

## Living with less rain

Published in The Australian, December 30, 2006 Much of Australia has been in and out of drought for the past several years, or continuously lacking rain.

Is there any hope of a sustained break in 2007? Rural writer Asa Wahlquist reports

THE drought and the consequent water shortage have been the defining issue of 2006. Every mainland capital city is on increasingly severe water restrictions.

Perth has brought Australia's first large-scale desalination plant on line. Southeast Queensland will vote early next year on recycling, while a poll this month for The Australian found 69 per cent of respondents would drink recycled water and a further 29 per cent were happy to use recycled water for non-drinking purposes.

Across the Murray-Darling Basin, irrigation allocations have been slashed. In the first week of summer, Australia's largest irrigation company, Murray Irrigation, for the first time in its 74-year history, cut off 2500km of channels. The system, which provides water for 2400 farms and four towns, had been on course to run out of water by Christmas. That has now been postponed to April. Farm income is expected to fall 72 per cent to \$2.6 billion this financial year and Treasurer Peter Costello reckons that could bring national economic growth back by 0.75 per cent to 2.5 per cent in 2006-07. Farmers have received more than \$1.2 billion in drought assistance since 2002.

The question for 2007 is when, or even whether, the drought will break. If flooding rains do not fall, 2007 will be catastrophically short of water.

The long dry is also raising questions about whether it is due to climate change or a return of old, drier, rainfall sequences.

CSIRO research fellow Barrie Hunt says a 10,000-year model shows the drought is due to natural climate variability. He says the impact of increased temperature because of climate change will be increasingly felt in the future. Head of the National Climate Centre Michael Coughlan says drought in 2002-03 was the first attributable to climate change, owing to the record high temperatures. Others, such as former head of CSIRO Land and Water, John Williams, think it is not so much a matter of drought as the re-emergence of the dry cycle of 1900-47.

The crops failed in the El Nino (low rainfall) years of 2002 and 2006. But in the years between, enough rain fell for farmers to produce a record grain crop in 2003, while 2004 and 2005 also produced above-average crops.

But it was a green drought: the crops grew and the grass was green but the dams' water levels kept falling. In hydrological terms, it has been a six-year drought for much of eastern Australia and a 10-year drought for most of Victoria.

Coughlan says Australia in 2006 has been affected by a short-term drought caused by the Pacific Ocean's periodic El Nino effect in addition to a five to 10-year decline in rainfall that has affected the southeast and southwest of the country. "It is a combination of a short El Nino drought on top of the gradually declining rainfall," he says. "Not only has it been generally dry, but also it has been especially hot. Because we had this decline in rainfall, our major water storages were drawn down, then with El Nino on top of that, that has really shaken everybody up."

This year Australia had the warmest spring on record, while 2006 has been the third driest year on record for southeast Australia. Coughlan says there are signs the latest El Nino has peaked "and we would expect to see things slowly shift back towards normal. Whether or not they go all the way back we probably won't know until around March."

The 1950s through to the '70s was historically a wet period. Then El Ninos were rare, and their opposites, the La Ninas that brought flooding rains, dominated. The reverse has been true since the late '70s. The last La Nina was in 1998.

Much of the country has been drying since. The average inflow into the Murray River is 11,200 gigalitres (billion litres). During the past 10 years, inflows have averaged between 4500 and 5000GL.

Inflows into the Murray for the six months to November this year have been just 610GL, well below the previous minimum, and just 7 per cent of the long-term average. Inflows into the river in the month of October were so low as to have a probability of one in 1000.

All along the Murray River irrigation allocations have been cut: in NSW general security irrigators are getting zero allocation this summer; those who bought water that was supposed to have been in the dam at the end of last season have had their allocations slashed to 48 per cent. South Australian irrigators are getting 60 per cent of their allocations.

Water managers are warning the three big dams on the Murray will be dry or close to dry by the end of May 2007 if there is no rain. If that happens, Adelaide, which relies on the Murray for much of its water, will, in the words of water

spokesman for the Australian Council for Infrastructure Development, Graham Dooley, be "basically stuffed. The amount of water available in the Murray for all purposes is going to be under very severe restrictions in 12 months' time: very, very severe restrictions."

Adelaide won't be the only city in trouble if the rains fail. Brisbane's dams were last full in January 2000. They are now at 23.9 per cent. The last big fall of rain was in February 1999: that year was the last in southeast Queensland with average rainfall. Without a heavy downpour this summer, the system will run out in late 2008.

Sydney's Warragamba Dam last overflowed in August 1998. It is down to 36 per cent and would be much lower if huge quantities of water hadn't been transferred from the Shoalhaven this year.

Melbourne's water storages were last full in October 1996. They are now 39 per cent full. Victoria has not had a good rainfall year since 1997.

According to the Bureau of Meteorology, rainfall has been declining over the eastern half of the continent since 1970. Some areas - all of coastal Queensland, north-coast NSW and southeast NSW, including the ACT - are now getting 50mm a year less than they used to. Tasmania has been relatively unaffected.

The most severely affected region, the southwest of Western Australia, is receiving one-third the inflow it got 30 years ago. Dooley says Perth is "the best example in the world of climate change. They have done everything possible and, even so, they haven't got enough water ."

He says other capitals - Brisbane, Sydney, Melbourne and Adelaide - have failed to secure their water supply.

Dooley is not alone in his view. A report last month by Marsden Jacob Associates, prepared for the Department of Prime Minister and Cabinet, noted that Perth, which has invested twice as much as the other cities in its water, was the only city to plan for the present drought.

Report author John Marsden says: "Each state has a different way of doing it and, to be blunt, they can't all be right."

Marsden says Perth water authorities identified what he calls two down-steps. Between 1911 and 1974, southwest Western Australia received an average inflow into its dams of 338GL. Between 1975 and 1996 that fell to 177GL, and then from 1997 to 2006 it fell further to 114GL.

Marsden says when the second down-step occurred in 1997, Western Australia's Water Corporation turned to a so-called scenario approach, using the latest - and lowest - figure as the basis of its planning. "It is one of the key things you need to do when you are working under a framework of uncertainty," Marsden says.

But the report has found that water planning in all the other capital cities "has, until recently, been based on historical records of up to 100 years, and in some cases the longest available historical record". This is despite other cities' dams also experiencing down-steps.

Inflows into Sydney's dams were 2011GL in the wet years between 1949 and 1990. But since 1990 inflows have down-stepped to just 572GL. Brisbane's Wivenhoe Dam experienced a wet period average between 1949 and 1991 of 1066GL, but has since down-stepped to 426GL.

Marsden says despite the recent lower inflows, Queensland, and especially NSW, have been planning on the basis of long-term averages. "If you just went through and took the last 10 years, sustainable yield from Warragamba would fall into a heap," he says.

Thinking in Victoria has now shifted sharply to a scenario approach. If Melbourne's rainfall continues at its present level, using the existing system by 2015 it will be facing a shortfall of 109GL, one quarter of its present use.

Williams believes Australia has to adjust to changed rainfall patterns. He rejects the term drought, saying it implies a good downpour will end the scarcity. He says present rainfall patterns are like those experienced in the Federation drought and the drought of the '40s. "We have forgotten what Australia was from 1900 to 1950, when we had dry sequences of many years. We have built most of our agriculture and dams since the '50s, in periods of relative plenty and short periods of dry time.

"We really have a serious problem here," Williams says. "This is an issue of adjustment. We must make the changes."

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