



COOPERATIVE RESEARCH CENTRE FOR

CATCHMENT HYDROLOGY ANNUAL REPORT 2000 – 2001





## MISSION

THE COOPERATIVE RESEARCH CENTRE FOR CATCHMENT HYDROLOGY WILL DELIVER TO RESOURCE MANAGERS THE CAPABILITY TO ASSESS THE HYDROLOGIC IMPACT OF LAND-USE AND WATER MANAGEMENT DECISIONS AT WHOLE-OF-CATCHMENT SCALE.



Hydrology is the study of the properties and laws of water, its distribution, movement across and impact on the earth's surface.

The CRC's main goal is to produce a region-appropriate decision support system to predict the movement of water, particulates and solutes from land to rivers. This system needs to link the impacts of climate variability, vegetation, soil and water management in an integrated package.

### THE INDUSTRY-IDENTIFIED ISSUES TO BE ADDRESSED BY OUR RESEARCH ARE:

- sustainable and efficient water allocation
- land-use impacts on rivers, especially after land-clearing
- climate variability (the potential to reduce hydrologic risk)
- urban runoff quality
- river restoration

### OBJECTIVES

To achieve its mission, the CRC will:

- mount a quality research program, targeted to meet national objectives in catchment hydrology, by focusing on achieving predictive capability at whole-of-catchment scale
- maximise the synergies of collaboration among its Parties and with related organisations
- involve end-users in the identification, formulation, conduct and use of its research activities
- provide training to increase awareness of, and the national skill base available in, catchment hydrology
- train and equip postgraduate students as future leaders in land and water management
- seek to sustain continuity of research in catchment hydrology consistent with the widespread and persistent nature of land and water problems.

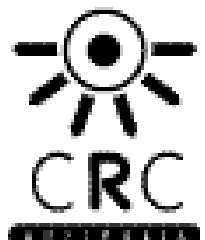
**COOPERATIVE RESEARCH CENTRE FOR  
 CATCHMENT HYDROLOGY ANNUAL REPORT 2000 – 2001**

**ASSOCIATES:**

- SA Water
- State Forests of NSW

**A COOPERATIVE VENTURE BETWEEN:**

- Brisbane City Council
- Bureau of Meteorology
- CSIRO Land and Water
- Department of Land and Water Conservation, NSW
- Department of Natural Resources and Environment, Vic
- Goulburn-Murray Water
- Griffith University
- Melbourne Water
- Monash University
- Murray-Darling Basin Commission
- Natural Resources and Mines, Qld
- Southern Rural Water
- The University of Melbourne
- Wimmera Mallee Water



**Front & Back Cover**  
Views of Lynbrook Estate,  
Vic – Water Sensitive  
Urban Design application  
guided by CRC Research

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The significant salinity and ecological impacts of land-use and water diversions we are now experiencing are the accumulation of a multitude of individual changes since European settlement. Solutions to these problems will only be achieved by management actions to reverse the trends over large catchments.

Soundly-based catchment-wide strategies will therefore be vital to ensuring these actions are beneficial, and do indeed lead to the desired result at the outlet of the catchment. The CRC's skills in predicting the impact of changes in land and water-use are crucial for developing these catchment-wide strategies.

Communication and adoption outcomes are also vital. The success of the CRC will be judged on the successful adoption of its research. Communication and adoption plans are therefore being developed as an integral part of each research project.

### WATER ALLOCATION AND TRADING

The Council of Australian Governments (COAG) has responded to widespread national concern about the need for our rivers and streams to be allocated more water, and the need to improve the economic viability of irrigation by introducing water trading reforms to optimise the use of water entitlements.

The CRC has responded to the wide-ranging reforms of water allocation including the introduction of water trading by pursuing Program 3: Sustainable Water Allocation. This research is contributing to the debate about how water is allocated in Australia.

The CRC recognises that cooperation of farmers is critical for the success of these COAG reforms so it is assessing the attitudes of irrigators to ensure the reforms achieve more economic water-use.

A major initiative undertaken by CRC researchers this year has been an extensive survey of the Goulburn Broken Catchment community, including water-users. The survey shows there is strong support for water reform. Irrigators believe their water entitlement will be more secure and reliable after reform, provided there are constraints on trading. The irrigators reject the notion of full-cost pricing however, unlike the catchment community, which accepts it.

### WATER QUALITY INITIATIVES

Program 2 – Land-use Impacts on Rivers, and Program 4 – Urban Stormwater Quality, are providing research information to help clarify issues related to improving water quality.

A comprehensive database of sediment movement in forests following disturbance, a research outcome of Program 2, is providing data to inform the political debate about the impact of forest practices on water quality. The debate can now operate on the basis of scientific knowledge rather than prejudice or special interest.

Program 4's research into Water Sensitive Urban Design is revolutionising urban stormwater management. The research is being applied at the Urban and Regional Land Corporation's Lynbrook Estate at Lyndhurst, a south-east Melbourne housing development. Lynbrook is the first large-scale residential estate in Australia to incorporate Water Sensitive Urban Design. The principles have also been introduced by Brisbane City Council into planning policy as a requirement for new residential developments.

### FOCUS CATCHMENTS

To ensure the outputs of the CRC's diverse research programs are linked and capable of practical implementation, five Focus Catchments have been selected as the principal sites for application of the research. The Board of the CRC for Catchment Hydrology has found the presentations by the Focus Catchment Coordinators informative, and indicate the concept is working well.

### FUTURE ISSUES WORKSHOP

The Future Issues Workshop, held on 24 May 2001 and attended by Board members, looked at forward planning for the next round of three-year projects to begin in 2002. It also aimed to encourage interaction, collaboration, and cooperation with agencies, and community leaders not formally associated with the CRC.

It attracted 17 leading water industry representatives, who gave feedback on the issues likely to impact on them in the future. In the next 12 months, the CRC will incorporate this feedback into planning the new research projects.

### THE BOARD

A defining feature of the CRC for Catchment Hydrology is the commitment the Parties show in cooperating to tackle major land and water management issues that cannot be solved by any one agency or industry player acting alone.

This commitment is reflected in Board meetings, which have focused on advancing the CRC's mission. With the first round of projects in place, the Board concentrated on implementing the business plan by setting in train the Communication and Adoption plan, approving several associated projects and initiating independent reviews of projects.

My thanks go to the Board, which continues to support the strategic goals of this CRC, and to the Director and staff for working enthusiastically to meet the challenges of developing predictive models for a constantly-changing climatic and water environment.



Dr John Langford  
Chairman



THE LEVEL OF GENERAL INTEREST IN CATCHMENT-SCALE WATER ISSUES IS AT AN ALL-TIME HIGH, WITH URGENT

DEMAND FOR SCIENTIFIC UNDERPINNING OF MANAGEMENT ACTIONS. THE CRC'S MISSION – PREDICTIVE

TOOLKITS FOR WATER, SEDIMENT, SOLUTE AND NUTRIENT MOVEMENT AT CATCHMENT SCALE – SETS OUR

TARGET TO HELP MEET THIS NEED.

Already, we have developed some capability for managers to use in catchment-scale modelling. A catchment model is near completion for south-east Queensland as part of the South East Queensland Regional Water Quality Management Strategy (SEQRWQMS) program. For urban catchments, a Pilot Decision Support System is now being trialled by Melbourne Water and the Brisbane City Council.

The above examples attest to the intention of the CRC to deliver its science in forms useful to land and water managers. The success of our entry in the CRC Associations Technology Transfer Award this year, and being one of three CRCs recognised for excellence in this field, was a particular highlight. Congratulations to Tony Wong and his team for their submission *Revolutionising Stormwater Management*, outlining applications of Water Sensitive Urban Design in Melbourne and Brisbane.

### PROGRESS ON CORE PROJECTS

Our integrated core projects, approved and resourced by the Board in February 2000 for a three-year period, are all near the half-way point. The independent review panels established for each project by the Board have strongly endorsed the quality of work being done by research staff, and commented favourably on the likely applications of potential research outcomes.

At the end of the first three-year research period, we will accelerate delivery of the catchment hydrology management capability we promised to land and water managers. We anticipate this delivery will take at least a further three years to achieve and relies strongly on cross-program integration of models and information from all projects.

In this reporting period, we reached close to a full complement of staff, many of whom are world-class researchers drawn to this CRC by the exciting outcomes it is generating.

We are also near filling our quota of funded postgraduate students.

### COOPERATION WITH OTHER CRC'S

We are pleased to report a high degree of cooperation with the Coastal Zone and Freshwater Ecology CRCs. This cooperation benefits researchers and users and we place great importance on it.

We share a Program Leader in Education and Training with the Coastal Zone CRC and jointly fund a Griffith University lecturer. The growing list of activities involving both CRCs includes joint training for postgraduates and shared activities in the Fitzroy Focus Catchment. The CRCs also share funding of a project on nitrogen movement in riparian zones.

With the Freshwater Ecology CRC, strong links have been established in the Urban Stormwater Quality and River Restoration Programs. These include work on wetland treatment of stormwater, sediment impacts on stream health, and impacts of differing environmental flow patterns.

### ASSOCIATED/ADDITIONAL PROJECTS

We are exceeding the targets set in our business plan to attract outside funds to conduct the research program that will meet the CRC's mission and objectives. The projects resourced in this way are termed Associated/Additional Projects. They must fit into the CRC's research plan to be accepted by the Board; that is, they will deliver important components of our integrated research agenda.

Examples are Associated/Additional Projects funded by the Murray-Darling Basin Commission (MDBC) to include salinity in the study of impacts of land-use changes on catchments, and by the Department of Agriculture, Fisheries, and Forestry (AFFA) to cover fishway design in the set of tools for stream rehabilitation. These strategic projects, like many others in the CRC, add great value to our research program.

### POSTGRADUATE PROGRAM

We aim to continue the standard we set in the initial CRC where our Education and Training Program received strong commendation for the strength of its postgraduate research. Among other achievements, our postgraduates won the CRC Young Water Scientist of the Year (an award sponsored by the five water CRCs and the Australian Water Association) twice in its first three years. This year, in this second CRC, our finalist – Rebecca Bartley – was again successful with a written submission and presentation on sediment slugs. Rebecca also won a Year 2001 Cooperative Research Centres Association conference award for the best postgraduate address, from 33 entries across the CRC program.



Postgraduates like Rebecca have made wonderful contributions to our research program – we greatly value their talents, energy, and enthusiasm. The CRC this year provided further training activities to help develop these attributes in all our postgraduates.

#### **INVOLVEMENT OF SMALL TO MEDIUM ENTERPRISES (SMES)**

The CRC for Catchment Hydrology exists for the public good, with a policy to make knowledge, data or tools widely available and at nominal cost to outside organisations. SMEs have been active participants in our industry workshops and seminars. For example, the workshop series Hydrology and Hydraulics for Floodplain Managers and a workshop on Water Sensitive Urban Design both attracted about a dozen private consultants. Consultants also help with our project review panels.

The CRC will build further on these already established links.

#### **THE ANNUAL WORKSHOP**

This year's workshop, held at Cobram-Barooga in early April 2001, was an outstanding success, with several veteran participants judging it the best yet. The involvement of our Visitor and some Board members was important to give us feedback on progress and future imperatives.

The workshop brought together participants from Qld, NSW, ACT, and Vic in a way that encouraged information exchange, establishment and enhancement of face-to-face contacts, theme and project development, and feedback to management.

It highlighted that a lot of the CRC's success will depend on how well we integrate people, ideas and research outputs. Integration is a prime challenge for the CRC, and one we aim to meet.



#### **LOOKING AHEAD – OUR SECOND-YEAR REVIEW**

CRCs are accountable to the Commonwealth for the money they receive for the seven-year program of work specified in their respective contracts of agreement. Independent reviews are held at the end of year two and year five to assess whether a CRC is doing what it said it would do, and how well. There are two stages: the first on the quality of the science, the second on Board governance, CRC management, communication and adoption, education and training. Our Stage One and Stage Two Panels will meet during 2001 – 2002.

We think we're on track and look forward to having an independent assessment of this.

#### **THANKS TO THE MANY CRC CONTRIBUTORS**

The CRC for Catchment Hydrology is fortunate to have an active and harmonious Board; this contributes significantly to its success. My thanks to Governing Board members for their cooperation and guidance, with particular accolades to the Board Chair, John Langford, for his commitment and unflagging enthusiasm.

The spirit of goodwill in this CRC is one of its greatest strengths and I'm indebted to all for maintaining it. The leadership roles played by the Program Leaders, Project Leaders, and Focus Catchment Coordinators have again been demanding ones this year - their ability to perform and keep smiling has been greatly appreciated.

A handwritten signature in black ink that reads "Russell Mein".

Russell Mein  
Director

## HIGHLIGHTS

2000 – 2001

OUR CRC HAS A REPUTATION FOR DELIVERING SCIENCE IN

FORMS THAT ARE USEFUL TO LAND AND WATER MANAGERS

Work with Melbourne Water, the Urban and Regional Land Corporation and Brisbane City Council has challenged conventional approaches to urban stormwater management by applying Water Sensitive Urban Design in Melbourne and Brisbane suburbs. It won one of three Year 2001 CRC Association Technology Transfer Awards for excellence.

The Education and Training Program strengths were endorsed by Rebecca Bartley's winning submission and presentation on sediment slugs for the CRC Young Water Scientist of the Year. The award is sponsored by the five water CRCs and the Australian Water Association. The win builds on the success of the initial Catchment Hydrology CRC's postgraduate program, which produced two award-winners in its first three years.

The Department of Natural Resources and Environment, Vic commissioned the Monash University Department of Civil Engineering and the CRC to provide workshops to train floodplain managers in hydrologic and hydraulic techniques related to their work. The four workshops each attracted about 30 participants.

An Environmental Management Support System (EMSS) was developed to predict land management impacts of water quality in 175 sub-catchments covering 22,670 km<sup>2</sup> of south-east Qld. The completed software will be available in 2001 – 2002.

The CRC's Program 2: Land-use Impacts on Rivers attracted external funding for some 10 Associated/Additional projects – ranging in size from \$100,000 to \$750,000 – to investigate key sediment movement issues for practical application across Australian catchments.



**Far Left** Lynbrook Estate – Award winning use of Water Sensitive Urban Design

**Left** Sydney weather – successful trial of 'nowcasting' model S\_PROG at Olympics

**Below** Land-use impacts on rivers – substantial external funding attracted



A large and comprehensive survey of irrigator and community attitudes to water reform and trading was conducted and the findings released in two CRC for Catchment Hydrology Technical Reports in April – May 2001.

At the Sydney Olympic Games, the CRC's S\_PROG rainfall forecasting (nowcasting) model and five other nowcasting systems from Canada, the US and the UK were tested as part of the World Weather Research Program Field Demonstration Project. The systems were connected to the Bureau of Meteorology network in Sydney during the Games, to demonstrate state-of-the-art forecasting of rainfall amounts.

An interactive CD version of the national Stream Rehabilitation Manual was released, building on the success of the hard-copy manual published in 1999 to widespread industry acclaim.

The first of three reviews of the CRC's communication activities was conducted in early 2001 by Brisbane-based communication consultancy, Econnect Communication Pty Ltd. The review report included very positive comments on the CRC's activities and feedback on the CRC's communication performance, benchmarks against which future activities can be measured, and suggestions for helping achieve the CRC's aim of best practice in communication and adoption.

### CENTRE STRUCTURE

The Centre brings together, in an unincorporated joint venture, the following Parties:

#### Land and Water Management Authorities

Department of Land and Water Conservation,  
NSW

Department of Natural Resources and  
Environment, Vic

Goulburn-Murray Water

Murray-Darling Basin Commission

Natural Resources and Mines, Qld

Southern Rural Water

Wimmera Mallee Water

#### Urban Water Authorities

Brisbane City Council

Melbourne Water

#### CSIRO

CSIRO Land and Water

#### Universities

Griffith University

Monash University

The University of Melbourne

#### National Meteorological Body

Bureau of Meteorology



### GOVERNING BOARD

The Board sets strategic directions, allocates budget and reviews program outcomes. It also monitors strategic direction and management, and budgeting effectiveness.

Board membership as at June 30, 2001 was:

**Dr John Langford** (Independent Chairman,  
Executive Director, Water Services Association  
of Australia

**Mr Barry Ball**, Manager Waterways Program,  
Urban Management Division, Brisbane City  
Council

**Mrs Bobbie Brazil** (Independent Board Member)

**Professor Mike Brisk**, Dean, Faculty of  
Engineering, Monash University

**Mr Geoff Earl**, Manager, Production and  
Catchments, Goulburn-Murray Water

**Mr Kevin Goss**, General Manager, Natural  
Resources, Murray-Darling Basin Commission

**Mr Graham Hawke**, Director, Technical Services,  
Southern Rural Water (non-voting participant)

**Professor Bill Hogarth**, Dean, Faculty of  
Environmental Sciences, Griffith University  
(Alternates – Dr Ron King, Prof Dennis Lincoln)

**Mr Denis Hussey** (Independent Board Member),  
Senior Associate, ACIL Consulting Pty Ltd

**Mr Peter Jackson**, Manager of Technical Services,  
Wimmera Mallee Water (non-voting participant)

**Professor Rao Kotagiri**, Associate Dean –  
Research, Faculty of Engineering, The University  
of Melbourne

**Dr Geoff Love**, Deputy Director, Services,  
Bureau of Meteorology (Alternates – Mr Jim  
Elliott, Mr Ross James)

**Professor Russell Mein**, CRC Director,  
Monash University

**Dr Chris Moran**, Program Leader, Waterway  
Management and Landscape Function, CSIRO  
Land and Water (replaces Dr Graham Harris,  
Chief, CSIRO Land and Water)

**Ms Rae Moran**, Senior Hydrologist, Catchment  
and Water Division, Department of Natural  
Resources and Environment, Vic

**Mr Frank van Schagen**, Executive Director,  
Natural Resource Sciences, Natural Resources  
and Mines, Qld (Alternate – Mr Don Begbie)

**Mr Ross Williams**, Executive Director, Centre for  
Natural Resources, Department of Land and Water  
Conservation, NSW

**Mr Ross Young**, Group Manager – Planning,  
Melbourne Water

The Governing Board met on these dates:

August 25, 2000

November 17, 2000

February 23, 2001

May 25, 2001





**Below Left** CRC Board members and Executive, Brisbane 2001 (Left to Right) Front Row – Dr Rob Vertessy, Dr Chris Moran, Dr John Langford, Prof Russell Mein, Mr Ross Williams, Prof Tom McMahon; Middle Row – Mr Denis Hussey, Mr Kevin Goss, Ms Rae Moran, Prof Mike Brisk, Mr Ross Young, Mr Barry Ball, Prof Bill Hogarth; Back Row – Mr Don Begbie, Dr John Tisdell, Mr Geoff Earl, Mr John Molloy, Mr Ross James

**Far Left** Future Issues Workshop (FIW) external participants (Left to Right) Ms Christine Forster (VCMC), Dr Fiona McConachy (Hydro Tas)

**Centre** Future Issues Workshop (FIW) external participants (Left to Right) Mr Ian Thompson (AFFA), Mr Tim Fisher (ACF)

**Below** Future Issues Workshop (FIW) external participants (Left to Right) Mr Wayne Harris, ActewAGL, Dr Colin Chartres (BRS)



## RESEARCH PROGRAMS

The Centre supports 14 core projects within the following six research programs:

- Predicting Catchment Behaviour
- Land-use Impacts on Rivers
- Sustainable Water Allocation
- Urban Stormwater Quality
- Climate Variability
- River Restoration

Program and Project Leaders have been chosen for their high-level skills in research and program management. They meet regularly, generally monthly, in conjunction with the Centre Executive. The five Focus Catchment Coordinators provide ongoing feedback to the Executive about progress and issues within each catchment.

The Technical Advisory Groups that helped identify and develop projects have been replaced by Review Panels for each project. These panels comprise independent research and industry specialists and meet once or twice-yearly.

## CENTRE MANAGEMENT

The Centre's Director and office are based at Monash University, Melbourne. The main research facilities are at Monash University, Clayton; CSIRO Land and Water, Canberra; Griffith University, Brisbane; and The University of Melbourne, with significant activity in several other Party locations.

The three Deputy Directors oversee operations at the Canberra, Brisbane and Melbourne sites.

## STRATEGIC DIRECTIONS

The Centre's strategic directions and operations are guided by its Business Plan, developed during the bid for the new CRC.

## FUTURE ISSUES WORKSHOP

Centres in the national Cooperative Research Centres (CRC) Program are expected to contribute to national objectives, including economic and social development, and the establishment of internationally competitive industry sectors through supporting long-term, high quality scientific and technological research.

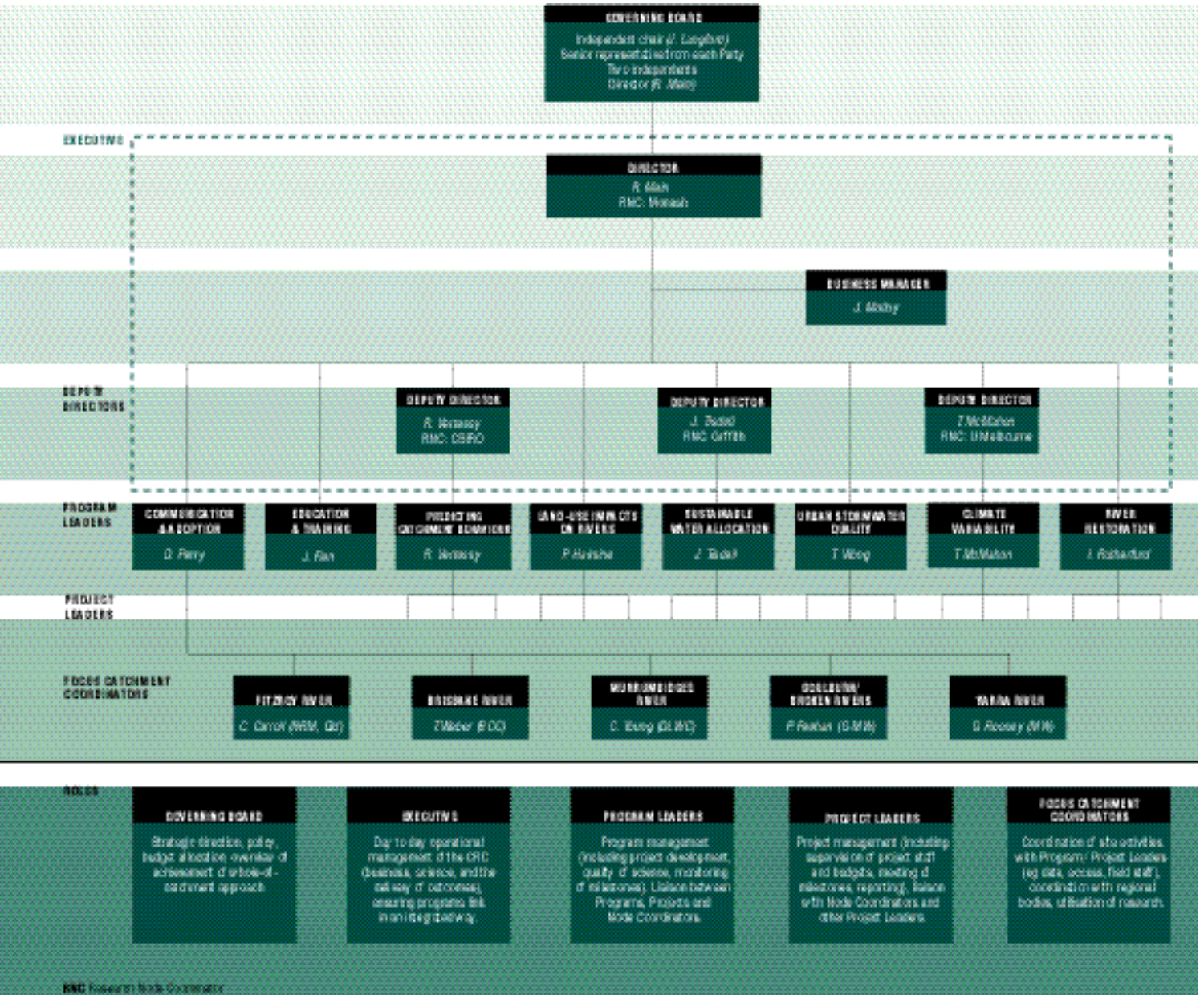
The 'Future Issues Workshop' held by the Centre was part of its strategic planning to ensure that it was addressing national issues in land and water management, and directing research and supporting activities in catchment hydrology to best meet them.

(This was the third of such workshops since the CRC's initial formation in 1992, others being held in October 1994 and March 1997)

The CRC greatly appreciated the contributions of the participants, both from 'outside' the CRC and within and was delighted that such a group of high-level representatives of the land and water management sector were able to attend.

# STRUCTURE AND MANAGEMENT

CRC FOR CATCHMENT HYDROLOGY ACCOUNTABILITY STRUCTURE





**Far Left** CRCBoard Members in session at Future Issues Workshop (FIW)

**Left** Future Issues Workshop (FIW) external participants (Left to Right) Mr Jim Miller (CRC Visitor), Mr Mike Burgess (Dept. Lands, Planning & Environment, NT), Mrs Barbara Wildin (Fitzroy Basin Association)

**Below Centre** Future Issues Workshop (FIW) external participants (Left to Right) Mr Andrew Campbell (Land & Water Australia), Mrs Leith Bouilly (Community Advisory Committee MDBC)

**Below** Program Leaders and Focus Catchment Coordinators workshop, Cobram-Barooga



### ANNUAL STAFF WORKSHOP

The annual CRC workshop was held at Cobram-Barooga, Victoria, in April 2001. It was a chance for participants from research and industry Parties to assess progress in projects, programs and Focus Catchments, look at opportunities and impediments to contributing models to the predictive toolkit. The workshop was also an opportunity to keep a focus on land and water industry needs, and the CRC's role in tackling them.

The workshop underlined that integration of CRC research outcomes is a big challenge requiring people to work together creatively and flexibly. It acknowledged that while water and environmental issues are at the top of the national agenda, solutions in the next decade will be complex with trade-offs. However, the CRC was thought well-placed to have an influence in decision-making, and has a good track record to provide predictive management options.

### PARTICIPATION ARRANGEMENTS

The Centre offers three forms of participation to prospective member organisations:

- CRC Party – with direct involvement in research and technology adoption and a full range of benefits.
- CRC Associate – direct involvement with a selected project and outcomes, plus other benefits.
- CRC Research Affiliate – A new category which provides an opportunity for major research collaboration with organisations outside the CRC.

### CENTRE VISITOR

The CRC benefits from liaison with the national CRC Program and guidance about its strategic direction from Mr Jim Miller, our Centre Visitor. Director General of the Queensland Department of Primary Industries from 1989-94, and now a part-time consultant in agricultural management systems, Mr Miller brings valuable industry knowledge and an understanding of land and water systems to the CRC.

He is also Visitor for three other CRCs - Sustainable Rice Production, Australian Cotton, and Biological Control of Pest Animals.

#### COLLABORATION ACROSS PROGRAMS

The research programs are structured to interact closely. Each project relies on others for crucial information to provide outputs that contribute to the main goal.

The basic concept behind this integrated approach by the CRC is that the drivers of catchment response are climate and land-use. The response to these gives rise to impacts, which, if understood, can be managed.

#### LINKS BETWEEN PARTIES

The cooperative involvement of Centre Parties is structured into projects in several ways:

- research and industry representatives jointly formulate research projects
- projects involve at least two Parties
- focus catchment research sites bring research, industry and regional representatives together
- the Parties participate in project review panels about every six months
- staff are seconded from industry to research sites and vice versa
- postgraduate supervisory panels include non-university members
- an annual CRC-wide workshop is organised for research and industry participants
- regular information exchange is encouraged through email, the newsletter *Catchword* and the internal bulletin *CatchUP*

Parties interact within programs in various projects and activities:

- The Environmental Management Support System to manage water quality across south-east Qld is funded by the SEQRWQMS and involves the CRC through Program 1. Parties collaborating are Brisbane City Council, CSIRO Land and Water, Natural Resources and Mines, Qld, and The University of Melbourne.

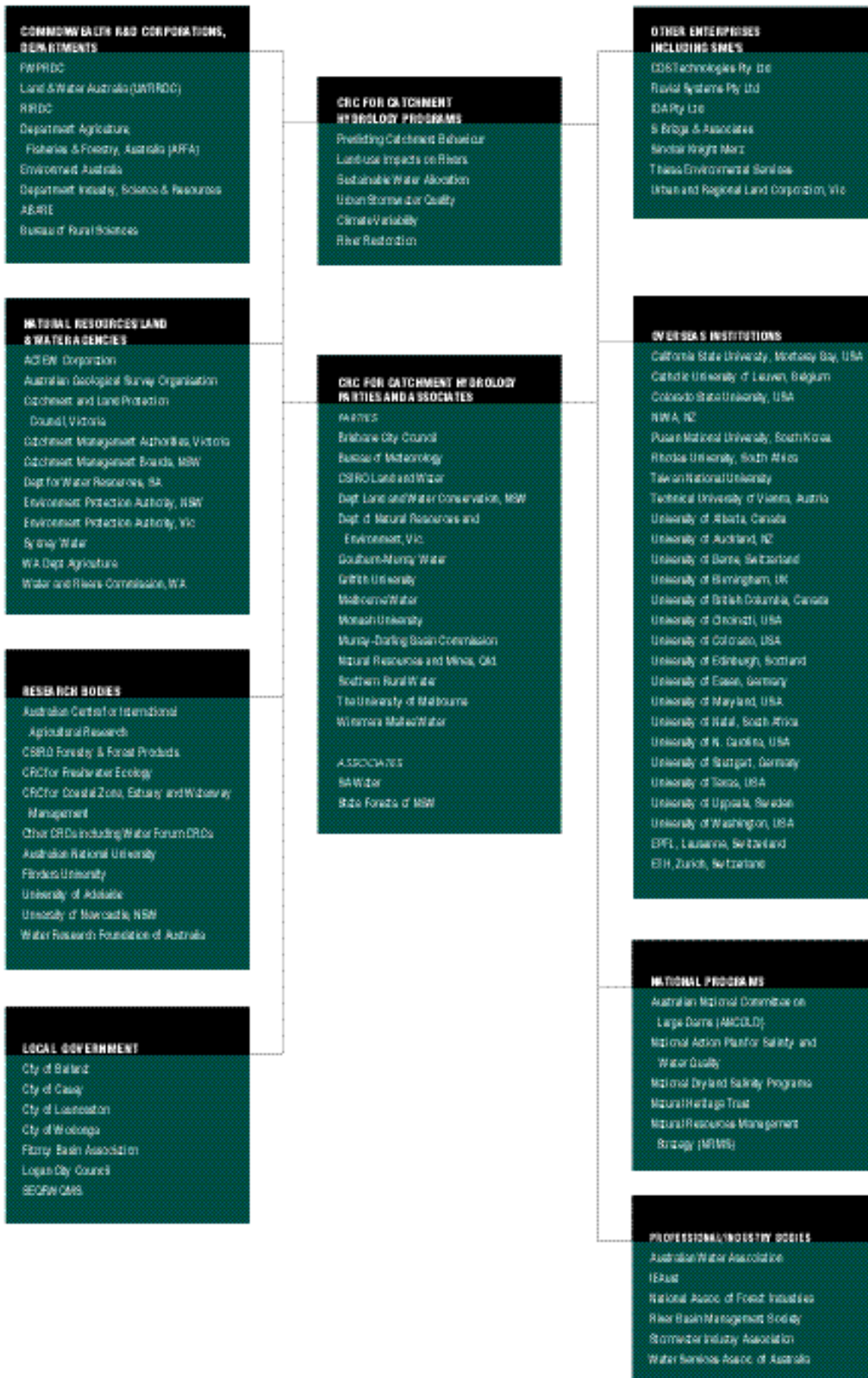
Final reporting of Land and Water Australia's (LWA's) project integrating R&D in catchment management comprised four half-day workshops with representatives of LWA, Bureau of Rural Sciences, Ord-Bonaparte project, MDBC, the Australian Geological Survey Organisation and AFFA.

- The MDBC provided an additional \$750,000 for work through an Associated/Additional Project in Program 2 (Land-use Impacts on Rivers)

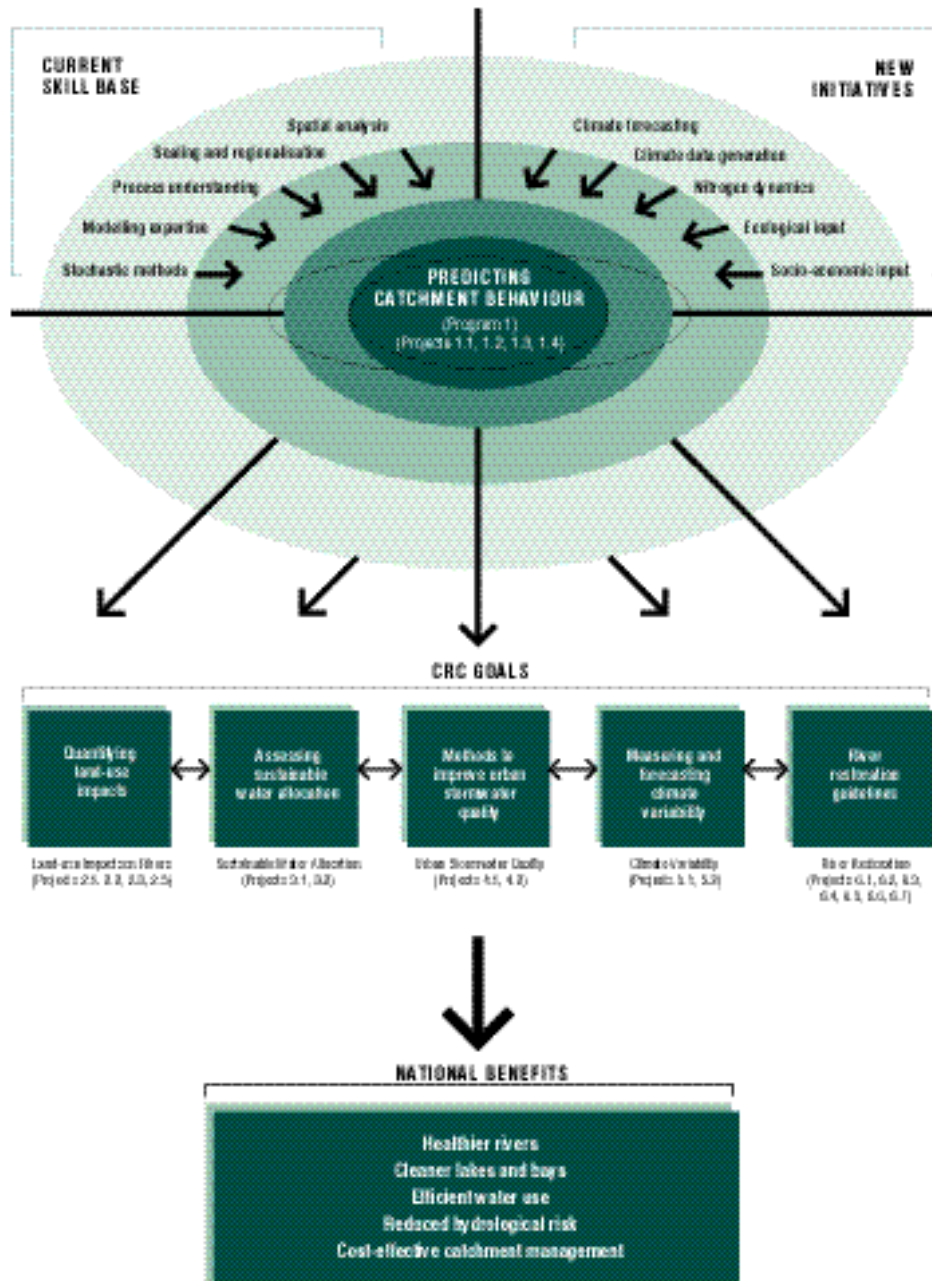
A project looking at the movement of potential pollutants through the landscape in the Brisbane Focus Catchment involves Natural Resources and Mines, Qld and is co-funded by the Coastal Zone CRC.

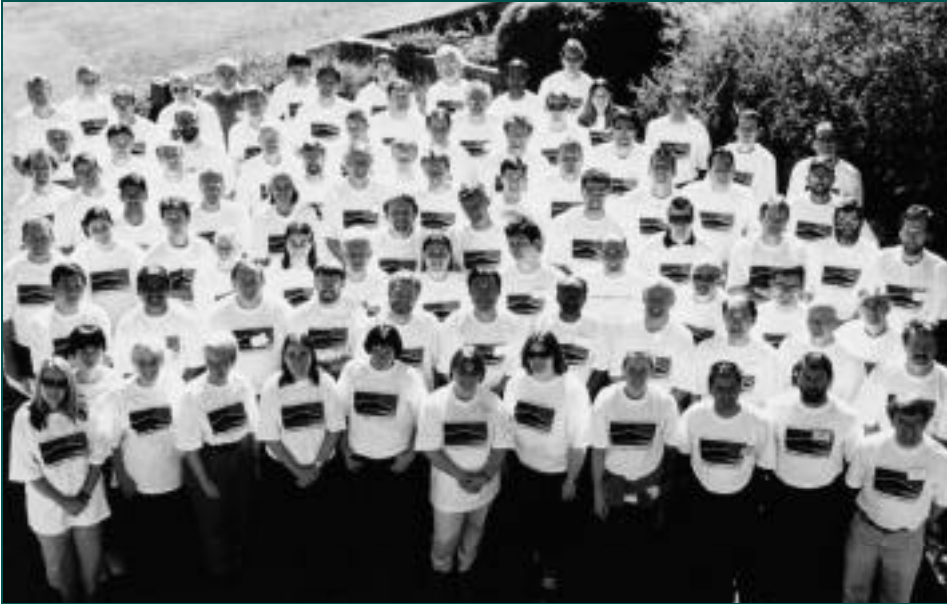


COOPERATIVE LINKAGES



INTEGRATION AND COLLABORATION ACROSS PROGRAMS





Left Participants at Annual Workshop, Cobram-Barooga, April 2001

- Program 3's (Sustainable Water Allocation) Fitzroy and Goulburn Broken Catchment irrigator surveys included all CRC Parties, stakeholder and community groups involved in the catchments. The surveys assessed each group's position on COAG water trading reforms and user-pay initiatives.

- Program 4 (Urban Stormwater Quality) has implemented Water Sensitive Urban Design principles for stormwater management into urban planning policy with Brisbane City Council and Melbourne Water.

An experiment was conducted on the role of vegetated filter strips in treating urban stormwater pollution with the Brisbane City Council in April 2001. A monitoring program for the Ruffey's Creek wetland, Vic, was designed with Melbourne Water.

In December 2000 and June 2001, the CRC initiated Yarra forum meetings with organisations involved in managing the Yarra Catchment, that is, the Freshwater Ecology CRC, Melbourne Water, DNRE Vic and the EPA.

- Several studies undertaken in Program 5 (Climate Variability) involve one Catchment Hydrology CRC -funded researcher working at the Bureau of Meteorology, Melbourne and two Bureau staff working full-time in the Program. The studies relate to forecasting short-term rainfall, space-time characteristics of rainfall and improving land-surface models within the Bureau's forecast models.

- Evaluation of riparian vegetation in a south-east Queensland catchment (a project in Program 6) includes SEQRWQMS, Natural Resources and Mines, Qld, and the Brisbane City Council.

Another project looking at the nature and effectiveness of environmental flows in the Campaspe River involves Goulburn-Murray Water which is the river regulator and a CRC core Party.

Melbourne Water has helped plan and is working in a project to optimise urban stream rehabilitation in Program 6.

Program 6 researchers have been principal organisers of the Third Australian Stream Management conference, to be held in Brisbane in August, 2001, which will bring together key researchers and principal stakeholders to plan how to further the achievement of healthy streams Australia-wide.

- Program 7, Communication and Adoption, and Program 8, Education and Training, enjoy active input from all CRC Parties. Several postgraduate students are co-located at non-university sites, for example CSIRO Land and Water, Canberra.

## COLLABORATION WITH OTHER RESEARCH GROUPS

The Centre adds value to its research outcomes by working with other CRCs and land and water management authorities with complementary research aims, strategies and skills. They are:

- the Freshwater Ecology CRC (River Restoration Program), sharing skills in aquatic ecosystems and environmental flows
- the Coastal Zone, Estuary and Waterway Management CRC sharing modelling capability of flows, sediment and nutrients
- Land and Water Australia, facilitating projects involving riparian zone and dryland salinity management, and sustainable water allocation.
- three CSIRO Divisions participating in a major Murray-Darling Basin land-use initiative
- the Water Forum CRCs, to assist training across the water industry

The Coastal Zone CRC is strongly involved in Project 2.5: Nitrogen and carbon dynamics in riparian buffer zones. The CRC for Freshwater Ecology is collaborating in five of the seven core projects in Program 6: River Restoration.

### INTERNATIONAL COLLABORATION

The Centre is well placed to make a significant contribution to the sustainable management of catchments and water supply in the Asia Pacific. It has important links with the National Taiwan University, the University of South Korea and South Korea's Pusan National University and with international development agencies such as the Australian Centre for International Agricultural Research, UNESCO and the World Bank.

Specific CRC projects involving international collaboration and funding arrangements are:

- in Program 5 Climate Variability, the Murray-Darling Basin will be used as a Focus Catchment for the Global Energy and Water Cycle Experiment. This will link Australian researchers with US-based research groups.
- international funding is assisting research to model the erosion of steep slopes using controlled plot-scale experiments that allow the transfer of outcomes to Asian countries (part of Program 1 Predicting Catchment Behaviour).

### INTERNATIONAL VISITORS

The Centre hosted the following visitors in 2000-01:

- **Prof Geoff Pegram**, University of Natal, South Africa, was awarded a Miegunyah Fellowship to do research at The University of Melbourne during early 2001. Prof Pegram was actively involved in CRC research including collaboration in Program 5.
- **Dr Laurent Beuselink**, Laboratory of Experimental Geomorphology, Catholic University of Leuven, Belgium, continued a collaborative study on sediment data and presented data at a seminar at CSIRO, Canberra in February 2001.
- **Dr Tomas Thierfelder**, Uppsala University, Sweden, was a Visiting Fellow at The University of Melbourne working with Associate Professor Rodger Grayson.
- **Dr Mandy Uys** from Rhodes University South Africa has been working at The University of Melbourne in Program 6, River Restoration.
- **Klaus Hickel**, a Masters student from the University of Stuttgart, Germany, spent six months at CSIRO Land and Water, Canberra, working on water yield modelling with Dr Rob Vertessy.
- **Sebastien Jeannelle**, a Masters student from University of Toulouse, France, worked on reservoir modelling at CSIRO, Canberra for five months.
- **Mark Verbunt**, a PhD student from ETH, Zurich, Switzerland, also spent five months at CSIRO, Canberra, working on water quality modelling.
- **Joe Soberaj**, a PhD student from the University of Cincinnati, in the USA, visited CSIRO Land and Water, Canberra for two months, working on soil hydraulic property prediction.
- **Dr Nora Chiang**, Department of Geography, National Taiwan University Taipei, Taiwan, from the Asian Exchange Program, visited Associate Professor Brian Finlayson at The University of Melbourne. Brian supervises a number of CRC postgraduates and is The University of Melbourne Representative on the Australian Studies Centre, National Taiwan University.
- **Dr David Chen**, from the Chinese University of Hong Kong, visited The University of Melbourne on the Young Asian Scholar Scheme.
- **Assoc Prof Kate Rowntree** from the Department of Geography, Rhodes University, South Africa visited Associate Professor Brian Finlayson to discuss advances and challenges in South African water law.





**Far Left** Dr Tomas Thierfelder, Visiting Fellow from Uppsala University, Sweden

**Left** Prof Geoff Pegram, from University of Natal, South Africa and Mrs Pegram

**Below** Klaus Hicel, postgraduate scholar from University of Stuttgart, Germany



### INTERNATIONAL VISITS

The Centre encourages staff to travel overseas to present their work and establish international collaboration in their research area. In 2000-01, these visits included:

- In July 2000 Dr Robert Argent visited Dr Neil Stuart at the University of Edinburgh, Scotland's Geography Department looking at Geographical Information Systems and multi-jurisdictional catchment management.
- In October-November 2000 Dr Margaret Greenway travelled to Europe, Asia and North America. She visited Professor Wolfgang Grosse, at the University of Cologne, Germany. Professor Grosse is coordinator of a major research project on the Biotechnological Approach to Water Quality Improvement in Tropical and Subtropical Areas for Reuse and Rehabilitation of Aquatic Ecosystems.

She also visited Professor Raimund Haberl, University of Agricultural Sciences Vienna, Institute for Water Provision. Professor Haberl is Chairperson of the International Water Association Specialist Group on Macrophytes for Water Pollution Control. She made a return visit to Professor Haberl's Institute in May-June 2001 to deliver a specialist course on Water Pollution Control, Aquatic Ecosystems and Wetlands.

Dr Greenway visited Dr Jaya Kumar, Warangal Engineering College, India, in November 2000 and will run a joint conference in December 2001.

- From July to October 2000, Dr Tony Ladson was a visiting scholar at the Department of Civil and Environmental Engineering, University of Washington, Seattle and in February 2001 he was a visiting scholar with the Catchment Research group, Department of Geography, Rhodes University, South Africa.
- Assoc Prof John Fien spent three months at UNESCO Paris in August – November 2000 collaborating on teacher education material for promoting sustainable development.
- The Program 1 toolkit modelling team held seminars and workshops in the United States in June/July 2001. Collaborative research discussions were pursued at a number of research centres including ESRI (California), the Centre for Research in Water Resources (University of Texas, Austin) and the International Centre for Ecological Economics (University of Maryland).