



The WRC and National Water Week

National Water Week was celebrated from 22-28 March 2004. The WRC participated in this event as follows:

- Published a special edition of *The Water Wheel* which was distributed to high school learners in Gauteng.
- Held workshops, together with DWAF, to promote water conservation and the SA Youth Water Prize
- Sponsored the prize for the Researcher Under 35 category (Awarded to Claire Reed)
- Co-ordinated the media launch of the WSSCC publication *Listening*
- Held exhibitions at various venues such as the Virgin Active gym in Hatfield
- Provided material for an exhibition held by Johannesburg Water at Johannesburg Zoo Lake
- Provided material for exhibitions in at least six libraries in Pretoria



Mr Jan du Plessis (Editor: *Water Wheel*) addresses learners at the WRC during National Water Week

The WRC @ the Kwanalu Agricultural Union Workshop



The KwaZulu-Natal Agricultural Union (Kwanalu) held a workshop for emerging farmers in Pietermaritzburg from 17-18 February. The WRC was invited to participate and funded a part of the workshop.

The two-day workshop aimed at stimulating economy through agriculture in the province by project delivery and creation of linkages with service providers. Another aim of the workshop was to discuss the direction that needs to be taken by small-scale farmer's leadership in order to fulfil the needs of previously disadvantaged farmers.

The Chairmen and Secretaries of the 32 District Farmers Associations, Kwanalu Board of Governors representing 10 District Agricultural Councils and Kwanalu and the Department of Agriculture and Environment Affairs officials attended the workshop.

Dr Gerhard Backeberg delivered a presentation on how small-scale farmers benefit from WRC activities and how farmers can contribute to achieve the objectives of WRC-funded research. The WRC exhibited WRC reports at the workshop and many participants placed orders for these reports.

Top left: Dr Gerhard Backeberg addressing delegates at the KWANalu Conference

Bottom left: Delegates at the KwaNalu Conference



Calling all innovative scientists

Ecology and Society invite entries for the 2004 Ralf Yorke Memorial Competition. The theme is "Novel Approaches of Integrative Science for the Future". Manuscript submissions, whilst exploring new ways of science, should include a balance of novelty and content. Each submission will be peer-reviewed for content and assessed by a panel of judges for novelty. Details can be found at www.ecologyand.society.org/submit/rysubmit.html. The deadline is June 30 2004.

Newsletter of the Water Research Commission

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Breen There, Done That!

The two-ingredient formula for Charles Mackie Breen's success in the field of aquatic ecology is difficult to fathom: a continual process of stepping back "to gain a bigger picture and being able to link directly with people who were going forward" as well as a tortuous process of "keeping quiet and listening". How this worked for this dedicated scientist, who contributed three decades of his life to aquatic science, baffles me. However, it has worked!

As a young boy growing up in the then Northern Rhodesia, Charles enjoyed being "in tune" with nature, mostly birding. This spurred him on study Botany at Rhodes University. Whilst employed as a junior lecturer at Rhodes, Charles studied further and completed the MSc. and PhD degrees in plant physiology (1960-1970). What followed were a series of career changes and the influence of strong selfless people which propelled this scientist to a level where he was able to make a significant contribution to aquatic science with the added bonus of a man who has immense faith in humanity. Such was his contribution that in 1999 The South African Society of Aquatic Scientists awarded Charles the Gold medal (the highest accolade) for his contribution in this field.

The two most influential people in Charles's career were Brian Allanson who introduced him to research in systems ecology through his programme on Lake Sibaya and the Kosi Lake system and Chris Bornman who stepped aside and made way for the young Charles to "step into the sunlight" – an opportunity that made a huge impact on Charles and his vast contribution to aquatic ecology. It is also true that success makes mammoth time demands on a person. In the case of Charles, his wife Anne and his two sons, Kenneth and Robert, were part of the process of "stepping back". Charles also says, "Graduate students have had a most profound influence on me and my career. I have had wonderful experiences from working with graduate students, many of whom have continued to challenge and stimulate my thinking. In many ways they are the drivers of change and the WRC can be very proud of the way its investment in research has created opportunity for these exciting young people."

In 1970-1971 Charles worked as a Research Fellow at the Indiana State University, USA. He returned to South Africa and was appointed Senior Lecturer in plant ecology at the University of KwaZulu-Natal. In 1980 he was appointed Associate Professor. In 1986 he was appointed Director at the Institute of Natural Resources, University of KwaZulu-Natal. Charles developed this division along business lines until it was registered as a Section 21 company in 1996. The WRC has been a core funder of the Eastern Cape Estuaries Research Programme, which was developed by this division. "It shows that the WRC has a good feel for contemporary issues and is willing to adjust in ways that enable research to be responsive to and interactive with society," says this down-to-earth (no pun intended!) professor.

In the 90's Charles led the interdisciplinary Estuarine and Kruger National Park Rivers Research Programmes (KNPRRP). His sharp mind, hard work and

dedication have resulted in the generation of knowledge which is recognized internationally and is reputed to exceed stakeholder requirements. Steve Mitchell, a director at the WRC says, "Charles's ability to work with people from all walks of life has greatly assisted in his making research relevant to the situation of individuals, and this, combined with the insights of the top scientist that he is, make a recipe for a successful interface between science and people."

Charles's work is characterized by innovation and creativity, traits no doubt attributed to his two-ingredient formula as well as by the influential people surrounding this brilliant man. Charles's innovation and vision are unsurpassed. He was responsible for a wide range of publications. In 1972-1979 he designed and led a research programme which developed a procedure for estimating environmental water requirements of rivers and floodplains. He drove a research programme on wetlands which led to the development of provincial policies and to a decision-support system promoting wise use of wetlands in private ownership. The Consortium for Estuarine Research and Management (CERM) was Charles's brainchild and it is currently used widely by researchers and scientists. In 1990 he conceptualized, designed and established the School of Rural Community Development to provide for outreach and transdisciplinary learning at the University of KwaZulu-Natal. The first virtual school at the University of KwaZulu-Natal was the School of Environment and Development. Once again, this idea was conceptualized and established by none other than Prof Breen. Charles also conceptualized the Protected Areas Management Master's degree programme in association with the University of Montana, SA National Parks and the KwaZulu-Natal Nature Conservation Services.

When aquatic science flows in your veins, it comes as no surprise that retirement translates to continuing with work and making a difference. And Charles chirps, "There is no time for retirement." Following from the KNPRRP, Charles collaborated with colleagues from the University of Montana and SANParks to generate research which is designed to better understand the inter-relationships between demand, capacity and constituencies in protected area management. He is also supervising PhD research programmes that relate to this subject and to community-based natural resource management funded by Ford Foundation. Charles is also on a contract with the World Bank, working with the Transfrontier Conservation Unit (TFCA) within the Ministry of Tourism in Mozambique. This contract entails co-ordinating the activities leading to the submission of a proposal for funding a second phase of TFCA development.

Charles's association with the WRC continues through support that he is affording the Wetlands Rehabilitation Research Project. Such inputs from a giant in this field are certainly appreciated by the WRC and the stakeholders concerned. Charles has lots of praise for the WRC and its innovative character. "The WRC has a wonderful relationship with researchers that is based on dialogue and mutual trust. It is this relationship that provides the crucible for innovation as evidenced in the work of colleagues."

Charles is a firm believer in "systems thinking". He says that "systems thinking" is a powerful mechanism for promoting structured, robust dialogue that forms the foundation for trust, as well as for designing research and implementation. 'Systems thinking' is a mechanism whereby we can promote both the human and technical aspects of research. It also helps us to focus on the issue and not the individuals so that dialogue is less personal and threatening."

Prof Breen, the WRC is glad to be associated with a man of your stature. We at the WRC urge you to take several steps back now and look at the gigantic picture that you have created!

A New Crop

KSA 4 (Water Utilisation in Agriculture) has had a new Research Manager join them. He is Dr Andrew Jabulani Sanewe who hails from Pietermaritzburg.

This 30-something innovative researcher boasts a PhD in Crop Science from the University of Reading, Berkshire, UK. He also holds a BSc in Crop Technology and Resource Management and a Post Graduate Diploma in Management. He is currently studying towards his MBA which he will complete in November 2004.

Andrew's experience is impressive: He undertook experiential training at the Horticultural Research International, Warwick, UK. He returned to South Africa to serve the Pietermaritzburg-Msunduzi TLC as a Coordinator who was involved in the management of the Masakhane project.

In 1999 Andrew joined the KwaZulu Department of Agriculture and Environmental Affairs where he implemented his knowledge on crop technology and advised farmers on such matters. In 2002 he was promoted to Deputy Manager where he was tasked with the overall management of agronomy, horticulture and crop protection.

This enthusiastic scientist views the WRC as a highly efficient organization "at the cutting edge of research". "I think the WRC is a well-managed institution and I am at home here. I hope to remain at the WRC for a long time and I am committed to making a significant contribution to the WRC and its stakeholders."

Andrew relaxes by spending time with his family: His wife, Sindi and his five-year old daughter, Phila. He enjoys settling down to either a novel or a good movie. Andrew is also a keen sportsman and an avid soccer player. Andrew, the WRC is honoured to have a man of your calibre in its family circle. Here's to a long and rewarding career at the WRC.



Farewell Seema

Seema Naicker joined the WRC in November 2000 as a financial officer. She served the WRC until January 2004. Seema joined Old Mutual as a Sales Manager. Seema, the WRC wishes you well in your new work environment.



WARFSA/WaterNet and Capacity-Building

WARFSA (Water Research Fund of Southern Africa) and Waternet have joined hands to create a formidable partnership to address the issue of capacity-building with twelve SADC partners as well as Uganda and Kenya. Waternet is funded by the Dutch government and is based at the University of Zimbabwe.

As an organization, Waternet aims at funding postgraduate studies in the water field as well as building the capacity of staff members at the various institutions. Funds for capacity-building are channeled via staff exchange, nodal strengthening and staff development. This well-structured organization is member driven and consists of a well-organised steering committee that is involved in its AGM as well as the Waternet-WARFSA annual symposium.

The WRC also supports Waternet in its endeavours by assisting with knowledge dissemination: Waternet's Manager, Lewis Jonker of UWC, said, "Waternet relies on WRC publications to perpetuate its work." Steve Mitchell, Director: Water-Linked Ecosystems, is a member of the WARFSA board and is also a role player in Waternet.

What's New

Report No 859/1/03 (Contractor: CSIR & DWAF)

The reliability of small spring water supply systems for community water supply projects

This project stemmed from a need to protect spring water, especially in rural communities. Such a study will improve the planning and design of rural water supply schemes where springs form a significant resource. This project will also demonstrate the value of monitoring springs over a longer period and will result in improved records being obtained, on an ongoing basis, of spring flows at a number of sites in the country. Spring flow monitoring can also provide valuable information on the consequences of drought events and how to predict the need for emergency measures for water supply to rural communities during periods of drought.

Report No KV 144/03 (Contractor: Laughing Waters Aquatic Research)

Development of river rehabilitation in Australia: Lessons for South Africa

This report is the outcome of a four-month Senior Research Fellowship at the Centre for Cooperative Research for Catchment Hydrology (CRCCH) at the University of Melbourne, Victoria, Australia during 2000. The aim of the report is to convey what South Africa can learn from the development of river rehabilitation in Australia, and from their national-level guidelines and methodologies. The report is directed at South Africa and Australian readers from diverse backgrounds and has been aimed at a non-technical level. In addition, geographic, environmental and socio-political "context" have been included.

Report No 1064/1/03 (Contractor: University of KwaZulu-Natal)

A decision support system for rehabilitation and management of riparian systems

A set of tools and approaches were developed that would have general applicability for river rehabilitation in South Africa. They have been developed principally for application in agricultural landscapes, and for streams of third order or less. This project has resulted in the accumulation of a considerable set of resources on river rehabilitation and management as well as the generation of a fair amount of expertise and a number of developing techniques and protocols.

Report No 1115/1/03 (Contractor: Technikon SA)

Assessment of environmental impacts of groundwater abstraction from Table Mountain Group (TMG) aquifers on ecosystems in the Kammanassie Nature Reserve and environs

This project was initiated to investigate the effects of large-scale groundwater abstraction of the Klein Karoo Rural water Supply Scheme (KKRWSS) on the environment. The report represents a culmination of a collaborative effort from various scientists: botanists, ecologists, hydrogeologists and climatologists. Groundwater abstraction and its impact on riparian vegetation, terrestrial vegetation, springs and Cape Mountain Zebra were investigated.

Report No 1287/1/03 (Contractor: McIntosh Xaba & Associates)

A monitoring and evaluation manual for municipal water and sanitation management

There is a need for effective local government monitoring and evaluation (M&E) systems. This water services M&E project will be the first step in creating a culture of performance management at local government level. The purpose of M&E is to provide information to decision-makers about the effectiveness of their administration, their programmes and their projects. It is a decision-making tool for policy makers, and makes it possible for decision-makers to be accountable to the public. This manual concentrates on M&E of ongoing management and is written with two broad aspects in mind: Operations and Maintenance (O&M) and Water consumption and demand management (WC & DM).

Report No 904/1/03 (Contractor: University of Pretoria)

Seasonal climate predictions with a coupled atmosphere-ocean general circulation model

In this project the CSIRO9 Atmospheric Circulation Model (AGCM) with a R21 resolution is used in an effort to produce improved seasonal rainfall forecasts for South Africa. The COCA Coupled Atmospheric Ocean General Circulation Model (CGCM) simulates forecasted Sea Surface Temperature (SST) patterns that serve as boundary forcing for the AGCM. Both the AGCM and CGCM models were developed by the CSIRO Atmospheric Research in Australia.

SST forecasts are supplied by Australian collaborators, while AGCM rainfall simulations are performed on a local super computer. A thorough investigation indicated that CGCM forecasts are superior to persistence and locally generated statistical forecasts. A forecasting technique was developed and probabilistic rainfall forecasts were successfully generated on a local super computer for the 2001/02 summer season.

Report No 1131/1/03 (Contractor: Sigodi, Marah, Martin)

Identifying examples of successful cost recovery approaches in low income, urban and peri-urban areas

This project identified the main causes of successful cost recovery for water services in South Africa and to use this information in the development of practical strategies to overcome obstacles to cost recovery. Following the results of a questionnaire, there appeared to be severe constraints on cost recovery, especially for the provision of basic water services to the poor. An unfortunate implication of these results is that extending basic services to the poor shows a strong tendency toward harming cost recovery outcomes.

Report No 1308/1/03 (Contractor: CSIR)

Resource monitoring procedures for estuaries- For application in the ecological reserve determination and implementation process

Guidelines and procedures are defined for the design of resource monitoring programmes for estuaries as part of the Ecological Reserve Determination process for estuaries, including baseline studies and long-term monitoring programmes. In order to accommodate the variability in the biophysical functioning of estuaries, the approach in setting procedures for the resource monitoring programmes is to provide generic sampling procedures for each abiotic and biotic component, to be applied when a component is selected for inclusion in baseline studies or the long-term monitoring programme of a particular estuary

849/1/03 (Contractor: Rhodes University)

Geomorphological research for the conservation and management of Southern African rivers. Vol. 1: Geomorphological impacts of river regulation

and

849/2/03 (Contractor: Rhodes University)

Geomorphological research for the conservation and management of Southern African rivers. Vol. 2: Managing flow variability: The geomorphological response

These reports present the results of research aimed at refining the geomorphological component of the Inflow Stream Requirement (IFR) methodology through fundamental research into geomorphological processes and the development of the hydraulic biotope concept. Volume 1 examines the geomorphological impact of water resource developments through impoundment behind dams and through interbasin transfers. This volume presents work on the impact of an interbasin transfer between the Fish River and Lake Darlington in the Eastern Cape- the first detailed study of the geomorphological impacts of an interbasin transfer scheme to be undertaken in South Africa. Volume 2 presents work undertaken with the specific objective of supporting the determination of the geomorphological flow requirement for the Environmental Reserve. The geomorphological contribution to the setting of IFRs focuses on three groups of information requirements: the maintenance of channel form, the maintenance of substratum characteristics, and the temporal availability of hydraulic habitat.

Other new WRC Reports:

1234/1/03 Evaluation of the application of natural isotopes in the identification of the dominant streamflow generation mechanisms in TMG catchments (CSIR)

911/1/03 Prediction of the formation of density currents for the management of reservoir sedimentation (University of Pretoria)

953/1/03 Role of the oceans in South Africa's rainfall (University of Cape Town)

1040/1/03 A two-enzyme cleaning-in-place programme for south African dairies (University of Port Elizabeth)

1069/1/03 Cytotoxicity and invasiveness of HPC bacteria (Rand water)

1191/1/03 Microbial characterization of activated sludge mixed liquor suspended solids (University of Pretoria)

939/1/03 Bioreactor systems for the conversion of organic compounds in industrial effluents to useful products (Rhodes University)

KV 142/03 PUTURUN: A simulator for rainfall-runoff-yield processes with in-field water harvesting (University of the Free State)

Reports can be ordered at orders@wrc.org.za

From left tot right: Dr Steve Mitchell (WRC); Prof Johan Rockstrom (Waternet) and Ms Anette Hugo (DWAF)