



MURRAY SYSTEM

Drought Update

ISSUE 13: MAY 2008

IN BRIEF

Autumn rainfall to date has been below average, and Murray System inflows during March and April have remained extremely low - approaching the record lows seen in 2007. Historical records indicate that, after a dry autumn, the chance that upper Murray inflows will be high this coming winter/spring is greatly reduced.

There is also growing evidence that lower rainfall and reduced runoff in south-eastern Australia, particularly in autumn, is linked to global warming.

Headwater storage levels are slightly higher than the record low levels of this time last year (due to higher levels of carryover) but still well below average.

A significant difference to this time last year is the severe and deteriorating outlook for the Lower Lakes in South Australia.

The prospects for irrigation in 2008-09 are entirely dependent on rainfall and streamflows over winter and spring, which is the critical period for runoff in the high yielding catchments of the upper Murray, Mitta Mitta, Kiewa and Ovens Rivers.

The Murray-Darling Basin Commission continues to undertake contingency planning and implement appropriate measures in consultation with relevant State and Australian government agencies.

THE CURRENT SITUATION

Unseasonably warm weather affected much of southern Australia in the first half of March 2008, whilst autumn rainfall has tended to be below average. Murray system inflows during March and April 2008 have approached the record lows experienced in 2007 (see Figure 1).

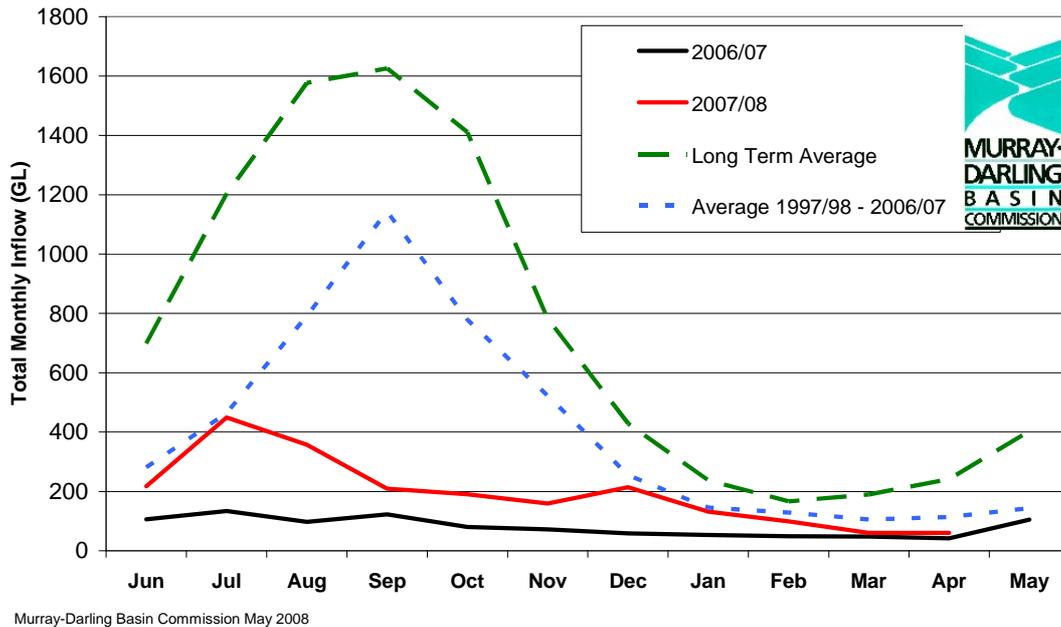


Figure 1. Murray system inflows (excluding Menindee and Snowy). Long term average and selected water years

The extreme dry state of the upper Murray catchments indicates that winter rainfall would need to be well above average to produce average inflows to upper Murray storages. Historical records show that the chances of winter/spring inflows reaching average levels after such a dry autumn are reduced.

The Bureau of Meteorology has reported that most indicators of the El Niño - Southern Oscillation are now neutral and that the La Niña event in the Pacific Basin has dissipated. Neutral conditions are expected to remain throughout winter. The outlook for rainfall over May to July shows a moderate shift in the odds towards a wetter than normal season over the northern half of the Murray-Darling Basin. In the southern half of the Basin the chances of rainfall being higher than normal are about the same as the chances of being lower.

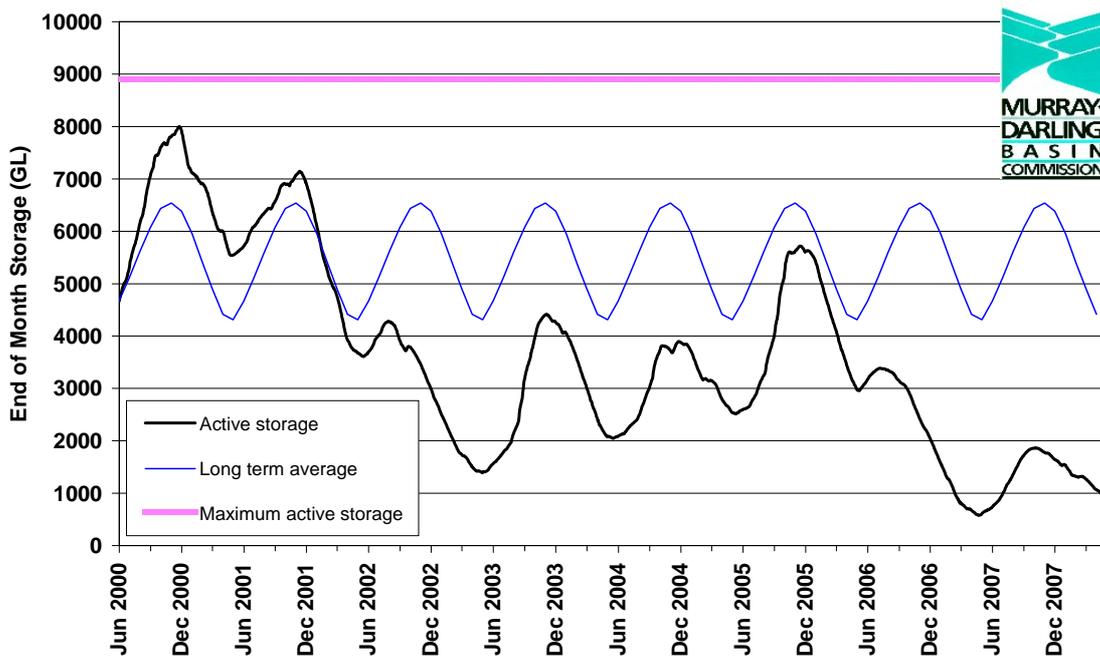


Figure 2. MDBC active storage; June 2000 to April 2008

MDBC active storage is currently 1020 GL, or 12 % of capacity (see Figure 2), which is slightly higher than this time last year (630 GL), but well below the long term average. There is an additional 570 GL in Menindee Lakes (which brings total storage to about 19 % of capacity), but this remains under NSW control. Without additional Darling inflows it is not expected that there will be any further significant transfers of water from Menindee Lakes to the Murray. However in extreme dry circumstances some of the water stored in Menindee Lakes could be available to assist delivery of water to meet critical needs in the Murray in 2008-09.

SYSTEM-WIDE STRATEGY FOR 2008-09

Due to protracted water scarcity in the southern half of the Basin, Murray operations over the last two seasons have concentrated on maximizing water availability, and reducing evaporation and transmission losses along the river system. This strategy will continue until critical urban, stock and domestic requirements for 2008-09 are guaranteed.

As the irrigation season draws to a close, the operating strategy will be similar to last year and will include:

- reduced minimum flow targets,
- the use of weirpools, in particular Lake Mulwala, to supply downstream requirements, and
- continuation of wetland disconnections to reduce evaporative losses.

A significant difference from this time last year is the severe and deteriorating outlook for disconnected wetlands, and particularly for the Lower Lakes in South Australia.

Reduced minimum flows

As the irrigation season comes to an end in May 2008, reduced minimum flows will again be adopted, at least until critical water needs are guaranteed for 2008-09. Similar to last year, the release from Hume Dam will be reduced to 400 ML/day (compared to the normal winter minimum of 600 ML/day). Similarly, the normal minimum of 1 200 ML/day at Doctors Point (near Albury) will be reduced to 800 ML/day.

Normal minimum flows at Yarrawonga Weir (1 800 ML/day), and Swan Hill (0.6 m local gauge height) will also not apply. Instead, flows downstream of Yarrawonga Weir will be reduced as much as possible to minimize flows through the Sunraysia district and downstream to Lock 7 near the South Australian border.

Strategies for weir pool operation

Commencing in late April 2008, water stored in Lake Mulwala is being used to help supply downstream requirements and this has resulted in the level of the lake falling below last summer's operating range of 124.2 to 124.5 m AHD (0.4 to 0.7 m below full supply level). Under a dry scenario, the level of the lake is expected to fall to about 123.8 m AHD (1.1 m below FSL) by mid-May. The lower water level will enable inflows from the Ovens and Kiewa Rivers to be re-regulated within the lake, so that downstream releases can be maintained as far as possible within the river's channel capacity. This will minimise overbank flow during small flushes and reduce losses in the Barmah-Millewa Forest. MDBC is exploring options to further lower the lake level during winter to help control weed growth and also permit periodic maintenance of the weir. However, this decision will depend on the system-wide outlook and cannot be guaranteed.

During autumn and winter, other weir pools between Torrumbarry and Lock 7 might be partially drawn down as necessary to help supplement downstream water requirements or to capture inflow events from tributaries. In South Australia, the pool levels in Weirs 1 to 6 are expected to remain close to full supply level, to limit salinity impacts.

Wetland disconnections

During 2007 a number of wetlands along the Murray River were disconnected to help reduce evaporative losses. This strategy will remain in place until the triggers for reconnection are met, although partial refilling of some wetlands may occur to prevent acidification.

Operation of the Edward-Wakool River system

Initially, very low flows will be passed along the Edward River, and the normal minimum flows at the Edward and Gulpa offtakes will not apply. The Stevens Weir Pool level will be gradually lowered and this water will be used to supply downstream requirements along the Edward River over autumn and winter. The operation of the Edward-Wakool River system will be continually reviewed during the winter months.

Flow to South Australia

Flow to South Australia has been below normal entitlement rates for the last 20 months. A minimum of 900 GL of water is expected to be available for 2008-09, and this will increase if water availability across the upper Murray improves during the year. The monthly flow patterns will be provided by South Australia and will be continually adjusted to account for any changes in diversions or losses, and also to manage river salinity. At Morgan, salinity is currently about 400 EC compared with an average of about 350 EC at the same time last year. Below Lock 1, the salinity at Murray Bridge is about 800 EC and in Lake Alexandrina (at Milang) the salinity is about 3600 EC. Closer to the barrages, the salinity in the lake rises above 20 000 EC.

Lower Lakes

The condition of the Coorong and Lower Lakes in South Australia is grave and deteriorating. The water level in Lake Alexandrina is -0.5 m AHD (or 50 cm below mean sea level) which is well below the previous historic low of 0.1 m AHD in April 1968 (see Figure 3). There has been no discharge through the barrages to the sea since October 2006. Large areas of mudflats have been exposed in Lake Albert and there is a serious risk of acidification. Pumping of water from Lake Alexandrina commenced in early May to maintain Lake Albert at its current level and prevent further exposure of sulfidic sediments. Cooler weather will also result in reduced evaporation in the Lower Lakes leading to a temporary stabilization of water levels over the winter months. Further management options for the Lower Lakes will be carefully considered during the 2008-09 season, responding to actual lake levels and system inflows.

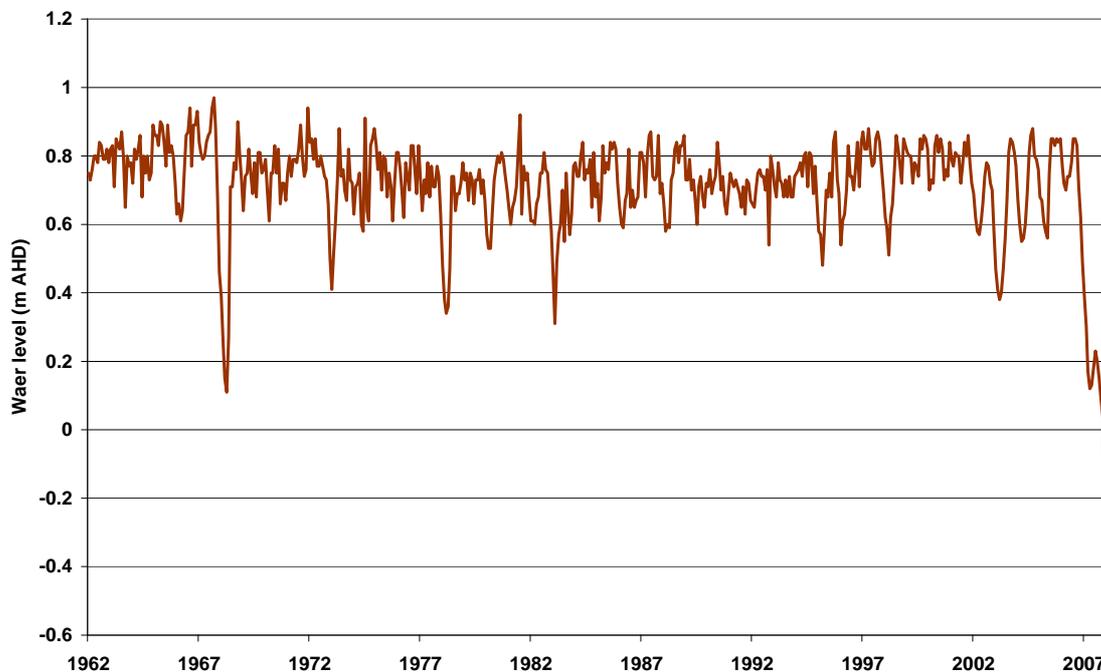


Figure 3. Lake Alexandrina water level, 1962-2008 (Full Supply Level = 0.75 m AHD).



Figure 4. Due to the historically low water levels below Lock 1 and in the Lower Lakes, some of the adjacent land is drying out for the first time in more than 50 years, resulting in cracking and subsidence.

Asset works and management activities

There are several important management activities planned across the system, and these will need to be coordinated with river operations. These include; removal of Mildura Weir for trestle replacement, Lock chamber maintenance at Locks 5 and 10 (resulting in closure of the river for passage through the locks for the duration of the works), gate maintenance at the Lake Victoria inlet regulator, and weed management in Lake Mulwala. MDBC will issue specific media releases regarding these activities throughout the coming months.

THE ENVIRONMENT

In response to significant regional rainfall and river flows out of the Condamine-Balonne catchment in Queensland, a major colonial waterbird breeding event commenced in the Narran Lake Nature Reserve in January 2008. This was the first such event in this wetland since 1999/2000 and the most significant in the Murray-Darling Basin since the mid-1990s. To maximize ecological outcomes of this event, the Murray-Darling Basin Commission purchased 11 GL of water to supplement the inflow to the system. Nest counts indicate in excess of 70,000 breeding pairs of mainly Straw-necked Ibis. An estimated 80,000 chicks have been raised successfully to date, in part due to the environmental flows. The Narran Lakes are now supporting many other species of waterbirds, in particular thousands of ducks. The watering was also contributing to the health of other organisms, including a variety of plant species, invertebrates, frogs and fish.

Further west, flooding in the Paroo and Warrego River systems filled a large number of wetlands and lakes and this has stimulated breeding colonies of waterbird species, including Pelicans, Great Cormorants, Pied Cormorants, Darters, Yellow-billed Spoonbill and Straw-necked Ibis.

In the southern half of the Basin the prolonged and severe drought continues to impact on the floodplain ecosystems along the Murray River. The latest studies show that about 70% of River Red Gums along the Victorian side of the Murray River are declining or dead. In response, small volumes of environmental water have been made available for high priority actions, in particular to replenish critical drought refuges and protect threatened species. Most recently, the Murray-Darling Basin Commission and the Victorian Department of Sustainability and Environment (DSE) are providing a small amount of environmental water (17 GL) for critical drought refuges and stressed River Red Gums. This will include the Gunbower Wetlands

and Little Lake Boort near Echuca, the Lindsay-Walpolla icon site in the Mallee, and the Reedy, Kinnaird, Black and Moodies swamps near Shepparton.

Also, 0.6 GL of Living Murray water will be provided by the Murray-Darling Basin Commission, together with an additional 0.2 GL from Banrock Station, to partially refill the Ramsar listed Banrock Station Wetland in South Australia's Riverland. This will prevent potentially irreversible damage from increasing salinity and protect critical plant and animal habitats.

The partner governments of the Murray-Darling Basin will continue to work cooperatively to manage the water available for environmental use.



Figure 5. Straw-necked Ibis chicks at Narran Lakes Nature Reserve. Photo, Dr Kate Brandis, University of NSW

OUTLOOK FOR 2008-09

Analysis of 116 years of inflow data shows a very strong correlation between dry autumns and continuing dry conditions for the following year. If inflows remain low through May, there is an increased likelihood of dry conditions persisting through winter and spring. The protracted nature of this current drought and the consistent above average temperatures have dried out catchments and reduced base flows from groundwater systems to rivers. It can be expected, therefore, that even with average rainfall in 2008-09, inflows could remain well below average. Full recovery of the system would take several years of above average rainfall.

There is also growing evidence that lower rainfall and reduced runoff in south-eastern Australia is linked to global warming. Figure 6 indicates that a large proportion of the decline in rainfall during the last 10 years has occurred in the months of March, April and May.

Whilst critical urban, stock and domestic requirements for 2008-09 are reasonably assured (but not yet guaranteed), opening water allocations for Murray irrigators in 2008-09 are again expected to be very low or zero, although some carryover water is likely to be available. Critical human needs for 2008-09 can be met for urban water users taking water supplies from the main stem of the Murray provided inflows are no worse than the record lows in 2006-07.

In this 'worst case' scenario some additional contingency measures beyond those used this year would be needed, involving Menindee Lakes, the tributaries, Lake Mulwala and other in-river storages. The outlook for urban and stock & domestic users who take their water from anabranches, canals or channels will remain uncertain until there are significant inflows in excess of those assumed in the 'worst case' planning.

Allocation improvements during the season will be dependent on rainfall and inflows over winter and spring, which is the critical period for runoff in the high yielding catchments of the upper Murray, Mitta Mitta, Kiewa and Ovens Rivers. The very low system storage also presents very serious challenges for the environment in 2008-09.

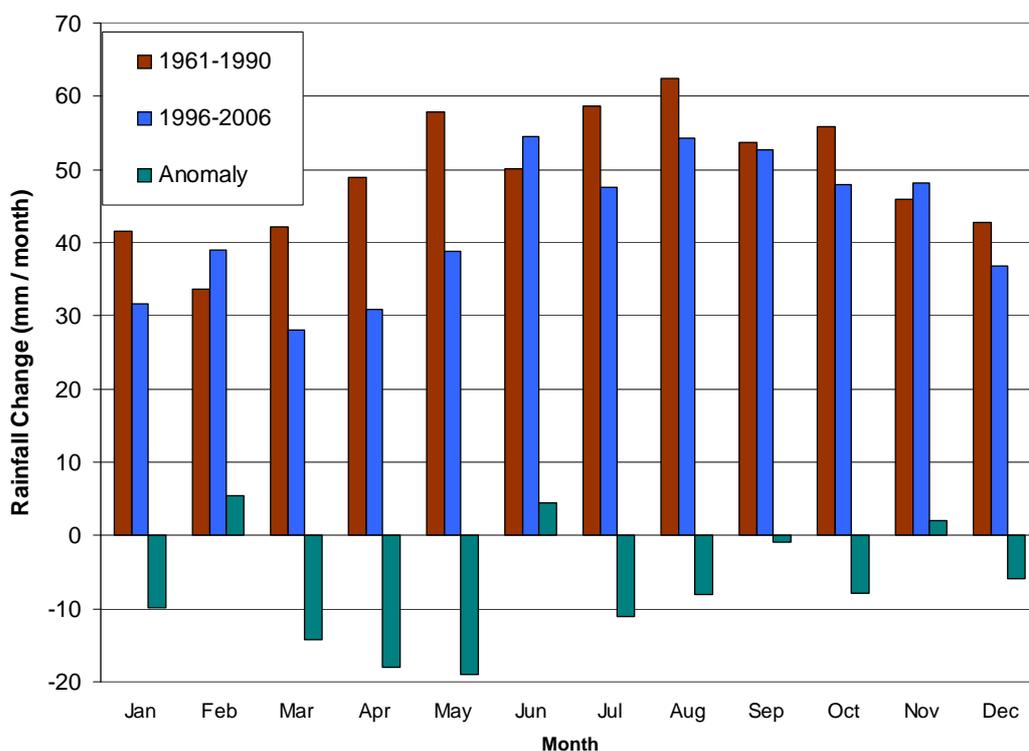


Figure 6. Change in rainfall in south-eastern Australia, 1961-1990 versus 1996-2006. (Courtesy of B Timbal, Bureau of Meteorology)

ADDITIONAL INFORMATION

MDBC will provide further drought updates in the coming months. Additional information is available at www.mdbc.gov.au also from the relevant Australian and State Government Agencies. For media interviews with MDBC personnel, please contact Sam Leone, MDBC Media Liaison, telephone 0407 006 332.