

ADRM Software

The Murray-Darling winds 400 miles across South Eastern Australia to sustain agriculture



ADRM Software helps Aussie Water Utilities cope with the “Big Dry”

The history of Australia is the history of drought. One of the most famous Australian poems was written in 1908 by Dorothea McKellar and is still apt today.

*I love a sunburnt country,
A land of sweeping plains,
Of ragged mountain ranges
Of droughts and flooding rains.
I love her far horizons,
I love her jewel-sea,
Her beauty and her terror
The wide brown land for me!*

Australia is the driest continent outside of Antarctica. Drought is a natural part of Australia’s highly variable climate.

It is not a case of whether drought will occur but when.

Since the first recorded drought in 1791 there hasn’t been a single decade when some part of Australia has not been in drought.

The Federation drought, beginning the mid-1890s, reached its devastating climax in 1902 one year after Federation.

The government declared 26 February 1902 a day of “humiliation and prayer”. The mighty Darling River was reduced to a trickle and in Queensland the State’s sheep flock was effectively wiped-out.

The 1914-15 drought resulted in the catastrophic failure of the wheat crop. Flows in the Murray River were reduced to just 2% of normal levels.

The World War II drought lasted from 1937 until 1945. The wheat crop was devastated and sheep and cattle numbers plummeted. Bush fires raged across the States and were responsible for the tragic “Black Friday” on 13 January 1939.

The 1982-83 Drought resulted in the wheat crop failure and the decimation of stock. On September 8 massive dust storms enveloped the state of Victoria and its capital city Melbourne, which were followed one week later by bush fires known as “Ash Wednesday”.

The current drought known as ‘The Big Dry’ began in 2002 and is now in its seventh year. It is the most severe drought that Australia has experienced in over 100 years and probably the worst since European settlement in 1788. It has changed the way Australia looks at both water and the environment.

"This is more typical of a one in a 1,000-year drought, or possibly even drier, than it is of a one in 100-year event." said David Dreverman, head of the Murray-Darling river basin commission.

Nowhere is the situation more desperate than in the Murray-Darling Basin. The Murray-Darling Basin is the heartland of Australia covering an area the size of France and Spain with more than 3 million Australians and supporting an agricultural industry worth A \$9 billion a year.

The Murray-Darling Basin comprises 14 percent of Australia’s land mass and generates 39 percent of the national farm income.

The Basin produces 53 percent of Australia’s cereal grain, 95 percent of its orange crop and 54 percent of its apple harvest.

By May 2007 the flows in the Murray-Darling River were only 5% of average.

The cost to the Australian economy has topped more than \$20 billion and resulted in over 10,000 farming families to leave the land and reducing the wheat production by over 60%.

The Australian government has taken action by committing to spend more than A\$50 billion on water improvement measures over the next ten years.

These efforts will include major projects such as the building of desalination plants and new pipeline infrastructure, as well as investment of A\$3.7 billion in water conservation measures in the Murray-Darling Basin.

Sydney Water

ADRM Software customer Sydney Water has big challenges in the largest of Australia’s cities.

The city attracts 50,000 new residents each year, which only adds to the challenge.

John Archer, who has written six books on Australia's water supply offers strong words about Sydney water.

“Sydney has less than two years of poor quality water left. If the desalination doesn't work, Sydney doesn't have any options other than evacuation.”



Sydney dust storm

“Sydney has less than two years of poor quality water left”

Sydney's largest reservoir is now only 40% full and many small rural towns in east Australia face big shortages within a month.

The Warragamba Dam, which supplies 80 percent of Sydney's water, fell to 37.2 percent of capacity in August and reached a record low 34.8 percent in June.

ADRM Software was selected to provide the enterprise and data warehouse architecture for Sydney Water to build its new customer, operational and billing systems.

“Sydney Water needed to address their problems immediately and with a data architecture that was real - something that could be used for a variety of data requirements such as analytics, analysis, CRM and data warehousing immediately,” said Larry Heinrich, ADRM Software Chief Data Architect.

“That’s what our products are designed to do and that’s what we did.”

Sydney Water is implementing leading water technology such as the new \$1.7 billion desalination plant that is part of an effort to drought-proof Sydney.

The new Sydney desalination plant can pump 250 megaliters of water each day, about 15 percent of the city's needs.

The plant pulls water from Botany Bay through a large tunnel. The water is then pushed at high pressure through tiny membranes, which capture the salt, in a process called reverse osmosis.

Kristina Keneally, premier of New South Wales said, “This is about preparing for Sydney's expanding population. It is guaranteeing that we have a safe and a secure drinking water supply.”

Environmental monitoring is critical to the effort and includes wastewater, stormwater or "reuse" systems, effluent from those systems and the measure of impacts on receiving environments.

Water monitoring includes raw water, treated water and recycled water that is reticulated for residential, commercial or industrial purposes.

Data and information is the key to Sydney Water’s efforts to plan and monitor water usage and quality to combat the drought.

Yarra Valley Water

Yarra Valley Water is a retail water company owned by the State Government of Victoria serving over 1.5 million people in the Melbourne, Australia area.

Melbourne is the second largest city in Australia and in its tenth consecutive year of drought.

Despite its water shortage, the city has consistently ranked among the world’s most livable cities.

Together with the rest of Victoria, Melbourne is implementing measures designed to preserve and augment scarce water resources.

Under these restrictions, residents can be fined up to A \$454 or have their water supplies reduced to trickles if they’re caught using drinking water for washing vehicles and paved areas, watering lawns at any time, or for watering gardens outside of nominated water days and times.

“We have dedicated crews roaming the streets in clearly marked vehicles keeping an eye out for water cheats,” warns CWW Managing Director Anne Barker.

T155, a campaign to reduce personal water consumption to 155 liters per day using water saving techniques, was also introduced in November 2008.



“The urgency of the water situation made terms like *critical data* more than just words.

The time saved by using the ADRM models resulted in not only significant financial savings but also significant savings in water.”

Kevin Schofield
VP Sales & Marketing

Many embraced this campaign so wholeheartedly that average per capita consumption by May 2009 was down to 139 liters, way ahead of target and a vast improvement from the 422 liters per capita consumption in the 1990s or the 180-liter rate in 2008.

Melbourne is one of only about five cities in the world that has protected catchments.

Most of the city’s water comes from these uninhabited catchments high up in the Yarra Ranges.

The catchments, which cover more than 157,000 hectares of national parks or State forests, are closed to human activity to protect water quality and public health.

The forests catch, hold and filter rainwater as it flows

across land into streams and then reservoirs.

Deep soils and shaded understore enable reliable streamflow, which helps accumulate water for storage. These storages provide security of supply during drought.

Melbourne's water supply system is based on the principle that it is better to start with the highest quality source water than having to treat it to reach required standards.

Recycled water is used extensively to augment the water supply.

Recycled water is water that has been treated to a standard for a specific application.

Recycled water is identified in three classes of water: Class A, Class B and Class C.

Class A is not intended for human consumption.

Class B is used for livestock, industrial and restricted public access.

Class C is used for raw/unprocessed crops, grazing cattle and sheep and closed industrial systems.

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An unexpected consequence of the draught is that pipes suffer from the drought as well as people and animals.

Yarra Valley Water managing director Tony Kelly said there was no doubt the severity of the drought was affecting Melbourne's underground infrastructure.

"When the ground shrinks and expands, quite often it can pull the pipes out of alignment, and when the drought is severe that happens more frequently, so we end up with more burst water mains," he said.



Mr Kelly said the drought had left the city's trees desperate for water, forcing them to break into pipes and sewers to find it.

"They go hunting for water and as soon as they find a sewer they get a sniff of water and they invade the pipes, so the roots get into the pipes," he said.

ADRM Software enabled the water utility to develop work orders, track problems and predict where similar events might occur based upon similar data and conditions.

SA Water

South Australia generates 39 percent of the national income that is derived from agricultural production and remains among the country's worst drought-affected areas.

Twelve years ago, the rain stopped falling in southeast Australia.

The average temperature has climbed 1.6 degrees Fahrenheit since 1950, according to the Commonwealth Scientific and Industrial Research Organization,

So much less rain is falling that surface flows across the region's river valleys have been cut 40 percent.

Over half of Australia's farmland is in drought, which is being described as the worst on record. Some regions have had no rain for nearly six years.

Leo Praesen

The government forecast its lowest wheat crop for 12 years, a 62% decrease on last year.

The country's greatest wetland, the Coorong near Adelaide, is drying up. As it does, sulfur in the exposed bottomlands mixes with oxygen in the air to form sulfuric acid mud that is killing aquatic life.

Over the past decade there has been so little water left in the lower sections of the Murray-Darling river system that for every four out of ten days, the Murray River

doesn't even have enough flow to reach its mouth in the Great Southern Ocean south of Adelaide.

The Murray-Darling river system, which receives 4% of Australia's water provides three-quarters of the water consumed nationally and was already 54% below the previous record.

Outside the country's borders, this growing crisis was barely known until last year, when the basin's one-million-ton rice crop failed.

The significance of the Murray-Darling Basin to the planet's food supply was emphasized.

The Australian rice failure was a factor in driving up prices that prompted global food riots in 34 countries.

Water quality is a major issue since much of the water flowing in rivers comes from northland farms and plantations, which contribute pesticides and chemicals to the water making it unsuitable for drinking.

This means that urban areas rely upon ground water, which is being depleted.

"The urgency of the water situation made terms like 'critical data' more than just words.

Using the ADRM Water Utility models for data analysis, analytics and to build a data warehouse enabled SA Water to start designing, mapping and loading data immediately - instead of after a year or more of consulting and design," said Kevin Schofield, ADRM VP of Sales and Marketing.

"The time saved by using the ADRM models resulted in not only significant financial savings but also significant savings in water."

To offset the reduced amount of water SA Water has

implemented industry-leading programs featuring 'greywater'.

Although not of the same quality as the drinking water, greywater - all non-toilet wastewater - generally contains sufficiently low levels of contaminants and is suitable for garden or lawn irrigation via sub-surface distribution.

Greywater includes wastewater from showers, baths, spas, hand basins, washing machines, laundry troughs, dishwashers and kitchen sinks.

Grey water can be used on fruit trees, lawn areas and on other plants (both exotic and native shrubs and trees).

The ADRM Software Water Utility models enabled SA Water to implement, measure and record both traditional and greywater offerings to customers by service location, rate plan, customer-needs and related data components.

Australia will never be free of drought.

However, new techniques, public awareness and programs to reduce the usage of water will go a long way to reduce the severity of the problem.

One of the main components that support these efforts is the data needed to plan, implement and measure water usage, water quality

and the infrastructure that supplies water.

ADRM Software is playing a critical role with the leading Australia water utilities in fighting the drought.



Those who lose dreaming are lost
- Australian Aboriginal proverb

Australia endures.

