

River Murray System

Drought Update No. 11

December 2007

IN BRIEF

The worst drought on record continues to bite hard, particularly for irrigators. Very hot weather arrived early in November, with temperatures up to 6°C above average for much of the southern Murray-Darling Basin. Water allocations on the Murray River have only gradually increased in Victoria, New South Wales and South Australia over spring. It is possible that continuing small improvements in available water will be seen over summer but it is unlikely that very significant improvements will occur as large inflows over this period are not common.

Murray River operations are focused on supplying water to users as efficiently as possible, with special water saving measures in place right along the river to try to minimise evaporation losses. The Murray-Darling Basin Commission is working with partner governments to plan for 2008/09 and to develop contingency plans should the drought continue.



Rivers and waterways are stressed by drought across the Murray System.
Photo by Col Hood, State Water Operations Officer

Key developments since the last Update:

- October rainfall remained below average across the Murray, however November produced above-average rainfall across much of the Murray-Darling Basin - the best November rain in several years;
- Inflows over October and November have yielded only small improvements in water availability. Inflows have been better than those received at this time last year but remain well below average. This water year to date (June - November 2007) is the 8th driest out of 116 years of record;
- The last 2 years have been the lowest 2-year inflow period for the Murray since records began;
- Total Murray storage is around 550 GL lower than this time last year, and the lowest for this time of year since 1940, when system storage capacity was only about 20% of current capacity;
- Summer operations have begun, with dam releases and flows in the river increasing to meet increased demand over the irrigation season;
- A small amount of water - less than 1% of current divertible water - is available for critical environmental watering projects, to protect endangered species and habitat.

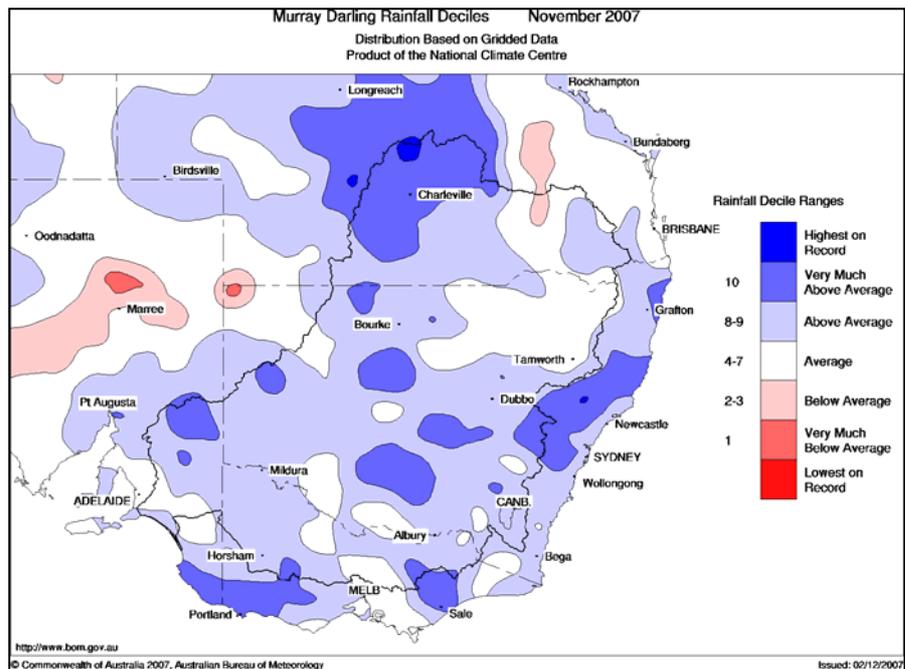
Planning for the rest of 2007/08 and beyond:

- System operations remain focused on maximising water availability and preparing for 2008/09
- Contingency planning is underway to ensure sufficient water for critical human needs in 2008/09

THE CURRENT SITUATION

October saw a return to average rainfall across the northern Basin, but significant deficits persisted over Victoria and southern NSW. November saw this improvement in rainfall spread to the southern Basin, with widespread average and above-average rainfall, resulting in the wettest November for several years (see Figure 1).

Figure 1 - Murray-Darling Basin Rainfall Deciles - November 2007
(Bureau of Meteorology)

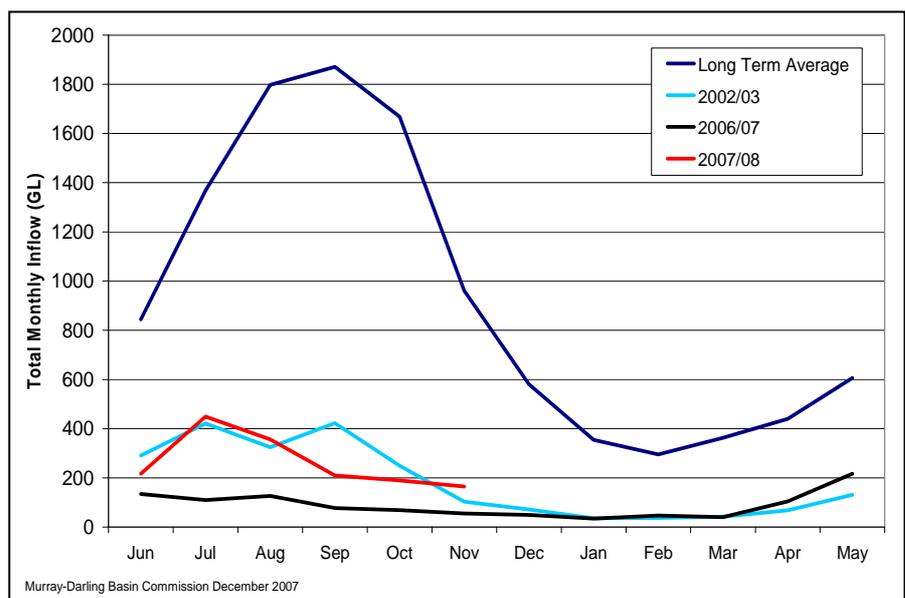


This rainfall improvement follows a very dry winter-spring period which, combined with record high temperatures, has severely diminished runoff and inflow from the rain events that have occurred. Consequently the drought, in terms of Murray inflows, has not broken.

Murray System inflows for October were 190 GL, which is well below the long term October average of 1670 GL.

Inflows in November totalled about 170 GL, compared with the long term November average of 960 GL (Figure 2). Monthly inflows have been below average since February 2005.

Figure 2 - River Murray Inflows
(Murray-Darling Basin Commission)



Just how bad is this drought?

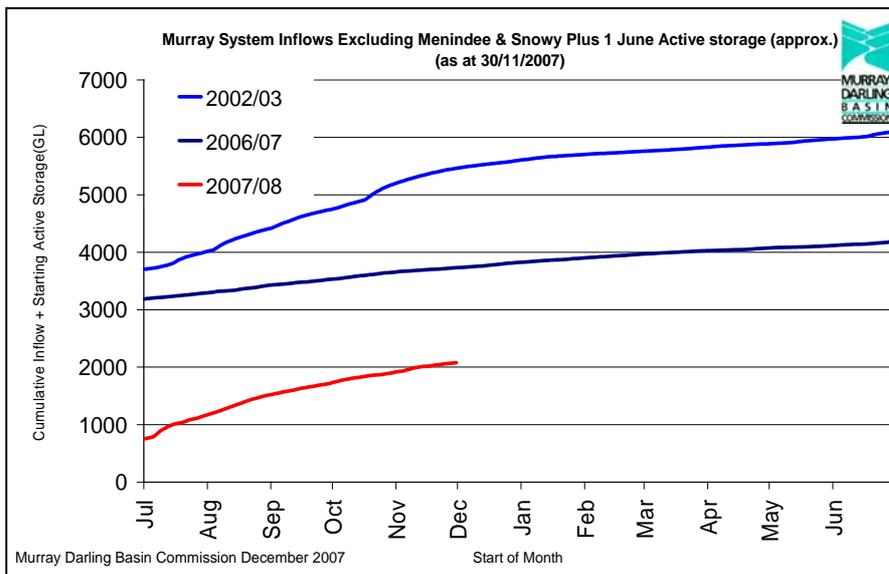
The drought on the Murray, in terms of system inflows, is the worst on record. Inflows over the 2006/07 water year were just 55% of the previous minimum on record. Temperatures have been consistently higher than average, leading to increased evaporation and substantially less runoff.

The low water reserves at the start of the 2007/08 summer irrigation season (see Figure 3) necessitated zero opening irrigation allocations for the first time in all three States.

Inflows over the 2007 winter were slightly better the previous winter, but still very much below average: last season and this season to date represent the lowest and 8th lowest inflow years ever recorded. The two year period to the end of November 2007 was the lowest two year inflow period on record - being 57% of the previous minimum (to end November 1938). So too the *three* years ending November has set a new record and so on all the way up to the 10 year period from December 1997 to November 2007.

Figure 3 - River Murray Inflows plus Starting Storage (Murray-Darling Basin Commission)

At November 30, the total volume of water stored in River Murray System storages was 1 885 GL (20%), which is the lowest for this time of year since 1940, before the construction of Dartmouth Reservoir and Menindee Lakes storages, and the expansion of Hume Dam. At this time last year storage totalled 2 435 GL.



What does the Bureau say?

The Bureau of Meteorology stated in October that 2007 was "the first time in the meteorological record dating from 1900 that an El Niño-drought in the Murray-Darling Basin has not been followed by at least one three-month period with "above normal" (Basin average) rainfall by the end of the following winter".

The Bureau's *Special Climate Statement 14* issued 1 November 2007 stated "This extreme dry period for the Murray-Darling Basin has also been accompanied by high temperatures, exacerbating the low rainfall. Both daytime maximum and daily mean temperatures for the six years from November 2001 to October 2007 have surpassed the previous records by a considerable margin ... As four out of the ten hottest years in the Basin have occurred since 2001, but none of the top ten years are from the 1930s or 40s, it is clear that temperatures during the current drought have far exceeded those experienced during previous droughts for which we have rainfall records."

CURRENT OPERATIONS

What's the overall plan?

The focus over winter and spring has been to maximise water held in the headwater storages of Hume and Dartmouth Reservoirs. This has required the river to be operated in new ways. Water saving measures, such as the temporary disconnection of selected wetlands and the lowering of some weir pools along the river, have reduced evaporation and minimised the draw upon Hume.

Now that summer demands are rising, flow rates are generally being increased across the river system. The overall goal of operations from now on will be to preferentially draw upon downstream storages, retaining water in upstream reservoirs. Lake Victoria will be drawn on first, then Hume and lastly Dartmouth Reservoir. This operation will minimise evaporation loss and maximise the ability of the system to capture potential inflows next autumn/winter, and keep as much water as possible stored in Dartmouth Reservoir at the end of the irrigation season.

There are constraints and some competing objectives in this operation; for instance the need to draw down Lake Victoria to lower its surface area and reduce evaporation while, at the same time, retaining enough water in the lake to mitigate potential water quality issues downstream. Similarly there needs to be enough water in Hume Reservoir over summer to meet peak demands downstream and to minimise the risk of algal blooms in the reservoir, which may require additional water to be released from Dartmouth Reservoir to supplement the Hume level.

Release from Dartmouth Dam will be closely monitored, with operations highly dependent on summer and autumn rains and inflows. Lake Hume will be steadily drawn down over the 2007/08 season, and by autumn levels will be similar to last year if conditions remain dry. An important difference to 2006/07, however, is that over the summer holiday period the lake is expected to be about 5 m higher than last year's levels in January, as a result of storage in Hume being at a higher level at the end of spring this year.

The Murray-Darling Basin Commission will continue to review its operational plans as the season unfolds and more details will be provided via media releases, operational updates and weekly reports.

Why are some weirpools lower than others?

The Murray-Darling Basin Commission is lowering as many weirpools as possible to reduce evaporation losses. Some weirpools - including those in South Australia and the Wentworth and Mildura weirpools, cannot be lowered significantly as this would allow extremely saline groundwater to seep back into the river. This could raise river salinities downstream, particularly in South Australia, to unusable levels.

Other pools, for example Lake Mulwala and the Torrumbarry weirpool are being used as 'mid river' storages and can be expected to be drawn upon as necessary to meet sudden increases in demand brought about by hot weather. Conversely, any increased flows in the river brought about by rain will be able to be captured by these pools rather than in Lake Victoria, in an effort to reduce evaporation loss.

The selection of wetlands to be disconnected to save evaporative losses has also required careful assessment, to minimise the risk of acid-sulphate soil reactions.

These operations have been undertaken with a "whole-of-system" view, to deliver the best overall outcome for the river, with no preference to any particular region or pool. The MDBC will continue to work cooperatively with partner Governments to deliver the best overall outcomes for the River Murray System.

Why is the river so full at Echuca?

Flows in some reaches of the Murray River are lower than normal for this time of year. Between Lake Hume and Yarrowonga Weir the flow rate is expected to fluctuate between 5 000 and 10 000 ML/day this season - well below the 20 000 to 25 000 ML/day expected in a high-allocation year. This is largely due to extremely low water use in the NSW and Victorian irrigation systems supplied from Lake Mulwala at Yarrowonga. These systems are currently drawing about 1000 ML/day, compared with the 13 000 ML/day expected in a good year.

At Echuca, and in general between Yarrowonga Weir and Lake Victoria, flows are a little closer to more normal summer flow rates. This is because overall demands in Sunraysia and in South Australia, whilst down on normal, are proportionally higher than at Lake Mulwala. The bulk of river losses are seen below Yarrowonga Weir meaning flows are also needed in this reach to meet these losses.

Should I cancel my holiday?



There is still plenty of Murray River to enjoy for recreation. While flows, river levels and some weirpools will be lower than normal, much of the river will experience conditions similar to last year. The level of Lake Hume is expected to remain about 5 m higher than last year's levels up to mid January.

Actual flows and levels will be affected by the weather, but the message remains that there should be good opportunity for recreation along the Murray River this summer. However, lower than normal levels in some locations may prove a boating hazard and it is important that river users consider this in their activities.

The MDBC will continue to issue media releases with more detailed information specific to individual structures and can be found on the MDBC website.

Will water quality be OK?

Water quality across much of the River Murray system remains high. However, with continued drought conditions there remains an elevated chance of algal blooms along the entire Murray River and an increased likelihood of high salinity in South Australia. In addition, the increased risk of acid-sulphate soil reactions in disconnected wetlands is being closely monitored.

Valuable understanding has been gained throughout the drought on the drivers of algal blooms. The MDBC is working closely with partner governments to have operational strategies to reduce the likelihood of blooms and timely response strategies to alert and contain the impacts of any potential bloom. Potential operational strategies include pulsing releases and weirpool manipulation aimed at breaking up potential developing blooms.

What about the environment?

The New South Wales Department of Water and Energy (DWE) recently announced an initiative to allow a limited release of 8 000 megalitres into the Wakool River and Merran Creek systems, to provide water for essential stock and domestic purposes and to benefit the environment.

The flows will give landholders along the Wakool River and Merran Creek systems access to fresh water for stock and domestic use for the first time in months. Regulated flow into the Edward-Wakool system was cut off at the end of May 2007, and the system has since contracted to a series of pools. The reconnection of these pools will help improve water quality and provide drought refuge for native fish and other aquatic species.

In Victoria, the Cardross lakes have been refilled, to support the endangered Murray Hardyhead (using Victorian environmental water in this case).

THE OUTLOOK

Rainfall and Streamflows

The Bureau of Meteorology has advised the La Niña event is now well established and is starting to have its effects felt in Australia. *"The Southern Oscillation Index (SOI) has ... risen to more typical La Niña values after being neutral for most of the year. November's SOI was +10 and monthly rainfall totals were above normal across much of Australia's eastern half."* They advise: *"Computer models continue to indicate the persistence of cold Pacific temperatures, consistent with a La Niña, until about April or May 2008."*

The Bureau's rainfall outlook states *"The chances of exceeding the median rainfall for summer are between 60 and 70% in a large area extending from southeast Queensland across both the northern inland and east of NSW."*

However, even in wetter years, significant inflows over summer are unusual, and the Bureau of Meteorology predicts an increased chance of higher temperatures this summer, potentially diminishing runoff. Nevertheless, the MDBC expects continued minor improvements in water resource availability as inflows, as low as they are, are still above the extreme low levels received last year, which are used as the basis for planning.

Will the dams empty?

Hume Reservoir (currently at 25% of capacity) is being drawn down to meet higher demand over summer. Lake Victoria is 60% full and is being drawn upon to supplement South Australian flow requirements, and is likely to reach very low levels by the end of the season. All efforts will be made to store improvements in water availability in Dartmouth Reservoir (currently 17% of capacity).

Overall, water in storages at the start of the 2008/09 water year will very likely be roughly equivalent to the beginning of this year. State water authorities have nominated their highest priority for the 2008/09 water year as the provision of critical human needs for the entire year, ensuring that any water available for use in June will be provided to towns and households along the river before industry and irrigation.

Operating the river through the unprecedented water resource conditions of the 2007/08 year has given water authorities invaluable experience in drought management, and the MDBC will work with partner Governments to further improve drought operations if the dry conditions persist.

Will there be water for 2008/09?

If current low inflow conditions persist through summer and into 2008, it is likely that there will be no more water in storage at the commencement of 2008/09 water year (1 June 2008) than there was on 1 June 2007. In these circumstances, water availability for irrigators for the next water-year would depend entirely on 2008/09 rain and inflows - as has been the case this year.

Under the "worst case" inflow scenario used for planning, there would be just enough water to operate the river and meet critical human needs, including some critical stock and domestic requirements. There would be no water for irrigation, other than any volumes carried over from this year.

To ensure critical needs can be met, a range of contingency measures similar to those adopted this year would be required, particularly to reduce evaporation losses as much as is practical.

Even with some small improvement, there would be difficulty supplying users who take their water from channel or anabranch systems, until the improvements were sufficient to cover the losses in those systems. This would be similar to the experience this year.

Several years of well above average inflow might be required to return the Murray system to long term average storage levels.

ADDITIONAL INFORMATION

MDBC will provide further drought updates in coming months. Additional information is available at <http://www.mdbc.gov.au> and 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