

# REPORT FOR THE WEEK ENDING

Wednesday, 3 October 2007

Our Ref : M2006/01015/PRS, AS  
Trim Ref : 07/12486

5 October, 2007



## Rainfall and Inflows

The dry weather has continued across the Murray-Darling Basin with most regions receiving less than 10mm of rain during the past week (see Map 1). The Victorian alpine region received the highest falls (up to 50 mm), and this resulted in a slight increase in flows in the Ovens, Kiewa and Mitta Mitta Rivers.

During the month of September, rainfall averaged across the Murray-Darling Basin was the driest in the historical record back to 1900 (see Map 2) and river flows continued to recede. The total monthly inflow was 210 GL which is only 13 % of the long term average for September. This makes it the 5<sup>th</sup> driest September on record. Inflows have now been below average for the last 24 consecutive months.

## River operations

Dartmouth Reservoir (currently at 680 GL or 17 % capacity) and Hume Reservoir (870 GL or 29 % capacity) continue to slowly rise, while Lake Victoria (530 GL and 78 % capacity) is slowly falling. The total system storage (including Menindee Lakes) is currently at 2130 GL which is well below the long term average for this time of year (7100 GL) and also below the storage volume 12 months ago (3350 GL).

The low storage volumes, combined with low inflows, have resulted in very limited water availability along the River Murray. The October Drought Update (attached) provides the latest information on outlooks and responses to the drought.

Flows along the entire length of the River Murray are being kept to a minimum and some weir pools are partially drawn down to save water. Lake Mulwala is currently at 124.0 m (90 cm below Full Supply Level) but is expected to rise very slightly during the coming week. During the past week, release from Yarrowonga Weir has been steady at 3000 ML/day and is likely to remain fairly constant during the next week. Torrumbarry Weir is currently about 10cm below FSL and is expected to fluctuate over the coming weeks. Release from Torrumbarry Weir is steady at about 2000 ML/day.

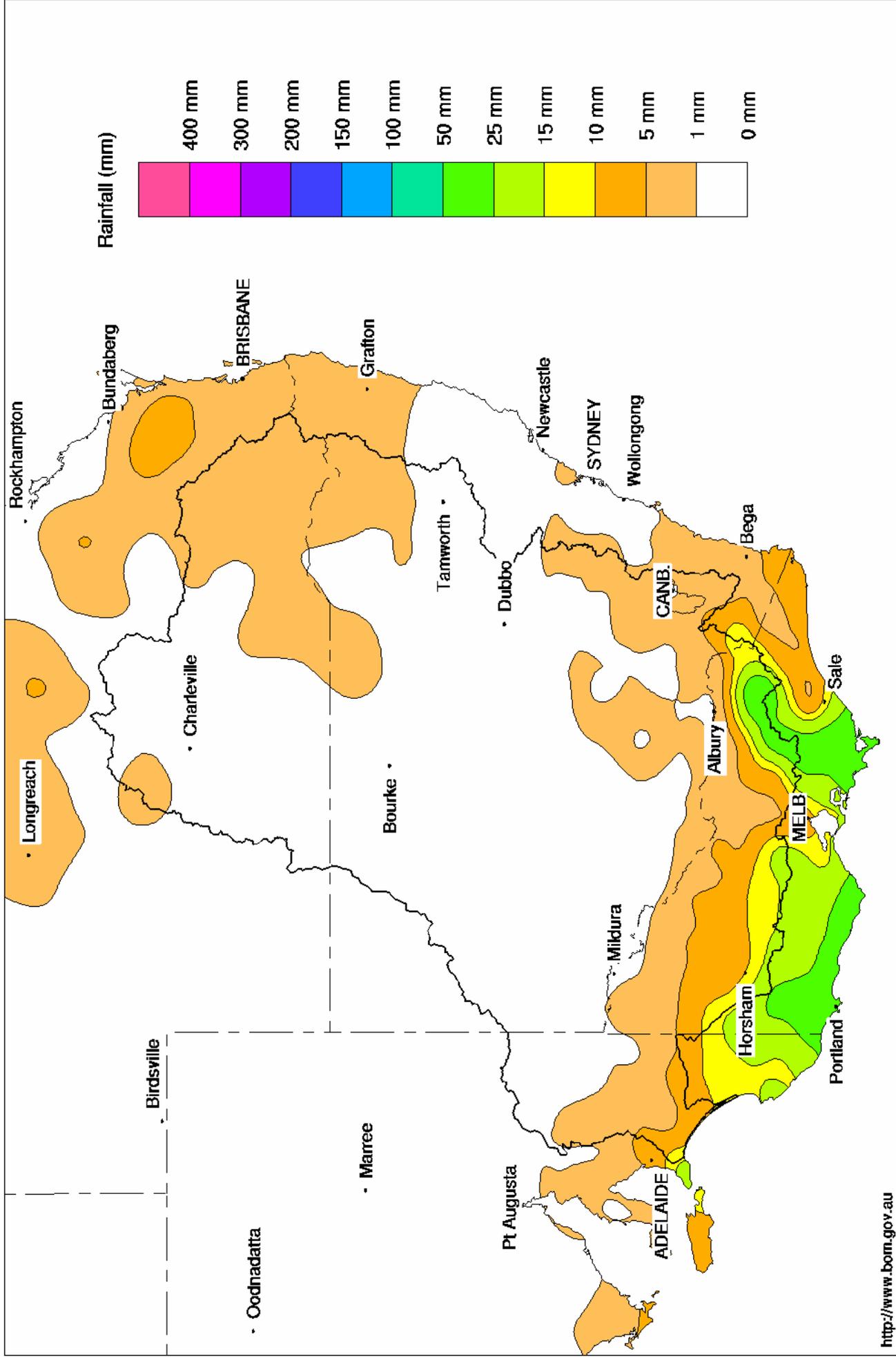
The partial lowering of Euston Weir has re-commenced at a rate of about 3 cm/week, and if conditions do not improve, it may fall to 0.5 m below Full Supply Level by mid November. The lowering will reduce evaporative losses from the Euston Lakes and hence increase water availability for consumptive uses.

During October, the flow to South Australia has been increased to 2600 ML/day, which is well below the normal entitlement flow of 5500 ML/day. The salinity at Morgan continues to slowly rise, and is currently at 780 EC. The Lower Lakes have received very little inflow from the River Murray since May 2007 and the water level has declined from 0.83 m to 0.16 m AHD over the last 12 months. If the dry weather continues, the level of the Lakes will continue to gradually fall, particularly as evaporative losses increase during late spring and summer.

DAVID DREVERMAN  
General Manager

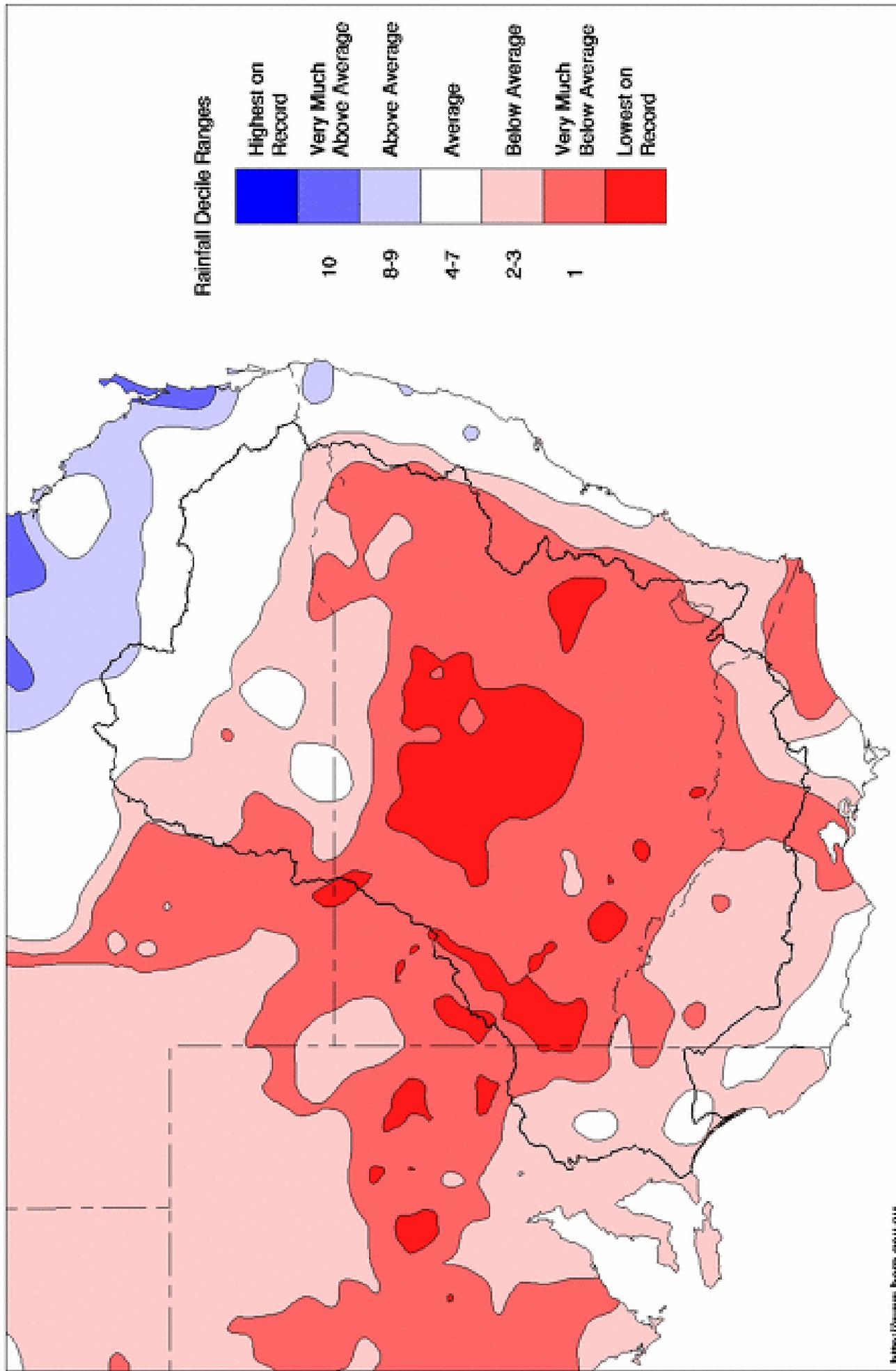
# Murray Darling Rainfall Analysis (mm) Week Ending 3rd October 2007

Product of the National Climate Centre



# Murray Darling Rainfall Deciles      September 2007

Distribution Based on Gridded Data  
Product of the National Climate Centre



# River Murray System

## Drought Update No. 10

October 2007

### IN BRIEF

#### Deepening Drought

Murray System inflows through winter 2007 have been marginally better than those received in 2006 (which was the driest year on record), but are still amongst the lowest on record and substantially less than the long term average. August and September were particularly dry across most of the Murray-Darling Basin.



Grape vine removal  
Photo by Arthur Mostead

Key developments since the last Update in August 2007:

- Rainfall (July - September) over much of the Basin has continued below average or very much below average, with patches of lowest on record in northern NSW
- Inflows over August and September have receded towards record low levels of 2006
- System storages are around 1200 GL lower than this time last year
- The prospect of substantial increases over the remainder of the season is poor given the majority of inflows are usually received during winter and early spring.
- 

Water is scarce throughout the Basin, with low or zero irrigation allocations widespread.

As the impact of this severe water shortage on irrigators and their communities is likely to be substantial, River Murray operations are focused on conserving as much water as possible. This includes keeping as much as possible in upstream storages, and making use of weir pools, such as Yarrowonga and Torrumbarry to supply downstream demands.

# CURRENT SITUATION

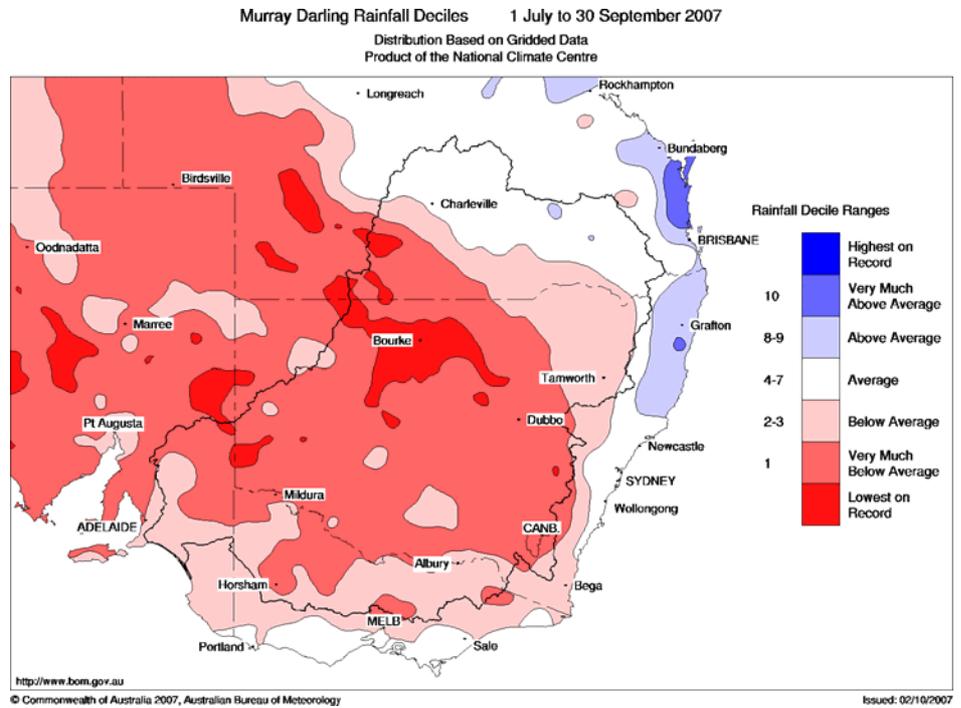
## Rainfall and Streamflow

In July the southern half of the Basin received average to above average rainfall, while the northern half of the Basin was below average. However in August the situation changed with most of the

Figure 1 - Rainfall Deciles Winter-Early Spring 2007 (Australian Bureau of Meteorology)

Basin receiving below average rainfall except for some regions in the north-east, and these dry conditions continued into September (Figure 1). Significantly, the upper catchments that feed the major storages of the River Murray suffered a severe rainfall deficiency.

The Bureau of Meteorology has stated that this is 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.

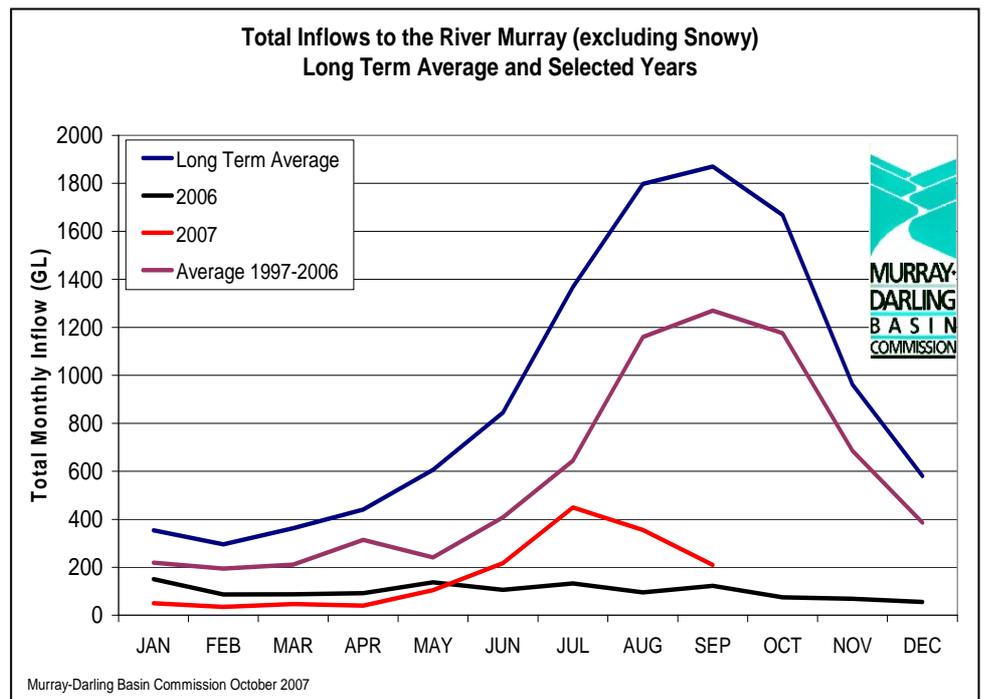


The deficiencies discussed above have occurred against a backdrop of multi-year rainfall deficits and record high temperatures that have severely depleted water supplies.

As a result of the below-average rainfall in the main catchment area during August, Murray System inflows for August were only 360 GL, which is well below the long term August average of 1570 GL.

The dry weather persisted throughout September, with inflows of about 210 GL, compared to the long term September average of 1610 GL (Figure 2). Monthly inflows have now been below average for the last 24 months.

Figure 2 - River Murray Inflows (MDBC)

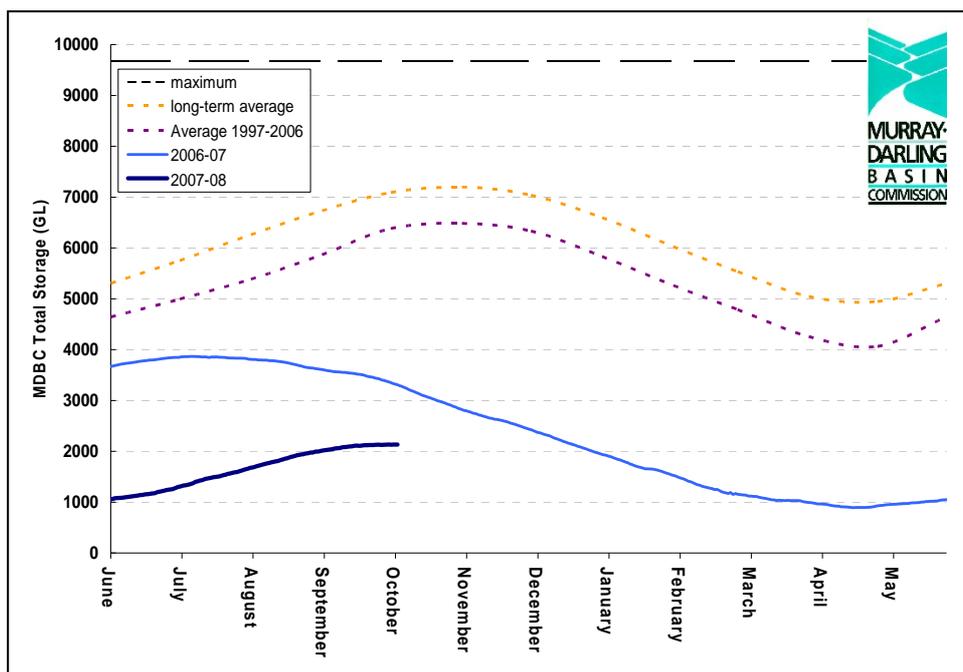


In August there were some good falls of rain in the far northeast of the Basin and this has resulted in some small inflows to the Darling River. This flow is travelling very slowly downstream, but is unlikely to result in significant inflows to Menindee Lakes.

## Storages

At September 30, the total volume of water stored in River Murray System storages was 2130 GL (23%), which is the lowest for this time of year since 1957, before the construction of Dartmouth Reservoir and Menindee Lakes storage, and the expansion of Hume Dam. At this time last year storage totalled 3350 GL. (Figure 3)

Figure 3 - MDBC Total Storage (MDBC)



Storage volumes in Dartmouth Reservoir (currently at 17% capacity) and Hume Reservoir (29% capacity) are rising slowly, but are forecast to drop as consumptive demand increases over summer. Lake Victoria is currently 78% full and has begun gradually falling as it is drawn upon to supplement South Australian flow requirements.

## CURRENT OPERATIONS

### Drought Response Measures

Current river operations are focussed on reducing system losses and allowing as much water as possible to be conserved in the upstream storages where evaporation rates are lower. The combination of low storage levels and low inflows will require the river to be operated outside the normal operating regime.

For the past few months, critical water requirements along the River Murray were largely supplied by the Kiewa River and Ovens River, which allowed the water stored in Hume and Dartmouth Reservoirs to be conserved for use later in the season. However, as the demand for water increased, and the Kiewa and Ovens inflows receded, the release from Hume Dam was increased in mid September.

To minimise in-river losses, the drawdown of some weir pools has commenced. This can significantly reduce evaporation losses from the surface of the weir pools and any associated lakes and wetlands. The water level in Lake Mulwala (Yarrowonga Weir) was gradually lowered over the last 2 months, and the first stage of the Euston Weir drawdown commenced in early August. The weir pool at Torrumbarry will be used to re-regulate flows along the mid reaches of the Murray, which will cause the pool level to fluctuate during the next few months. See specific MDBC Media releases for details of these drawdowns.

Further water saving measures being considered include a limited drawdown of Weirs 8 and 9. Water users will be notified in specific media releases well in advance. Weir pool levels in South Australia will remain as close as possible to Full Supply Level immediately upstream of the weirs to contain salinity increases. However, the lower lakes are likely to fall to record lows under continuing dry conditions (possibly as low as -0.6m by March 2008). The temporary disconnection of selected wetlands in South Australia and New South Wales will deliver significant water savings, and has the additional benefit of reducing the amount of salt and nutrients entering the river.

Water currently stored in Lake Victoria is the result of tributary inflows during winter, particularly from the Ovens and Kiewa Rivers. This will provide a significant portion of South Australia's water over the coming

months and will reduce the demand on Hume and Dartmouth Reservoirs. The flow to South Australia has increased to 2600 ML/day and will remain at this level for the rest of October. This is well below South Australia's entitlement flow for October of 5500 ML/day. As a result of the low flow, salinity has been increasing, and at Morgan had increased from 430 EC in early June to 780 EC by the end of September.

### Salinity and Other Water Quality Considerations

Since May there has been very little flow beyond Wellington into Lake Alexandrina. The lake level was steady over winter due to local rain and low rates of evaporation, but has now begun to gradually fall.

The water in the reach between Lock 1 and Wellington has been of reasonably good quality, with salinities of less than 500 EC. As water from this reach evaporates or is pumped to Adelaide and other urban centres in South Australia, it is slowly replaced with poorer quality water from upstream. Under continuing dry conditions, salinities are forecast to rise, and flows to South Australia will be aimed at maintaining the water quality within levels suitable for human consumption.

Salinity in the Lower Lakes is already in the range of 2300 to 2500 EC, with much higher levels immediately upstream of the barrages, where leakage over, under or through the structures has resulted in seawater mixing with the much fresher water of Lake Alexandrina. In isolated areas of the lakes salinity levels may also be higher due to local groundwater inflows. Considerable efforts have gone into minimising leakage, but seepage under, and storm waves over, the barrages cannot be prevented and will continue to bring salt in to the lake.

Regular water quality monitoring undertaken along the entire River Murray will provide early indications of salinity increases or any other problems, such as algal blooms. All people using the waters of the River Murray should be aware of the increased potential for water quality problems and the difficulty dealing with these issues while flows remain very low.

### Environmental Considerations

Water allocated to the environment has been severely reduced by the drought, just like water allocated to irrigators and the community.

Any water made available to the environment of the River Murray this season will be used to provide critical drought refuge for key species in specific locations.

Less than 1% of total available water has been earmarked for environmental use, and discussion is currently underway to ensure appropriate usage of this small volume of water for critical environmental purposes under the current extreme conditions.



Rapid growth of Azola in Broken Creek near Cobram, Victoria  
Azola growth has been exacerbated by the long drought and low inflows. Photo by Arthur Mostead

## OUTLOOK

### Rainfall and Streamflows

The Bureau of Meteorology's ENSO wrap-up shows a La Niña weather pattern intensifying during September. With such a late-developing La Niña, however, the typical increased rainfall response is not as likely as in past episodes.

The Bureau's rainfall outlook for October to December shows no strong odds of wetter or drier conditions. However, the outlook is for warm conditions over this period which could have a significant impact on demands, river system losses and runoff from any storm events that do occur. With catchments drier than normal for this time of year it will take a series of medium to large rainfall events to produce a good response in streamflow.

### Water Availability for 2007/08

Current water availability is the lowest for the River Murray System over the past 116 years (using modelled behaviour at the current level of system development). Additionally, significant improvement over the next few months is becoming less likely. Two months ago we reported that there was a 25% chance that total water availability would be less than in 2006/07. The chance of this occurring has now increased to about 50% - if conditions don't improve significantly in October there will be a greater than 75% chance that total water available for use by the end of the season (in May 2008) will be worse than last season, as the months from November to May do not typically yield substantial inflows.

By October 3, there had been 1108 GL of improvements (excluding transmission losses) above critical human requirements available for sharing between States, according to special sharing rules agreed by partner governments to manage extremely low water availability. South Australia has announced a 16% allocation, with full delivery of carryover. Victoria has made all carryover water available and allocation is currently at 16% of High Reliability Water Shares. NSW has announced 0% allocation for both high security and general security water, but has re-credited 25% of water suspended in 2006/07. Some small allocations have also been granted to meet critical industry needs and to sustain permanent plantings. State water authorities provide regular updates, including information about the probability of future improvements in allocation.

### Drought Planning for 2007/08 and Beyond

MDBC has been working closely with partner governments to develop contingency plans to manage water supplies during this unprecedented drought. In early 2007, agreement was reached on special water sharing arrangements that ensured critical human water was delivered to towns along the Murray, and changed the way water is shared between states to cope with the current extreme conditions.

The temporary disconnection of wetlands in all three States is expected to deliver savings equal to the amount of water required to supply critical human needs in Victorian and New South Wales towns dependent on Murray supplies for 2007/08.

South Australia has pumped water earlier usual from the lower Murray to storages in the Adelaide hills. Major South Australian pump stations are being lowered to allow operation at low river levels. This measure has been critical in being able to defer the construction of a temporary weir near Wellington. Wellington Weir would not increase water availability to South Australian or upstream users, but would maintain a pumping pool for urban water supply offtakes. Hence, the proposal to construct a temporary weir near Wellington is considered a measure of last resort.

Senior officials from MDBC and partner governments have been investigating options to ensure that there is sufficient water available in 2008/09 to meet critical human needs in the Murray Valley, as well as supplying urban centres in South Australia, including Adelaide. A range of contingency measures have been identified which can be implemented if late season improvements this year and inflows next year are insufficient by themselves to guarantee that critical human needs can be supplied. The probability of such poor inflows occurring is very low, but it is prudent to plan for such circumstances.

### 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

**Water in Storage**

MDBC Storages	Full Supply Level (m AHD)	Full Supply Volume (GL)	Current Storage Level (m AHD)	Current Storage		Dead Storage (GL)	MDBC Active Storage (GL)	Change in Storage for the week (GL)
				(GL)	%			
Dartmouth Reservoir	486.00	3 906	410.77	677	17%	80	597	+12
Hume Reservoir	192.00	3 038	177.37	869	29%	30	839	+12
Lake Victoria	27.00	677	25.74	529	78%	100	429	-15
Menindee Lakes		1 731 *		59	3%	(- -) #	0	-2
<b>Total</b>		<b>9 352</b>		<b>2 134</b>	<b>23%</b>	<b>--</b>	<b>1 865</b>	<b>+7</b>

\* Menindee surcharge capacity 2050 GL % of Total Active MDBC Storage = 22%

# NSW takes control of Menindee Lakes when storage falls below 480 GL, and control reverts to MDBC when storage next reaches 640 GL

**Major State Storages**

Burrinjuck Reservoir	1 026		409	40%	3	406	-6
Blowering Reservoir	1 631		483	30%	24	459	-2
Eildon Reservoir	3 390		781	23%	100	681	+14

**Snowy Mountains Scheme**

Snowy diversions for week ending 02-Oct-2007

Storage	Active storage (GL)	Weekly change (GL)	Diversions (GL)	This week	From 1 May 2007
Lake Eucumbene - Total	387	+19	Snowy-Murray	+5	255
Snowy-Murray Component	268	+22	Tooma-Tumut	+4	99
Target Storage	1 400		Nett Diversion	0.7	156
			Murray 1 Release	+14	399

**Major Diversions from Murray and Lower Darling (GL)**

New South Wales	This week	From 1 July 2007
Murray Irrig. Ltd (Net)	.7	24.2
Wakool System loss	0.0	2.5
Western Murray Irrig.	0.2	1.4
Licensed Pumps	1.6	11.5
Lower Darling	0.2	1.4
<b>TOTAL</b>	<b>2.7</b>	<b>40.9</b>

Victoria	This week	From 1 July 2007
Yarrawonga Main Channel (net)	2.5	16
Torrumbarry System + Nyah (net)	1.5	22
Sunraysia Pumped Districts	1.3	7 *
Licensed pumps - GMW (Nyah+u/s)	0.1	3
Licensed pumps - LMW	0.5	7
<b>TOTAL</b>	<b>5.8</b>	<b>54 *</b>

\* please note that these values do not include Millewa pumping figures.

**Flow to South Australia (GL)**

Entitlement this month	170 *	
Flow this week	15.5	(2 200 ML/day)
Flow so far this month	8	
Flow last month	50	

\* Reduced to approx. 80 GL during October drought contingency operations

**Salinity (EC)**

(microsiemens/cm @ 25° C)

	Current	Average over the last week	Average since 1 August 2007
Swan Hill	110	100	110
Euston	130	130	110
Red Cliffs	-	-	-
Merbein	150	150	120
Burtundy (Darling)	1 230	1 220	1 110
Lock 9	120	120	130
Lake Victoria	170	170	170
Berri	480	480	490
Waikerie	-	700	660
Morgan	770	780	710
Mannum	470	460	430
Murray Bridge	590	570	550
Milang (Lake Alex.)	2 570	2 390	2 210
Poltalloch (Lake Alex.)	2 150	1 980	2 070
Meningie (Lake Alb.)	2 520	2 510	2 510
Goolwa Barrages	15 780	14 680	14 460



**River Levels and Flows**

	Minor Flood stage (m)	Gauge height		Flow (ML/day)	Trend	Average flow this week (ML/day)	Average flow last week (ML/day)
		local (m)	(m AHD)				
<b>River Murray</b>							
Khancoban	-	-	-	1 420	R	2 480	3 130
Jingellic	4.0	1.33	207.85	2 030	F	3 800	4 130
Tallandoon ( Mitta Mitta River )	4.2	1.30	218.19	440	S	470	440
Heywoods	5.5	1.46	155.09	2 120	F	2 790	1 970
Doctors Point	5.5	1.98	150.45	3 960	F	4 440	3 590
Albury	4.3	1.01	148.45	-	-	-	-
Corowa	7.0	1.21	127.23	3 720	F	3 630	2 490
Yarrowonga Weir (d/s)	6.4	0.61	115.65	3 020	S	3 020	2 540
Tocumwal	6.4	1.03	104.87	2 950	F	2 900	2 480
Torrumbarry Weir (d/s)	7.3	0.93	79.48	1 950	F	2 080	1 860
Swan Hill	4.5	0.59	63.51	1 990	F	2 070	2 000
Wakool Junction	8.8	1.40	50.52	2 210	R	2 160	2 110
Euston Weir (d/s)	8.8	0.45	42.29	1 920	S	1 860	1 840
Mildura Weir (d/s)	-	-	-	1 190	F	1 480	1 790
Wentworth Weir (d/s)	7.3	2.79	27.55	1 350	R	1 220	1 640
Rufus Junction	-	2.78	19.71	2 130	R	1 780	1 360
Blanchetown (Lock 1 d/s)	-	0.25	-	1 580	R	910	1 510
<b>Tributaries</b>							
Kiewa at Bandiana	2.7	1.88	155.11	2 064	R	1 610	1 430
Ovens at Wangaratta	11.9	8.22	145.90	1 442	R	1 340	1 320
Goulburn at McCoys Bridge	9.0	1.15	92.57	369	S	360	280
Edward at Stevens Weir (d/s)	-	0.46	80.23	210	F	210	200
Edward at Liewah	-	0.44	55.82	185	R	170	180
Wakool at Stoney Crossing	-	0.07	54.56	21	F	30	50
Murrumbidgee at Balranald	5.0	0.47	56.43	197	F	200	210
Barwon at Mungindi	-	3.18	-	23	F	100	180
Darling at Bourke	-	4.18	-	738	F	970	880
Darling at Burtundy Rocks	-	0.65	-	12	S	20	30

<b>Natural Inflow to Hume</b> (ie pre Dartmouth & Snowy Mountains scheme)	6 780	5 670
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**Weirs and Locks**

**Pool levels above or below design level**

<b>Murray</b>	FSL (m AHD)	u/s	d/s		FSL (m AHD)	u/s	d/s
Yarrowonga	124.90	-0.86	-	No. 7 Rufus River	22.10	-0.06	+0.46
No 26 Torrumbarry	86.05	-0.13	-	No. 6 Murtho	19.25	+0.00	+0.00
No. 15 Euston	47.60	-0.25	-	No. 5 Renmark	16.30	+0.03	+0.05
No. 11 Mildura	34.40	+0.03	+0.03	No. 4 Bookpurnong	13.20	-0.02	+0.24
No. 10 Wentworth	30.80	+0.03	+0.15	No.3 Overland Corner	9.80	+0.02	+0.20
No. 9 Kulnine	27.40	+0.01	+0.01	No. 2 Waikerie	6.10	+0.07	+0.12
No. 8 Wangumma	24.60	+0.02	-0.05	No 1. Blanchetown	3.20	+0.06	-0.50

<b>Murrumbidgee</b>	FSL (m AHD)	relation to FSL	d/s gauge ht.		Flow (ML/day)
			local (m)	(m AHD)	
No. 7 Maude	75.40	-1.21	0.54	69.89	243
No. 5 Redbank	66.90	-1.22	0.09	61.39	220



**Lower Lakes**

FSL = 0.75 m AHD

	(m AHD)
Lake Alexandrina average level for the past 5 days	0.16

**Barrages**

**Fishways @ Barrages**

	Openings	Level (m AHD)	Status	Rock Ramp	Vertical Slot
Goolwa	128 openings	0.01	All closed	-	Closed
Mundoo	26 openings	0.10	All closed	-	-
Boundary Creek	6 openings	-	All closed	-	-
Ewe Island	111 gates	-	All closed	-	-
Tauwichee	322 gates	0.40	All closed	Closed	Closed

AHD = Level relative to Australian Height Datum, i.e. height above sea level