

television campaign, launched in May last year, has motivated 2.3 million residents to voluntarily change their water habits.

"This campaign has been responsible for a monumental shift in Queensland residents' attitude to water and accepting we could not continue wasting water the way we were," Lucas said.

The International Water Association named the Queensland Water Commission as the winner of the "best promoted protection activity or program" category of their marketing and communication awards 2008. The submission competed against 50 entries

from across the world and was based on the poster "Turn off the tap, turn on the savings".

The Target 140 campaign is a finalist in the savewater! awards in the Government – Water Authority Category, to be decided as this magazine goes to print. It is also in the running for the Australian Marketing Institute Awards for Marketing Excellence and the Public Relations Institute of Australia Awards which recognise excellence, best practice and professionalism in public relations. ●

Behaviour modelling investigates policies

By Don Perugini, Michelle Perugini and Mike Young

Behavioural modelling has been used to assess the water saving impact of urban water trading policies in the urban environment.

The sustainability of Australian water supplies presents a significant challenge for the future. New policies, including urban water trading, have been proposed to manage water allocation among households. Intelligent Software Development's agent-based strategic water management simulation, SimulAlt Water, was used to analyse urban water trading and water saving incentives.

With urban water trading, households are given a set allocation of water. Households that use less than their allocation may trade (or sell) their surplus water to households that require greater than their allocation. Households that require more than their allocation in addition to any traded water obtained must pay an expensive scarcity price per kilolitre of additional water, where the scarcity price is adjusted depending on the availability of water.

Urban water trading has been proposed to facilitate a change in culture in Australia from one where water is considered a cheap and infinite resource, to one where water is a valuable and limited resource. Allowing market mechanisms to define the financial value of water depending on its scarcity will lead to natural adjustments in the use of water in times of crisis, and thus remove the need for water restrictions. Lastly, as the price of water increases with scarcity, entry of private industry into the water supply market will become viable. As a result, the responsibility of water supply will likely shift from governments to private industry, and encourage competition, and thereby innovation to identify efficient methods of supplying water.

In this study the water saving hypothesis of urban water trad-



Human behaviour was simulated to investigate urban water trading practices.

PHOTO: TOMAS BERGIC/STOCKPHOTO

ing was investigated, and the impact of urban water trading on households analysed. Agents are autonomous software programs that exhibit human-like behaviours, such as goal-directed, reactive and social capabilities.

The simulation comprised 3000 software agents that represented individual households, one agent that represented a water authority who set the pricing policies and charged for water, and an agent that represented the water supply that distributed water to households. The 3000 household agents comprised of 1000 each of low, medium and high demographic types. Households' water consumption and price payed was simulated over one year.

The simulation was based on Adelaide households where the average water consumption under the current two tier pricing is 280kL. In the model low, medium and high agents use 140kL, 280kL and 420kL of water respectively.

The two pricing schemes that were implemented: (a) the two tier pricing scheme; and (b) a tradeable water with scarcity pricing scheme.

In the analysis, the current hypotheses regarding urban water trading were challenged. Modelling results indicated that as the scarcity price increased, although high water users had an incentive

This is based on the paper "Water Saving Incentives: An Agent-Based Simulation Approach to Urban Water Trading" by Don Perugini and Michelle Perugini from Intelligent Software Development and Mike Young the University of Adelaide. For more information contact DonPerugini@intelligentsoftware.com.au.

to obtain cheaper traded water, low water users did not have any incentive to use less water and trade to high water users. Therefore, further incentives, in addition to scarcity price, were required for low water users to trade and save water.

Results suggested that increasing the allocation of tradeable water given to households could decrease overall water consumption. A tradable water allocation that is too low will prevent opportunities for households to trade and save water.

SimulAI Water modelled the intangible and dynamic factors required for strategic water infrastructure and policy planning, and demand forecasting. These included economic, political, environmental, human and social elements, which are an integral part of any water system. Future work will involve using SimulAI Water to analyse and explore proposed water reform options to enable a decentralised market for the water industry, including rural-urban trade. ●

Control in the open channel

By Nina Rozenbes

A new IT-based water management system for reducing water losses in irrigation has been developed by engineers at the University of Melbourne and Rubicon Systems Australia.

To distribute large volumes of water from dams through open channels, they have developed a novel approach that combines IT systems with civil infrastructure; the result is an automated large-scale management network, a modern solution that brings water distribution into the 21st century.

The water-saving technology, known as Total Channel Control, is a key component of Victoria's \$2 billion plan to modernise ageing irrigation infrastructure in the Goulburn-Murray water irrigation districts. It is the outcome of a longstanding collaboration between researchers and engineers at the University of Melbourne, UniWater, NICTA Victoria Research Laboratory and industry partner Rubicon Systems Australia.

Much of the research work focused on accurate water flow measurement and precision flow control. The teams designed

a radio network integrated sensor that provides irrigation managers with detailed information about the behaviour of the distribution system and enables water trading markets to operate efficiently. The system is automated to manage water movement across the entire irrigation network from a single point of command and control. Unlike manually operated systems, Total Channel Control can respond to problems such as leaks, equipment failure and water storms, and quickly respond to changes throughout the channels.

Engineers have investigated the problem of water losses in irrigation for decades with varying degrees of success. Total Channel Control is an important innovation that has been commercialised by Rubicon Systems Australia. It has been attracting significant attention overseas, with the irrigation market in the US warming to the potential of this technology.

Research leader and dean of engineering, Professor Iven Mareels, said this breakthrough technology will significantly improve the efficiency of water distribution.

"It brings open channel water distribution as close to a pressurised distribution system as is physically possible without changing the canals into pipes," Mareels said. "We anticipate that at least 70GL of water will be saved annually in Victoria through the implementation of this technology. It is a cost-effective solution that is so important in a country where water supply is not abundant."

Mareels said researchers hope to explore the integration of all aspects of water distribution across an entire river basin.

"Our ongoing work will focus on the integration and expansion of the sensor network technology across the vast time and spatial scales inherently associated with water supply and demand in a basin," he said.

Mareels is one of four recipients of the 2008 ATSE Clunies Ross Award for reducing water wastage through an IT-based management system for water in irrigation canals. ●

Source: Research Review (<http://uninews.unimelb.edu.au/researchreview.php>).



Solar powered equipment and accompanying software are used to regulate the flow of water through the open channels.

PHOTO: PROF IVEN MAREELS AND DAVID AUGHTON