COOPERATIVE RESEARCH CENTRE FOR

CATCHMENT HYDROLOGY

The Cooperative Research Centre for Catchment Hydrology is a cooperative venture formed under the Commonwealth CRC Program between:

Brisbane City Council

Bureau of Meteorology

CSIRO Land and Water

Department of Land and Water Conservation, NSW

Department of Sustainability 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

Associates:

Water Corporation of Western Australia

Research Affiliates:

Australian National University

National Institute of Water and Atmospheric Research, NZ

University of New South Wales

Industry Affiliates:

WBM Oceanics

OUR PROJECT PORTFOLIO (2003-2006)

INTRODUCTION

Formation

The current Cooperative Research Centre (CRC) for Catchment Hydrology was established in July 1999, following the successful seven-year life of the initial CRC (1992-1999). The CRC involves fourteen Parties from land and water industry and research organisations, one Associate, three Research Affiliates and one Industry Affiliate.

Aims

The Mission Statement for our CRC is:
'To deliver to resource managers the capability to assess the hydrologic impact of land-use and water-management decisions at whole-of-catchment scale'.

This is complemented by our Vision Statement:
'Sustainable management of the nation's water resources through adoption of an integrated approach to land-use, water allocation, hydrologic risk, and environmental values'

Programs

Our CRC operates with the following research Programs:

1. Predicting catchment behaviour
2. Land-use impacts on rivers
3. Sustainable water allocation
4. Urban stormwater quality
5. Climate variability
6. River restoration

supported by:

7. the Communication and Adoption Program
8. the Education and Training Program

Mountain streams provide valuable catchment water yield and habitat for biota. Photo: André Taylor

Projects

Our CRC has completed most of its first round of three-year research projects. A new round of three-year projects commenced in January 2003.

Our Governing Board has approved 22 new projects, involving 158 staff (50 FTEs) spread across 11 Parties to the CRC. Total resources dedicated to this suite of projects comprise $30 million. The portfolio includes fifteen research projects, 5 development projects and two support projects.

A feature of our new R&D portfolio is the 'Development Projects' for each of our five Focus Catchments: Goulburn-Broken, Murrumbidgee, Fitzroy, Yarra and south-east Queensland. These projects are aimed at putting our modelling products in operation through their application by our industry Parties in the focus catchments. Development Projects are not just about technology transfer; they are also about end-users providing feedback to researchers and shaping future development of the models. We regard these Development Projects as a vital component of our overall approach to getting adoption of research.

Resources

Over our current seven-year term the Commonwealth provides $16.2 million in funding and the Parties provide $51.5 million, including $7 million cash. Our overall budget for the seven-year term is $67.7 million.

Riparian vegetation is an important component in maintaining river health.

OUR TARGET MODELLING CAPABILITY

Modelling Goal

Put simply, our CRC's goal is to develop modelling tools enabling the prediction of catchment behaviour at large whole-of-catchment scales, in response to major land and water management options.

A central part of our activities is to develop a Catchment Modelling Toolkit (our Toolkit project), which will provide integrated catchment prediction tools for land and water managers.

Scale and Spatial Structure

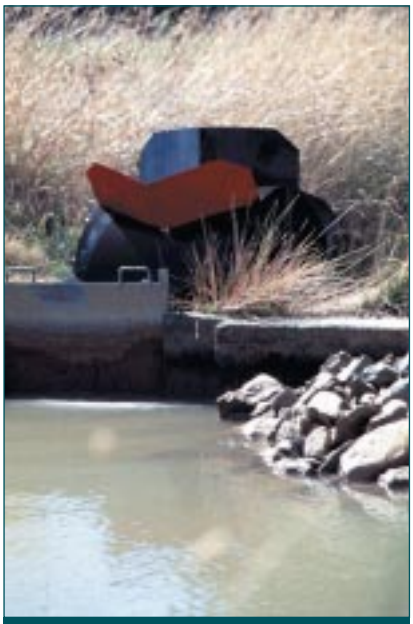
Our ambition is to predict the hydrologic behaviour of large catchments, ranging in size between 10,000 and 160,000 km^2. This is the scale of our five focus catchments. We have to demonstrate a modelling capability at the larger scale of our focus catchments, but we also intend to develop modelling capability at smaller scales. Hence, some of our projects are geared to deliver smaller scale models with more process detail.

In our intended regional model structure, the focus catchments will comprise several hundred sub-catchments, interlinked by a river network of thousands to tens of thousands of kilometres in length. Gridded spatial data of elevation, land-use, climate and soils will be linked to this spatial structure. Software tools have been, or are being, developed in the Toolkit project to enable this. Smaller-scale models will be nested within this structure.

Land and Water Processes

Our goal is to be able to predict the flow and load of sediment, nutrients and salt at any point in the river network of a focus catchment over various time scales from daily time steps, to months or decades.

A key to accurate prediction is linking processes on hillslopes to those in groundwater and rivers (including riparian areas). What we are proposing has not been done before. We also seek the ability to predict the ecologic and economic impacts of changes in river flow and quality. Ecologic consequences will relate to the changed habitat and ecologic health of the river system. Economic consequences will include both catchment and regional impacts.



Sustainable water allocation is a key issue in catchment management.

Catchment Drivers

The primary catchment 'drivers' are climate, land-use, land management, and river management. Our modelling capability must allow users to change these drivers to evaluate their impact on river flow and quality, and consequent ecologic and economic impacts.

Catchment Modelling Toolkit

Building this modelling capability will be a major challenge. So too will be delivering it to the land and water management industry. Our plan is to make all of the models developed within our CRC publicly available through the World Wide Web. Users will be able to download our modelling products (and associated documentation) at www.toolkit.net.au. This web site will include a user forum to assist users with problem solving. The CRC will run an active training program to equip end-users with the skills needed to run these models. Our Development Projects will be an initial test-bed for assessing the utility of our modelling products and will provide useful feedback for the future development of the models.

Integration

In our new project portfolio, there is a major emphasis on integration of our modelling tools. Significant effort has been directed towards identifying ways to integrate these products within the Catchment Modelling Toolkit. An outline of these integrative linkages is provided in Figure 1.

The project team for integrating catchment prediction models (Project 1B) has developed an integration blueprint outlining the technical specifications for our target modelling capability, and worked with other project leaders to ensure that their projects provide outputs that suit our integration needs. Over the next three years, Project 1B has the responsibility of ensuring that we adhere to our integration plan.

Developing a "culture of integration" across our research and industry parties is an important part of our communication activities over the coming three years. This involves not only technical issues of integrating models, but also the promotion of a holistic approach to natural resource management.

Existing models

The target modelling capability described above will be progressively developed over the next three years. However, it is worth noting that our CRC already has a small group of models that operate at the whole-of-catchment scale. Many of these models will be released for industry use in the first half of 2003.

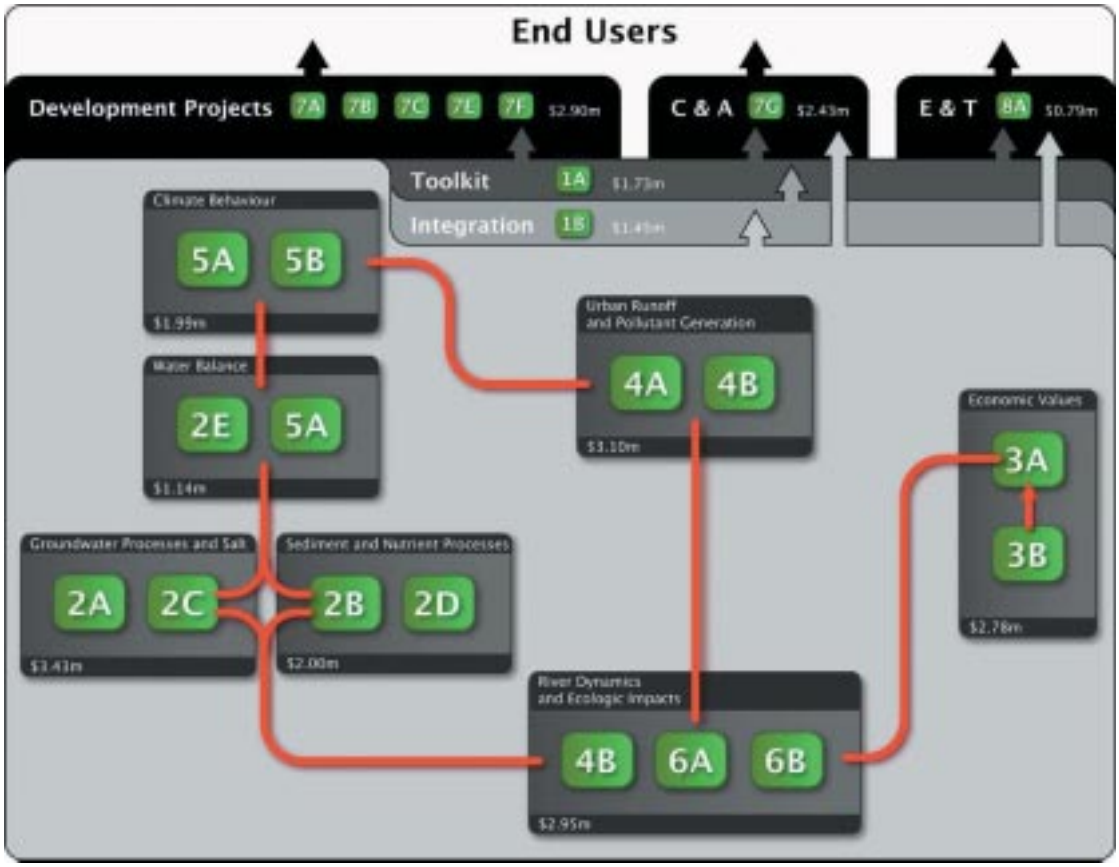


Figure 1. Linkages between projects in the CRC for Catchment Hydrology Project Portfolio (2003-2006). Funds ($ million) allocated in each area of activity are shown.

The TIME framework

Most of the models within the Catchment Modelling Toolkit will reside in a model framework called TIME (The Invisible Modelling Environment).

Developed by our CRC, TIME allows easy building and integration of models written in different programming languages, including Microsoft .NET® dialects of Visual Basic, Fortran 95, C++, Java, Delphi and C#. TIME applications can be deployed as Windows, console or web based systems.

We have developed TIME in response to stakeholder requests that we offer a software development environment that can support multiple languages. Most existing CRC for Catchment Hydrology models written in the TARSIER and ICMS frameworks are being ported to TIME.

The CRC's target modelling capacity will be delivered through the Catchment Modelling Toolkit web site at

www.toolkit.net.au

SUMMARY OF PROJECTS

PROGRAM 1 Predicting Catchment Behaviour

Project 1A: Implementation of the catchment modelling toolkit

Project Leader: Joel Rahman
CSIRO Land and Water, Canberra

Phone: (02) 6246 5701

Email: joel.rahman@csiro.au

This project satisfies a core requirement of the Business Plan to construct the Catchment Modelling Toolkit. The Toolkit is both an adoption pathway to industry and our approach for interlinking models. The project requires significant resources to service all of the other programs, and maintain continuity of specialist software skills. The work program undertaken by this project will be set mainly by the model specification emerging from Project 1B (see below). The project will use the CRC's TIME modelling framework to interlink models and model support tools developed by the other programs.

Duration: 3 years, starting January 2003. Total Budget: $1.78 million

Project 1B: Methods for integration in catchment prediction

Project Leader: Robert Argent
The University of Melbourne, Melbourne

Phone: (03) 8344 7115

Email: r.argent@unimelb.edu.au

This project will be the 'engine-room' of the CRC's integration activity. The aim is to regularly 'workshop' the integration process with each of the other programs to ensure that the discrete models built by each group conform to an overall conceptual design that can be encoded in the Toolkit (a core recommendation of the independent Second Year Review).

Issues being addressed by the project include defining:

- The appropriate space and time scales of models
- The depth of process representation in models
- The estimation of uncertainty in model predictions, and
- Transfer functions to link interacting processes.

The project relies on significant time contributions from each Program Leader to ensure that the required cross-fertilisation occurs. An overall model design will be formulated in this project and used to inform the work of the software engineers in Project 1A.

Duration: 3 years, starting January 2003. Total Budget: $1.50 million

PROGRAM 2 Land-use Impacts on Rivers

Project 2A: Reducing the impacts of irrigation and drainage on river water salinity

Project Leader: Evan Christen
CSIRO Land and Water, Griffith

Phone: (02) 6960 1586

Email: evan.christen@csiro.au

This project focuses on predicting the impact of irrigation management on river water quality. It will link sub-catchment scale conditions (climatic variability, groundwater conditions) and management actions (irrigation practices, drainage design, land-use, water availability) to river networks at whole of catchment scale. The project findings will be demonstrated in the irrigation regions of the Murrumbidgee and Goulburn-Broken focus catchments. The project also aims to link with economic modelling activities being undertaken in Project 3A.

Duration: 3 years, starting January 2003. Total Budget: $1.12 million

Project 2B: Improved suspended sediment and nutrient modelling through river networks

Project Leader: **Ian Prosser**
CSIRO Land and Water, Canberra

Phone: **(02) 6246 5830**

Email: **ian.prosser@csiro.au**

This project is strongly focused on the refinement and extension of the SedNet model, developed for the National Land and Water Resources Audit. It will permit prediction of erosion hotspots within focus catchments and the likelihood of sediment and nutrient delivery to particular reaches of river networks. The project is pitched at just the right spatial scale for our intended integrated modelling capability. New developments will allow the model to operate at a finer time step, improve predictions of river bank erosion, and improve the representation of sediment and nutrient delivery ratio (previously considered a constant).

This project is needed to underpin water quality predictions responsive to climate variability and land-use change. These predictions will have immediate value for the NAPSWQ target setting, the socio-economic models being built in Program 3, and the aquatic ecosystem response models we intend to build in Program 6.

Duration: 3 years, starting March 2003. Total Budget: $1.01 million

Project 2C: Predicting salt movement in catchments

Project Leader: **Mark Littleboy**
Department of Land and Water Conservation, Queanbeyan

Phone: **(02) 6298 4022**

Email: **mlittleboy@dlwc.nsw.gov.au**

This project will deliver the capacity to identify salinity hot spots in focus catchments and to predict the effectiveness of revegetation in reducing salt loads into rivers. It builds upon a large body of modelling work and data capture undertaken by DLWC, DSE, QDNRM and CSIRO. Like Project 2B, this project forms a vital part of our water quality modelling approach.

A key part of the project will be integrating at least two salinity modelling approaches (BC2C and CATSALT) that have different strengths and weaknesses. The BC2C (Biophysical Capacity to Change) model focuses on groundwater flow systems and their water yield and salt load responses to changes in land-use. It is a promising screening tool for setting priorities on which catchments to revegetate, but has limited predictive capability for water quality target setting as it operates on an annual time scale. The CATSALT model operates on a daily time step and therefore offers this capability, though only at a reduced spatial scale and without due consideration to groundwater flow systems.

This project will formulate a hybrid modelling system to address both sets of needs. It will most likely also contain elements of other models.

Duration: 3 years, starting January 2003. Total Budget: $2.35 million

Project 2D: Modelling and managing nitrogen in riparian zones to improve water quality

Project Leader: **Heather Hunter**
Department of Natural Resources and Mines, Brisbane

Phone: **(07) 3896 9637**

Email: **heather.hunter@nrm.qld.gov.au**

In many systems, nitrogen is the 'limiting' nutrient responsible for nuisance algae that threaten aquatic ecosystems. This project will deliver the ability to predict nitrogen influx into streams from shallow groundwater, and to estimate the ability of riparian and in-stream areas to 'consume' the nitrogen via the process of denitrification (microbial conversion of nitrate to nitrogen gas which is removed to the atmosphere).

The project addresses a key requirement in our modelling capability: the ability to estimate the fate of nutrients entering the river network and the efficacy of riparian management in different physio-climatic settings.

This project complements Project 2B (which focuses on nutrient delivery to streams) and two research proposals submitted to Land and Water Australia by CRC researchers.

Duration: 3 years, starting March 2003. Total Budget: $0.99 million

Project 2E: Modulating daily flow duration series to reflect the impact of land-use change

Project Leader: Lu Zhang
CSIRO Land and Water, Canberra
Phone: (02) 6246 5802
Email: lu.zhang@csiro.au

Several components of the CRC's Catchment Modelling Toolkit require an ability to specify how daily flows will change when catchment land-use is changed. For instance, our water allocation, water quality and flow-biota relationship models will all require the ability to forecast how daily flow series will change if we modify land-use.

The purpose of this project is to develop a simple method that can quantify how the daily flow duration series for a catchment will vary in response to a major change in land-use (eg. from agriculture to plantation). The method to be developed will link to available conceptual rainfall/runoff models such as AWBM, SIMHYD, IHACRES and SACRAMENTO.

Duration: 1 year, starting January 2003. Total Budget: $0.20 million

PROGRAM 3 Sustainable Water Allocation

Project 3A: Hydrologic and economic modelling for water allocation

Project Leader: Bofu Yu
Griffith University, Brisbane
Phone: (07) 3875 5258
Email: b.yu@mailbox.gu.edu.au

This project is our main vehicle for integrating biophysical and socio-economic models. It will use the IQQM and REALM models to generate catchment flow regimes for different land and water management policy options.

The project will develop and add a water trading model to the existing water allocation models. The water trading model will permit simulation of the economic consequences of reallocating water resources through trading.

The project harnesses new economic modelling skills from Griffith University, particularly in the area of input-output analysis. It relies on significant input from DLWC and QDNRM researchers using IQQM, and DSE researchers using REALM.

Duration: 3 years, starting January 2003. Total Budget: $1.99 million

Project 3B: An evaluation of permanent water markets

Project Leader: John Tisdell
Griffith University, Brisbane
Phone: (07) 3875 5291
Email: j.tisdell@mailbox.gu.edu.au

This project will extend the CRC's work on experimental water markets. It will provide fundamental insights into the behaviour of water markets that will bound water allocation scenarios to be modelled in Project 3A. There is strong demand within the water industry for this kind of data.

Duration: 3 years, starting January 2003. Total Budget: $0.79 million

PROGRAM 4 Urban Stormwater Quality

Project 4A: Development of integrated stormwater models

Project Leader: **Tony Wong**
Monash University, Melbourne
Phone: **(03) 9905 2704**
Email: **tony.wong@eng.monash.edu.au**

This project will refine and extend the development of MUSIC (Model for Urban Stormwater Improvement Conceptualisation), and promote its use in industry. MUSIC's continued refinement will be based on further fundamental research undertaken in Project 4B. MUSIC will be the principal mechanism for dissemination of our research in the field of Urban Stormwater Quality.

In addition, this project will integrate MUSIC within the whole-of-catchment scale modelling capability that the CRC is building. Further development of MUSIC modules will offer some value to the larger scale models we plan to build for the rural focus catchments.

The project will also incorporate lifecycle cost analysis and ecologic impact prediction into MUSIC.

Duration: 3 years, starting January 2003. Total Budget: $1.65 million

Project 4B: Predicting urban stormwater quality, treatment and impacts

Project Leader: **Tim Fletcher**
Monash University, Melbourne
Phone: **(03) 9905 2599**
Email: **tim.fletcher@eng.monash.edu.au**

This project will improve the reliability of the MUSIC model through the provision of better algorithms and the acquisition of validation data. It will improve the prediction and understanding of urban stormwater quality (for example, association of pollutants with particle size), and incorporate predictions of some new pollutants (such as metals and pathogens). The project will develop the ability to reliably predict the performance of bioretention system performance, with some examination of the role of biofilms in pollutant removal. It will also seek to better predict the role of 'inter-event processes' in determining treatment performance.

This project is tightly coupled to Project 4A, and will deliver much of its outcomes via releases of enhanced versions of MUSIC.

There will be some work undertaken (in association with the CRC for Freshwater Ecology) on the ecologic consequences of urban stormwater management, and water sensitive urban design. The CRC for Freshwater Ecology is running a 'sister project' to this project (led by Chris Walsh, Monash University), focusing more heavily on the ecologic aspects.

Duration: 3 years, starting January 2003. Total Budget: $3.26 million

Many of the CRC's publications are available for downloading as Adobe Acrobat files from the CRC web site. Visit

www.catchment.crc.org.au

Click on the 'Publications' button at the top of the page.

PROGRAM 5 Climate Variability

Project 5A: Hydrologic modelling for weather forecasting

Project Leader: Alan Seed
Bureau of Meteorology, Melbourne
Phone: (03) 9669 4591
Email: a.seed@bom.gov.au

This project promises two things. The first is an improved land surface parameterisation scheme for use in the Bureau of Meteorology's numerical weather prediction models, and focus catchment scale hydrologic modelling in general. The second is continuation of a major field campaign to monitor soil moisture patterns in the Murrumbidgee catchment. The soil moisture monitoring forms an important part of the GEWEX program (an international experiment looking at global energy and water balances). Both of these activities build upon previous work in Project 5.1 and involve substantial in-kind commitments from the Bureau of Meteorology.

One aspect of the project that is crucial to our target modelling capability is the regionalisation (across focus catchments) of parameters used in conceptual rainfall-runoff models, and guidance on how to change these to reflect land-use change (an overlapping interest with Project 2E). There is considerable interest from water authorities in the project; they are eager to use short-term weather forecasts to improve their water system operations.

Duration: 3 years, starting January 2003. Total Budget: $1.42 million

Project 5B: Stochastic rainfall data generation models

Project Leader: Sri Srikanthan
Bureau of Meteorology, Melbourne
Phone: (03) 9669 4513
Email: sri@bom.gov.au

This project will continue building and testing a suite of software programs that can be used to generate stochastic sequences of climate variables for input to our hydrologic models. The emphasis in this project has shifted from the point scale (the focus of an earlier CRC project) to whole-of-catchment scale, by considering spatial correlations in rainfall data. For our hydrologic models to function at focus catchment scales, we require continuous surfaces of climate variables. We could use historical data, but the stochastically-generated maps that will emerge from this project will allow us to put probabilities on modelled catchment responses.

This project promises excellent cooperation with partner research groups (and hence leverage of knowledge) and will yield very practical tools for inclusion in the Catchment Modelling Toolkit.

Duration: 3 years, starting January 2003. Total Budget: $1.55 million

PROGRAM 6 River Restoration

Project 6A: Development of flow-ecological response models

Project Leader: **Nick Marsh**
Griffith University, Brisbane
Phone: **(07) 3875 7101**
Email: **nick.marsh@mailbox.gu.edu.au**

This project will develop software for the Toolkit to allow water managers to quantify the ecological impacts of alternative flow regimes. The project is being jointly conducted with the CRC for Freshwater Ecology (CRCFE), and will build on previous environmental flow research conducted within both CRCs.

The initial focus of the project will be on the development of quantitative models of biotic response to flow. Quantitative flow-biota models will be developed by using existing fish and macro-invertebrate data to validate conceptual models of biotic response to flow. The resulting empirical relationships will be able to 'back-end' our flow predictions made at the focus catchment scale to allow the prediction of biotic response to alternate flow scenarios. CRCFE are running a 'sister project' to this project (led by Angela Arthington, Griffith University), focusing more heavily on the ecologic aspects.

Duration: 3 years, starting January 2003. Total Budget: $0.97 million

Project 6B: Predicting spatial and temporal variations in channel form

Project Leader: **Mike Stewardson**
The University of Melbourne, Melbourne
Phone: **(03) 8344 7733**
Email: **mjstew@unimelb.edu.au**

In large scale hydrologic modelling it is essential to have some knowledge of the geometric properties of the river network (at least width, depth and variance in depth). This knowledge is necessary to achieve credible routing of flow, pollutants (cf. models from Program 2) and coarse sediment.

This project will develop a channel metrics model that can be incorporated into the Toolkit for use in large scale modelling studies. The model will be able to relate changes in river flow (via land-use and climate change) to changes in channel geometry and aquatic habitat. Hence, there is a vital link between this project and the ecosystem response model to be developed in Project 6A.

Duration: 3 years, starting January 2003. Total Budget: $1.18 million

To discuss opportunities for collaborative research including postgraduate study contact

Prof. Rob Vertessy
Director
CRC for Catchment Hydrology
CSIRO Land and Water
GPO Box 1666
Canberra ACT 2601

tel: (02) 6246 5746
fax: (02) 6246 5846
email: rob.vertessy@csiro.au

PROGRAM 7 Communication and Adoption

Project 7A: Development Project for the Goulburn-Broken Focus Catchment

Project Leader: Pat Feehan
Goulburn-Murray Water, Tatura
Phone: (03) 5833 5687
Email: pfeehan@g-mwater.com.au

This Development Project will utilise and further develop the CRC's capabilities in predicting land-use impacts on pollutant (pathogens, sediment, nutrients, turbidity and salinity) delivery and transport, and water yield.

These tools will be progressively integrated during the course of the project, based largely on the current EMSS model interface. The use of these modelling tools in two case study catchments (Mid-upper Goulburn and Upper Loddon) with major water storages (Lake Eildon, Goulburn Weir and Lake Tullaroop) will enable Goulburn-Murray Water and other catchment management agencies to improve their predictions of sources and transport of pollutants and the impact of land-use changes on water yield.

The project will aid development of cost effective, targeted management strategies and guidelines aimed at improving catchment and storage water quality and protect water yield.

Duration: 3 years, starting November 2002. Total Budget: $0.89 million

Project 7B: Development Project for the Murrumbidgee Focus Catchment

Project Leader: Carolyn Young
Department of Land and Water Conservation, Queanbeyan
Phone: (02) 6298 4020
Email: cyoung@dlwc.nsw.gov.au

This Development Project will utilise and further develop the CRC's capabilities in predicting land-use impacts on pollutant (sediment and nutrients) delivery and transport.

Through the project, we seek to make operational within DLWC the modelling tools developed by the CRC in the first round Projects 1.4 (EMSS) and 2.1 (SedNet). The use of these modelling tools will enable DLWC to improve their estimates of sources and transport of pollutants, and to target management strategies aimed at improving water quality. The modelling tools will enable DLWC to provide scientific information to the Murrumbidgee Catchment Management Board (CMB) to refine their water quality target, and also guide investment in the catchment.

As the project progresses, a process of stakeholder engagement (via a Project Steering Committee) will provide the Murrumbidgee CMB and DLWC with regional understanding and support for the management actions proposed.

Duration: 18 months, starting January 2003. Total Budget: $0.22 million

Project 7C: Development Project for the Yarra Focus Catchment

Project Leader: **Graham Rooney**
Melbourne Water, Melbourne
Phone: **(03) 9235 7224**
Email: **graham.rooney@melbournewater.com.au**

Our CRC has developed modelling products in stochastic climate generation, flow routing, pollutant generation and transport, and land-use impacts on in-stream water quality (EMSS) and ecosystem response (LEMSS).

This Development Project will use these products in order to develop a whole-of-catchment model for the rural area of the Yarra River basin. The Department of Sustainability and Environment (DSE) will collaborate with Melbourne Water on this project.

The major outcome being sought is the ability to predict river water quality at the lower end of the rural Yarra River.

Duration: 3 years, starting January 2003. Total Budget: $0.68 million

Project 7E: Development Project for the South-east Queensland Region

Project Leader: **Tony Weber**
Brisbane City Council, Brisbane
Phone: **(07) 3831 6744**
Email: **trweber@wbmpl.com.au**

The CRC has been actively involved in building catchment scale models in the south-east Queensland region, including both EMSS and LEMSS. This development project, entitled "Enhancing Stakeholder Capacity in Prioritising Water Quality Management Actions", is strongly focused on: building the awareness of the existing models; assisting the technical capacity to use, modify and interpret those models; and using the models regionally in water quality planning in the Northern, Western and Lower Brisbane Catchments of south-east Queensland.

Additionally, the application of the models will provide feedback to the model developers to further enhance the toolkit products. The project will be undertaken by staff from both QDNRM and Brisbane City Council and will run in conjunction with work being undertaken by the Moreton Bay and Waterways Catchments Partnership.

Duration: 2 years, starting February 2003. Total Budget: $0.85 million

Project 7F: Development Project for the Fitzroy Focus Catchment

Project Leader: **Bruce Cowie**
Department of Natural Resources and Mines, Biloela
Phone: **(07) 4992 9115**
Email: **bruce.cowie@nrm.qld.gov.au**

This Development Project will apply the CRC's water quality models (EMSS, SedNet and LEMSS) to the Fitzroy catchment and smaller sub-catchments within it. This will be done in close partnership with the Fitzroy Basin Association (FBA), providing a strong catchment stakeholder focus and technical input to the NAP target setting process in that catchment.

The project builds upon a successful environmental assessment modelling exercise involving our CRC, the Coastal Zone CRC and the FBA, and the strong catchment group linkages that emerged from that activity.

Duration: 18 months, starting January 2003. Total Budget: $0.47 million

For further information about CRC activities designed to meet industry needs, please contact

David Perry
Communication and Adoption
CRC for Catchment Hydrology

Department of Civil Engineering
Building 60,
Monash University, Vic 3800

tel: 03 9905 9600
fax: 03 9905 5033
mob: 0419 326 533
email:
david.perry@eng.monash.edu.au

Project 7G: Communication and Adoption

Project Leader: **David Perry**
Monash University, Melbourne
Phone: **(03) 9905 9600**
Email: **david.perry@eng.monash.edu.au**

Goals of the Communication and Adoption Project include:

- Ensuring the integration of effective communication and adoption principles into the planning and implementation of each research program and project.
- Maximising the effectiveness and efficiency of each Program and Project's communication and adoption of research outcomes through the development and implementation of collaborative projects with other programs, industry, other CRCs and research organisations.
- Developing and maintaining current best practice for the communication and adoption of CRC research outcomes and undertake independent reviews at years one, three and five to monitor our effectiveness.
- Utilising the potential communication and adoption capacity of the CRC parties (both industry and research) to extend the CRC research outcomes to end-users in the most effective and relevant form.
- Ensuring effective communication within the CRC parties and within focus catchments.

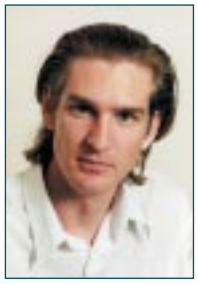
To meet these objectives this project provides delivery support for the CRC research programs including the CRC's website, *Catchword*, CatchUP, technical reports, industry reports, workshops, seminars and annual reports.

Duration: 3 years, starting January 2003. Total Budget: $2.64 million

PROGRAM 8 Education and Training

Project 8A: Education and Training

Project Leader: **Tim Smith**
Griffith University, Brisbane
Phone: **(07) 3875 5176**
Email: **t.smith@mailbox.gu.edu.au**



Project 8A will serve as the foundation to our education and training program, through the scoping, development, brokering and delivery of priority education and training needs of postgraduate students, researchers and stakeholders.

This project will link with all other projects in the CRC for Catchment Hydrology to support the adoption of research outputs by key stakeholders.

Duration: 3 years, starting January 2003. Total Budget: $0.89 million

COOPERATIVE RESEARCH CENTRE FOR
CATCHMENT HYDROLOGY

For further information about the CRC for Catchment Hydrology contact the Centre Office:

Centre Office
CRC for Catchment Hydrology

Department of Civil Engineering, Building 60,
Monash University, Vic 3800

tel: 03 9905 2704 **fax:** 03 9905 5033 **email:** crcch@eng.monash.edu.au
www.catchment.crc.org.au