

# The big barrage question

THE "Myth and the Murray" campaign launched last week argues the case for salt.

It wants the 7.6 kilometres of concrete barrage erected along the outflow of Lake Alexandrina to be modified so seawater can flow back into the lakes when freshwater outflows drop.

But others claim the Murray River's dynamics have been so altered by diversions that the barrages, and good environmental flows, must be maintained if the environment and communities of the lower Murray are to survive.

"This idea of lifting the barrages was put forward by people with no understanding of the issues at all," says Dean Brown, chairman of the Lower Murray Drought Reference Group and South Australian Liberal premier from 1993 to '96.

"Doing so would produce the equivalent of the dead sea very quickly in Lake Alexandrina and Lake Albert.

"There wouldn't be enough sea

It's the acid question: should the lakes of the lower Murray River in South Australia be freshwater or estuarine? MATTHEW CAWOOD reports.



water coming in through the Murray mouth, or fresh water down the river, to flush in and out of the lakes.

"It would end up becoming hypersaline, like the southern lagoon of the Coorong, which has had salt levels seven times that of sea water."

The wide and shallow lakes – Alexandrina is 64,900 hectares and on average 2.8 metres deep, Albert covers 17,100ha to an average depth of 1.7m – have been protected from seawater incursions since the barrages were completed in 1940.

Around this freshwater resource has been built substantial irrigation and tourism industries. The lakes and the Coorong have been listed as Ramsar wetlands of international significance.

The "lift the barrages" campaign says that maintaining these barriers

comes at an untenable cost: the need for environmental flows to be delivered from the Murray Darling Basin into the lakes at times when the rest of the system is drought-stressed, coupled with the annual loss from the lakes of about 800 gigalitres in evaporation, seepage and other leakages.

But a team of ecologists who reviewed the situation in the Lower Murray in 2009 recommended an extra 700GL of river water be allocated to the lakes.

Diversions have left the Murray-Darling system with just over a quarter of its long-term natural flows, lead researcher Richard Kingsford, of the Australian Wetlands and Rivers Centre, said – inadequate, he says, to flush saltwater through the system should the barrages be removed.

That would lead to Lake Alexandrina becoming saltier than the sea within two to three years, in his team's estimation.

Mr Brown also points out the Murray mouth is the drain for about two million tonnes of salt that annually leaches from the basin.

If that salt was allowed to accumulate in the lakes because they were inadequately flushed by sea or river, "eventually the salt would creep back and kill the lower half of the river, potentially right into Victoria".

But preserving the status quo, or improving the condition of the lakes with 700GL inflows a year, will be difficult, if not impossible to sustain, in the view of scientist, Peter Gell.

"If this century we're going to lose 7000GL to climate change from a system that only has 14,000GL – we're already massively over-allocated," said Professor Gell, who is director of The Centre for Environmental Management at the University of Ballarat.

"If you've got an ever-decreasing water resource to allocate to the environment, you try and use it multiple times as it goes down the system, or you give it to systems that have an exclusively fresh history," he said.

"And that doesn't apply certainly to the Coorong. You might flush Lake Alexandrina every three to five years if you had the water, but you certainly wouldn't allocate 700 gigs a year."

At the same time, sea levels are forecast to rise by a metre or more this century, depending on the behaviour of the world's ice sheets.

The Lower Murray lakes are now about 30 centimetres higher than sea



level when full, but become lower than sea level as lake levels fall.

Professor Gell said with a metre of sea level rise, and the potential for increased tidal fluxes, "it's difficult to see the Coorong and the other lakes retaining a freshwater state".

Ecologists who had produced the 2009 report, *Engineering a Crisis in a Ramsar Wetland*, had said climate change issues could be overcome with careful water management and more sophisticated management in the Murray-Darling Basin.

## Kahlbetzer: 'it's an obvious next step'

JOHNNY Kahlbetzer says he wants modification of the barrages that block natural ebb and flow from the Southern Ocean – not their removal altogether.

"The barrages use 1930s technology. The existing wood and concrete structure uses gates which are opened and closed individually. I understand that each concrete bar needs to be placed one by one with a crane," said Mr Kahlbetzer, who is a member of the new Myth and the Murray group and

the head of Twynam, in a statement.

"Surely with the billions allocated by the Federal Government to fix the Murray-Darling some money could be allocated to fix the barrages," he said.

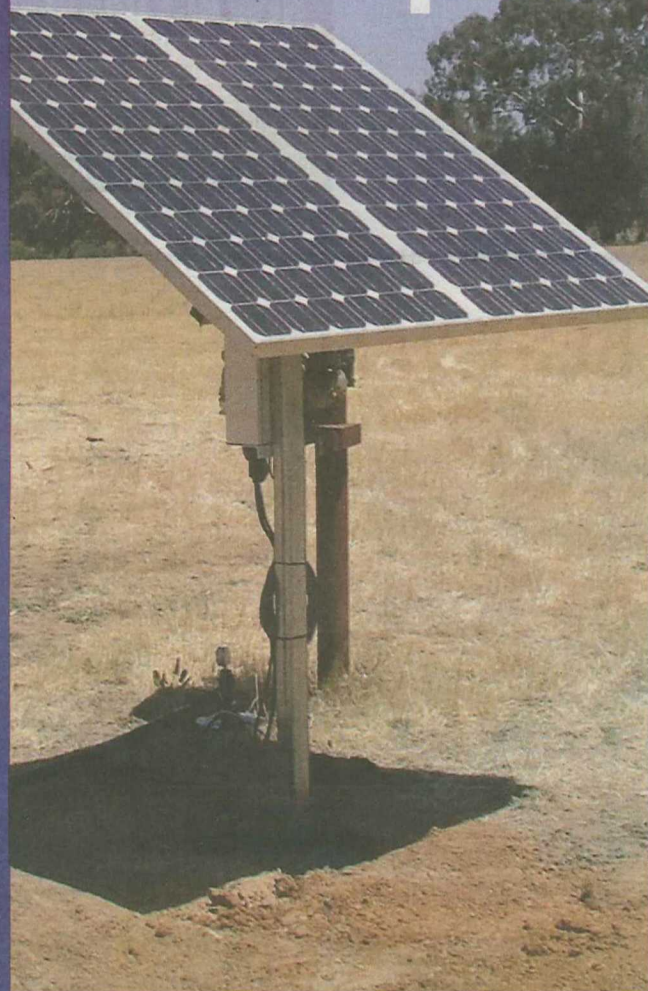
"There has been a focus on improving irrigation efficiencies upstream through investment in new technology. The biggest water savings can now be made by fixing the barrages and the management of the Lower Lakes.

"Of course, fixing the Lower Lakes

and barrages will not solve all the problems of the Murray-Darling, but it is the obvious next step."

Mr Kahlbetzer said the South Australian Government had been in denial about the management of the Lower Lakes for far too long, and international experts should now be called in to advise on the best technology to replace the barrages, which were now an impediment to tidal operation.

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5m	5,400	10,500	22,500	25,500	11,700	14,400	36,000	41,000	16,000
10m	5,400	9,900	16,500	24,000	11,700	14,400	30,000	39,000	16,000
15m	5,400	9,000	10,500	21,000	11,400	13,300	25,000	37,000	15,900
20m	5,100	8,400	7,500	18,000	11,100	12,600	21,000	34,000	15,500
25m	4,800	7,500	3,000	15,000	10,800	11,800	12,000	31,000	15,100
30m	3,600	6,000			10,500	10,000		27,000	14,900
40m	1,350				10,200	7,900		14,000	14,700
50m					9,000	6,000			13,000
60m					6,000				11,000
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100m									6,000
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Indicative figures in litres per day based on 5 peak sun hours per day at 1000W/m<sup>2</sup> 25° C. Prices include GST.

\* Cashback is refunded after installation and RECs.

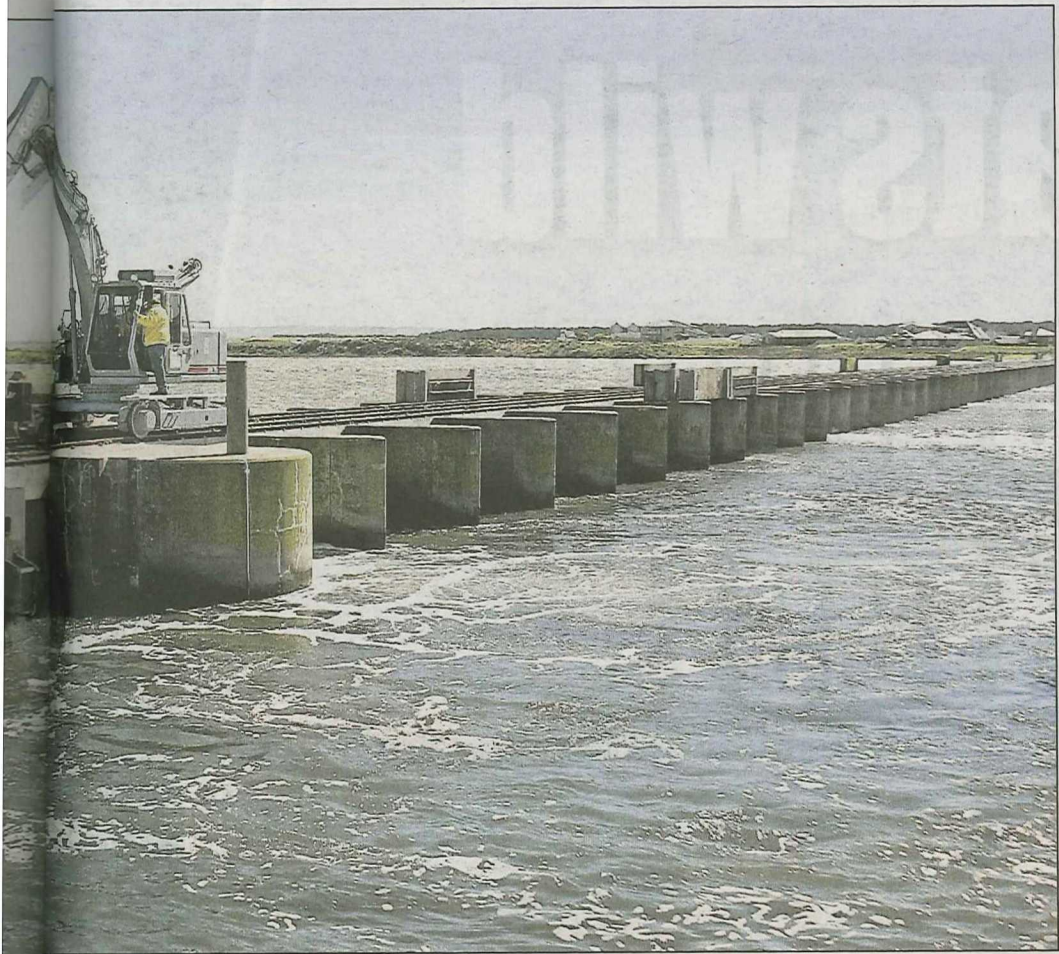
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### Making News

**Kempsey evacuation:** Torrential rain on the Mid North Coast triggered evacuation orders yesterday for parts of Kempsey and for smaller townships downstream on the Macleay River, and flood warnings for virtually all rivers from Tuggerah Lake north to the Bellingen River.

Several towns received more than 300 millimetres of rain in the week to 9am Wednesday, with 437mm at Woolgooga the highest, and as of midday rain was still

falling over much of the area.

The Bureau of Meteorology also issued a sheep graziers alert for cold weather, rain and high winds for the Northern Tablelands, Mid North Coast and the Hunter Valley.

Useful rain also fell in the northern inland and should boost freshly sown winter crops, with heavier falls including Guyra 58mm, Bingara 49mm, Warialda 57mm and Moree 55mm, while Bombala on the Southern Tablelands cracked 82mm.

**Weed threat:** A new plan to stop the invasive weed, parthenium, establishing itself in NSW has been launched.

The NSW Parthenium Taskforce aims to find and eradicate weed outbreaks as part of an \$8 million control program for weeds across the State.

Parthenium is fast growing, can impact on pasture growth and contains powerful allergens that can cause a range of human health problems.

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## One thing, then the other

ABOUT 70 centuries of evidence says there was always a push-pull action between the sea and the Lower Lakes of the Murray, with the Murray usually winning.

The skeletons of diatoms – a siliceous algae the various families of which have very specific likes when it comes to salt levels – tell the story back to when the Murray estuary formed around newly stabilised sea levels about 7000 years ago.

Across that time, University of Adelaide researcher, Jennie Fluin, says, the diatoms found in Lake Alexandrina sediments were mostly those associated with freshwater.

“In terms of the lakes being predominately marine – no,” Dr Fluin said.

“Not even estuarine.”

Her supervisor during her diatom research, Peter Gell, argues for a more complex picture.

About five to 25 per cent of diatoms found at the lower end of the lake had marine associations, although that fell to only two per cent at the upper end.

That indicated regular incursions of seawater, Professor Gell said, although it was unclear whether those incursions happened once every 20 years, in a big drought, or roughly annually when the end of the dry season coincided with a king tide.

But since the 1820s, when Kangaroo Island sealers reported the presence of big freshwater lakes on the mainland, white Australians have considered the default state

A report supplied by the Government of New South Wales showed that on the north bank of the river there are 70 trusts and other diversions, which use in summer 765 cubic feet (1 cubic foot = 28 litres) of water per minute, and in winter 1,065 cubic feet per minute.

On the south or Victorian bank there were 63 trusts and other diversions, taking in summer 46,577 cubic feet per minute, and in winter 161,618 cubic feet per minute.

It was therefore no wonder people were complaining that the lakes near the Murray mouth are going salt.

– Reported in the South Australian House of Assembly, 1889.

of the lakes to be fresh.

Terry Sim and Kerri Muller's paper, *A Fresh History of the Lakes*, details the settlement and industry that developed through the 1800s around the lakes – and the growing alarm, around 1890, that burgeoning irrigation upstream would weaken flows and allow seawater to intrude.

By 1889 about 216,260 million cubic feet (6120 gegalitres) had already been allocated to irrigation schemes, real and speculative, in Victoria and NSW.

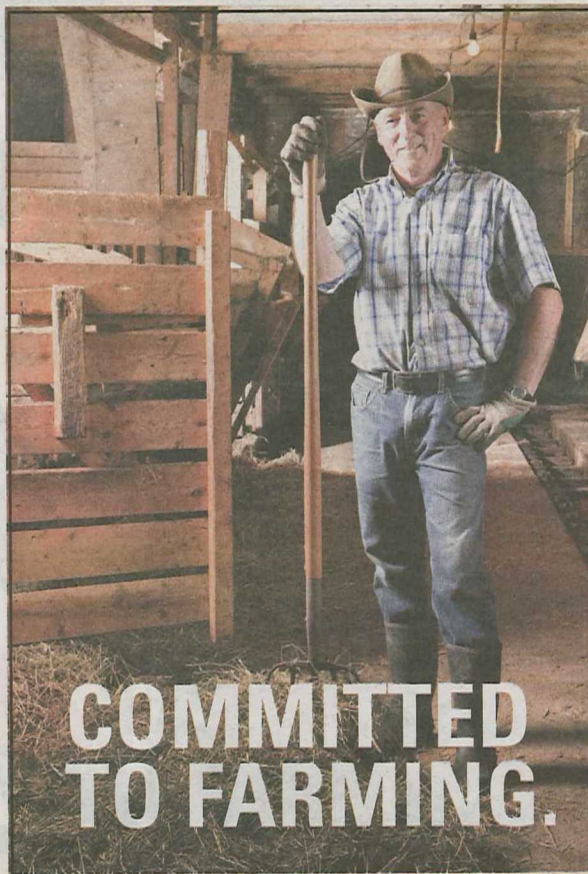
Through the early decades of the 1900s, the effects of these

diversions and drought were felt in South Australia, as seawater made more aggressive intrusions into the lakes, killing reeds and degrading stock water.

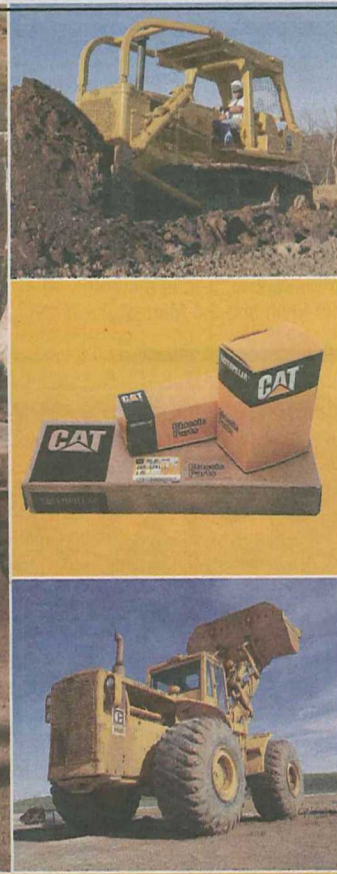
In the 1930s South Australia decided to protect its access to fresh water, and the thriving economies of the Lower Lakes, by building the barrages, the concrete barriers that separate the mostly freshwater lakes from the mostly estuarine Coorong.

Work on the barrages began in 1934, and was completed in 1940.

– MATTHEW CAWOOD



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