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Newsletter of the Water Research Commission

February 2003



WRC at the Forefront of Atmospheric Modelling

The 2nd Regional Atmospheric Modelling workshop was held at the University of Pretoria during the week of 25-29 November 2002.

This workshop formed part of WRC-funded research projects that aim to promote, develop and improve the discipline of regional atmospheric modelling in southern Africa. This is the second workshop funded by the WRC and was presented collaboratively by:

- The University of Pretoria (Centre for Environmental Studies and the Laboratory for Post Graduate Research in Atmospheric Modelling (LRAM))
- South African Weather Service (Prediction, Research and Development)

Participants at the workshop consisted of a range of researchers and professionals. The invited guest was Dr Anji Seth from the International Research Institute for Climate Prediction in New York.

Among the delegates were representatives from nine SADC countries: Namibia, Zambia, Tanzania, Botswana, Zimbabwe, Mauritius, Lesotho, Swaziland and South Africa.

The keynote address was delivered by Dr George Green from the WRC. Dr Green discussed the importance of atmospheric research to the South African water sector.

Dr Green (WRC) with delegates at the workshop on Regional Atmospheric Modelling

Dr Gerhard Backeberg: Director: Water Utilisation in Agriculture

Dr Sizwe Mkhize: Research Manager

Gerda Kruger (Co-ordinator)

Linda Smit (Group Assistant)

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Key Strategic Area (KSA): Water Utilisation in Agriculture

This KSA focuses on:

- Increasing the efficient use of water for the production of food, fibre, fuelwood and timber
- Ensuring sustainable water resource use in rainfed and irrigated areas
- Increasing the household food security and profitability, and the livelihoods of people who are dependent on agriculture

Primary objective:

To increase national food security and to improve the livelihoods of people on a farming, community and regional level through efficient and sustainable utilisation and development of water resources in agriculture.

Secondary objectives:

- Increase biological, technical and economic efficiency of water use
- Reduce poverty through water-based agricultural activities
- Increase profitability of water-based farming systems
- Ensure sustainable water resource use through protection and reclamation practices

Research thrusts:

- Water utilisation for food and fibre production
- Water utilisation for fuelwood and timber production
- Water utilisation for poverty reduction and wealth creation in agriculture
- Water resource protection and reclamation in agriculture

Areas of key importance:

- Solving real-life problems of subsistence and commercial farmers
- More effort invested in technology transfer projects
- Effective communication with farmers on farming and irrigation scheme level.

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In This Edition

Water on the Rocks

Dr Lisa Cave is a distinguished environmental geochemist who is based at the CSIR, Stellenbosch. This innovative 28-year old scientist has many accolades to her credit: BSc (Chemistry, Geology) Summa Cum Laude; BSC Hons (Chemistry) Cum Laude; MSc (Environmental Geochemistry) Distinction; Frank Warren Medal for Best Senior Chemistry Student (1994); James Moir Medal of the South African Chemical Institute for the Top Chemistry Honours student at University of Natal, Pietermaritzburg in 1995; the Tony Reynders Memorial Award for the most promising young South African hydrogeologist at the International Association of Hrdrogeologists Congress in Cape Town; best poster award at the 10th International Symposium on Water Rock Interaction in Italy in 2001. In December 2002, Lisa was awarded her PhD in Geochemistry at the University of Cape Town. This acclaimed KwaZulu-Natal born researcher's main professional interest is the use of geochemistry and isotopes for groundwater resource characterisation and water quality management in artificial groundwater recharge schemes.

Lisa has participated in 6 research projects for the WRC and is currently research leader for a project investigating chemical geotherms for tracing deep groundwater flow. Kevin Pietersen, Director: Water Resource Management at the WRC, regards Lisa as "the most promising groundwater scientist in South Africa with the potential to earn international recognition for her work. She has been involved in the WRC-funded study on artificial recharge which presented her with an opportunity to complete both her MSc and PhD studies." This blossoming scientist says, "I have skills in geochemical modelling using PHREEQC software, which I have applied to investigations of water-rock interactions and the impacts on groundwater quality."

In South Africa, Lisa contributed in many ways: Water quality specialist in an ongoing groundwater management project in Atlantis, City of Cape Town; Groundwater consultant in the development of a stormwater management plan for a peri-urban horticultural area in an unconfined, primary aquifer (Philippi Horticultural area). Lisa played an active role as part of a team that was responsible for compiling guidelines for groundwater management under the newly-formed Catchment Management Agencies (CMAs). This involved writing guideline chapters on groundwater protection and groundwater monitoring.

Lisa was invited to the laboratories of the USGS in Boulders Colorado, USA for a 3-month internship in 2000. In May 2000, Lisa played the key role of soil and groundwater specialist in Mauritania, where an investigation was carried out on the environmental liabilities associated with power generation activities at four fuel-fired power stations.

Lisa relaxes by keeping fit, listening to her favourite rock bands or simply curling up with a book. This young lady is committed to being part of the transforming South Africa and relishes in the opportunities that empowered women like herself can exploit.

The WRC applauds water researchers such as Lisa. Her dedication and commitment is apparent and is certainly appreciated. Lisa, your elixir, water on the rocks, must surely be the fountain of your genius!

Non-Solicited Research Proposals Accepted for 2003

The WRC recently issued separate calls for solicited and non-solicited research proposals. In response to the latter, 205 proposals were received, of which 179 were deemed suitable for further consideration by reviewers.

The assistance of a total of 249 reviewers facilitated the smooth running of the entire process. Most reviewers reviewed more than 1 proposal: 56 reviewed 5 or more proposals. A staggering 753 reviews were completed. This translates to approximately 3.6 reviewers per proposal. The WRC is grateful to all the reviewers, who went about their work with great professionalism, and helped to make this process an objective and effective one.

	KSA 1	KSA 2	KSA 3	Total*
No. of proposals received	79	48	78	205
No. of proposals sent to reviewers	67	41	71	179
No. of proposals accepted for full or partial funding	14	8	29	51
Value of proposals accepted (R)	3 145 240	4 255 700	4 882 131	12 283 071

Key:
KSA 1: Water Resource Management
KSA 2: Water-Linked Ecosystems
KSA 3: Water Use and Waste Management
KSA 4: Water Utilisation in Agriculture
* Note that during 2002, KSA 4 did not call for non-solicited research proposals. All funds for new research in this KSA had been allocated to solicited research.

This rigorous process has gone a long way towards ensuring that projects of a high calibre were selected and that water research priorities are being addressed in a manner which will meet the changing needs of society.

Farewell Nozi Mjoli

On 1 October 2002 Dr Nozi Mjoli, former director of the Water Resource Management key strategic area (KSA), left the WRC.

Nozi served the WRC for seven years. During her stint as Research Manager and more recently as Director, she implemented changes in the Rural Water Supply and Sanitation sector. Her research outputs resulted in policy change in this area in the water sector.

Gender issues are also close to Nozi's heart: This was evident when she played a major role in the first regional workshop on Gender & Water and Sanitation which was held in 1997.

The former Minister of Water Affairs and Forestry, Prof Kader Asmal, saw her potential when she was appointed

Deputy Chairperson of the National Water Advisory Council (1996-1998) and Chairperson (1999-2001).

Nozi is convinced that her efforts resulted in the diversity that exists in the water supply and sanitation sector. This innovative researcher, who holds a PhD in Microbiology, is determined to "continue to make a contribution to sanitation delivery, especially among rural communities. This is complemented by also addressing gender issues in the sector."

Nozi has joined Tsinde Development as a Project Manager for the Department of Water Affairs and Forestry (DWAF) - National Sanitation Programme Management Support Contract. To Dr Mjoli, the WRC provided a platform to address these vital national issues. We at the WRC wish you well in your endeavours.

WRC Appoints New Director

Yuven Gounden of the WRC interviewed Kevin Pietersen, newly appointed Director: Water Resource Management

Kevin Pietersen has been appointed Director of the key strategic area (KSA) Water Resource Management. He succeeds Dr Nozi Mjoli. This 37-year old Cape Town-born researcher is no stranger to the WRC. He joined the organization in 1998 as a Research Manager in the groundwater research field.

During this time he has managed to strengthen the role of groundwater by distributing and integrating it over several KSAs at the WRC. The support to post-graduate research has also increased significantly during his stint as Research Manager.

What is your vision for your KSA?

My vision is two-fold. Firstly, I want the KSA, through research support, to ensure that the water resources of South Africa are used optimally and protected so as to ensure sustainability. Consequently, it is important that we develop research programmes that have high research impacts and are relevant to the country's requirements. Secondly, I need to cultivate team spirit within the KSA to ensure that the objectives that we set ourselves are met. In order to promote such a culture, I shall strive to create a healthy, harmonious and collaborative work environment.

Describe your innovation in the groundwater field since you joined the WRC.

I have succeeded in building the profile of groundwater within the context of Integrated Water Resource Management. In doing so, I have expanded the knowledge base in this exciting field. I have contributed by developing high impact research programmes to address the needs of the country.

Will your new appointment take you away from your pet area - groundwater?

On the contrary, I shall still maintain my position as Research Manager who is responsible for groundwater. I shall use my present position as a platform to champion the cause of groundwater as an integral part of Integrated Water Resource Management.

What is your message to stakeholders from the water sector?

I must state at the outset that I am an approachable person and I am amenable to advice and input. I shall initiate participatory and consultative approaches to address research needs and priorities. The focus of my KSA will also be on high impact research and collaboration between institutions and individuals.

More Intellectual Capital at the WRC

On 1 December 2002 Dr Heather Mackay joined the ranks of the WRC. This Zimbabwean-born aquatic scientist boasts a string of competencies in the water sector: expertise in the development of policy tools for sustainable management of water resources and water law reform in South Africa; design and management of multi-disciplinary scientific and technical projects in the environment sector; expertise in the development and derivation of instream water quality criteria for the protection of aquatic ecosystems, to name but a few.

Heather has been involved in several WRC-funded projects in the past: estuarine water quality management, impacts and management of urban runoff, analysis and development of water policy are some of the noteworthy projects.

This distinguished scientist's work experience is varied: a scientist and lecturer in Oceanography; a high school science teacher; Project leader for Water Quality Information Systems at the Council for Scientific and Industrial Research (CSIR); Assistant Director: Water Policy at the Department of Water Affairs and Forestry (DWAF); Executive Director: Living Waters Foundation, South Africa and, more recently as Senior Ecologist at the CSIR.

The WRC can only benefit from the wealth of such expertise and experience. Heather, the WRC welcomes you and cherishes the hope that your stay will be a long and rewarding one.

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The WRC @ the Stander Evening

The biennial Stander Evening was held on 17 October 2002 at the CSIR Conference Centre in Pretoria. The event commemorates the late Dr Gerrie Stander, first Director of the National Water Research Institute at the CSIR and also the first Executive Director of the WRC.

The main guest speaker at this function was Prof WA Pretorius, emeritus professor at the University of Pretoria where he held the position as the Rand Water Chair in Water Utilisation Engineering. The topic of his talk was "*Water Quality Renaissance*".

It is traditional practice for young, innovative researchers to share the stage with eminent researchers such as Prof Pretorius. This year was no exception: Dr Lisa Cave, who is a researcher at the CSIR, Stellenbosch, spoke about "*Water on the Rocks: Geochemistry and Groundwater Quality*"; Dr Graham Jewitt, Senior Lecturer and Programme Director at the School of Bioresources at the University of Natal, addressed the audience on "*The South African National Water Act of 1998: Challenges and Opportunities for Hydrological Scientists*".

This prestigious event was well attended and the audience was once again enthralled by the calibre of the distinguished speakers.

From left to right: Dr Lisa Cave; Dr Graham Jewitt; Prof WA Pretorius; Mr Dries louw (President of WISA) and Dr George Green (Deputy CEO of the WRC)

What's New

Report No. TT 184/02
Calculating Hour-Day Factors for Potable Water Distribution Systems in South Africa

The Hour-Day Factor (HDF) software and this user manual are part of the ongoing process of refining and improving the methodologies for assessing and understanding leakage in water distribution systems in South Africa. This manual contains details of the HDF procedures as well as a user-guide to the HDF model. It also contains a few examples to demonstrate typical factors for situations which may be encountered in the field.

Report No. 932/1/02
Enzymatic Defouling of Ultrafiltration Membranes: A Defouling-on-Demand Strategy Using Immobilised Enzymes

This report focuses on using enzymatic cleaning as an alternative to chemical cleaning since enzymes are biodegradable and do not cause additional pollution problems. In addition, enzymes operate under mild conditions of PH and temperature, and would not contribute to membrane damage. The report presents a new approach for the cleaning of ultrafiltration (UF) membranes used for NOM decolorisation.

Report No. TT 199/02
Corporatisation of Municipal Services Providers

In the light of the South African municipal experience being limited, an attempt was made to address this area. The report provides a definition of corporatisation and guides decision-makers about exercising this option.

Report No. TT 164/01
Micro-Irrigation for Smallholders

This report deals with how smallholders experience micro-irrigation, and how they cope with the difficulties they encounter when using this type of irrigation. It also concentrates on factors that determine success or failure in smallholder crop production when making use of micro-irrigation.

Report No. TT 166/01
Standardisation of the Use of Particle Counting for Potable Water Treatment in South Africa

This report aims to assist users of particle counting technology in the basic principles of this technology. It offers guidelines on aspects such as standards that are applied in the country, handling of data generated by particle counters and presentation of results from case studies in order to illustrate the application of particle counting in potable water treatment.

Report No. 1023/1/02
Inhibition of Biofilm Regrowth in Potable Water Systems

This report investigates the inhibition of bacterial and biofilm regrowth in a chlorinated water distribution system. In order to have a comparative study done, groundwater and surface water as well as mild steel and galvanized steel water pipes were used.

Report No. 1071/1/02
Electrochemical Generation of High-Concentration Ozone in Compact Integrated Membrane Systems

The report deals with the construction and testing of an electrochemical ozone generator. An objective of this project was to combine electrochemical ozone generation with electrochemical generation of hydrogen peroxide to improve water treatment efficiency.

Report No. KV137/02
Alternative Service Delivery Options for Municipalities in the Rural Areas: Kamiesberg Local Municipality Case Study

This report reflects on the viability and feasibility of the creation of water services providers in the current municipal context. The conclusions suggest that the emphasis will be on consolidating municipal capacity and not on introducing flexible and innovative Alternative Service Delivery (ASD).

Report No. 1095/1/02
Development of Generic and Sectoral Competencies in the Water Supply and Sanitation Training Sector

The report aimed at developing generic and sectoral competencies for the community water supply and sanitation sector. The final outcome of the project was a database containing 3 625 competencies, 77 occupational functions, 12 issues, 5 areas and 6 phases.

Report No. 962/1/02
Water Quality Management for Small Communities: Decision-Support Software and Guidelines Manual

This report has as its focus the development of expert systems in order to provide decision-makers with information and expertise on personal computers. An output of the project was WATTREAT, a suite of software, that has been designed to address water treatment for small communities.

Report No. 833/1/02
Measurement of COD (Organics) in Drinking Waters and Tertiary Effluents

In this report an alternative procedure is proposed for assessing dissolved organic carbon (DOC) in water down to concentrations of about 1 mgC/l. The method involves a novel modification to the conventional COD (chemical oxygen demand) test.