

River Murray Flow Report and Water Resources Update



Report #36/2022

Issued 10:00 am 16 September 2022

This supersedes the previous Flow Report issued by the Department for Environment and Water (DEW) on 9 September 2022. The next Flow Report will be provided on Friday 23 September 2022.

Water resources update

During August 2022, the total River Murray System inflow was approximately 2 250 GL, which is above the August long-term average of 1 592 GL. During August 2022, the total Menindee Lakes inflow was approximately 726 GL, which is significantly higher than the August long-term average of 182 GL.

The flow to South Australia during August 2022 was approximately 1 571 GL, which is almost double the August long-term average of 860 GL. The flow comprised of Entitlement Flow (including environmental water on SA licence), environmental water, trades, Additional Dilution Flow (ADF) and unregulated flow.

Management of South Australia's deferred water

The Murray-Darling Basin Authority confirmed that on 1 September 2022 South Australia had 201 GL of deferred water held in storage in the Murray-Darling Basin.

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 (CHWN).

On 6 August 2022 the Murray-Darling Basin Authority began pre-releases from Dartmouth Dam in response to increased rainfall. As a result, 135.2 GL of Storage Right was spilt from Dartmouth during August. This total volume was made up of 100.5 GL of private carryover (all of the private carryover being held) and 34.7 GL of CHWN.

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.

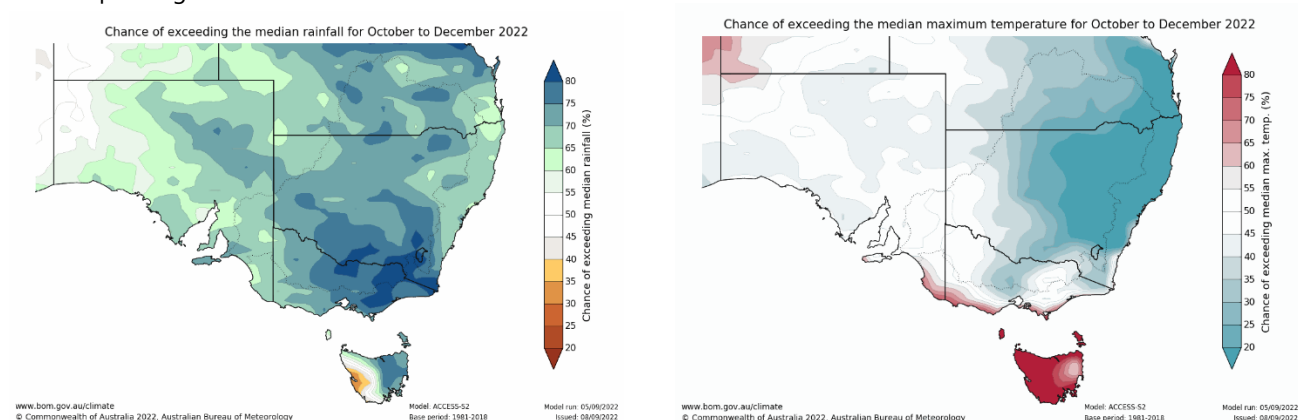
Table 1: South Australia's deferred water storages at 1 September 2022

At 1 September 2022				
Purpose	Lake Victoria (GL)	Hume (GL)	Dartmouth (GL)	Total (GL)
*CHWN	0	0	201	201
Private Carryover	0	0	0	0
Total	0	0	201	201

*Critical Human Water Needs (CHWN)

Rainfall and temperature outlook

As at 8 September 2022, the Bureau of Meteorology weather outlook forecasts that there is a 60 - 80 % chance (depending on location) that rainfall from October to December 2022 is likely to be above median for all of the Murray-Darling Basin. There is a 20-50% chance of exceeding median maximum temperatures from October to December 2022 across all of the Basin depending on location.



The climate outlook between October and December 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 late spring. A negative IOD increases the chances of above average winter–spring rainfall for large parts of Australia.
- The ENSO outlook shows that a La Nina is underway and likely to peak during spring. A La Nina event increases the chances of above-average rainfall for northern and eastern Australia during spring and summer. This is the third year a La Nina event has been declared. Since 1900 this has only happened three times (1954-57, 1973-76 and 1998-2001).
- The development of a positive Southern Annular Mode (SAM) that is likely to be positive for the next three months. During spring a positive SAM has a wetting influence for parts of eastern NSW and far eastern Victoria.

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)	14/9/2022 (GL)	14/9/2021 (GL)	Long-term average (end of Sept) (GL)
Dartmouth	3 856	3 818 (99%)	2 970 (77%)	
Hume	3 005	2 879 (96%)	2 911 (97%)	
Lake Victoria	677	477 (70%)	656 (97%)	
Menindee Lakes	*1 731	1 847 (106%)	1 761 (101%)	
TOTAL	9 289	8 621 (93%)	8 289 (89%)	7 457 (80%)

*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 September 2021 to September 2022. The dashed-lines identify the Basin Plan (BP) thresholds for the corresponding colour coded location. The dashed-lines identify the Basin Plan (BP) thresholds for the corresponding colour coded location.

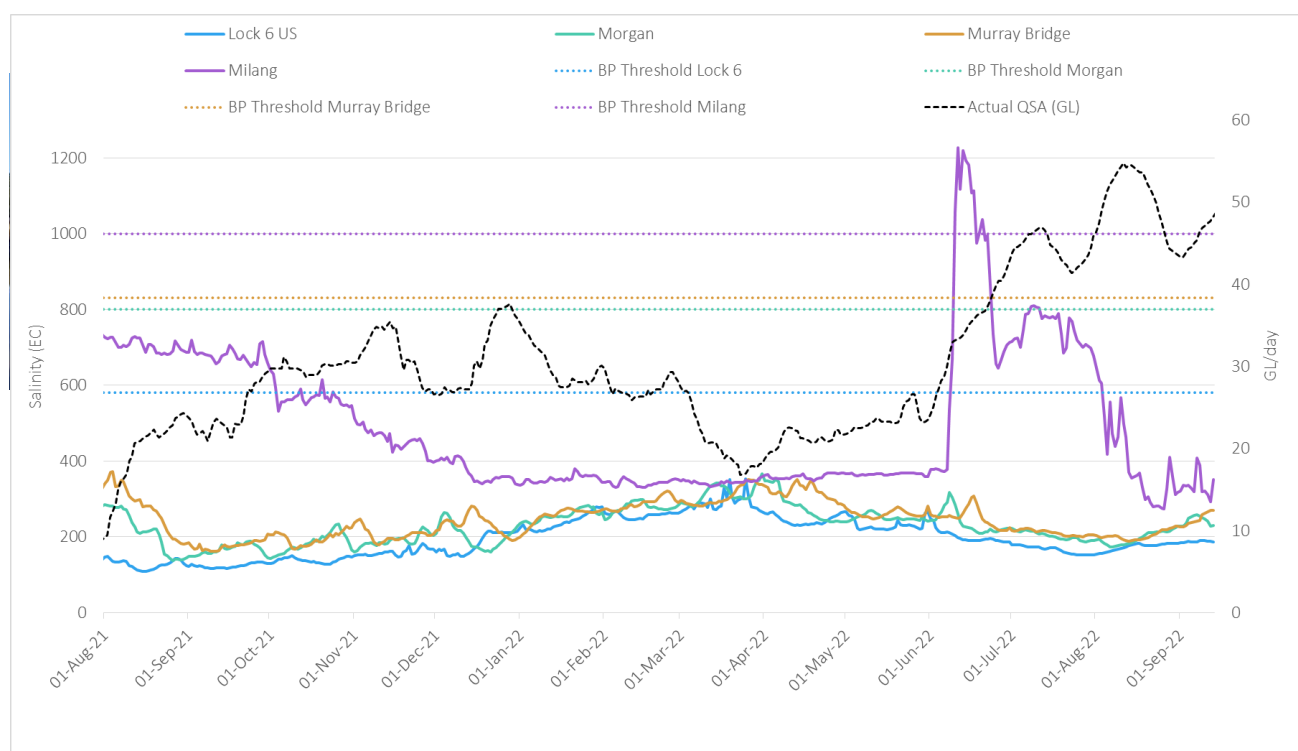


Figure 1: Salinity levels at Lock 6, Morgan, Murray Bridge and Milang from September 2021 to September 2022 (a spike in salinity at Milang in June 2022 was due to reverse flow conditions at the barrages during storm events)

Flow outlook



The flow at the South Australian border is approximately 50 GL/day and is forecast to increase to around 54 GL/day over the coming week. The current flow at the border comprises:

- full September Entitlement Flow (4.5 GL/day);
- plus water for the environment (see below Environmental News);
- interstate trade adjustments;
- Additional Dilution Flow (ADF); and
- Unregulated flow.

The latest forecasts upstream of the South Australian border indicate that the flow to SA is likely to continue increasing into October as a result of rainfall in the upstream catchments in mid-August. The extent to which it will rise again is currently difficult to predict, however there is a possibility that **flow to SA could reach between 75 – 80 ML/day by mid to late October**. The accuracy of the forecast will continue to be improved in coming weeks as tributary flows approach South Australia, and will also be contingent on any additional rainfall.

Current and forecast water levels (including higher flows)

In the table below are estimated high water levels (based on historical events and modelling) and approximate timing of those water levels should the flow reach 80 GL/day over the following weeks. Note that forecasts are based on information available at the time of preparation and may change due to rainfall events or changed operations upstream.

Location	Normal Pool Level (m AHD)	Current level at 14/9/16 (m AHD)	Water level is currently (m AHD)	Forecast water levels at ~80 GL/day		2016 High Water Level (m AHD)
				Level (m AHD)	Estimated date	
Lock 6	19.25	19.66	Rising	19.81	17 - 21 Oct	20.19
Renmark	-	16.86	Rising	17.23		17.44
Lock 5	16.30	16.74	Rising	16.65		17.05
Lyrup	-	14.00	Rising	15.48	-	15.80
Berri	-	13.63	Rising	14.80	20 - 24 Oct	15.21
Lock 4	13.20	13.31	Rising	14.58		14.73
Loxton	-	12.03	Rising	13.35	21 - 25 Oct	13.54
Cobdogla	-	-	Rising	11.02	-	11.59
Lock 3	9.80	9.99	Rising	10.48	23 - 27 Oct	10.98
Overland Corner	-	8.44	Rising	10.00	-	10.41
Waikerie	-	7.35	Rising	8.75	25 - 29 Oct	9.20
Lock 2	6.10	6.62	Rising	7.81	26 - 30 Oct	8.32
Cadell	-	5.04	Rising	6.63	-	7.01
Morgan	-	4.52	Rising	6.19	28 Oct - 1 Nov	6.38
Lock 1	3.20	3.21	Rising	4.07	29 Oct - 2 Nov	4.46
Swan Reach	0.75	1.72	Rising	Water levels below Lock 1 are difficult to forecast due to influence of Lower Lakes water levels & barrage operations	-	3.11
Mannum PS	0.75	0.82	Rising		-	1.33
Murray Bridge	0.75	0.64	Rising		4 - 9 Nov	1.04

The flow over Lock 1 is approximately 42 GL/day and will increase to around 44 GL/day over the coming week.

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 (DEW) 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*).

Flood Advice

The SA SES have issued a Flood Advice for shack areas between Cadell and Mannum on the River Murray in SA. You can view the latest advice on the SES website: <https://www.ses.sa.gov.au/incidents-and-warnings/current-warning-list/>

High Flow Advice

Alongside the SES Flood Advice, the Department for Environment and Water has issued a *High Flow Advice* with this River Murray Flow Report. 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 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.

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

Delivery of water for the environment this winter-spring is continuing with floodplain and weir operations providing much needed water to floodplains, wetlands and river banks.

The Pike regulator has now reached the target operation level where it will be held to generate widespread inundation, or until the elevated river flows provide a higher level of inundation than that of the regulator.

The operation of the Chowilla regulator is being drawn down (along with the water level in Lock 6) to ensure that once flows reach around 50 GL/day the Lock 6 weir can be safely removed to ensure the structural integrity of the weir. After this point any increases in water levels will be due to the elevated river flows. Natural events like this continue to provide benefits for plants and wildlife. Frogs can be heard calling at several sites and the productive wetlands are providing good food resources for waterbirds and bushland birds alike.

At Katarapko the good River Murray flows are providing watering across significant areas of the floodplain. Operation of the infrastructure is on hold as water levels are already elevated due to the higher River levels and inundation extent similar to that of the managed event is expected to be achieved with the next peak of natural flow to South Australia.

Please visit the National Parks website for information on park and access track closures due to high flows in the Murray River National Park at www.parks.sa.gov.au/parks/murray-river-national-park and www.parks.sa.gov.au/parks/chowilla-game-reserve for information regarding closures at Chowilla.

The event at Lock 2 aimed to raise water levels by up to 55 cm. This level has now been surpassed and water levels are being held up due to elevated River flows and no longer via manipulation of the weir.

Below you will find Table 1 showing detailed information on the levels at the regulators and Locks:

Structure	Normal pool level (m AHD)	Water level at 12/9/2022 (m AHD)	Status as at 12/9/2022	Maximum target of event* (m AHD)
Chowilla regulator	16.40	19.48	↓ Lowering in order to safely remove the weir as per high flow operations.	19.85
Lock 6	19.25	19.66		19.87
Pike regulator	14.55	16.18	Holding around max target	15.90
Lock 5	16.30	16.73	Holding around max target	16.80
The Splash regulator (Katarapko)	10.00	-	Higher water levels due to the elevated River Murray flows	-
Lock 4	13.20	13.28		-
Lock 3	9.80	10.07	↑ Rising within normal operating range	-
Lock 2	6.10	6.65	Higher water levels due to the elevated River Murray flows	6.65
Lock 1	3.20	3.26	Holding around max target	3.30

*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 11 September 2022, a total of approximately 8 646 348 m³ of sand has been removed from the Murray Mouth. Both dredges are working 12 hours a day, 5 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 0.67 m AHD and Lake Albert is approximately 0.79 m AHD. The difference is due to wind effects.

As of Tuesday 13 September 2022, the weekly releases were approximately 205 GL. 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 2: Number of barrage gates open each day for the week ending Tuesday 13 September 2022

Barrage (total number of gates)	Goolwa (120)	Mundoo (25)	Boundary Creek (5)	Ewe Island (110)	Tauwitchere (319)	Fishways
7 Sept 2022	26	4→2*	1	58	180	Fishways at all barrages and at Hunters Creek (11 in total) were open during the entire week
8 Sept 2022	26→0	2*→0	1	58→0	180→2	
9 Sept 2022	0	0→6*→0→6*	1	0→12*→0→12*	2→23→2→23	
10 Sept 2022	0→1*→0	6*→0→6*	1	12*→0→12*	23→2→23	
11 Sept 2022	0→1*→0	6*→0	1	12*→0	23→2	
12 Sept 2022	0→16	0→6*	1	0→12*→58	2→180	
13 Sept 2022	16→26	6*	1	58	180	
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.

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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