



# RIVER MURRAY WEEKLY REPORT

FOR THE WEEK ENDING WEDNESDAY, 31 AUGUST 2016

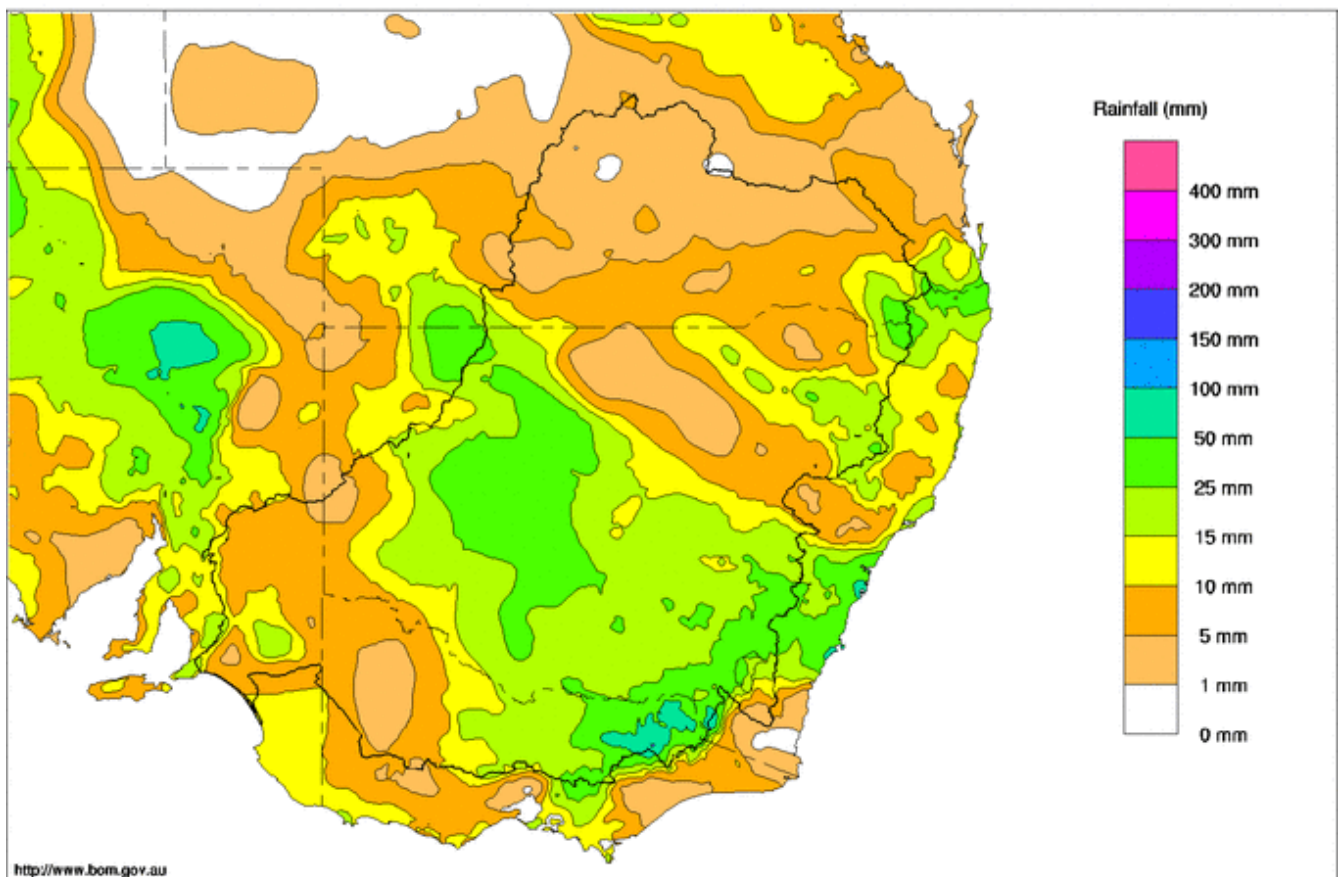
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## Rainfall and inflows

During the week rainfall was recorded across central NSW and also northeast Victoria. There was little rainfall in Queensland and South Australia.

Notable totals recorded in Victoria were 105 mm at Mount Buffalo, 73 mm at Mount Hotham and 66 mm at Harris Lane. In NSW Thredbo recorded 91 mm, Ivanhoe 43 mm and Taralga 36 mm.

Murray-Darling Rainfall Totals (mm) Week Ending 31st August 2016  
Australian Bureau of Meteorology



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Issued: 31/08/2016

Map 1 - Murray-Darling Basin rainfall week ending 24th August 2016 (Source: Bureau of Meteorology (BoM))

Rainfall on Wednesday has increased stream flows in the upper Murray tributaries. Hinnomunjie, on the Mitta Mitta River, has risen to 3,400 ML/day. On the upper Murray, the flow at Biggara has risen from 1,600 ML/day to 2,400 ML/day.

The Kiewa River at Mongans Bridge has increased from 1,650 ML/day to over 4,400 ML/day. On the Ovens River, the flow at Rocky Point has risen from 5,700 ML/day to 11,000 ML/day and forecast to rise further over the coming days.

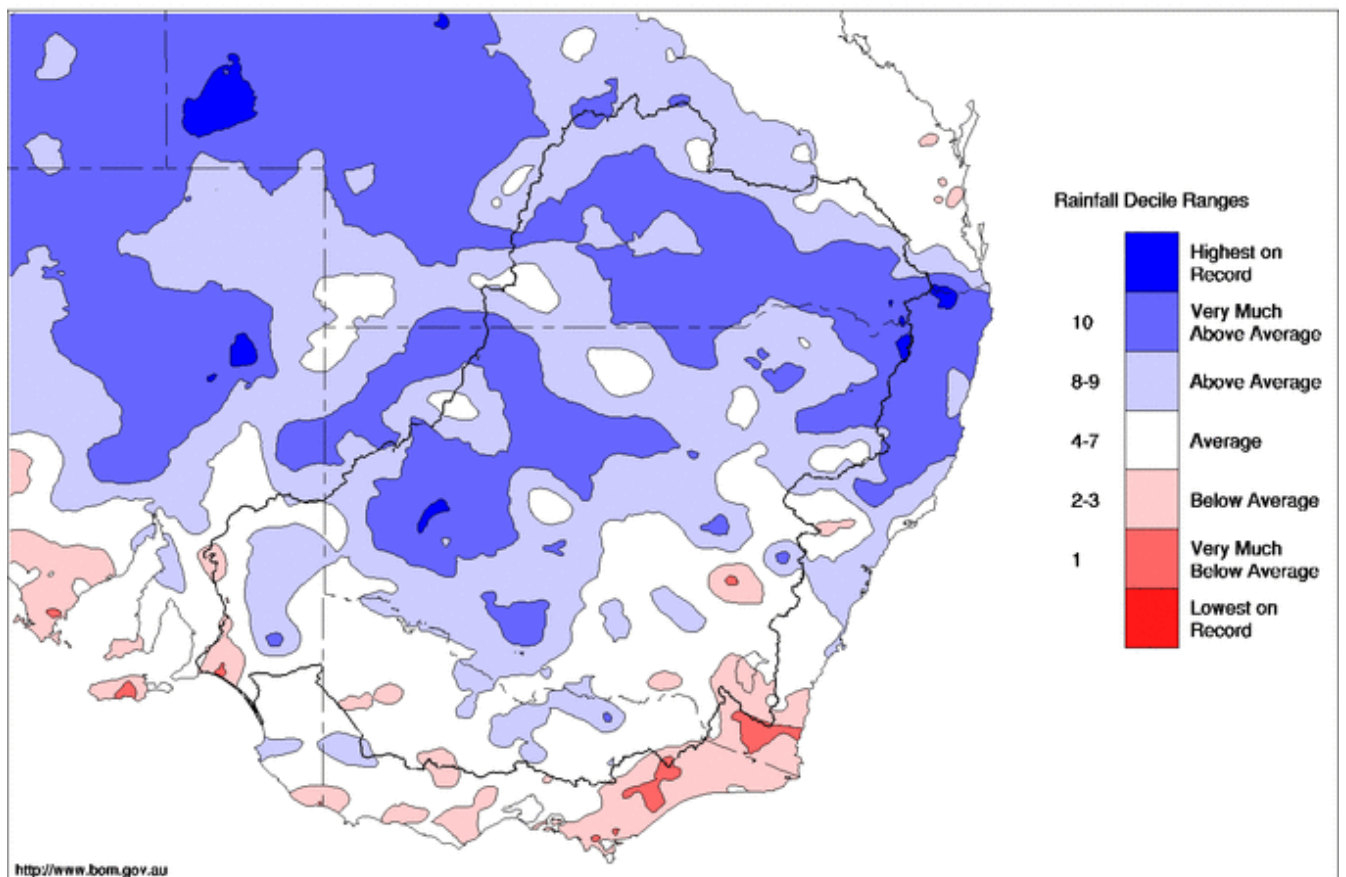


## August 2016 Summary

Rainfall in August was very much above average in Queensland and western NSW. Rainfall was average for much of the upper Murray catchments, see map 2.

Murray-Darling Rainfall Deciles August 2016

Distribution Based on Gridded Data  
Australian Bureau of Meteorology



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Map 2 - Murray-Darling Basin rainfall deciles for August 2016 (Source: Bureau of Meteorology (BoM))

The Bureau of Meteorology has reported that overall the Basin recorded an average rainfall of 51 mm, which is 35% above average for August. New South Wales reported rainfall 44% above average and South Australia 56% above average which were in the top fifteen highest area averaged rainfalls for August whilst Victoria recorded rainfall 15% below the average.

Above average rainfall for the past three months has made catchments very responsive. As a result this month's rainfall delivered significant Murray System inflows (excluding Snowy, Darling, inter-valley trade and environmental inflows) of around 2,000 GL which is around 730 GL more than the long term average. Higher August inflows have only been observed in 34% of years.

Estimated evaporation losses from MDBA storages for August 2016 are provided in Table 1. Evaporation loss 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 this calculated evaporation. At Dartmouth and Hume Reservoirs, rainfall exceeded evaporation hence there was a net gain of water at these storages.



**Table 1:** Monthly evaporation figures for MDBA storages

Storage	*Approximate (net) evaporative loss in August 2016 (GL)	Average storage volume in August 2016 (GL)	Percentage net evaporative loss in August 2016
Dartmouth	-1.2	2145	-0.1
Hume	-1.2	2438	0
Lake Victoria	1.0	572	0.2
Menindee Lakes	2.0	169	1.2

\* Evaporative loss from storage = surface area of the storage x net evaporation. Net evaporation = measured evaporation (using a 'pan' instrument) - rainfall.

## River operations

- Airspace management releases made at Hume Dam
- Pumping of unregulated flows into Hattah Lakes has commenced

Irrigation allocations have increased in NSW and Victoria for the beginning of September, see page 10. In Victoria the Murray High Reliability Water Share has increased to 61%. In NSW the Murray allocation has increased by 5% to 30%. With average general security carryover of around 27%, the equivalent general security availability is now 57% in NSW.

Murray allocations in Victoria and NSW are not yet at 100% as storage in Dartmouth Dam is only at 57% (with about 1,600 GL of airspace) and also because water is not yet available to the Murray from the Menindee Lakes. In the coming weeks and months, any water demands which are met from tributary inflows downstream of Hume Dam will reduce the reliance on water held in storage and therefore may allow NSW and Victoria to further increase allocations.

Unregulated flows (that is those flows unable to be captured in Lake Victoria) are currently available in the Murray and Edward River systems downstream of Hume Reservoir. Forecast rain is likely to extend the period of unregulated flows in the upper reaches of the Murray. The unregulated flows are providing extra opportunities for environmental watering along the Murray. Environmental managers and system operators are working closely to achieve the best possible overall environmental outcomes from the Barmah-Millewa Forest to the Coorong.

MDBA total storage increased by 215 GL this week, with the active storage now 5,319 GL (63% capacity).

At **Dartmouth Reservoir**, the storage volume increased by 29 GL to 2,206 GL (57% capacity) and the releases, measured at Colemans, continue to target the minimum flow rate of 200 ML/day.

At **Hume Reservoir**, the storage volume increased by 133 GL to 2,729 GL (91 % capacity). MDBA has commenced 'airspace management' releases aimed at providing a measure of flood protection, balanced against ensuring Hume fills to maximise water availability prior to demand emerging. Current releases from Hume dam are 10,000 ML/day. Environmental water releases from Hume Reservoir ceased last week based on the rain forecast for the Ovens and Kiewa Rivers.

In recent weeks, by capturing significant inflow events, Hume Dam has provided considerable flood protection to communities downstream. However, as the storage approaches its full supply level (3,005 GL), the dam will have reduced capacity to mitigate future floods. Further details about flood management at Hume Dam are available on the [MDBA website](#). Regular updates on Hume storage levels and releases will be provided in future weekly reports, however communities are reminded that all [Flood Watches and Warnings](#) are issued by the Bureau of Meteorology. In addition, community members living close to the river downstream of Hume Dam are reminded of the WaterNSW Early Warning Network (EWN) service. This service alerts people when the River Murray increases to relatively high levels in the stretch downstream of Hume Dam to Albury via SMS, email or voice message notifications. More information including how to register are provided on the [WaterNSW website](#).

This week, releases from **Yarrowonga Weir** were increased to 18,500 ML/day as the Ovens and Kiewa Rivers flows passed through Lake Mulwala from rain last Wednesday. With releases from Hume and



the current response from the Ovens and Kiewa Rivers the release is expected to rise over 30,000 ML/day over the coming week.

On the **Edward River**, the flow through the Edward Offtake is 1,950 ML/day while the Gulpa Offtake is 680 ML/day. Downstream at Toonalook, the flow is rising again and is currently around 4,800 ML/day. At **Stevens Weir**, the gates have been reinstalled and the flow is currently 3,700 ML/day. At Kyalite the flow is almost 12,000 ML/day which is largely due to the rain event at the beginning of August. The flow is expected to reduce over the next couple of weeks.

Inflows to the Murray from the **Goulburn River** are currently 5,200 ML/day and forecast to rise over the coming week. On the Murray at **Torrumbarry Weir**, the weir pool is currently 85.98 m AHD and will be raised to Full Supply Level (86.05 m AHD) over the coming week. The downstream flow has receded to 16,800 ML/day and forecast to rise as the Goulburn inflows reach Torrumbarry.

**Gunbower** and **Koondrook-Perricoota Forest** have been naturally inundated since early August due to the high flows at Torrumbarry. Whilst the natural overbank flows have receded this week, inundation is likely to occur again with flows at Torrumbarry likely to exceed 20,000 ML/day over the coming week.

At Balranald on the **Murrumbidgee River**, the flow has receded to 7,000 ML/day. Downstream on the Murray at **Euston**, the flow has increased to 37,300 ML/day and is expected to recede over the coming week. **Euston** weir pool is currently targeting a level of around 25 cm below FSL.

The recent high flows along the Murray would have been much larger without regulation and would have resulted in large natural inflows and higher levels in **Hattah Lakes**, see figure 1. With the unregulated flows currently available, pumping at Hattah Lakes began this week to partially reinstate these inflows. The pumping plan will increase flows into Chalka Creek by 280 ML/day until a target rate of 1,000 ML/day is reached. Pumping is expected to continue for around the next 30 days and will increase the levels in Hattah Lakes to a target level of 43.5 m AHD (around two metres higher than the current observed level).



Photo 1 – Flow being pumped into Hattah Lakes through Chalka Creek (source: Matt Fitzgerald G-MW)

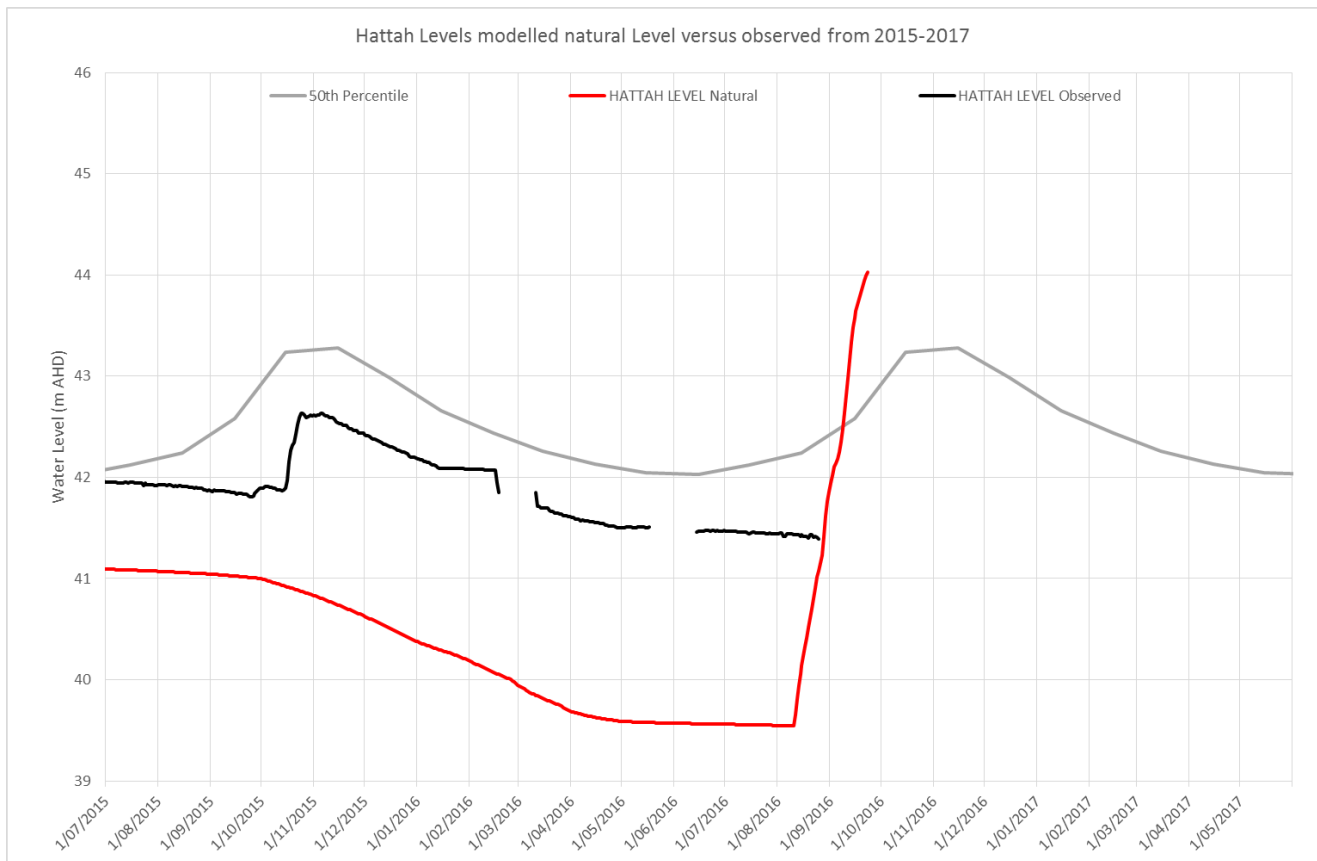


Figure 1 – Plot showing the modelled natural level in Hattah Lakes versus the current observed level.

On the Darling River at **Menindee Lakes** the storage increased 30 GL to 211 GL (12% capacity). Inflows from the Darling continue with the flow at **Bourke** currently around 6,900 ML/day. Releases from Lake Wetherell into the lower Darling River commenced 29 July. Flows at Weir 32 are currently around 550 ML/day and further downstream, the flow at Burtundy is 200 ML/day. The MDBA has considered options of lowering **Wentworth Weir** to try and mitigate the impact of higher salinities in the Darling arm of the pool. However, this operation is currently not feasible due to operational constraints and impacts to other users of the weir pool. Higher flows are expected to arrive at Burtundy next week which will help accelerate the passage of saline water down the Darling. Given the high flows in the Murray, only a minor and short-lived rise in salinity is expected downstream and into South Australia.

On the Murray at **Lock 9** the weir pool is currently 13 cm above FSL and at **Lock 8** the weir pool is 62 cm above FSL. The river is flowing freely through **Lock 7** as the stop logs have been fully removed. The higher flows are resulting in a river height around 80 cm above FSL.

At **Lake Victoria** outflows were reduced last week and inflows were increased resulting in the total storage increasing by 24 GL to 578 GL (85% capacity). However, the MDBA began decreasing inflows by 500 ML/day this week ahead of the rainfall to slow the filling of Lake Victoria. MDBA will manage the Lake Victoria level over the coming period to minimise the time that Lake Victoria is held at full supply level to reduce the disturbance to Aboriginal cultural heritage material.

Operations to further test the **Chowilla Regulator** and ancillary structures commenced on 10 August 2016 and are anticipated to extend until December 2016, provided flow conditions remain favourable. Testing involves progressively placing stop logs between the concrete piers at the Chowilla Regulator to raise the water level behind the structure. The event is targeting an initial water level at the Chowilla Regulator of up to 19.4 m AHD (3.1 m above normal pool level) and is currently 19.1 m AHD. However, if the flow to South Australia remains around the current rate for an extended period, then the target water level may be increased up to 19.75 m AHD.



As water levels are raised behind the Chowilla Regulator, the **Lock 6** water level is also being progressively raised, at a rate of approximately by 0.05 m/day, up to 19.75 m AHD (0.5 m above FSL). The current pool level is 19.57 m AHD. Raising the Lock 6 water level is important to manage water quality and protect important habitat for native fish. This event will enable further testing of the environmental watering structures and provide inundation across the floodplain to improve the condition of floodplain vegetation and habitat for wildlife.

The flow to South Australia averaged 27,500 ML/day this week and is expected to be slightly higher over the coming week, in part due to the reduced inflows to Lake Victoria.

At **Lock 5** the current target weir pool level is 45 cm above FSL, while the **Lock 2** weir pool is being raised by up to 0.75 m above the normal pool height. This will raise Lock 2 to 6.85 m AHD. The weir pool raisings are using unregulated flow and environmental water provided by the Commonwealth Environmental Water Holder.

Weir pool manipulations aim to reinstate some of the natural variability of water levels in the River Murray system, which has been lost due to river regulation. The manipulations will assist to improve lateral connectivity, health, resilience and biodiversity of the river channel, floodplain and wetlands. Weir pool manipulations are now a routine part of river operations along the Murray.

Downstream at the **Lower Lakes**, flows through the barrages continued with higher flow rates than last week. Releases are being made to help improve water quality in Lake Albert and the Coorong, and to assist in scouring sand from the Murray Mouth. The 5-day average water level in Lake Alexandrina increased this week to 0.86 m AHD.

**For media inquiries contact the Media Officer on 02 6279 0141**

ANDREW REYNOLDS  
Acting Executive Director, River Management



**Water in Storage**

**Week ending Wednesday 31 Aug 2016**

MDBA Storages	Full Supply Level	Full Supply Volume (GL)	Current Storage Level	Current Storage		Dead Storage (GL)	Active Storage (GL)	Change in Total Storage for the Week (GL)
	(m AHD)		(m AHD)	(GL)	%			
Dartmouth Reservoir	486.00	3 856	456.49	2 206	57%	71	2 135	+29
Hume Reservoir	192.00	3 005	190.59	2 729	91%	23	2 706	+133
Lake Victoria	27.00	677	26.17	578	85%	100	478	+24
Menindee Lakes		1 731*		211	12%	(- -) #	0	+30
<b>Total</b>		<b>9 269</b>		<b>5 724</b>	<b>62%</b>	<b>--</b>	<b>5 319</b>	<b>+215</b>
Total Active MDBA Storage							63% ^	

**Major State Storages**

Burrinjuck Reservoir	1 026	915	89%	3	912	+7
Blowering Reservoir	1 631	1 352	83%	24	1 328	+53
Eildon Reservoir	3 334	1 892	57%	100	1 792	+60

\* 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 30 Aug 2016

Storage	Active Storage (GL)	Weekly Change (GL)	Diversion (GL)	This Week	From 1 May 2016
Lake Eucumbene - Total	1 724	n/a	Snowy-Murray	+48	459
Snowy-Murray Component	832	n/a	Tooma-Tumut	+8	160
Target Storage	1 190		Net Diversion	39	299
			Murray 1 Release	+53	631

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

New South Wales	This Week	From 1 July 2016	Victoria	This Week	From 1 July 2016
Murray Irrig. Ltd (Net)	5.9	60	Yarrowonga Main Channel (net)	0.8	3
Wakool Sys Allowance	0.0	0	Torrumbarry System + Nyah (net)	5.1	37
Western Murray Irrigation	0.1	0	Sunraysia Pumped Districts	0.4	2
Licensed Pumps	n/a	8	Licensed pumps - GMW (Nyah+u/s)	0	1
Lower Darling	n/a	1	Licensed pumps - LMW	1	9
<b>TOTAL</b>	<b>6.0</b>	<b>69</b>	<b>TOTAL</b>	<b>7.3</b>	<b>52</b>

\* 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 Lower than normal for this month due to SA entitlement deferral.

Entitlement this month	124.0 *
Flow this week	192.8
Flow so far this month	848.5
Flow last month	322.0

(27 500 ML/day)

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

	Current	Average over the last week	Average since 1 August 2016
Swan Hill	90	90	100
Euston	-	-	-
Red Cliffs	120	130	140
Merbein	110	110	130
Burtundy (Darling)	1 040	1 070	1 510
Lock 9	120	120	130
Lake Victoria	150	160	160
Berri	160	170	170
Waikerie	190	190	190
Morgan	210	200	200
Mannum	200	210	230
Murray Bridge	240	220	250
Milang (Lake Alex.)	760	840	850
Poltalloch (Lake Alex.)	270	300	420
Meningie (Lake Alb.)	1 540	1 790	1 760
Goolwa Barrages	760	1 110	1 850



**River Levels and Flows**

**Week ending Wednesday 31 Aug 2016**

River Murray	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)				
Khancoban	-	-	-	9 750	F	9 310	7 510
Jingellic	4.0	2.82	209.34	14 900	R	15 490	13 690
Tallandoon ( Mitta Mitta River )	4.2	2.22	219.11	3 090	R	2 190	2 550
Heywoods	5.5	2.25	155.88	5 000	S	1 890	2 010
Doctors Point	5.5	2.44	150.91	8 480	R	6 180	5 700
Albury	4.3	1.46	148.90	-	-	-	-
Corowa	4.6	1.43	127.45	4 910	F	5 770	5 400
Yarrowonga Weir (d/s)	6.4	2.66	117.70	18 600	R	17 370	14 740
Tocumwal	6.4	3.34	107.18	19 570	R	17 630	15 800
Torrumbarry Weir (d/s)	7.3	4.59	83.14	16 800	F	18 990	25 180
Swan Hill	4.5	3.29	66.21	19 970	F	20 570	20 810
Wakool Junction	8.8	6.97	56.09	31 680	S	31 030	28 610
Euston Weir (d/s)	9.1	4.90	46.74	37 340	R	36 480	34 340
Mildura Weir (d/s)	-	-	-	36 990	F	34 400	32 840
Wentworth Weir (d/s)	7.3	4.83	29.59	33 770	R	32 980	30 910
Rufus Junction	-	5.91	22.84	28 210	R	27 550	29 280
Blanchetown (Lock 1 d/s)	-	1.83	-	25 400	R	25 810	27 450
<b>Tributaries</b>							
Kiewa at Bandiana	2.8	2.68	155.91	3 570	R	4 590	4 280
Ovens at Wangaratta	11.9	10.25	147.93	7 720	R	9 470	9 090
Goulburn at McCoys Bridge	9.0	3.66	95.08	5 250	R	4 810	4 570
Edward at Stevens Weir (d/s)	5.5	2.94	82.72	3 710	F	3 560	6 960
Edward at Liewah	-	4.66	60.04	5 870	F	6 090	5 330
Wakool at Stoney Crossing	-	3.70	57.20	5 720	S	5 470	4 090
Murrumbidgee at Balranald	5.0	5.09	61.05	7 040	F	7 360	7 890
Barwon at Mungindi	6.1	3.33	-	310	F	450	690
Darling at Bourke	9.0	4.90	-	6 890	F	7 000	7 840
Darling at Burtundy Rocks	-	0.76	-	210	S	300	830

Natural Inflow to Hume	17 760	20 750
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(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	-0.14	-	No. 7 Rufus River	22.10	+0.76	+3.60
No. 26 Torrumbarry	86.05	-0.07	-	No. 6 Murtho	19.25	+0.28	+1.67
No. 15 Euston	47.60	-0.25	-	No. 5 Renmark	16.30	+0.46	+1.37
No. 11 Mildura	34.40	+0.04	+1.95	No. 4 Bookpurnong	13.20	+0.06	+2.30
No. 10 Wentworth	30.80	+0.03	+2.19	No. 3 Overland Corner	9.80	+0.03	+1.79
No. 9 Kulnine	27.40	+0.13	+1.62	No. 2 Waikerie	6.10	+0.45	+1.71
No. 8 Wangumma	24.60	+0.62	+2.08	No. 1 Blanchetown	3.20	-0.09	+1.08

**Lower Lakes** FSL = 0.75 m AHD

Lake Alexandrina average level for the past 5 days (m AHD)	0.86
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**Barrages**

**Fishways at Barrages**

	Openings	Level (m AHD)	No. Open	Rock Ramp	Vertical Slot 1	Vertical Slot 2	Dual Vertical Slots
Goolwa	128 openings	0.82	18	-	FALSE	Open	-
Mundoo	26 openings	0.77	4	-	-	-	FALSE
Hunters Creek	-	-	-	-	Open	-	-
Boundary Creek	6 openings	-	1	-	Open	-	-
Ewe Island	111 gates	-	12	-	-	-	Open
Tauwitchere	322 gates	0.86	24	Open	Open	Open	-

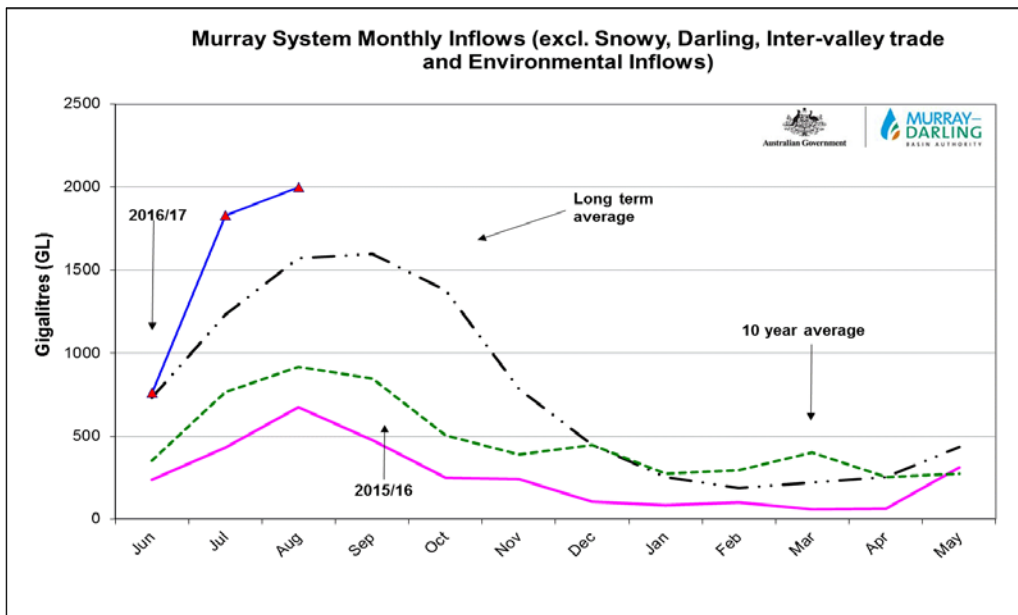
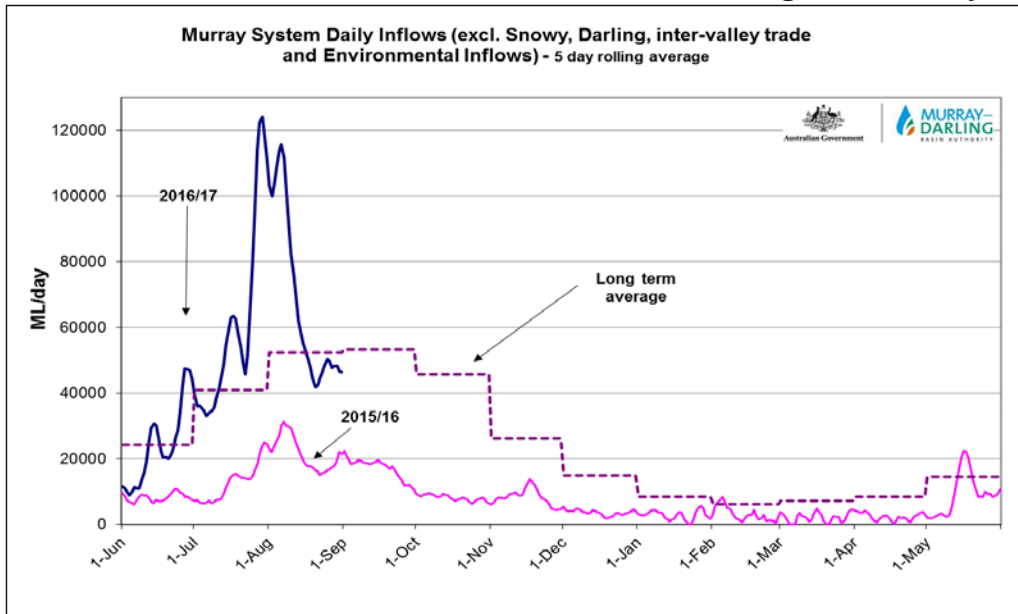
\* Mundoo Barrage Dual vertical slots are currently under construction.

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





Week ending Wednesday 31 Aug 2016



State Allocations (as at 01 Sep 2016)

NSW - Murray Valley

High security	97%
General security	30%

Victorian - Murray Valley

High reliability	61%
Low reliability	0%

NSW - Murrumbidgee Valley

High security	95%
General security	54%

Victorian - Goulburn Valley

High reliability	57%
Low reliability	0%

NSW - Lower Darling

High security	100%
General security	0%

South Australia - Murray Valley

High security	100%
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- 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>