



5.1 Introduction



*Peter Cottingham,
Knowledge Broker.*

The Centre's goal is to improve the health of inland waters through improving the sustainable management of land and water resources. The application of the Centre's research to support sustainable management is a fundamental measure of the centre's success. To this end, the Centre affords a high priority to knowledge exchange.

A knowledge exchange strategy has been developed to guide the Centre's knowledge exchange activities. The strategy seeks to assist Centre members by providing appropriate information to land and water managers and decision-makers at all levels, and by contributing an ecological perspective to policy debates within the water industry. Future knowledge exchange will be delivered via knowledge exchange plans developed for each of the CRC research programs, while specific technology transfer plans will be developed to help promote the findings of selected projects. The synthesis and promotion of previous research outcomes, with emphasis on the implications for water resource management, is a major component of the CRC knowledge exchange strategy.

A knowledge exchange team has been convened to implement the knowledge exchange strategy and help coordinate knowledge exchange activities. The team includes the Chief Executive, Knowledge Brokers and the Communications Manager. The Knowledge Brokers' specialist role is to provide a window to the ecological knowledge of the CRC for partners and other stakeholders. The team has developed links with the CRC research program and the CRCCH Communication and Adoption Program.

5.2 Major achievements



*John Whittington,
Knowledge Broker.*

- The Centre completed a report for Environment Australia to identify the ecological outcomes of the Council of Australian Governments (COAG) water reforms. The report documents state and territory government progress and assesses the likely ecological benefits of these actions. This information, along with the consideration of emerging issues will aid further development and implementation of the COAG Water Resources Policy.
- The Centre developed a framework for the Sustainable Rivers Audit (SRA) on behalf of the Murray-Darling Basin Ministerial Council. The Centre, in close consultation with water industry representatives, utilised its experience in water quality and ecological assessment to develop the SRA framework, which will be a significant part of future reporting on river health and the implementation of the Cap on diversions in the Murray Darling Basin.
- The Centre was contracted to produce a report "Ecological Sustainability of Rivers of the Murray-Darling Basin" as an input to the "Review of the Operation of the Cap" undertaken by the Murray-Darling Basin Ministerial Council. Recommendations made in the Centre's reports were adopted in the Ministerial Council's Review of the Operation of the Cap and are now being implemented.
- The Centre has produced two reports that document the outcomes of workshops facilitated by the CRC for the Queensland Department of Natural Resources. The workshops and associated reports were undertaken to improve the input of environmental science to the Water Allocation and Management Planning process.

Previous page:
*Salt crystals on remains of dead
tree at Quairading, WA.
Photo: B van Aken*

- AUSRIVAS models and their application continued, with their inclusion in a statewide assessment using the Index of Stream Condition in Victoria, and interest in its use shown by Indonesia and New Zealand. The Centre continued to provide training in the use of AUSRIVAS across Australia and is developing training workshops and materials for agency personnel. The Centre has also liaised with the lead agencies responsible for AUSRIVAS in each state to finalise models for the AUSRIVAS internet site. These models will be widely available for the assessment of river condition around Australia.



*Measuring stream velocity for assessing river health using the AUSRIVAS model.
Photo: P Sloane*



*Nerida Davies calculating alkalinity for assessing river health using the AUSRIVAS model.
Photo: P Sloane*



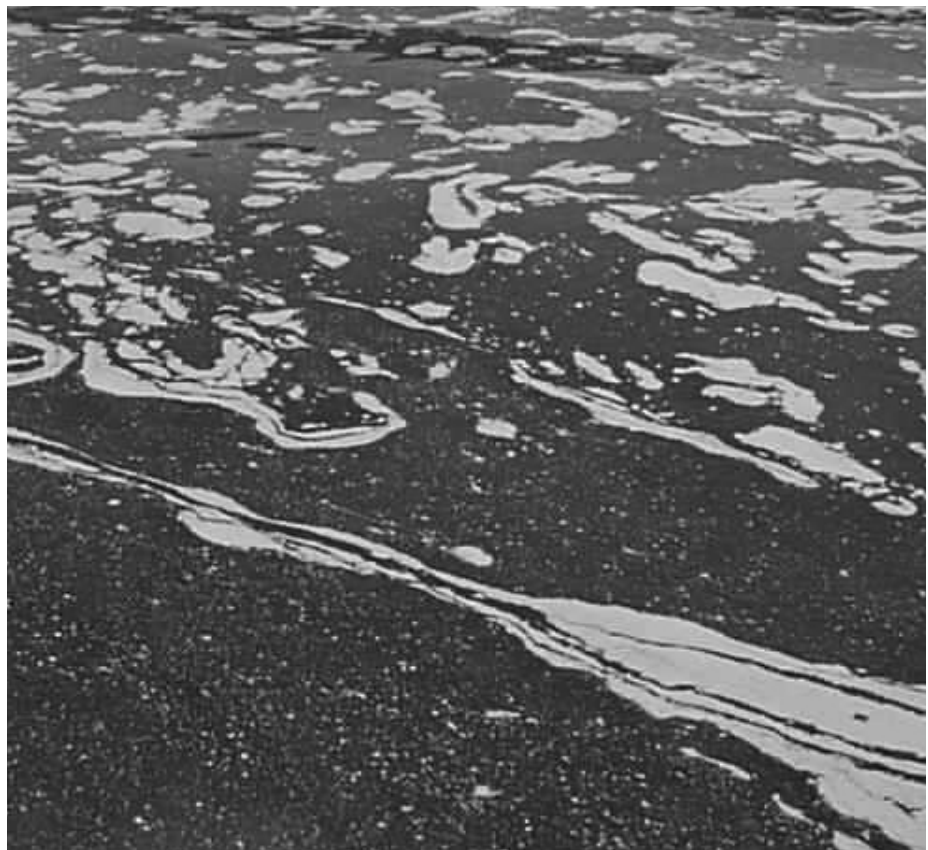
*Dan Mawer collecting an edge sample at Micalong Creek for assessing river health using the AUSRIVAS model.
Photo: P Sloane*

- CRCFE expertise was called on by the Prime Minister, the Minister for the Environment, the Minister for Science, Resources and Industry and the Minister for Agriculture, Fisheries and Forestry, to provide expert advice on water issues.
- CRCFE expertise was sought by the Olympic Coordinating Authority to advise on plant growth in the Olympic Rowing Course.
- The new ANZECC/ARMCANZ Water Quality Guidelines were released to the public for comment. Centre staff contributed extensive drafting material, including the proposal to shift to a risk based – ecosystem assessment approach, and participated in workshops in all capital cities around Australia to disseminate the new philosophy and approach of the guidelines..
- The ANZECC/ARMCANZ National Water Quality Monitoring Guidelines were released to the public for comment. Centre staff played a major part in the restructuring and development of the Guidelines.
- The ANZECC/ARMCANZ National Guidelines for Urban Stormwater Management were released for public comment. Centre staff played a major part in the revision of these Guidelines.



- The Centre continues to be seen as a provider of high quality, independent advice; resulting in significant consulting activity with an annual income of \$1.4 M.
- * Recommendations about the design of stormwater wetlands contained in the CRCFE stormwater pond and wetland design guidelines (Lawrence & Breen 1998) and the joint CRCFE-CRCCH Industry Report (1999 Managing Urban Stormwater using Constructed Wetlands) are being adopted by Melbourne Water in a major stormwater management project to reduce nitrogen loads to Port Phillip Bay. The project is jointly funded by Melbourne Water and the Natural Heritage Trust.
- Knowledge generated from the Centre's urban stream research has underpinned and supported Melbourne Water Corporation initiatives to promote Water Sensitive Urban Design to the land development industry. Melbourne Water Corporation has supported an Urban Land Corporation project to develop a Water Sensitive Design precinct in a commercial land development. The success of the project will be evaluated by CRCCH.
- Members of the Burrinjuck project team conducted two Reservoir Managers' workshops, presenting knowledge gained from the Burrinjuck project and other Australian reservoirs and its implications for reservoir management. The workshops were designed to facilitate productive discussion between the research team and all the participants. A report documenting the workshops was produced; please see section 7.6 for report reference.

*Algae in Burrinjuck Reservoir.
Photo courtesy DLWC*



5.3 Federal Political Briefings

The Centre was highly successful at providing independent advice to Government on science and water issues.

Peter Cullen briefed:

- The Prime Minister on water reform issues.
- The Minister for the Environment, Senator Hill on dilution and salinity in the Lower Murray, in collaboration with Professor Tom McMahon and with assistance from the MDBC.
- Minister for Science, Resources and Industry, Senator Nick Minchin on water issues and science policy.
- The Minister for Agriculture, Fisheries and Forestry, Mr Warren Truss on the PMSEIC Salinity report.
- The Parliamentary Secretary, Sharman Stone on the salinity issue.
- Members of the Labour Science and Technology Committee on science policy issues.
- A group of Labour Shadow Ministers on appropriate responses to salinity.

John Whittington and Terry Hillman discussed water issues with Ms Peta Seaton MP (NSW Shadow Minister for the Environment) and Mr Ian Glachan (Member for Albury) during their visit to MDFRC.

Ben Gawne and other staff discussed water issues with Mr John Forest, Federal Member for Mallee during their visit to the Lower Basin Laboratory.

Ben Gawne and other staff discussed water issues with Senator Lyn Allison during their visit to the Lower Basin Laboratory.

Through his presidency of the Federation of Australian Science and Technological Societies (FASTS), Peter Cullen has been able to influence policy development at the highest levels in government. His last major activity as FASTS President was to lead the 'Science Meets Parliament' day, where 180 scientists had scheduled meetings with 140 parliamentarians. This included six CRCFE staff members. The day was thought to be a great success, and the Speaker and Minister have both indicated it should become an annual event. Terry Hillman, Ben Gawne, Richard Norris, John Whittington and Peter Cottingham also attended and made representations to ten parliamentarians.

5.4 Membership of committees

One effective way of making the Centre's expertise available is by staff serving on Government and community committees. Most staff members actively contribute to committees; the list below covers Management Committee members only.

Prof Stuart Bunn

Member, Scientific Committee for Water Research, International Council for Science. Director, Land and Water Resources R&D Corporation; Member of Communications



Committee, Program Management Committee, Remnant Vegetation Program, and Rivers Policy Group

Deputy Chair, Scientific Expert Panel, SouthEast Queensland Regional Water Quality Management Strategy

Member, River Symposium Advisory Committee

Member, Technical Advisory Panel on Environmental Flows in the Fitzroy Basin for Qld DNR

Member, Editorial Board, Journal of Marine and Freshwater Research

Member, Editorial Board, Ecological Management and Restoration

Member, School Committee, Australian Environmental Studies, Griffith University

Member, Advisory Committee, MDFRC Northern Laboratory

The Murray River, a priceless natural resource that crosses State boundaries.

Photo: B van Aken, CSIRO Land and Water



Prof Peter Cullen

President, Federation of Australian Scientific and Technological Societies
(until November 1999)

Member, Prime Minister's Science, Engineering & Innovation Council
(until November 1999)

Director, Landcare Australia Limited

Chair, ACT Environment Advisory Committee

Member, ACT Science and Technology Council

Member, Gungahlin Development Authority

Chair, National River Health Program Advisory Committee

Chair, ACT State Assessment Panel, National Heritage Trust

Chair, Technical Advisory Committee, Gippsland Water (until April 2000)

Member, Community Advisory Committee, Murray-Darling Ministerial Council

Adviser, Lake Eyre Catchment Management Coordinating Group
Scientific Advisory Committee, Parks Victoria
Director, Water Research Foundation of Australia

Assoc Prof Arthur Georges

Member, ACT Environmental Advisory Committee
Chair, ACT Nature Conservation and Namadgi Sub-committee
Member, Office of the Commissioner of the Environment, Biodiversity Reference Group

Prof Barry Hart

Board Member, Victorian Environment Protection Authority
Member, Victorian Catchment Management Council
Chair, Technical Advisory Group, Gippsland Water
Chair, Scientific Panel, Victorian River Health Strategy
Member, Scientific Advisory Panel, Environmental Flow Monitoring Committee,
NSW Department of Land & Water Conservation
Chair, Victorian Nutrient Management Strategy Implementation Committee
Chair, Victorian Environmental Water Quality Management Committee,
Member, Scientific Advisory Panel to Victorian EPA, Member

Dr Terry Hillman

Member, Lower Balonne Floodplain Project Steering Committee
Member, Off Allocation Water Value Subgroup, MLDCRC
Member, Monitoring Working Group, MLDCRC
Member, Waterlines Steering Committee
Member, Lower Kiewa Revegetation Corridor Steering Committee
Member, Murray Corridor Floodplain Rehabilitation Consultative Committee
Member, North East/Goulburn-Broken Water Co-ordination Committee
Member, Expert Assessment Panel Funding Applications for Fish Rehabilitation Program
(AFFA)
Member, Advisory Group on Hume to Yarrawonga Waterway Management
Member, La Trobe University Regional Board
Member, Charles Sturt University Johnstone Centre Advisory Board
Member, National Executive of the Murray Darling Association
Alternate member for the NSW Murray Unregulated River Management Committee
Board Member, North East Catchment Management Authority
Specialist Adviser, Wetland Care
Member, Murray-Lower Darling Community Reference Committee

Assoc Prof Richard Norris

Chairman, Canberra Region State of the Environment Reporting Committee
Member, ACT Flora and Fauna Committee



5.5 Support for Expert Panels

Dr Gerry Quinn

Member, State Technical Advisory Committee (STAC) for DLWC's IMEF (Integrated Monitoring of Environmental Flows) Program.

An approach pioneered by the Centre is the use of expert panels to provide expertise and make recommendations on water issues. Staff have participated in a number of such panels over the year.

Prof Angela Arthington

Member, Technical Advisory Panels for the Logan, Burnett and Pioneer Basin WAMPs for the Departments of Natural Resources, Queensland.

Scientific Expert Panel for South-east Queensland Regional Water Quality Management Strategy

Scientific Expert Advisor to the River Monitoring Committee, Lower Clarence County Council, NSW.

Prof Stuart Bunn

Scientific Expert Panel for South -east Queensland Regional Water Quality Management Strategy

Technical Advisory Panel for the Fitzroy Basin Water Allocation and Management Plan for the Department of Natural Resources, Queensland

Prof Peter Cullen

Landscape and Open Space Expert Advisory Panel for the Olympic Coordinating Authority

Dr Terry Hillman

Chairman of an Expert Panel on the "Health of the Murrumbidgee River to DLWC and the Murrumbidgee Agribusiness Forum

Dr Bill Maher

ACTEW Expert Panel on Trade Waste

Assoc Prof Richard Norris

Expert Panel on Strategies for the Implementation, Management and Monitoring of Environmental Flows in the Gosford/Wyong Shires.

Assoc Prof Martin Thoms

Queensland Department of Natural Resources, Technical Advisory Panel for Condamine-Balonne and Border Rivers WAMP

Victoria Department of Natural Resources and Environment, River Murray Scientific Panel



- 5.6 Specialist advice, workshops, seminars and presentations** Over the last year, the Centre provided expertise through workshops, seminars and presentations for over eighty industry users and other organisations. Chapter 2, Cooperative Links contains more detail about the knowledge exchange activities for our partners.
- 5.7 Small to medium sized enterprises** Many of the Centre's clients and partners are SMEs. In addition to its regular knowledge exchange activities with SMEs, the CRC is developing an associate scheme, tailored specifically to allow SMEs more systematic access to its ecological expertise.
- 5.8 International committees and activities** Knowledge exchange in international forums is essential to ensure the Centre and the Australian water industry are abreast of the best knowledge from overseas and that the Centre's work is informing international research and practise.

Committee/activity	Country	CRC staff
Member, International EcologyInstitute (ECI)	Various, based in Germany	Peter Cullen
Academy of Technological Sciences & Engineering - Meeting on Foresighting.	Delegation from UK and New Zealand	Peter Cullen
Attended the Binnington Geomorphology Symposium	Various	Martin Thoms
Lecture	Faculty de Ciencias, Universidad de Vigo, Spain	Sam Lake
Inspection of sites and discussions of data interpretation, part of a arge integrated project on the ecological condition of Mediterranean rivers	Universidad de Vigo and Universidad de les Iles Balleares, Spain	Sam Lake
Attended a workshop on ecological monitoring of Mediterranean rivers	Universities of Granada, Almeria, Murcia, Barcelona, Vigo and the Balearic islands, Spain	Sam Lake
Presented four papers at the IXth International Rotifer Symposium, Thailand	Various	Russ Shiel
Presented papers at the annual meeting of the North American Benthological Society (NABS)	Various	Richard Norris, Peter Davies and Stuart Bunn
Provided lectures and advice to visiting Thai academics from arange of institutions, brought to Australia under the TASEAP program.	Thailand	Mike Grace and John Whittington
Attended a workshop with the USEPA	USA	Richard Norris
Scientific Committee for Water Research meeting, International Council of Science	Various	Stuart Bunn



5.8 International committees and activities continued

Committee/activity	Country	CRC staff
Participated in two Workshops of SCOPE (the Scientific Committee on Problems of the Environment)	Various	Sam Lake
Identified microfaunal samples	USA	Russ Shiel
Involved in planning the International Conference on Best Practice Environmental Flows, to be held in Cape Town, 2002	South Africa	Angela Arthington
Presented two papers at XV International Symposium of Odonatology	New York State, USA	John Hawking
Participated in Minnesota Dragonfly Survey	Minnesota, USA	John Hawking

5.9 CRCFE consulting activities Consulting work continued as a significant part of the centre's knowledge exchange activities. Consulting projects provide an opportunity to apply the knowledge and expertise generated by the CRCFE to aid informed decision making and to address specific issues. Consulting work is also a revenue source that assists with the wider knowledge exchange activities conducted by the CRCFE.

Examples of major consultancy and contract projects

Project	Client	Coordinator
Australian Alps Stream Health Monitoring Project	Alps Liaison Committee	R Norris
First National Assessment of River Health	ACT Government, EA	R Norris
Perisher Resorts Biological Monitoring	NSW Parks & Wildlife Service	R Norris
AUSRIVAS Development and Training (various projects)	EA/LWRRDC	R Norris
National Land & Water Audit	LWRRDC	R Norris, M Thoms
Development of Experimental Design & Monitoring for a Weir Draw Down Trial	MDBC	G Wilson
Review of the Ecological Sustainability of the CAP	MDBC	J Whittington
Scope of the Sustainable Rivers Audit	MDBC	J Whittington
Western Rivers Scientific Forum	QDNR	P Cullen
Likely Ecological Outcomes of the COAG Water Reforms	EA	P Cullen, J Whittington
Assessment of Distributed Wastewater Treatment Plant Effluent Standards	ACTEW	I Lawrence
Technical Review of Elements of the WAMP Process of the Queensland DNR	DNR	P Cullen

Examples of major consultancy and contract project, continued

Project	Client	Coordinator
Namoi River Environmental Scan	DLWC	P Cottingham
Thomson Macalister Environmental Flows	West Gippsland CMA, Victoria	B Hart
Woronora River Environmental Flow Monitoring Program Development	SCA	P Cottingham
Review of Lake Wollumboola Catchment Development	L.Wollumboola Support Group	B Maher
Operation Analysis of the Northern Water Feature, Homebush Bay	SOCOG	I Lawrence, Willings
Advice on Stormwater Pollution Control Retrofitting, Development of Wetland Designs, Ellenbrook WA	Water and Rivers Commission, WA	I Lawrence, P Breen
National Water Quality Monitoring Guidelines	EA	Maher
Design of Carrs Park Wetland, Kogarah	Kogarah City Council	Kinhill, I Lawrence
Design of Smithfield Lake, Cairns	Lester Firth	Willings, I Lawrence
Murrumbidgee Environmental Flows Assessment	DLWC	T Hillman
Review of Newcastle Stormwater Management Practice	Newcastle City Council	I Lawrence
Review of Nutrient Export Model	NSW EPA	I Lawrence
Review of Waterway Design	ANU	Kiah Environmental Designers, I Lawrence
Review of SoE Report on Inland Waters, and Brisbane City Council SoE Report	EA/BCC	A Arthington
Monitoring of Fletcher Challenge Paper Cooling Water Discharge to Eight Mile Creek	Fletcher Challenge Paper	J Hawking
Biological monitoring of the Upper Murray	MDBC	J Hawking

A summary of consulting activities is presented in the figures on the following page. The revenue received and revenue per consultancy all increased significantly in 1999/2000, even though the total number of consultancies fell from 1998/99 levels and the Centre declined to accept a number of offers for additional work. These figures reflect the recognition of the Centre as a provider of high quality, independent advice to the water industries.



Figure 5.1:
Number of consultancies undertaken annually

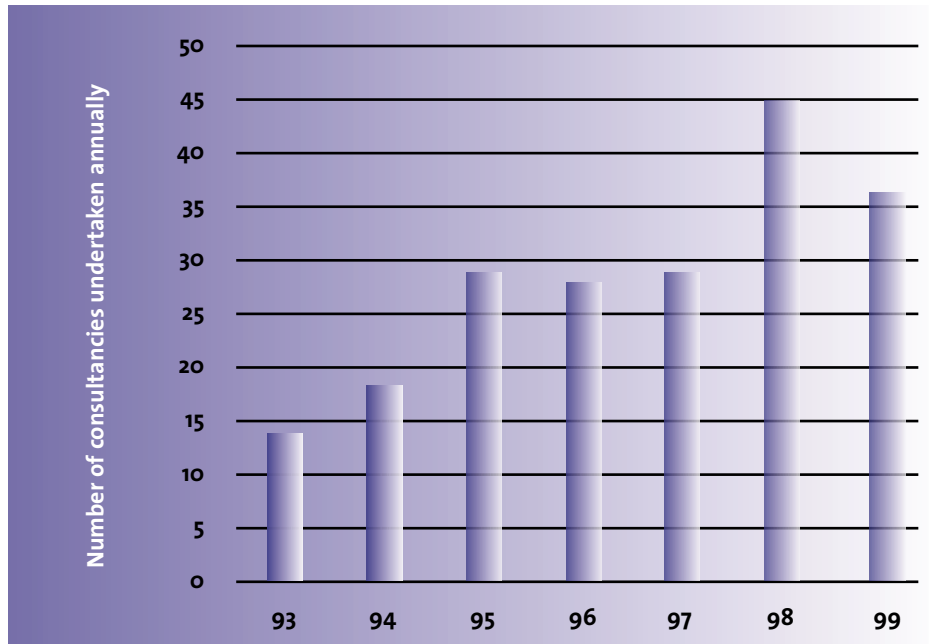
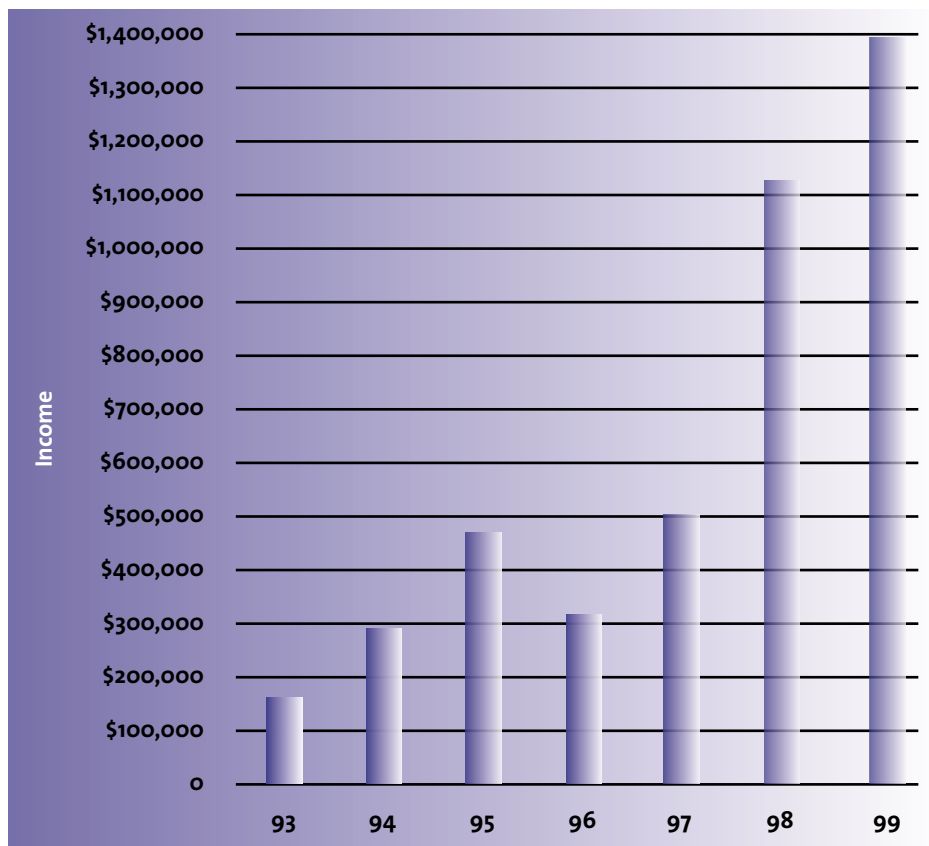


Figure 5.2:
Annual income received from consultancies



In addition to undertaking consulting work directly or as a sub-consultant, the Centre also provides general advice to consultants undertaking natural resource projects.



*Encountering brumbies in Kosciuszko National Park for the Alps Project.
Photo: P Sloane*



Transferring edge sample into container for the First National Assessment of River Health.



Measuring stream velocity using a flow meter for the First National Assessment of River Health.



5.10 Associated Projects

A number of externally funded projects are now included in the knowledge exchange program. The projects cover areas such as the development of resource assessment and communication tools, and the provision of training for the use the AUSRIVAS models for stream health assessment.

Associated projects include:

- The status of fish in the upper Murrumbidgee catchments (M Lintermans)
- Field guide to aquatic and riparian fauna of the southern tablelands (M Lintermans)
- Fish stocking in the Murray-Darling Basin (J Harris)
- Guide to invertebrates of Australian inland waters (J Hawking)
- National land and water audit. Waterway condition: biological assessment and overall integration (R Norris, M Thoms)
- AUSRIVAS training and accreditation (R Marchant, R Norris, J Hawking)
- AUSRIVAS mapping and reference sites screening module (R Norris)
- NRHP - AUSRIVAS software enhancement (R Norris)
- AUSRIVAS physical and chemical assessment module (M Thoms)
- Griffith University contributions to research projects on biological monitoring (Projects DIBM₃ and RR₃) for the SEQRWQMS

*A reference site for the AUSRIVAS model.
Photo: P Sloane*

