

River Murray Flow Report and Water Resources Update



Report #31/2022

Issued 10:00 am 12 August 2022

This supersedes the previous Flow Report issued by the Department for Environment and Water (DEW) on 5 August 2022. The next Flow Report will be provided on Friday 19 August 2022.

Water resources update

During July 2022, the total River Murray System inflow was approximately 870 GL, which is below the July long-term average of 1 238 GL. During July 2022, the total Menindee Lakes inflow was approximately 861 GL, which is significantly higher than the July long-term average of 153 GL.

The flow to South Australia during July 2022 was approximately 1 374 GL, which is more than double the July long-term average of 625 GL. The flow comprised of Entitlement Flow (including environmental water on SA licence), environmental water, trades, Additional Dilution Flow (ADF) and unregulated flow.



Figure 1: Sunrise at Renmark (Photo: Casey O'Brien, DEW)

Management of South Australia's deferred water

The Murray-Darling Basin Authority confirmed that on 1 August 2022 South Australia had 336.2 GL of deferred water held in storage in the Murray-Darling Basin. The following table identifies the storage in which it is held and its purpose. Volumes stored are adjusted for net evaporation losses and spills until delivered to South Australia.

On 5 August 2022 the Murray-Darling Basin Authority began pre-releases from Dartmouth Dam in response to recent rainfall. This means that releases from the dam have begun in order to ensure the safety of the dam and mitigate flood risks where possible.

As per the rules in Schedule G of the Murray-Darling Basin Agreement the first water to spill if a storage spills or a pre-release is made is water from the South Australian Storage Right. Schedule G also states that when water from the Storage Right does spill or is required to be pre-released, water set aside for private carryover will be released before the reserve for critical human water needs. It is expected that the total volume of water held in the storage right will be reduced when it is next reported on 1 September 2022.

SA will resume setting aside water to rebuild the volume held in storage as soon the opportunity exists to ensure the state's future water security.

More information on pre-releases from Dartmouth Dam can be found on the MDBA website:

<https://www.mdba.gov.au/news-media-events/newsroom/media-centre/pre-releases-create-close-250gl-airspace-hume-dam-ahead-wet>

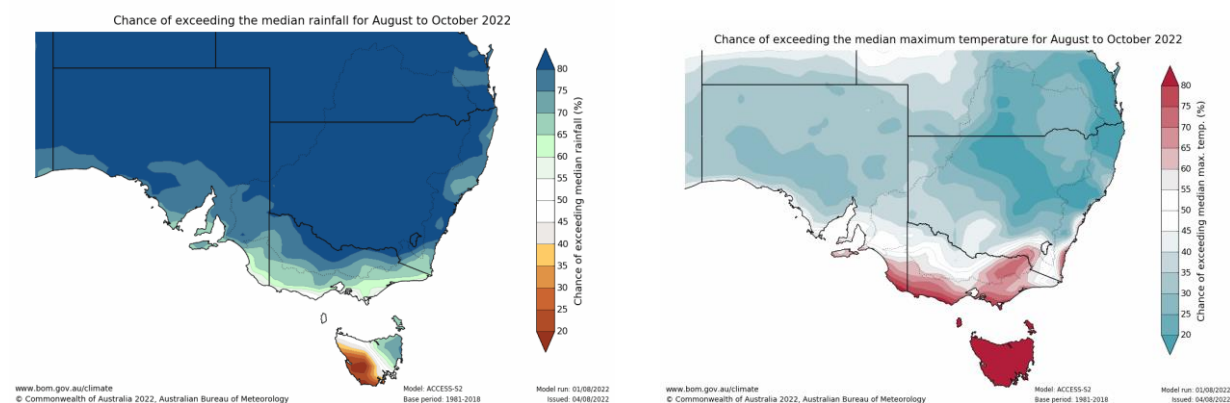
Table 1: South Australia's deferred water storages at 1 August 2022

At 1 August 2022				
Purpose	Lake Victoria (GL)	Hume (GL)	Dartmouth (GL)	Total (GL)
*CHWN	0	0	235.7	235.7
Private Carryover	0	0	100.5	100.5
Total	0	0	336.2	336.2

*Critical Human Water Needs (CHWN)

Rainfall and temperature outlook

As at 10 August 2022, the Bureau of Meteorology weather outlook forecasts that there is a high chance (>80%) that rainfall from August to October 2022 is likely to be above median for the majority of the Murray-Darling Basin. Areas across the Basin will have a 65 – 80 % chance of exceeding the median rainfall depending on location. Temperatures from August to October 2022 are likely to be below median for the majority of the Northern Basin but have a slightly higher chance of exceeding median maximum temperatures in the Southern Connected Basin.



The climate outlook between August and October 2022 reflects several significant climate influences. These include:

- The development of a negative Indian Ocean Dipole (IOD). Outlooks indicate that the negative IOD will continue into spring. A negative IOD increases the chances of above average winter–spring rainfall for large parts of Australia.
- The ENSO outlook is currently at La Nina WATCH. This means that there is around a 50% chance that a La Nina will form again later in 2022. At this stage three of the seven international climate models are suggesting a La Nina will return.

The latest Bureau of Meteorology outlook information can be accessed [here](#).

Storage volumes

Table 2: Murray-Darling Basin Storage volumes

Storage	Full Supply Volume (GL)	10/8/2022 (GL)	10/8/2021 (GL)	Long-term average (end of Aug) (GL)
Dartmouth	3 856	3 769 (98%)	2 758 (71%)	
Hume	3 005	2 881 (96%)	2 682 (89%)	
Lake Victoria	677	403 (60%)	595 (88%)	
Menindee Lakes	*1 731	1 997 (115%)	1 247 (72%)	
TOTAL	9 289	9 050 (97%)	7 282 (78%)	7 127 (77%)

*Menindee Lakes can be surcharged to 2 015 GL

Water quality - Salinity

A number of targets are identified under the Murray-Darling Basin Plan, which all Basin jurisdictions must have regard to in managing River Murray flows. The targets for real-time salinity are identified below. Salinity should not exceed these values for 95 % of the time: 580 EC at Lock 6, 800 EC at Morgan, 830 EC at Murray Bridge and 1 000 EC at Milang.

The following graph shows the salinity at these locations and the flow to South Australia (QSA) from August 2021 to August 2022. The dashed-lines identify the Basin Plan (BP) thresholds for the corresponding colour coded location. A spike in salinity above 1 000 EC was recorded at Milang for a short period of time during June 2022 due to storm conditions and reverse flows. The BP salinity target for Milang states that salinity should remain below 1 000 EC for 95 % of the time. While salinity did spike above 1 000 EC for a period, it quickly returned to the acceptable range and is therefore unlikely to affect long-term compliance with BP targets. The dashed-lines identify the Basin Plan (BP) thresholds for the corresponding colour coded location.

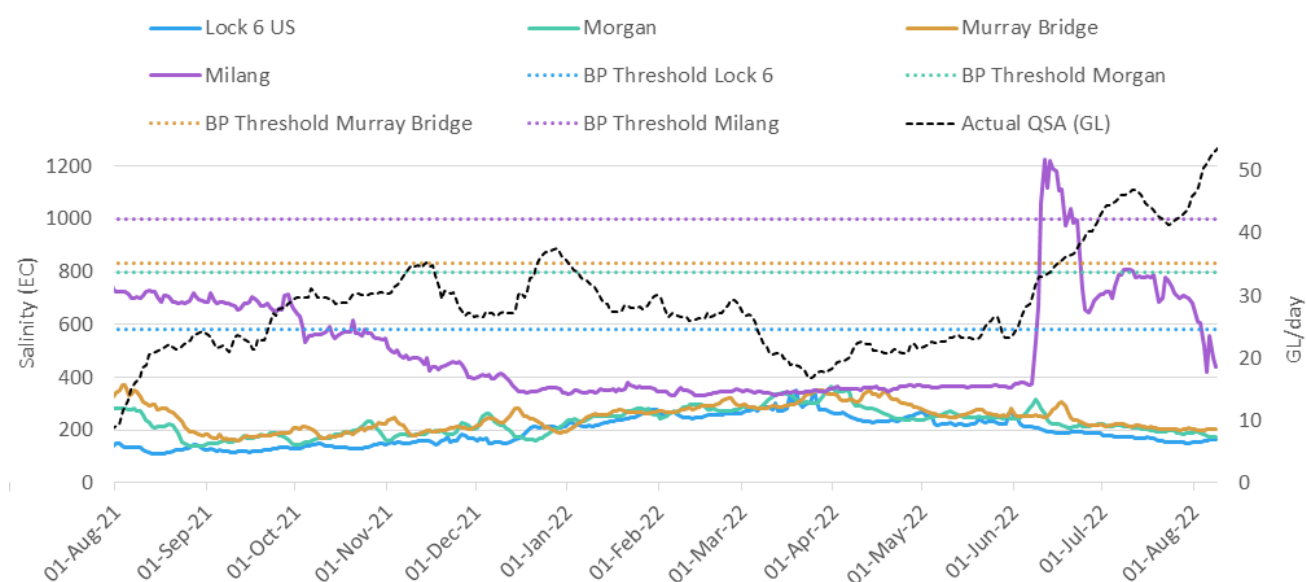


Figure 2: Salinity levels at Lock 6, Morgan, Murray Bridge and Milang from August 2021 to August 2022

Flow outlook



The flow at the South Australian border is approximately 53 GL/day and is forecast to decrease to around 50 GL/day over the coming week. The current flow at the border comprises:

- full August Entitlement Flow (4 GL/day);
- plus water for the environment (see below Environmental News);
- interstate trade adjustments;
- Additional Dilution Flow (ADF); and
- Unregulated flow.

The flow over Lock 1 is approximately 41 GL/day and will increase to around 43 GL/day over the coming week.

It is important to note that flow forecasts in this advice are based on the information available at the time of preparation. Advice may change as new gauging information becomes available or due to rainfall events or changed operations upstream.

What is considered a flood in South Australia?

With the flow at the South Australian border increasing it's a timely reminder to remain aware of what is considered a flood in South Australia, even if flood levels are not reached at this point in time.

When the flow at the South Australian border is forecast to exceed 40 GL/day, the Department for Environment and Water will issue a *High Flow Advice*. This is not an emergency warning. A High Flow Advice is intended to inform the community of higher than normal river flow, velocity and water levels, as well as raise awareness and monitoring regarding potential hazards and to prompt the community to consider preventative actions to minimise any potential impacts.

If the flow at the South Australian border is forecast to exceed 60 GL/day, a *Flood Advice – River Murray Shack Areas* is issued by the South Australian State Emergency Service (SA SES) as an official emergency warning product, consistent with the Australian Warning System. The River Murray Shack Areas comprises the shack communities between Cadell and Mannum, excluding the towns. Above 60 GL/day, low lying areas and floodplains become inundated and ground level flooding of the shack areas commences. For the remainder of the River Murray in South Australia, a High Flow Advice remains in place.

When the flow at the border is forecast to exceed 100 GL/day, a *Flood Advice – River Murray* is issued by the SA SES for the River Murray between the SA border and Wellington. Further advice will be issued by the SA SES when the flow reaches 130 GL/day at the border (*Flood Watch and Act – River Murray*) and 200 GL/day at the border (*Flood Emergency Warning – River Murray*).

The most up to date information will continue to be provided in the SA River Murray Flow Report and readers can subscribe [here](#).

High Flow Advice

With flow at the South Australian border above 40 GL/day, the Department for Environment and Water has issued a *High Flow Advice* with this River Murray Flow Report and Water Resources Update. The *High Flow Advice* is also available on the DEW website at the following location: <https://www.waterconnect.sa.gov.au/River-Murray/SitePages/River%20Murray%20Flow%20Reports.aspx>

Environmental news

Unregulated flows have been continuous to SA since July 2021 due to wetter than average conditions across much of the Murray-Darling Basin. Water for the environment, including return flows from actions in upstream catchments and releases from Lake Victoria, is currently supplementing the unregulated flows and providing a range of benefits for the environment in SA, including:

- connecting the river with floodplains and wetlands, providing water to areas that have been dry for more than five years;
- allowing fish dispersal and movement into new habitats;
- providing 'flowing water habitat' to benefit native fish, animals and plants in the River Murray channel that have adapted to a riverine environment;
- providing for barrage releases to the Coorong to support a productive, food-rich environment for fish and birds and provide salinities and water levels that support healthy populations of keystone native plant *Ruppia tuberosa*;
- providing habitat for birds, frogs and threatened small-bodied native fish species in the Lower Lakes;
- maintaining healthy water quality, salinity and water levels in the River Murray Channel and the Lower Lakes and Coorong;
- removing excess salt from the River Murray; and
- delivering a range of outcomes to wetlands in the Riverland via arrangements with Renmark Irrigation Trust.



Figure 3: Higher flows in the River are causing water to flow into the Hogwash Bend wetland complex (between Locks 2 and 3) just as nature intended (Sam Hardy, Murraylands and Riverland Landscape Board)

Floodplain operations and weir pool raising/lowering in 2022-23

Delivery of water for the environment for the coming winter-spring has commenced. The environmental watering actions aim to achieve a range of benefits for vegetation and wildlife across the floodplains, wetlands and along the River.

The Pike floodplain operation is underway with water extending out onto areas of floodplain lignum. The Chowilla floodplain operation commenced on 21 July 2022 with water levels already boosted through the floodplain due to the natural high flows.

At Katarapko, given the lower lying nature of this floodplain the higher water levels associated with the current good River Murray flows are already providing watering across significant areas of the floodplain. The timing and scale of operations to increase the watering across the Katarapko floodplain will depend on the River Murray flow conditions.

Weir pool raising at Lock 2 has commenced with water levels at the Lock to be raised by up to 55 cm. Please note that while the impact of the weir raising reduces as you move upstream towards Lock 3 the levels downstream of Lock 3 may be higher than normal due to the ongoing natural high flows in the River. The weir raising will enable inundation of some additional floodplain vegetation and provide additional valuable habitat for wildlife.

Below you will find a table with detailed information on the levels at the regulators and Locks:

Structure	Normal pool level (m AHD)	Water level as at 8/8/2022 (m AHD)	Status as at 8/8/2022
Chowilla regulator	16.40	18.86	↑ Rising
Lock 6	19.25	19.51	↑ Rising
Pike regulator	14.55	15.31	↑ Rising
Lock 5	16.30	16.73	↑ Rising
The Splash regulator (Katarapko)	10.00	N/A	Higher water levels associated with River Murray flows are providing inundation without the need to operate infrastructure at this point in time.
Lock 4	13.20	13.44	↑ Rising within normal operating range
Lock 3	9.80	9.95	↑ Rising within normal operating range
Lock 2	6.10	6.50	↑ Rising
Lock 1	3.20	3.25	↑ Rising within normal operating range

*Final operations will depend on actual flow conditions as the event progresses.

Murray mouth

Dredging operations at the Murray Mouth commenced on 9 January 2015 to maintain connectivity (exchange of water) between the Coorong and the Southern Ocean. At 7 August 2022, a total of approximately 8 524 957 m³ of sand has been removed from the Murray Mouth. Both dredges are fully operational working 24 hours a day, 7 days a week.

Barrage releases combined with dredging have helped to maintain flow connectivity of the River Murray Channel to the Murray Mouth and have assisted in exporting salt from the river system.

There are a number of shallow zones in and adjacent to the Murray Mouth. Mariners should use caution when traversing the mouth area, follow all directions, reduce speed and avoid travelling at low tide. Mariners equipped with echo sounders should check depths regularly. Navigation through the Murray Mouth is only permitted during daylight hours. Exclusion Zones established around the dredging operations are in place to ensure public safety. Refer to Notice to Mariners No 42 of 2016 [Notice 42](#).

There is a partial park closure in place for the northern tip of the Coorong National Park. For more information visit [Coorong partial park closure notice](#).

Barrage operations and water levels in the Lower Lakes

The water level in Lake Alexandrina is approximately 0.81 m AHD and Lake Albert is approximately 0.86 m AHD. The difference is due to wind effects.

As of Tuesday 9 August 2022, the weekly releases were approximately 133 GL. Lake levels rose suddenly over the weekend due to barrages being closed to prevent reverse flow and large volumes of water continuing to flow over Lock 1. As a result large numbers of gates have been opened this week to release more water.

Total daily release volumes from the barrages can now be accessed via [Water Data SA](#) by searching for the gauge [A4261002](#). Gate openings at the barrages during the week can be seen in Table 3.

Table 3: Number of barrage gates open each day for the week ending Tuesday 9 August 2022

Barrage (total number of gates)	Goolwa (120)	Mundoo (25)	Boundary Creek (5)	Ewe Island (110)	Tauwitchere (319)	Fishways
3 Aug 2022	6→0	0	1→0	56→0	100→0	Fishways at all barrages and at Hunters Creek (11 in total) were open during the entire week
4 Aug 2022	0→6→0	0→6*→0	0	0→12*→0	0→21*→119→98→0	
5 Aug 2022	0	0	0	0	0	
6 Aug 2022	0	0	0	0	0	
7 Aug 2022	0→1*→25	0	0	0	0	
8 Aug 2022	25	0→6*	0→1	0→12*→35→58	0→21*→74→126→179	
9 Aug 2022	25	6*	1	0	179	
Objective of releases	Maintain connectivity between the River Murray channel through to the Murray Mouth to support fish migration.	Provide localised freshening conditions in the Mundoo channel & support fish passage.	Provide attractant flow adjacent the fish way to support fish passage.	Releases will help push fresher water down the Coorong to assist lowering salinity levels and provide habitat diversity.		Provide for fish passage between the Coorong and Lower Lakes.

*Automated gate utilised to maximise delivery to Coorong and avoid reverse flows.

During adverse weather conditions, SA Water will operate the barrages to minimise the risk of seawater entering Lake Alexandrina, therefore minimising any negative salinity impacts from reverse flow events.

Water levels and barrage operations are monitored closely by the South Australian Government, Murray-Darling Basin Authority and Commonwealth Environmental Water Office.

Lock 3 River Vessel Waste Disposal Station

The Lock 3 River Vessel Waste Disposal Station is currently out of commission due to an infrastructure failure. Investigations are currently underway to replace the station. In the interim, river vessel users can contact Riverland Tank and Drain directly on 0412 839 392 for emptying of black and grey water in the Lock 3 area. Alternatively, they can utilise the nearest alternative waste facility located at Waikerie. Normal boat waste (domestic or galley waste) can still be deposited at the Lock 3 facility at the present time.

Navigation issues

Sandbars in the vicinity of the Murray Mouth may cause navigation hazards. Mariners are advised to navigate with caution when operating in the area. Sandbars are also present along sections of the River Murray downstream of Locks 7 and 8 and in South Australia. All Mariners should be aware of the risk of submerged navigation hazards and should regularly check river depth.

River Murray water levels

Table 4. River Murray water levels at a number of locations from Lock 10 to Murray Bridge.

Location	River km	Normal Pool Level (m AHD)	Current Level 10/8/2022 (m AHD)	2016 High Water Level (m AHD)
Lock 10	825.0	30.80	30.85	32.72
Lock 9 Kulnine	764.8	27.40	27.47	28.85
Lock 8 Wangumma	725.7	24.60	25.59	26.85
Lock 7 Rufus River	696.6	22.10	24.07	24.97
Lock 6 Murtho	619.8	19.25	19.51	20.19
Renmark	567.4	-	16.90	17.44
Lock 5	562.4	16.30	16.73	17.05
Lyrup	537.8	-	14.17	15.80
Berri	525.9	-	13.79	15.21
Lock 4	516.2	13.20	13.44	14.73
Loxton	489.9	-	12.12	13.54
Cobdogla	446.9	-	-	11.59
Lock 3	431.4	9.80	9.95	10.98
Overland Corner	425.9	-	8.34	10.41
Waikerie	383.6	-	7.23	9.20
Lock 2	362.1	6.10	6.50	8.32
Cadell	332.6	-	5.03	7.01
Morgan	321.7	-	4.65	6.38
Lock 1 Blanchetown	274.2	3.20	3.25	4.46
Swan Reach	245.0	0.75	1.72	3.11
Mannum PS	149.8	0.75	0.95	1.33
Murray Bridge	115.3	0.75	0.78	1.04

Note that the above water levels may be affected by local wind conditions

Further information

The Water Data SA website is South Australia's comprehensive water information portal. For real-time data (like salinity, water levels) go to the following page: [Water Data SA](#).

Up-to-date River Murray salinity, flow and water level information can also be accessed at the SA Water and Murray-Darling Basin Authority websites:

- [Water allocation and carryover announcements](#)
- [River Murray real-time water data](#)
- [SA Water River Murray info - levels, flows etc.](#)
- [Murray-Darling Basin real-time water data](#)

The latest news, information and announcements about the River Murray and Basin Plan are available at [River Murray Update](#).

The Department for Environment and Water has published a series of inundation maps for the River Murray. They are available at [River Murray Inundation Maps](#).

Information on the management of acid drainage water in the Lower River Murray can be accessed at: [Managing Acid Sulfate Soils Research Project](#)

Details of river height and rainfall information in the River Murray within Victoria and New South Wales are available at the Bureau of Meteorology website:

- [Victoria rainfall and river conditions](#)
- [NSW rainfall and river conditions](#)

Information provided by the Commonwealth Environmental Water Office can be accessed at [CEWH Environmental Watering](#).

Information on The Living Murray can be accessed at [MDBA TLM](#).

Chowilla Floodplain Icon Site management [Chowilla-floodplain](#).

[Katarapko Floodplain](#) site management

[Pike Floodplain](#) site management

Department for Environment and Water [Home page](#).

Information provided by the Department of Planning, Transport and Infrastructure on boat licences, registering motor boats, owning and operating water craft, and boat and marine safety can be accessed at [Boating and marine](#).

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