



RIVER MURRAY WEEKLY REPORT

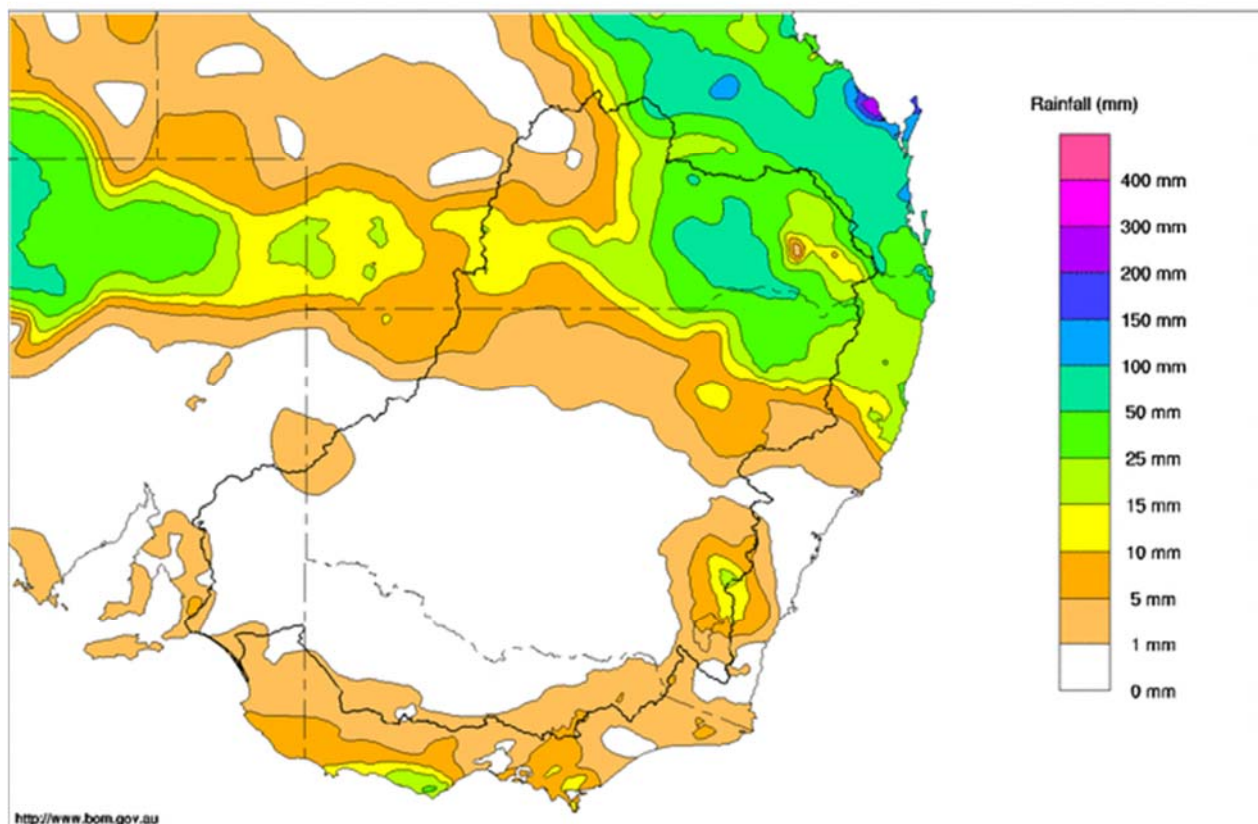
FOR THE WEEK ENDING WEDNESDAY, 4TH OCTOBER 2017

Trim Ref: D17/34540

Rainfall and inflows

Rainfall in the southern Basin, for the week ending the 4th October, was mostly confined to scattered showers in the Victorian ranges. Towards the end of the week an easterly trough delivered moderate to heavy falls to areas of the northern Basin. Rainfall totals in excess of 50mm were observed in parts of the Darling Downs in Queensland and north-eastern New South Wales (see Map 1). Very little rainfall was observed in central New South Wales, northern Victoria and the South Australian Murray-Darling Basin.

Murray-Darling Rainfall Totals (mm) Week Ending 4th October 2017
Australian Bureau of Meteorology



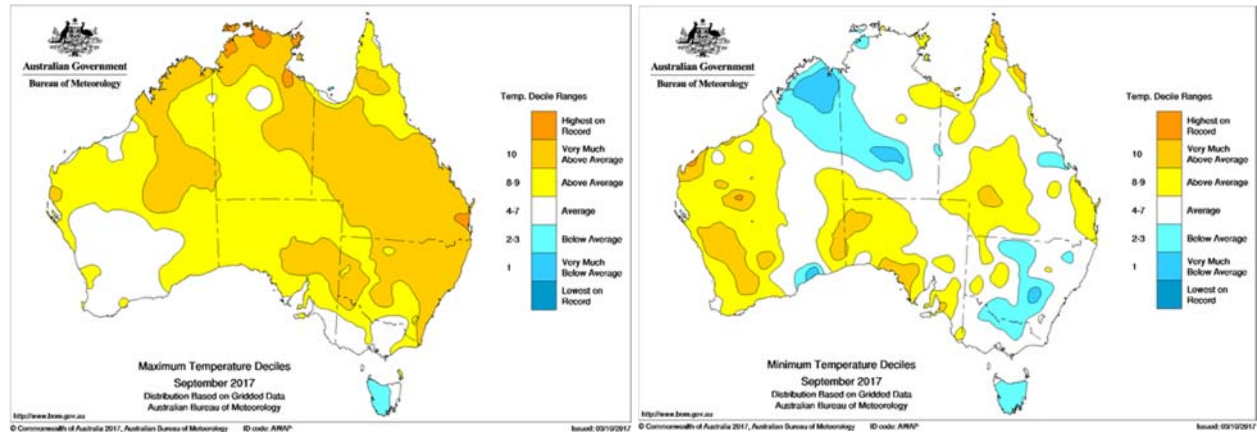
Map 1 - Murray-Darling Basin rainfall map week ending 4 October 2017 (Source: Bureau of Meteorology).

The impact of the continuing dry conditions in the southern basin is seen in the ongoing but gradual recession of flows upstream of Hume Dam. Flow at Hinnomunjie Bridge on the upper Mitta Mitta River averaged around 2,300 ML/day. On the upper Murray at Biggara, the flow decreased from 1,620 ML/day to 1,430 ML/day. Downstream on the Ovens River at Wangaratta the flow receded from 4,270 ML/day to 2,420 ML/day. Without further rainfall the upper Murray tributaries are expected to continue to recede.



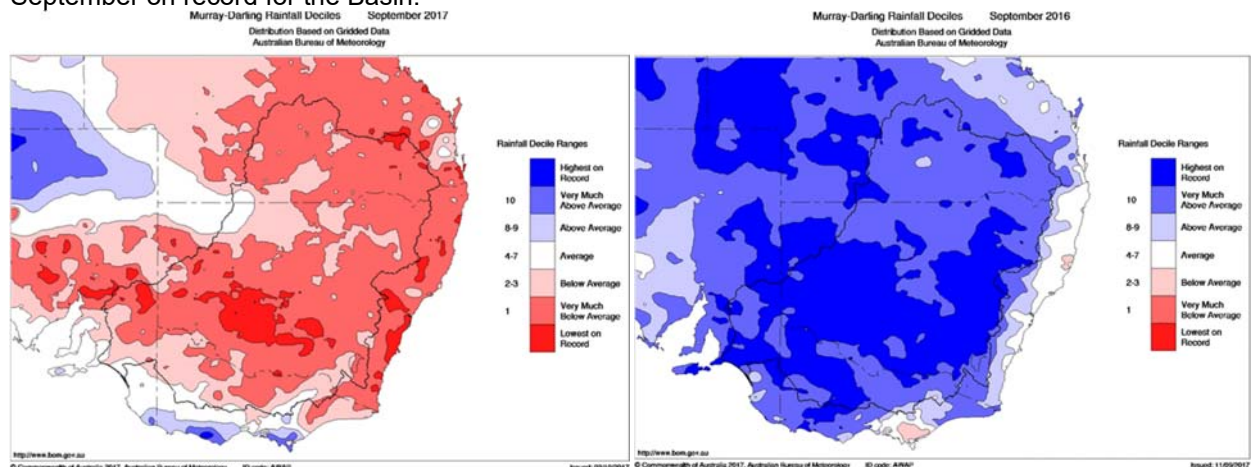
September 2017 Summary

September was a very warm month for Australia (Map 2). In terms of maximum temperatures, the Bureau of Meteorology (BoM) reports that September 2017 was the equal fifth warmest September on record for Australia as a whole (2.03 degrees above average). Due to the clear skies and dry conditions, minimum recorded temperatures across much of the Basin were generally average or below average during September 2017 (Map 2).



Map 2 Murray Darling Basin maximum and minimum temperature deciles for September 2017 (Source: Bureau of Meteorology).

Rainfall for September was below average or very much below average across most of the Basin (see Map 3). Some areas of central New South Wales observed the lowest September rainfall on record. For the Basin as a whole, the BoM reports that September 2017 was the driest September on record (in 118 years of records). This is in stark contrast to one year ago (Map 3) when September 2016 was reported the wettest September on record for the Basin.



Map 3 Murray Darling Basin rainfall deciles comparing September 2017 and September 2016 (Source: Bureau of Meteorology).

Inflow to the River Murray system during September (excluding Snowy inflows, inflows to the Menindee Lakes, managed environmental flows and inter-valley transfers) totalled 640 GL. This represents an annual exceedance probability (AEP) of 82% (that is only 18% of years would be expected to have lower inflows in September). This compares with inflows of almost 3,000 GL in September 2016 (AEP 11%). The moist catchment conditions left over from August and melting snowpack contributed to higher than expected September inflows, especially given the low rainfall.

Estimated evaporation losses from MDBA storages for September 2017 are reported in Table 1. Evaporation is estimated by multiplying the surface area of the storage by the net evaporation. Net evaporation is derived by subtracting the rainfall recorded at the storage from the calculated evaporation. At Dartmouth Reservoir, rainfall exceeded evaporation during September and hence there was no net loss of water. However at Hume



Reservoir, evaporation exceeded rainfall. This was also the case for Lake Victoria and Menindee Lakes resulting in a net evaporative loss for the month at these storages. Evaporation at the Menindee Lakes was significant and reflects the hot and dry conditions observed during September.

Table 1: Monthly evaporation figures for MDBA storages

Storage	*Approximate (net) evaporative loss in September 2017 (GL)	Average storage volume in September 2017 (GL)	Percentage net evaporative loss in September 2017
Dartmouth	-1.2	3,201	0.0
Hume	9.9	2,720	0.4
Lake Victoria	11.5	615	1.9
Menindee Lakes	31.6	693	4.6

* Evaporative loss from storage = surface area of the storage x net evaporation. Net evaporation = measured evaporation (using a 'pan' instrument) - rainfall. A positive value indicates a loss, whilst a positive value indicates a gain in water.

River operations

- Yarrawonga release increasing to 14,500 ML/day
- Flow downstream of Weir 32 on the Lower Darling River increasing up to 1,800 ML/day
- Pulse from the Goulburn River reaches Swan Hill

MDBA total storage decreased by 24 GL this week.

At **Dartmouth Reservoir**, the storage volume increased by 22 GL to 3,261 GL (85% Capacity). The release from the reservoir, measured at Colemans, remains at the minimum rate of 200 ML/day.

The **Hume Reservoir** storage level has continued to gradually fall (Figure 1). The current volume is 2,717 GL (90% capacity). Releases from Hume have risen over the week from 10,500 ML/day to 14,000 ML/day to meet increased downstream demands. Further increases are expected in the coming days. Without further rain, the storage level is expected to continue gradually falling.

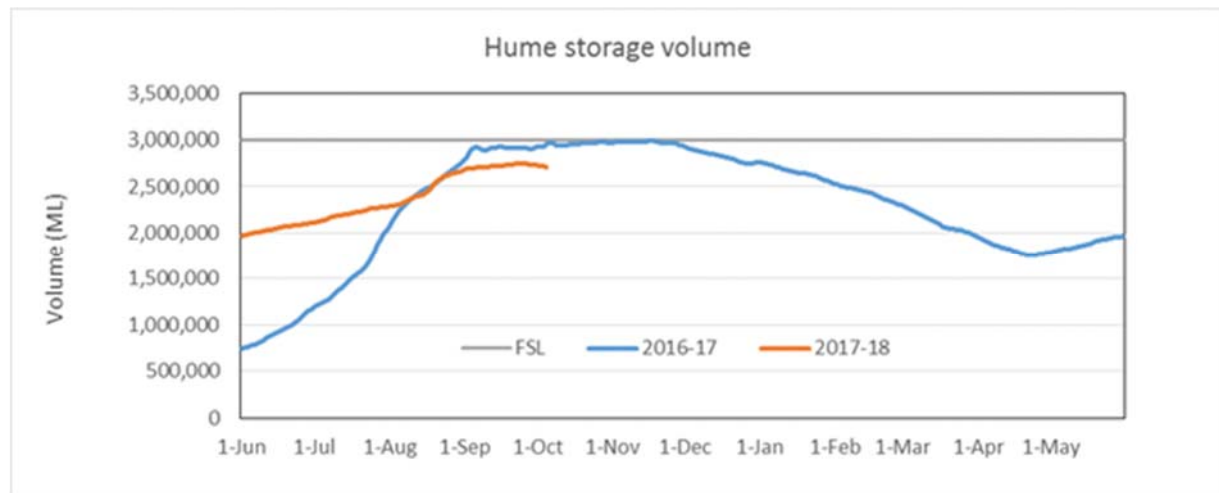


Figure 1 Hume storage volume June 2016 to October 2017

At **Yarrawonga Weir**, the flow downstream has been increased to 10,810 ML/day with a further increase to 14,500 ML/day planned in the coming days. Due to the continuing warm and dry conditions, increased releases are required to transfer water to Lake Victoria in order to have the storage as full as possible by the end of the year to supply anticipated high system demands over the coming summer and autumn. These higher releases are at rates above the channel capacity of the Barmah choke and will result in low levels of inundation of the Barmah-Millewa forest. Targeting higher releases at this time of year, rather than later in



summer, minimises delivery losses, is beneficial to the Barmah-Millewa forest and reduces the risk of hypoxic blackwater.

Irrigation diversions have remained steady this week, but are expected to increase over coming weeks as preparations continue for summer cropping. Diversions into Mulwala Canal averaged around 3,600 ML/day, while Yarrowonga Main Channel has been taking close to 1,940 ML/day. The level of Lake Mulwala has remained within its normal operating range, and is currently at 124.89 m AHD. Most of the regulators in the Barmah-Millewa Forest remain open allowing water to flow into the local flood runners as would naturally happen at this time of year.



Photo 1 River Murray below Noreuil Park, Albury (photo courtesy Hugo Bowman, MDBA)

Flow into the **Edward River system** via the Edward River offtake is around 1,560 ML/day with 350 ML/day passing through Gulpa Creek offtake. Flow through the Gulpa offtake will increase to at least 500 ML/day in line with increased flow downstream of Yarrowonga over the coming week. Flows through Millewa Forest are contributing to the flow at Toonalook, which is currently 2,400 ML/day.

At **Stevens Weir**, the average flow has increased to 1,350 ML/day compared to an average of 1,140 ML/day last week. Irrigation demand at Wakool Main Canal averaged 544 ML/day this week.

The flow at McCoys Bridge on the **Goulburn River** has receded to 4,660 ML/day from a peak of around 7,140 ML/day last week following the environmental flow pulse. Flow at McCoys Bridge is expected to continue to recede before returning to seasonal minimum flows of around 500 ML/day in mid-October.

Further downstream at **Torrumbarry Weir** the flow is currently 9,460 ML/day. The flow is expected to recede in the coming week. The diversion into National Channel averaged 2,700 ML/day during the week.

At **Swan Hill**, the flow in the River Murray has increased to 8,800 ML/day. The flow at Swan Hill will recede over the coming week as the environmental pulse from the Goulburn River continues downstream.

Flow in the **Murrumbidgee River** at Balranald is about 1,050 ML/day and steady. The flow is expected to remain around 1,030 ML/day.

The weir pool at **Euston** remains 30 cm above FSL. This higher level is part of the [weir pool variability program](#). The downstream release is now 8,200 ML/day and is expected to rise over the coming week with a peak flow of around 9,000 ML/day expected mid-October.

The storage volume in the **Menindee Lakes** reduced by 14 GL this week to 649 GL (37% capacity). WaterNSW will start increasing the release from the Menindee Lakes system, late this week to deliver water



ordered by the Murray-Darling Basin Authority. MDBA is calling on this water to help meet system demands in the Murray downstream of the Darling River confluence. The release, measured at Weir 32, will begin to increase gradually from 7th of October to reach 1,800 ML/day over several days. More information on releases from the Menindee Lakes can be found in the attached [media release](#).

The flow at **Wentworth Weir**, at the junction of the Murray and Darling Rivers, is currently 4,900 ML/day. The peak of the pulse from the Goulburn River is expected to pass Wentworth in mid-October, with flows potentially exceeding 8,000 ML/day.

The weir pool level at **Lock 9** is currently about 17 cm above FSL, **Lock 8** is 32 cm above FSL and **Lock 7** is nearly 50 cm above FSL. Lock 9 pool level will be gradually lowered to return to FSL this week. These high pool levels are part of the [weir pool variability](#) program, which aims to help restore a more natural wetting and drying regime for river banks and adjacent wetlands.

At **Lake Victoria**, the storage volume decreased by 8 GL during the week to 562 GL (98% capacity). The storage is being drawn down to assist in meeting South Australia's entitlement flow in the coming weeks.

Flow into **South Australia** this week averaged 5,300 ML/day. The flow is expected to increase over the coming days to reach 10,000 ML/day early next week. This increased flow is due to the delivery of the environmental pulse originating from the Goulburn River.

At the **Lower Lakes**, the 5-day average water level in Lake Alexandrina is 0.77 m AHD. Releases through the barrages are continuing when conditions allow. Barrage fishways have remained open throughout the week to enable fish passage between the Lower Lakes and the Coorong.

For media inquiries contact the Media Officer on 02 6279 0141

ANDREW REYNOLDS
Executive Director, River Management



Water in Storage

Week ending Wednesday 04 Oct 2017

MDBA Storages	Full Supply Level	Full Supply Volume	Current Storage Level	Current Storage		Dead Storage	Active Storage	Change in Total Storage for the Week
	(m AHD)	(GL)	(m AHD)	(GL)	%	(GL)	(GL)	(GL)
Dartmouth Reservoir	486.00	3 856	476.46	3 261	85%	71	3 190	+22
Hume Reservoir	192.00	3 005	190.52	2 717	90%	23	2 694	-23
Lake Victoria	27.00	677	26.88	662	98%	100	562	-8
Menindee Lakes		1 731*		649	37%	(480 #)	169	-14
Total		9 269		7 289	79%	--	6 615	-24
Total Active MDBA Storage							77% ^	

Major State Storages

Burrinjuck Reservoir	1 026	608	59%	3	605	-29
Blowering Reservoir	1 631	1 247	76%	24	1 223	-38
Eildon Reservoir	3 334	2 422	73%	100	2 322	-2

* Menindee surcharge capacity – 2050 GL

** All Data is rounded to nearest GL **

NSW has sole access to water when the storage falls below 480 GL. MDBA regains access to water when the storage next reaches 640 GL.

^ % of total active MDBA storage

Snowy Mountains Scheme

Snowy diversions for week ending 03 Oct 2017

Storage	Active Storage (GL)	Weekly Change (GL)	Diversions (GL)	This Week	From 1 May 2017
Lake Eucumbene - Total	1 491	+61	Snowy-Murray	+0	505
Snowy-Murray Component	612	+21	Tooma-Tumut	+10	114
Target Storage	1 400		Net Diversion	-10	391
			Murray 1 Release	+19	630

Major Diversions from Murray and Lower Darling (GL) *

New South Wales	This Week	From 1 July 2017	Victoria	This Week	From 1 July 2017
Murray Irrig. Ltd (Net)	27.2	155	Yarrowonga Main Channel (net)	12.8	54
Wakool Sys Allowance	2.0	9	Torrumbarry System + Nyah (net)	0.1	15
Western Murray Irrigation	0.3	2	Sunraysia Pumped Districts	2.2	12
Licensed Pumps	5.1	34	Licensed pumps - GMW (Nyah+u/s)	1	6
Lower Darling	0.6	19	Licensed pumps - LMW	4.6	36
TOTAL	35.2	219	TOTAL	20.7	123

* Figures are derived from actual and estimates where data is unavailable. Please note that not all data may have been available at the time of creating this report.

** All data above is rounded to nearest 100 ML for weekly data and nearest GL for cumulative data**

Flow to South Australia (GL)

* Flow to SA will be greater than normal entitlement for this month due to environmental flows.

Entitlement this month	170.0 *	
Flow this week	37.4	(5 300 ML/day)
Flow so far this month	24.9	
Flow last month	191.0	

Salinity (EC) (microSiemens/cm at 25° C)

	Current	Average over the last week	Average since 1 August 2017
Swan Hill	100	110	130
Euston	-	-	-
Red Cliffs	170	170	190
Merbein	150	140	170
Burtundy (Darling)	720	710	690
Lock 9	170	180	180
Lake Victoria	210	220	250
Berri	320	330	310
Waikerie	370	370	360
Morgan	410	390	380
Mannum	410	410	420
Murray Bridge	460	460	500
Milang (Lake Alex.)	590	590	580
Poltalloch (Lake Alex.)	620	610	580
Meningie (Lake Alb.)	1 530	1 520	1 540
Goolwa Barrages	910	1 030	1 570



River Levels and Flows

Week ending Wednesday 04 Oct 2017

	Minor Flood Stage	Gauge Height		Flow (ML/day)	Trend	Average Flow this Week (ML/day)	Average Flow last Week (ML/day)
		local (m)	(m AHD)				
River Murray	(m)						
Khancoban	-	-	-	5 420	R	4 320	3 300
Jingellic	4.0	2.07	208.59	7 660	R	6 880	6 780
Tallandoon (Mitta Mitta River)	4.2	1.59	218.48	1 020	S	1 100	1 300
Heywoods	5.5	2.80	156.43	12 320	R	11 100	7 870
Doctors Point	5.5	3.03	151.50	15 000	R	13 390	10 410
Albury	4.3	1.99	149.43	-	-	-	-
Corowa	4.6	2.84	128.86	13 080	F	12 870	9 060
Yarrowonga Weir (d/s)	6.4	1.80	116.84	10 810	R	10 010	8 800
Tocumwal	6.4	2.32	106.16	9 310	F	9 060	8 150
Torrumbarry Weir (d/s)	7.3	3.06	81.60	9 460	F	9 620	5 350
Swan Hill	4.5	1.69	64.61	8 800	R	7 050	3 360
Wakool Junction	8.8	3.39	52.51	9 270	R	7 500	6 670
Euston Weir (d/s)	9.1	1.74	43.58	8 170	R	6 670	7 830
Mildura Weir (d/s)	-	-	-	5 440	F	5 530	9 630
Wentworth Weir (d/s)	7.3	2.98	27.74	4 900	S	5 080	9 520
Rufus Junction	-	3.50	20.43	6 520	R	4 860	4 410
Blanchetown (Lock 1 d/s)	-	0.75	-	4 590	R	2 830	4 480
Tributaries							
Kiewa at Bandiana	2.8	2.39	155.62	2 700	R	2 550	2 650
Ovens at Wangaratta	11.9	8.77	146.45	2 420	F	3 190	5 090
Goulburn at McCoys Bridge	9.0	3.39	94.81	4 660	F	6 180	5 260
Edward at Stevens Weir (d/s)	5.5	1.63	81.40	1 410	F	1 350	1 140
Edward at Liewah	-	1.90	57.28	1 190	F	1 300	1 510
Wakool at Stoney Crossing	-	1.53	55.03	690	F	790	1 140
Murrumbidgee at Balranald	5.0	1.54	57.50	1 050	F	1 170	1 360
Barwon at Mungindi	6.1	3.18	-	80	F	70	50
Darling at Bourke	9.0	4.08	-	260	F	340	220
Darling at Burtundy Rocks	-	0.76	-	190	F	210	240

Natural Inflow to Hume	11 910	14 560
------------------------	--------	--------

(i.e. Pre Dartmouth & Snowy Mountains scheme)

Weirs and Locks Pool levels above or below Full Supply Level (FSL)

Murray	FSL (m AHD)	u/s	d/s		FSL (m AHD)	u/s	d/s
Yarrowonga	124.90	-0.01	-	No. 7 Rufus River	22.10	+0.49	+1.17
No. 26 Torrumbarry	86.05	+0.00	-	No. 6 Murtho	19.25	+0.02	+0.49
No. 15 Euston	47.60	+0.29	-	No. 5 Renmark	16.30	+0.45	+0.20
No. 11 Mildura	34.40	+0.00	+0.08	No. 4 Bookpurnong	13.20	+0.04	+0.72
No. 10 Wentworth	30.80	+0.01	+0.34	No. 3 Overland Corner	9.80	+0.06	+0.63
No. 9 Kulnine	27.40	+0.17	+0.32	No. 2 Waikerie	6.10	+0.52	+0.05
No. 8 Wangumma	24.60	+0.32	+0.54	No. 1 Blanchetown	3.20	-0.08	+0.00

Lower Lakes FSL = 0.75 m AHD

Lake Alexandrina average level for the past 5 days (m AHD)	0.77
--	------

Barrages

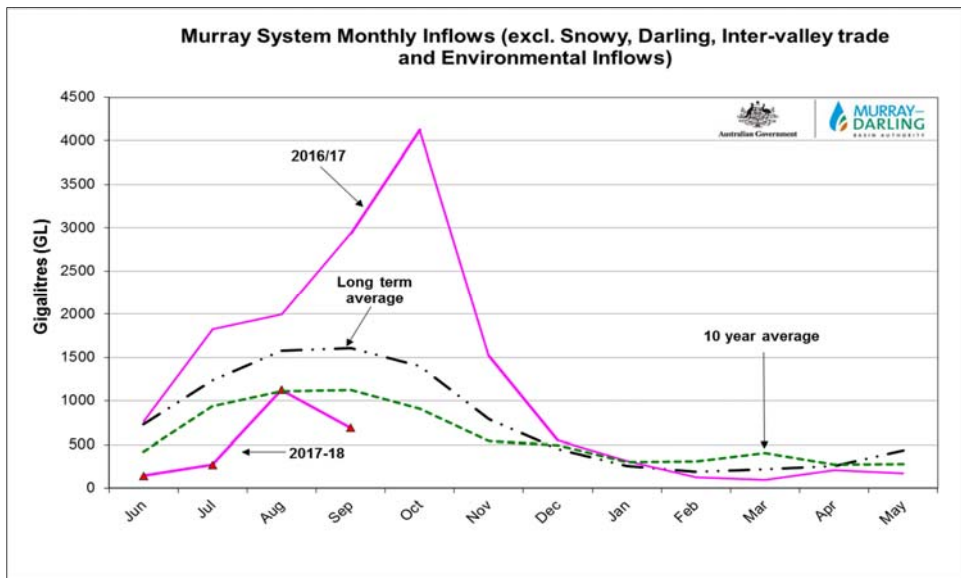
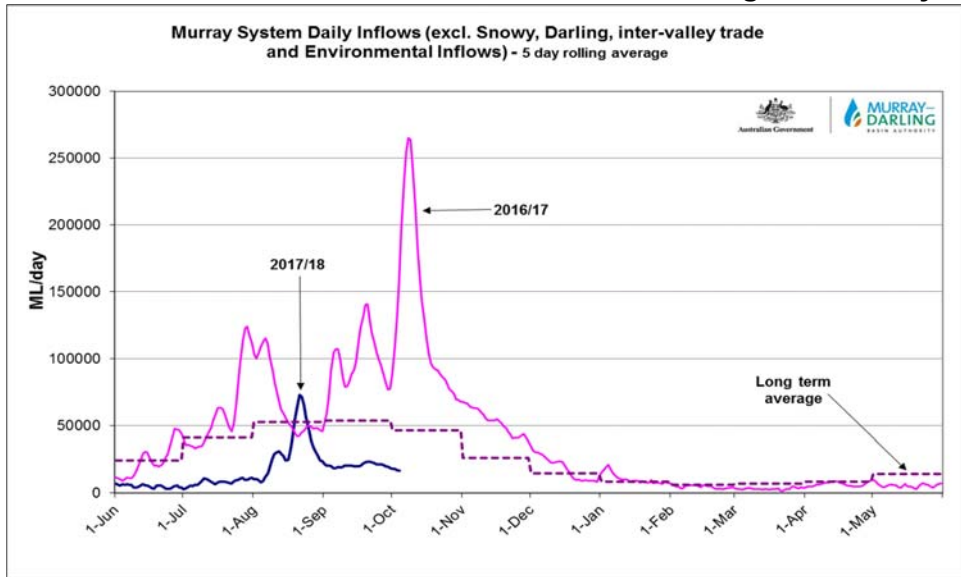
Fishways at Barrages

	Openings	Level (m AHD)	No. Open	Rock Ramp	Vertical Slot 1	Vertical Slot 2	Dual Vertical Slots
Goolwa	128 openings	0.85	2	-	Open	Open	-
Mundoo	26 openings	0.83	1	-	-	-	Open
Hunters Creek	-	-	-	-	Open	-	-
Boundary Creek	6 openings	-	1	-	Open	-	-
Ewe Island	111 gates	-	All closed	-	-	-	Open
Tauwitchere	322 gates	0.85	3	Open	Open	Open	-

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



Week ending Wednesday 04 Oct 2017



State Allocations (as at 04 Oct 2017)

NSW - Murray Valley

High security	97%
General security	29%

Victorian - Murray Valley

High reliability	100%
Low reliability	0%

NSW - Murrumbidgee Valley

High security	95%
General security	33%

Victorian - Goulburn Valley

High reliability	81%
Low reliability	0%

NSW - Lower Darling

High security	100%
General security	100%

South Australia - Murray Valley

High security	100%
---------------	------

NSW : <http://www.water.nsw.gov.au/water-management/water-availability>
 VIC : <http://nvrn.net.au/seasonal-determinations/current>
 SA : <http://www.environment.sa.gov.au/managing-natural-resources/river-murray>

JOINT MEDIA RELEASE

5 October 2017

Releases to increase from Menindee lakes

WaterNSW will start increasing releases from the Menindee lakes system late this week (7th October) to deliver water ordered by the Murray–Darling Basin Authority (MDBA), while continuing to operate the lakes to maximise future water security for local users.

In accordance with the longstanding Murray–Darling Basin Agreement, the MDBA may direct releases from Menindee Lakes system until the volume of water in the lakes falls below 480 GL. MDBA releases are made to meet demands in the Murray downstream of the Darling River confluence.

MDBA head of river operations, Andrew Reynolds, said continuing dry conditions over winter has also prompted early transfers from Hume Dam to Lake Victoria to meet River Murray demands over summer and autumn.

"Menindee lakes are shallow and high evaporation losses mean the storages are used ahead of others, such as Dartmouth Dam," Mr Reynolds said.

"Mindful of the challenges facing the local community, we have limited our releases from the lakes systems to allow for, as much as possible, the preservation of water in Lakes Wetherell and Pamamaroo."

WaterNSW Executive Manager System Operations, Adrian Langdon, said the Menindee lakes system was managed to supply licensed customers including Essential Water and Lower Darling landholders, as well as ensuring water security for customers along the Murray.

"Having a greater proportion of water in the upper lakes, when the 480 GL trigger is reached, provides greater security to local water users," Mr Langdon said.

"Safeguards are built into the water sharing arrangements so that the use of Menindee Lakes is limited to protect Broken Hill's water supply and lower Darling use once lake volumes fall below 480 gigalitres.

"The higher releases in the coming months will continue to provide benefits to the riverine environment though, including flow conditions favourable for native fish.

"WaterNSW's recent operations have ensured that when the 480 GL trigger is reached, which is likely to occur in mid November, the majority of the water is in the upper two lakes which will be used as storage to meet future needs."

WaterNSW and the MDBA will provide further details on flow rates in coming weeks.

Current dam storage information is available on the WaterNSW [website](#).

ENDS

For more information, contact the MDBA Media office at media@mdba.gov.au or 02 6279 0141 or the WaterNSW Media contact: tony.webber@waterNSW.com.au or 0428 613 478

Follow @MD_Basin_Auth on Twitter: twitter.com/MD_Basin_Auth

Find us on Facebook: facebook.com/MDBAuth