for the National Carbon Accounting  
System, Prof M. Hutchinson

UTE Book, Dr L. Robin, Prof Q. Grafton

VC's Plan for Growth – ANU Environment, Prof R. Wasson

Vegetation restoration and Landscape Design for Enhanced Biodiversity Conservation,  
Prof D. Lindenmayer

Volunteer field project assistance (Leadbeaters Possum), Prof D. Lindenmayer