



## LETTERS TO THE EDITOR

### **No denying climate change**

The recent response by Dr Midgley and Prof Underhill to the earlier article by Prof Alexander (*Is Climate Prediction Model Flawed*, *Water Wheel* March/April 2007) deserves amplification and emphasis.

Even without the details and statistical analysis provided by Midgley and Underhill, the Alexander article was characterised by some very strange arguments and pseudo-logic. I strongly share the belief that peer review was either absent or minimal. We have a looming problem here and the only uncertainties relate to the magnitude and time frame.

There is the consolation that the Midgley/Underhill article may well have served to bring together data which might not have been easily accessible to many readers. Maybe these authors could be persuaded to provide some directions to authoritative, easily accessible input on climate change implications for this country.

**Prof AT Forbes, Marine & Estuarine Research, Hyper by the Sea**  
(The letter has been edited – Ed.)

### **Cooperation or confrontation in water resource development?**

In the late 1960s, civil engineers in the Department of Water Affairs appreciated that South Africa's water resources would approach depletion soon after the turn of the century. A commission of enquiry was appointed. Its 1970 report resulted in the establishment of the Water Research Commission. The commission of enquiry also recommended that research be conducted on the development of a climate prediction model that was required for future water resource development and management.

Coupled with this research was the need to determine the role of variations in solar activity on climate.

No scientists have yet developed a multiyear climate prediction model or examined the role of solar activity. I examined and reported on both aspects in my technical report, *Long Range Prediction of River Flow – A Preliminary Assessment*, published in 1978. My paper *Floods, Droughts and Climate Change* was published in August 1995 in which I successfully predicted the imminent reversal from drought to flood conditions. I continued my research. In April 2004 my paper, *Development of a Multiyear Climate Prediction Model*, was published in *Water SA*. Based on my studies, in November 2005 I issued a flood alert. Climatologists disagreed. Within three months countrywide floods occurred over virtually the whole of Southern Africa.

My *Water SA* paper had three components. The first was the further development of a multiyear climate prediction model recommended in the commission of enquiry's report thirty years ago, including the influence of solar activity. The second was the development of an advanced method for numerical characterisation of the hydrometeorological processes that would be needed for water resource development and management applications as our resources become depleted. This characterisation makes provision for changes in flow regimes resulting from climate changes once these can be verified and quantified. The third aspect of my paper was that I was unable to detect any changes in the hydrometeorological processes that could be attributed to global warming.

It is not all that clear which of these three aspects Midgley and Underhill challenged

in their response printed in the March/April 2007 issue of the *Water Wheel* (*Is Climate Prediction Model Flawed?*). I have successfully developed, calibrated and verified a multiyear climate prediction model that meets the requirements identified by the Commission of Enquiry more than thirty years ago.

The ball is now firmly in the court of the Water Research Commission. With South Africa rapidly approaching the depletion of our remaining water supplies, and my prediction based on the model that we can expect drought sequences all the way through to 2016, the Commission is under a fundamentally important obligation. The Commission must decide urgently whether or not my studies meet the requirement set out in the report of the Commission of Enquiry that led to the Commission's establishment. If the Commission has doubts about my work then it will have to initiate research on this topic as a matter of urgency.

By publishing the vitriolic article of Midgley and Underhill, the Commission has unintentionally discouraged all future research in this field. No researchers are likely to undertake this research in the knowledge that they may expose themselves to personal attacks such as those published in *Water Wheel*.

**Prof Will Alexander**  
(Climate change remains an extremely passionate issue for researchers, decision makers and the public alike. Due to the many uncertainties that remain, it is understandable that there are many opinions regarding this issue. Only time will tell what the future climate will look like in South Africa. Please note that no other correspondence on this issue will be accepted. – Ed.)

Letters must be addressed to The Editor and can be faxed to (012) 331-2565 or E-mailed to [laniv@wrc.org.za](mailto:laniv@wrc.org.za). Letters are published at the editor's discretion, and may be edited for length. Letters are strictly the opinion of the author(s) only and do not necessarily reflect the considered opinions of the members of the *Water Wheel* or the WRC.

## Let's build together – Minister

Public Works Minister Thoko Didiza has called for greater cooperation in the construction industry in an effort to drive infrastructure development in emerging economies.

As government news agency BuaNews reports the Minister was speaking at the closing session of the International Council for Research and Innovation in Building and Construction in Cape Town earlier this year. She said that the construction industry has a pivotal role to play in infrastructure provision. "Construction creates the foundations of the global economy and the basis for human advancement. It also accounts for about 10% of the global economy, and provides much needed employment and dignity to millions of people around the world."

That is why infrastructure development continues to occupy a central position in government's agenda to roll back the underdevelopment of decades of neglect, Didiza said. The inherited backlog of uneven deployment coincides with the need for new levels of infrastructure investment.

Increased infrastructural development would enable the country to deliver the Accelerated and Shared Growth Initiative of South Africa (AsgiSA) which aims to achieve an economic growth rate of 6% by 2010 and to halve poverty and unemployment by 2014.

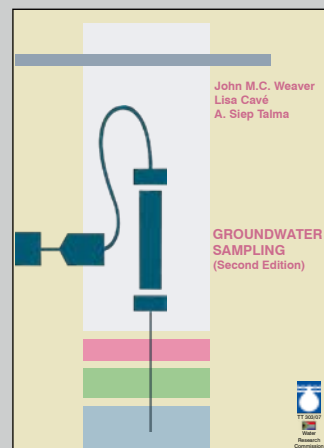
## New groundwater sampling manual available

A new manual on groundwater sampling has been published by the Water Research Commission (WRC).

This revised edition follows the publication of the first manual by the organisation in 1992. Authors John Weaver, Lisa Cavé, and A. Siep Talma explain that the purpose of the manual is to provide consistent groundwater sampling techniques that will ensure that all groundwater quality data collected is representative of in situ groundwater quality.

For many years, groundwater sampling has been directed towards evaluating water quality of aquifers for water supply purposes. Closely allied to this objective has been the curiosity of hydrogeologists, who have wished to understand the natural processes that govern changes in groundwater chemistry over the distances and time of long groundwater flowpaths.

Recently, more attention has been focused on the contamination of groundwater. With this attention the understanding of the complex hydrogeochemical and hydrogeological processes governing the fate and transport of these contaminants has increased. Closely linked to this has been a proliferation of specialised sampling equipment, complex



sampling techniques, and legislation governing sampling at pollution sites.

The new manual incorporates a number of additional sections, such as sampling for isotopes, and down-hole logging, to name a few. Some chapters have been substantially revised to include advances in field instrumentation, such as pH meter technology and increased attention to organic compounds. "The manual provides sufficient technical detail for hydrogeologists involved in water supply projects to collect proper samples, and to conduct hydrogeochemical investigations of natural systems," note the authors.

- To order the manual (WRC Report No TT 303/07) contact Publications at Tel: (012) 330-0340 or E-mail: [orders@wrc.org.za](mailto:orders@wrc.org.za)

## Keeping an eye on our rivers



This year's World Water Monitoring Day will take place on 18 September.

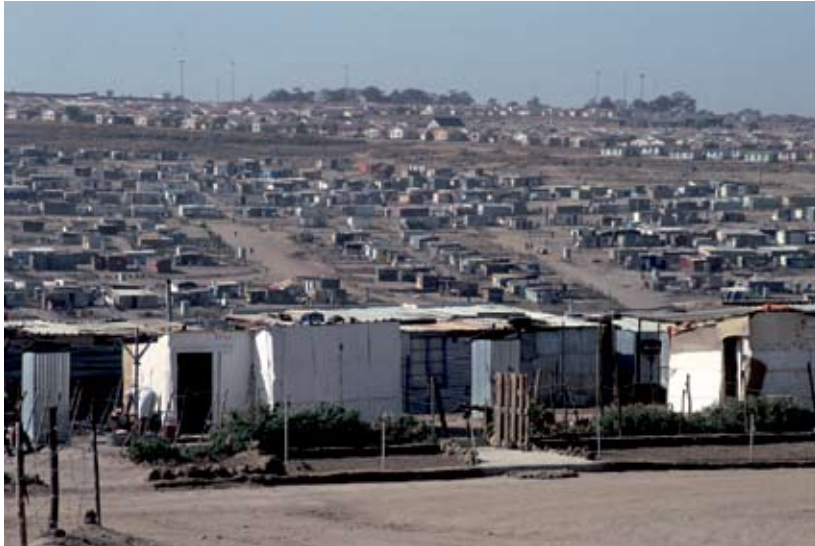
This international outreach programme, created by the Water Environment Federation and the International Water Association build public awareness and involvement in protecting water resources around the world.

Held annually since 2002, the programme engages communities in monitoring the condition of local rivers, streams, estuaries and other water bodies.

On-line site registration and purchase of monitoring kits begins on 18 July. The monitoring period occurs between 18 September and 18 October.

- For more information, go to [www.worldmonitoringday.org](http://www.worldmonitoringday.org)

## SA's housing efforts not enough – UN expert



Despite South Africa's efforts to redress housing inequality, desperate living conditions persist in some areas, according to United Nations human rights expert Miloon Kothari following a visit to the country earlier this year.

Kothari, who is a Special Rapporteur on adequate housing called on the government to boost social services and take other measures to improve all settlements. "Success cannot be measured merely through the number of houses built, but also needs to take into account quality of housing and access to services."

While praising the South African government's post-1994 efforts, he eluded to the many informal settlements which have sprung up as a result of large development projects, rapid urbanisation, and land

restitution claims. "In many such cases, communities do not receive even the most basic support services, including proper sanitation, water, access to schools and access to livelihood options," he said, adding that "there are few follow-up support mechanisms, such as regular maintenance or service repair facilities in cases of resettlement."

To redress these conditions, Kothari recommended that government improve coordination between departments of housing, water, health and social services, ensuring a unified approach to housing. He also advocated inclusive tactics for the rehabilitation of urban areas, strategies to mitigate skyrocketing real-estate prices, restrictions on evictions and renewed concern for shelter for households headed by women.

## R184-m. to get rid of NW buckets

The North West government has budgeted R184-million for the eradication of the bucket system in all formal areas by the end of the 2007/08 financial year, government news agency BuaNews reports.

Delivering his budget speech earlier this year, MEC for Local Government & Housing Pheny Vilakazi said this was

aimed at meeting the 2007 deadline for the eradication of bucket sanitation. One of the local authorities battling to improve sanitation to receive funds is Matlosana Local Municipality, which will have R85-million to replace its 14 000 bucket toilets. In total, North West still has about 25 124 bucket toilets in formal settlements.

## Global news at a glance

- UN-Habitat has signed an agreement with **Coca-Cola** to collaborate on projects to improve community access to water and sanitation in India and Nepal. Among others, the collaboration will see 150 schools in West Bengal state receiving safe water and sanitation facilities.
- The **Sante Fe River** is the most endangered river in the US, according to the American Rivers Organisation.
- The World Bank will be providing US\$360-million in loans and guarantees to the 250MW **Bujagali** hydropower project in Uganda. The scheme, which will be constructed on the Victoria Nile, is due to be commissioned in 2011.
- Eritrea, Ethiopia, Kenya, Uganda, Somalia and Sudan have strengthened East Africa's capacity to predict climate-related disasters through the establishing of a regional **climate monitoring** institution, the Intergovernmental Alliance on Development Climate Prediction and Application Centre.
- New research confirms that avoiding **deforestation** can play a key role in reducing future greenhouse gas concentrations. According to CSIRO, in Australia, deforestation in the tropics accounts for nearly 20% of carbon emissions due to human activities.

## DWAF to spend billions on storing water

A significant percentage of the Department of Water Affairs & Forestry's (DWAF's) R5,3-billion budget for the 2007/08 financial year will go towards financing the construction of bulk raw water infrastructure.

Presenting her first budget as Minister of Water Affairs & Forestry in Parliament earlier this year, Lindiwe Hendricks said funds had

also been set aside for the maintenance of dam safety, weirs, canals, tunnels, pump stations, siphons, pipelines and related buildings. "My department has completed a preliminary assessment of refurbishment requirements, which is estimated at R3,1-billion. While R1,5-billion has been secured we will continue to investigate various avenues for funding the R1,6-billion shortfall."

While construction of the De Hoop Dam gets underway in Limpopo, investigations into a number of other bulk raw water infrastructure projects continue. These include the construction of the Spring Grove and Mzimkulu Off-channel dams in KwaZulu-Natal, as well as the possible raising of the Hazelmere Dam in the same province. Decisions on these projects are expected this year.

Another potential bulk infrastructure being investigated at present is the Groot Letaba River Water Resources Development project in Limpopo. The main feature of this project is the possible construction of the Nwamitwa Dam below the confluence of the Groot Letaba and Nwanedzi rivers. If constructed, this dam could have a storage capacity of 144 million m<sup>3</sup> and an estimated yield of 47-million m<sup>3</sup> a year.

The main purpose of the development is to meet the projected growing primary water requirements of the region to 2025 and to improve the water availability for the riverine ecosystem in an effort to improve the baseflows into the Kruger National Park. The project is also expected to stabilise water availability to the irrigation sector for existing development, including the establishment of resource poor farmers.

Initial feasibility studies were completed in 1998. A bridging study addressing issues pertaining to environmental authorisation; project financing and technical aspects (such as updating cost estimates, optimising configuration and sizes, and reassessing the yield) is underway at present.

It is expected that these projects will in future be implemented through the National Water Resources Infrastructure Agency. Meanwhile, Hendricks pointed to the lack of bulk infrastructure and wastewater capacity as one of the greatest challenges faced by municipalities. "This lack of infrastructure is becoming increasingly acute as we roll out water and sanitation services."

The optimum solution, according to the Minister, was often regional works that could supply a number of municipalities. "My department has decided to establish a special programme for water services bulk infrastructure. The programme will come into operation during this financial year, and a grant amount of R1,4-billion has been allocated over the next three years."

## Heritage Site 'outgrows' old name

South Africa's first World Heritage Site, Greater St Lucia Wetland Park, has been renamed.

According to Minister of Environmental Affairs & Tourism, Marthinus van Schalkwyk, the park's new name, iSimangaliso Wetland Park, better reflects its "unique identity and sense of place". "The 220 000 ha wetland park has outgrown the name of St Lucia, linked to the town and lake of the same name. "The consolidated boundaries of the park now include a third of the length of the KwaZulu-Natal coastline, and destinations such as Kosi Bay, Lake Sibaya, Sodwana Bay, uMkhuze Game Reserve, False Bay, Fannies Island, Charters Creek, Lake St Lucia, Cape Vidal and Mapelane," the minister continued. "In addition, internationally the island of St Lucia in the Caribbean, with its newly-established World Heritage Site, has a strong market presence, which dilutes the brand value of our St Lucia Wetland Park."

## Water by Numbers

- **240** – The number of reservoirs under Umgeni Water's jurisdiction.
- **R4,8-million** – Nelson Mandela Bay municipality's estimated annual savings through its water conservation programme. People in the community are trained as plumbers and sent out to poorer areas to repair leaking pipes and taps.
- **3** – The number of river systems of strategic importance to eThekweni Municipality that are still in a natural state. A total of 61 river systems were surveyed.
- **1 billion** – The estimated number of people who have received at least basic sanitation in the last 14 years, according to the United Nations. About 2,6 billion people are still without toilets, an estimated 980 million of them children.
- **R2-million** – The capital cost of the Koeberg project, which is supplying water to nine farms in the Vanrhynsdorp area, in the Western Cape, through four groundwater pumps, and a new 18 km-pipeline and associated 21 water tanks.
- **11 Ml** – The size of Rand Water's largest reservoir, Libanon. The water utility has a total of 47 reservoirs.
- **R284,8-million** – The total funds allocated to the Eastern Cape to eradicate the bucket system in the province, according to government news agency BuaNews. There are about 58 470 households in the province still using the bucket system.
- **500 l** – The average daily water consumption of a typical resident in California, US.
- **US\$23,1-million** – The earned revenues of the South African desalination plant market in 2006, according to global growth consulting firm Frost & Sullivan. This value is expected to more than triple by 2013 spurred on by increased demand due to expected future water shortages.
- **300 000** – The number of deaths linked to a number of causes most closely connected to shifting weather patterns by 2030, according to the World Health Organisation.

## Water on the Web

[www.hydrogeologistswithoutborders.org](http://www.hydrogeologistswithoutborders.org)

Hydrogeologists Without Borders was initiated by a group of Canadian Hydrogeologists in 2005. HWB is a group of hydrogeologists, water well technicians, groundwater specialists and groundwater organisations who share a concern about the high importance of ground-

water in developing countries. HWB places a particular emphasis on potable water supply to the most impoverished areas of the world and seeks to build hydrogeologic capacity to apply local solutions to the development, use, management and long-term protection of groundwater resources in developing countries.

## Water Diary

### WATER QUALITY

#### AUGUST 13-17

The Unilever Centre for Environmental Water Quality is offering an introductory course in managing environmental water quality. Registration deadline: 24 July. *Enquiries:* Tel (046) 622 2428; *E-mail:* [course@iwr.ru.ac.za](mailto:course@iwr.ru.ac.za)

### SUSTAINABLE DEVELOPMENT

#### AUGUST 15-17

Sustain, the water, energy, earth and air business-oriented exhibition will be held at the Sandton Convention Centre. *Visit:* [www.sustainex.co.za](http://www.sustainex.co.za)

### DRINKING WATER

#### AUGUST 19-22

DWAF, WISA and the WRC are hosting a Drinking Water Quality Conference at Sun City. *Enquiries:* Taryn van Rooyen, Tel: (011) 463-5085; Fax: (011) 463-3265; *E-mail:* [conference@soafrica.com](mailto:conference@soafrica.com)

### BILLING & METERING

#### AUGUST 21-24

Billing & Metering World Africa will take place at the Sandton Convention Centre, Johannesburg. *Visit* [www.terrapinn.com/2007/bmwza](http://www.terrapinn.com/2007/bmwza)

### RIVERS

#### SEPTEMBER 3-6

The 10<sup>th</sup> International River Symposium and Environmental Flows Conference will be held in Brisbane, Australia. This year's

symposium will focus on the emerging field of river management and environmental flows. *Enquiries:* Lynette Maxwell, *E-mail:* [lynette@riverfestival.com.au](mailto:lynette@riverfestival.com.au); *Visit:* [www.riversymposium.com](http://www.riversymposium.com)

### CLIMATE CHANGE

#### SEPTEMBER 3-6

The Third International Conference on Climate and Water will be held in Helsinki, Finland. Main themes include climate change and hydrological extremes, climate change and water resources; risk and risk management; adaptation to the impacts of climate change in the water sector; climate change mitigation and hydrology. *Enquiries:* Esko Kuusisto (conference secretary); *E-mail:* [esko.kuusisto@ymparisto.fi](mailto:esko.kuusisto@ymparisto.fi); *Visit:* [www.ymparisto.fi/default.asp?contentid=169172&lan=en](http://www.ymparisto.fi/default.asp?contentid=169172&lan=en)

### RIVERS

#### SEPTEMBER 3-6

The Tenth International River Symposium and International Conference on Environmental Flows will be held in Brisbane, Australia. *Enquiries:* Emily Smigrod, River Symposium event coordinator; Tel: +61 (0)7 3034 8230; Fax: +61 (0)7 3846 7660; *E-mail:* [Emily@riverfestival.com.au](mailto:Emily@riverfestival.com.au); *Visit:* [www.riversymposium.com/index.php?page=Symposium2007](http://www.riversymposium.com/index.php?page=Symposium2007)

### HYDROLOGY

#### SEPTEMBER 6-7

The 13<sup>th</sup> SANCIAHS Symposium will be

held at Breakwater Lodge, in Cape Town. The theme for this year's symposium is "Hydrology and Water Resources: The Future is Not What It Used to Be." *Enquiries:* Roxanna Cloete, Tel: (021) 481-2446; Fax: (021) 424-5588; *E-mail:* [Roxanna.cloete@shands.co.za](mailto:Roxanna.cloete@shands.co.za); *Web:* [www.ru.ac.za/institutes/iwr/index/html](http://www.ru.ac.za/institutes/iwr/index/html)

### WASTEWATER TREATMENT

#### SEPTEMBER 9-13

IWA's 10<sup>th</sup> Specialised Conference on Large Wastewater Treatment Plants will be held in Vienna, Austria. This conference aims to promote the exchange of experience and knowledge in wastewater treatment between designers, managers, operators and scientists on an international level. *Enquiries:* [austropa@interconvention.at](mailto:austropa@interconvention.at)

### GEOCHEMISTRY

#### SEPTEMBER 10-14

The 7<sup>th</sup> International Symposium on Applied Isotope Geochemistry will be held in Stellenbosch, Western Cape. *Enquiries:* Dr Jodie Miller, Chair organising committee, Fax: (021) 808-3129; *E-mail:* [aig7@sun.ac.za](mailto:aig7@sun.ac.za); *Web:* [www.sun.ac.za/geology/aig7.htm](http://www.sun.ac.za/geology/aig7.htm)

### DAMS

#### SEPTEMBER 17-19

The 14<sup>th</sup> German Dam Symposium will be held in Munich, Germany, in conjunction with the Seventh ICOLD Symposium. *E-mail:* [talsperre@conventus.de](mailto:talsperre@conventus.de) or *Visit:* [www.conventus.de/talsperre](http://www.conventus.de/talsperre)

## CT ups pump station power to help curb spills

The City of Cape Town will in future be using mobile and fixed power generation plants in collaboration with the city's electricity department to curb possible sewage overflows.

In a report to the Utility Services Portfolio Committee, the Directorate of Utility Services says there are 501 pump stations in the metropole. Of these, 376 are used to pump sewage while others are used to pump potable water to higher lying areas.

In the last year, at least 33 of the sewage

pump stations failed, mainly due to local power failures. "The City has considered installing standby generators at all sewage pump stations. However, this would come at an installation cost of R30-million," reported Clive Justus, Chair of the Utility Services Portfolio Committee. "As this would not guarantee perfect functionality, the City has now embarked on a strategy of using a combination of mobile and fixed generation plant."

All sewage pump stations are monitored

via a telemetry system which monitors which pumps are running, the availability of pumps, as well as pump trip conditions, including mains failure and power outages, wet well high level alarm, and intruder alarms in high-risk areas. These monitoring systems provide an early warning to rectify the situation before the pump station overflows. The average response times to alarms range from 30 to 60 minutes, which is in most cases ample time to prevent pump station overflows, the City said in a statement.

## HELP – Linking hydrology with society's needs

*With the HELP Southern Symposium taking place in South Africa in November, it is prudent to reflect on the origin and purpose of the HELP initiative and touch on progress that has been made to date.*

**H**ELP (Hydrology for the Environment, Life and Policy) is a joint UNESCO/WMO programme which is designed to establish a global network of catchments to improve the links between hydrology and the needs of society. It is a cross-cutting programme of the UNESCO International Hydrological Programme, the key intergovernmental programme to advance water science.

In many international water fora, for example the Second World Water Forum in The Hague in 2000, there has been a growing call to advance processes of collaboration between science and technology in a field context and water policy and management. This finally led to the HELP Programme, designed to create a framework that enables water law and policy experts, water resources managers and water scientists to work more closely together on water-related problems and achieve scientific results that are more directly beneficial to the needs of society.

This is to be achieved in an integrated long-term programme with process hydrology undertaken at larger drainage basin scales than previously, so that it can be of more practical value to the resource management process. Importantly, the HELP design also recognised the inequality of opportunity between developed and developing countries, and therefore emphasises the technology transfer, education and capacity-building initiatives needed to allow the HELP objectives to be achieved throughout the world.

To date, some 70 HELP basins have been set up worldwide, with 14 of them in Africa. South Africa has two HELP basins, namely the Olifants

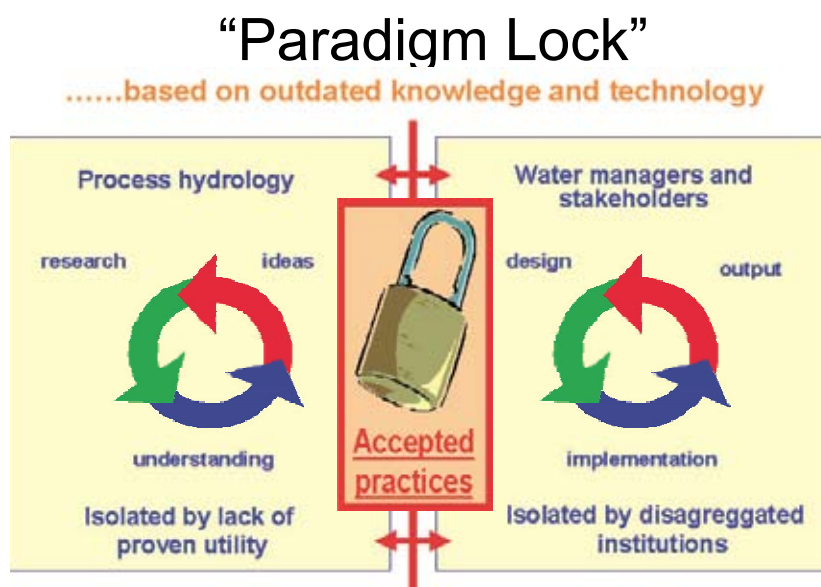
(draining into Mozambique) and the Thukela. These initiatives are being led by the International Water Management Institute (IWMI) and the University of KwaZulu-Natal respectively. A further HELP basin for the Berg River, coordinated by the University of the Western Cape, is under consideration. With the unique challenge provided by the National Water Act that water resources management should be devolved to 19 catchment management associations, it would seem desirable that each catchment and its management association should have an academic institution at its side, providing essential scientific support.

Given the need for science-led water resources management, the Department of Water Affairs and Forestry in 2005 took the strategic decision to strengthen its National Committee for the UNESCO-IHP. The Committee is now representative of the water sector as a whole and the Secretariat is provided by the Water Research Commission.

Some four hundred HELP basin representatives and water resources specialists from around the world will share their experiences and chart the way forward for this important initiative. A particular challenge for the Symposium organisers is how to not only make this an excellent once-off event, but an ongoing process for sharing and learning – a HELP related International Centre of Excellence maybe?

To encourage wide participation from roleplayers and particular students, the South African Committee has extended the Call for Posters on the Symposium Themes until 31 July 2007. Please submit your 1 page (150-300 words) to [wbfv@dwaf.gov.za](mailto:wbfv@dwaf.gov.za)

Should you be interested to attend this event, registration can be done via the Symposium website [www.unescohelp.co.za](http://www.unescohelp.co.za) which also contains greater detail on the poster requirements.



*The 'Paradigm Lock' based on outdated knowledge and technology.*

## New phase as TCTA turns 20



**T**CTA, originally created to implement and oversee the South African side of the Lesotho Highlands Development Project, has turned 20.

The company, a Schedule 21 State-owned entity, later handled liability management of the project. In 2002, TCTA was appointed to fund and implement the Berg Water Project (BWP) near Franschhoek, in the Western Cape. Construction of the project started in July 2004 at an estimated cost of R1,6-billion. The project is funded through a combination of long-term committed facilities and a commercial paper programme to cater for short-term liquidity requirements.

In 2004, TCTA was further issued a directive by the Minister to implement and fund the Vaal Pipeline Project (VRESAP), a 121 km-long pipeline that abstracts water from the

Vaal Dam to Secunda to sustain economic growth and development in Mpumalanga.

Sasol and Eskom are the main beneficiaries of this R2,5-billion emergency project. The project is funded on a similar structure as the BWP.

"The occasion of our twentieth anniversary assures a new phase in TCTA's life," said Chair Malixole Gantsho. "We see ourselves as a key component of the future National Water Resources Infrastructure Agency, drawing on the reservoir of our experiences and playing a catalyst role in the responsibility of funding, financing, implementing, administering, further developing, altering, refurbishing, operating, maintaining and managing South Africa's national water resources infrastructure going forward."

## Water on the Web

[www.ewisa.co.za](http://www.ewisa.co.za)

E-WISA is the new business and information system of the Water Institute of Southern Africa (WISA), established to promote the Institute's vision of "building expertise, sharing knowledge and improving the quality of life for all South Africans." The main objective of the initiative is to promote capacity building through online and off-line learning programmes. The website offers information on various subjects, including water companies, water resources, potable water and capacity building.

<http://water.nml.uib.no/>

The Water Research Network database is a collaborative effort, run by the University of Bergen, in Norway, and sponsored by the Norwegian Research Council and the Dutch government. The database is a tool in the process of creating a multi-volume publication entitled *History of Water and Civilisation* initiated by UNESCO. The database is said to be useful for researchers and students from various disciplines dealing with the role of fresh water in history and development.

## Anglo Coal aims for zero waste through new project

**C**SIR and Anglo Coal have signed a contract for the construction of a demonstration plant to recover products from waste gypsum.

The plant will reportedly make use of CSIR's patented GypSLiM process which produces sulphur, limestone and magnesite from the waste gypsum produced during the neutralisation of acid mine-water.

Anglo Coal, in partnership with BHP Billiton, is currently constructing the world's first plant to produce drinking water from acid mine drainage. Water from the plant, which will have an initial capacity of 20 Ml/day, will be supplied to the Emalahleni Local Municipality.

"Anglo Coal sees this (pilot project) as an exciting opportunity to solve the waste problem by converting a mining environmental liability into a sustainable asset," said Rian van der Merwe, Anglo Coal Head: Joint Ventures and New Business Development. He emphasised that even at the present 99% water recovery at the Emalahleni Water Reclamation Plant, the waste being produced over the next 20 years will cost R300-million to manage, while the coal mining house is aiming for zero waste disposal.

## Chlorine gas plant planned for Coega

**T**he Coega Industrial Development Zone has signed its tenth investor, Singaporean chlorine manufacturing and water desalination company Straits Chemicals.

The firm is reportedly investing R5,8-million in its Coega plant, which is expected to be constructed in two years' time. Once up and running, it is expected to turn out 600 t of chlorine a day for local and international markets. About 250 permanent jobs will be created by the new plant.

## US fish show estrogenic activity

A new study from the US' University of Pittsburgh Cancer Institute's Centre for Environmental Oncology suggests that fish caught in Pittsburgh rivers contain substances that mimic the actions of estrogen, the female hormone.

The study also demonstrated that the chemicals extracted from the local fish can cause growth of estrogen-sensitive breast cancer cells cultured in the laboratory. Extracts of fish caught in areas heavily polluted by industrial and municipal wastes resulted in the greatest amount of cell growth. "We know that there are hundreds, even thousands, of chemicals in the environment that can have estrogenic activity," said Dr Patricia Eagon, a principal investigator of the study. "These chemicals usually come from industrial pollution, farm animals, farm chemicals and municipal water treatment plants. What surprised us most in this study was that these estrogenic materials are present in such easily detected levels in local fish."

The next step in this research is to identify the estrogenic chemicals and their sources in the local water and fish.

## Aliens use 'resource conservation' as weapon

Biologists have long assumed that alien species pose less of a threat in resource-poor environments because they are less able to compete with indigenous plants, which have adapted to their habitats over thousands of years.

However, a new study, published in the April 26 issue of the journal *Nature*, has found that invasive alien plants can indeed flourish in low-resource environments by adopting efficient ways to use available resources. Jennifer Funk, a postdoctoral fellow in the Stanford Department of Biological Sciences explains that the researchers studied three ecosystems in Hawaii, a forested area with limited light, volcanic soils with low nutrients and a desert.

A total of 19 invaders were compared with 19 closely-related indigenous plants. "Invasive plants were more efficient on



short-time scales, but overall there is no difference in the long term," said Funk. "We were surprised that the invasive plants were not at a disadvantage under conditions where resources were scarce."

## Bottled water pricey for environment

The present boom in the global water market could have detrimental effects on the environment, according to a new report by US organisation, the Worldwatch Institute. In parts of the world excessive withdrawal of natural mineral or spring water to produce bottled water has threatened local streams and groundwater, while the product consumes significant amounts of energy in production and shipping.

Millions of tons of oil-derived plastics, mostly polyethylene terephthalate (PET), are used to make the water bottles, most of which are not recycled. Each year, about two million tons of PET bottles end up in landfills in the



US alone, according to the report.

"Bottled water might be an industry winner, but it's an environmental loser," said Ling Li, a fellow with the Institute's China Programme who authored the report. "The beverage industry benefits the most from our bottled water obsession. But this does nothing for the staggering number of the world's poor who see safe drinking water as at best a luxury, and at worst, an unattainable goal." Consumers in industrial countries choose to drink bottled water for taste and convenience, while in developing countries, unreliable and unsafe municipal water supplies have driven the growth in consumption. Yet many poorer people who seek improved drinking water supplies cannot afford the bottled version. Bottled water can be between 240 and 10 000 times more expensive than tap water. Global consumption of bottled water more than doubled between 1997 and 2005, securing the product's place as the world's fastest-growing commercial beverage. The US remains the largest consumer of bottled water, but among the top ten countries, India has nearly tripled its consumption, while China more than doubled its consumption between 2000 and 2005.

## Premature babies caused by pesticides in water

The growing premature birth rate in the US appears to be strongly associated with increased use of pesticides and nitrates, according to work conducted by the Indiana School of Medicine.

According to Prof Paul Winchester, his team's research found that preterm birth rates peaked when pesticides and nitrates measurements in surface water were highest (April-July) and were lowest when nitrates and pesticides were lowest (August to September). More than 27 million US live births were studied.

"A growing body of evidence suggests that the consequence of prenatal exposure to pesticides and nitrates as well as to other environmental contaminants is detrimental to many outcomes of pregnancy. As a neonatologist, I am seeing a growing number of birth defects, and preterm births, and I think we need to face up to environmental causes," said Dr Winchester.

## Helping Municipalities Manage their Natural Riches

A new publication aimed at assisting municipalities in managing estuaries and their catchments has been published by the Water Research Commission (WRC).

The publication, *Estuaries & Integrated Development Planning: A Manager's Guide*, was prepared for the WRC and the Tony & Lisette Lewis Foundation by the Centre for Environment, Agriculture & Development at the University of KwaZulu-Natal (UKZN). According to editor Duncan Hay, it is hoped that the publication will assist in the improved management of the country's estuaries.

Estuaries are considered some of the richest natural resources in the world due to the goods and services they provide. In South Africa, estuaries are not only valued for their aesthetic beauty, which attracts tourists and investors from all over the world, but also as sources of food and income to the poor.

In Mngazana, for example, local community members harvest mangroves for building material. These mangroves also form the nursery habitat for fish caught by subsistence and recreational fishermen, are the focal interest of commercial canoe trails and contain a honey production business. The economic value of these mangroves to local communities is estimated at around R3,4-million a year.

Development in South Africa's coastal areas, at and around estuaries, and in their catchments, has increased dramatically in the last few years. With this is an increased demand for the goods and services that estuaries supply. Different forms of development compete with each other for what an estuary can provide and, in some instances this



The view of the Knysna estuary increases property values by up to R2-billion.

Courtesy of SA Tourism

competition compromises the value of the estuary system.

According to the authors decisions have to be made about who gets what. "This requires active management. Estuaries are not privately owned, they are public resources. So, management is complex, and requires cooperation between residents, interest groups, government and the private sector."

Due to the relatively small size of the majority of South Africa's estuaries (less than 100 ha), all or part of an estuary is likely to fall entirely within a local or district municipality. These municipalities, through their integrated development planning (IDP) processes are then responsible for leading managing developmental activities within their area of authority.

At present estuaries hardly feature in municipality IDPs as a scan of IDPs in the Eastern Cape, where over half of South Africa's estuaries are located, shows. Estuary management is generally not considered and not budgeted for, despite being valuable municipal assets.

The new publication hopes to change this by assisting municipalities to engage in more effective estuary management. It describes the value of estuaries; how estuaries function; the potential impacts on the functioning of an

estuary; how to support the establishment of sustainable businesses at estuaries; how to optimise the benefits and reduce the impacts of estuaries; as well as where to find more information.

"Municipalities are development orientated. They are trying to correct the disparities of the past, trying to increase income-earning opportunities for residents and to increase the income for

themselves, so that there will be sustained delivery of infrastructure and services," say the authors. "Estuaries provide numerous opportunities to do this, and development should be encouraged. If we are unable to obtain tangible economic benefits from a system, what is the incentive for its management? However, we must go about obtaining these economic benefits carefully."

- To order the publication (WRC Report No **TT 294/07**), contact Publications at Tel: (012) 330-0340; Fax: (012) 331-2565; or E-mail: [orders@wrc.org.za](mailto:orders@wrc.org.za)

