River Murray Flow Report

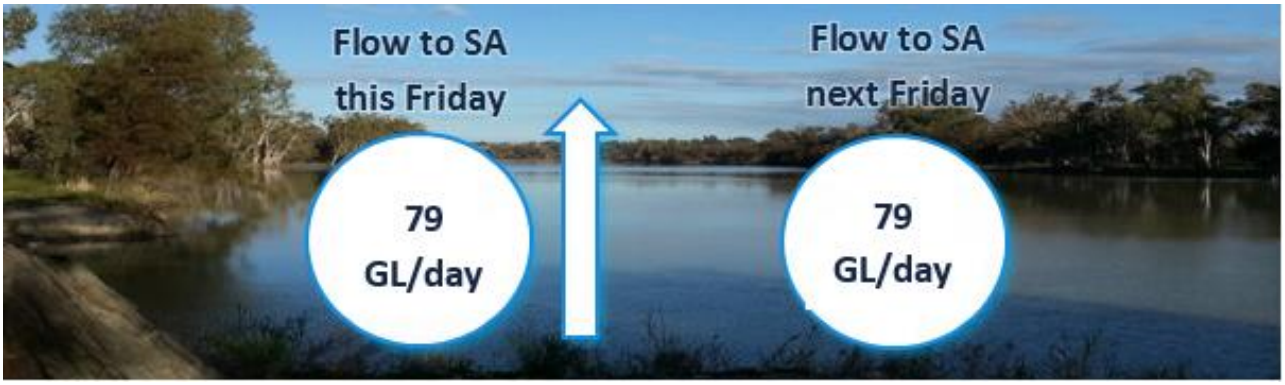
Government of South Australia
Department for Environment and Water

Report #40/2022

Issued 10:00 am 14 October 2022

This supersedes the previous Flow Report issued by the Department for Environment and Water (DEW) on 07 October 2022. The next Flow Report will be provided on Friday 21 October 2022.

Flow outlook



The flow at the South Australian border is approximately 79 GL/day and is forecast to remain around 79 GL/day over the coming week. The current flow at the border comprises:

- full October Entitlement Flow (5.5 GL/day), which includes water for the environment;
- 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 will increase again during November. It is expected that the **flow to SA will remain in the vicinity of approximately 79-80 GL/day for about two weeks. The flow to SA is then expected to rise further from early November and could reach 90 GL/day in mid-November.** Further increases are possible as a result of high rainfall totals over the Murray-Darling Basin in the past week.

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)

The table below shows estimated high water levels (based on historical events and modelling) and approximate timing of those water levels if the flow reaches 90 GL/day at the SA border in the coming 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. Note also that the current forecast indicates a flat peak spanning a number of weeks, hence an approximate date range has been provided.

Location	Normal Pool Level (m AHD)	Current level at 12/10/22 (m AHD)	Water level is currently (m AHD)	Forecast water levels at ~90 GL/day (m AHD)	Estimated timing of peak	2016 High Water Level (m AHD)*
Lock 6	19.25	19.56	Rising	20.08	17 Nov – 24 Nov	20.19
Renmark	-	-	Rising	17.50		17.44
Lock 5	16.30	16.26	Rising	17.01		17.05
Lyrup	-	14.76	Rising	-	-	15.80
Berri	-	14.31	Rising	15.30	20 Nov – 27 Nov	15.21
Lock 4	13.20	13.93	Rising	14.68		14.73
Loxton	-	12.61	Rising	13.62	21 Nov – 28 Nov	13.54
Lock 3	9.80	9.80	Rising	11.15	23 Nov – 30 Nov	10.98
Overland Corner	-	9.02	Rising	10.17	-	10.41
Waikerie	-	7.79	Rising	9.43	25 Nov – 2 Dec	9.20
Lock 2	6.10	6.91	Rising	8.50	26 Nov – 3 Dec	8.32
Cadell	-	5.62	Rising	-	-	7.01
Morgan	-	4.80	Rising	6.87	28 Nov – 5 Dec	6.38
Lock 1	3.20	3.32	Rising	4.44	29 Nov – 6 Dec	4.46
Swan Reach	0.75	2.06	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	0.91	Rising		-	1.33
Murray Bridge	0.75	0.72	Rising		5 Dec – 12 Dec	1.04

*In 2016, the peak flow was 94.6 GL/day at the SA border and 81.4 GL/day at Lock 1. The degree to which the peak flow attenuates (reduces and flattens out) as it moves down the river in South Australia varies between each event. Water level predictions in the above table are higher for 90 GL/day than the 2016 event in some locations because at this stage it has been assumed that less attenuation of the peak will occur.

The flow over Lock 1 is approximately 55 GL/day and will increase to around 58 GL/day over the coming week.

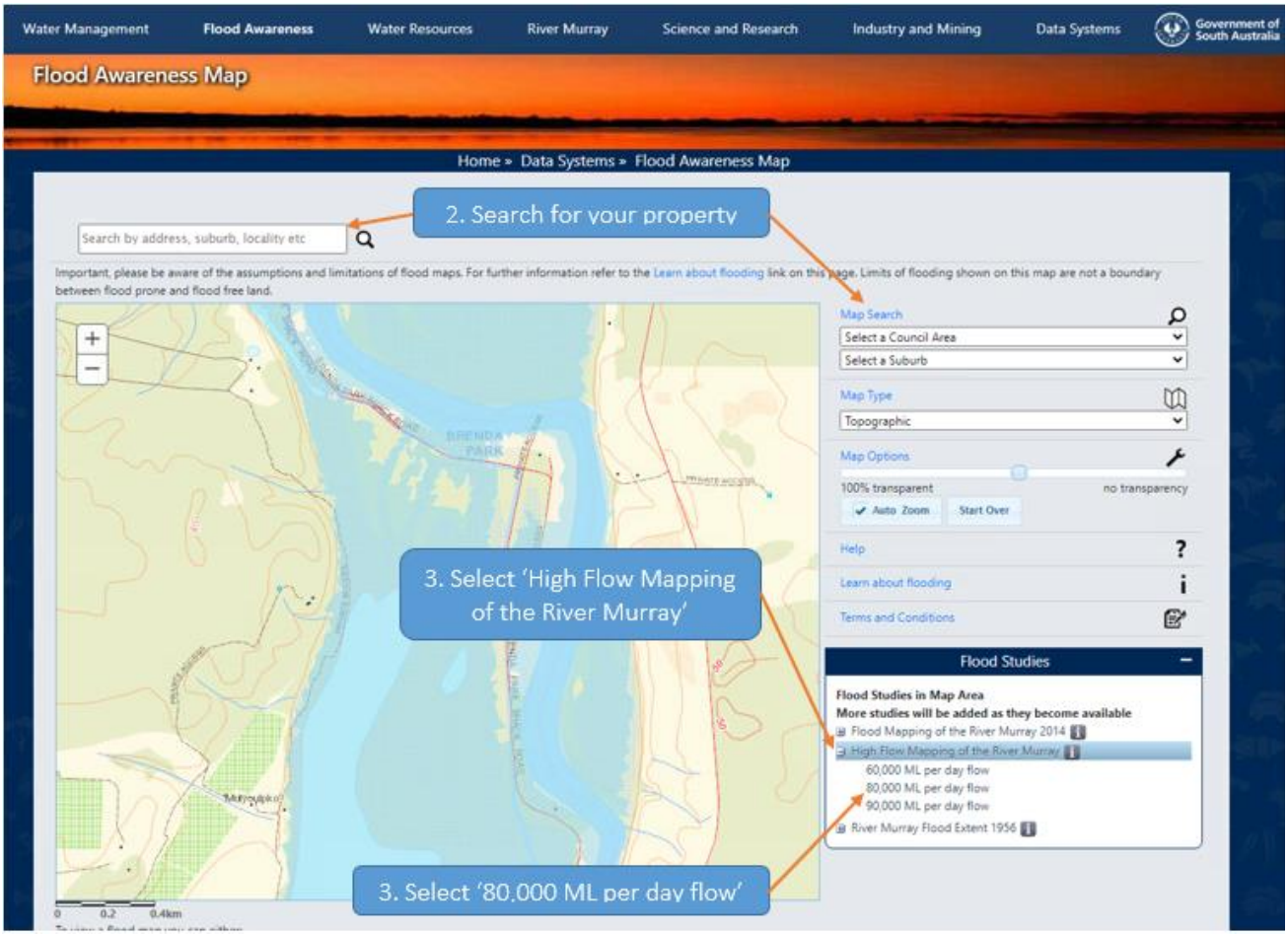
Flood awareness mapping

As floods don't regularly occur in South Australia it can be hard to plan for one or even know if you are at a high risk of being affected. To help people know if they are at a greater risk of being affected by flooding, communities can use the Department for Environment and Water's Flood Awareness Map.

The mapping for the River Murray shows the inundation expected at a range of flows. To see if your property is impacted at flows of 80 GL/day you can follow these steps (also seen below on the image):

1. Open the Flood Awareness Map and agree to the terms and conditions;
2. Search to your property via the search box at the top of the map or via council area or suburb drop down lists;

3. In the box titled '*Flood Studies*' select '*High Flow Mapping of the River Murray*' (note there are several River Murray related studies but this one will allow you to see the impacts at 90 GL/day);
4. Then select, *'90,000 ML per day flow'* (you can also select any of the other flow bands but this is the flow closest to the latest forecast).



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 (SASES) 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 SASES for the River Murray between the SA border and Wellington. Further advice will be issued by the SASES 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 SASES has 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 SASES website: https://www.ses.sa.gov.au/incidents-and-warnings/current-warning-list/

High Flow Advice

Alongside the SASES 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

The floodplain and weir operations have been completed, ahead of the increasing flows to South Australia.

Operation of the Chowilla regulator is complete. Water levels fell through the anabranch as stop logs were removed from the Chowilla regulator, but are now rising again in response to the increasing river flows. Natural high flow events like this provide continuing 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.

The Pike regulator has also been fully opened for connected throughflow, as the level in the floodplain has equalised with River levels. The water level and extent of inundation has reduced with lowering of the regulator, but is now likely to increase again with River flow over the coming weeks. A diversity of waterbirds, including migratory waders, have been observed using the mosaic of deep and shallow waters and, six species of frogs have been heard calling.

At Katarapko the good River Murray flows are providing watering across significant areas of the floodplain and with flows on the rise, the operation of the major infrastructure has not been needed.

At some locks all stop logs have been removed with river flow, rather than the weirs themselves, controlling water levels. With the weirs 'removed' weir pool raising and lowering is no longer possible. Weir removal only occurs when river flows are greater than approximately 55 000 ML/d and is exciting for the environment. With the river free-flowing our native fish can move upstream freely (rather than only through fishways) and carbon, nutrients and water bugs coming off the inundated floodplains can be transported through the system to fuel the food web.

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.

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 **10/10/2022** (m AHD)	Status as at **14/10/2022**	Maximum target of event* (m AHD)
Chowilla regulator	16.40	18.97	Higher water levels due to the elevated River Murray flows	19.85
Lock 6	19.25	19.50	Higher water levels due to the elevated River Murray flows Navigation pass has been removed	19.87
Pike regulator	14.55	15.64	Higher water levels due to the elevated River Murray flows	16.10
Lock 5	16.30	16.33		16.80
The Splash regulator (Katarapko)	10.00	13.30	Higher water levels due to the elevated River Murray flows Navigation pass has been removed	-
Lock 4	13.20	13.89		-
Lock 3	9.80	9.79	Holding at normal pool level until removal of navigation pass is undertaken	-
Lock 2	6.10	6.88	Higher water levels due to the elevated River Murray flows Navigation pass has been removed	6.65
Lock 1	3.20	3.32	Higher water levels due to the elevated River Murray flows	3.30

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 9 October 2022, a total of approximately 8 694 848 m^3 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 0.64 m AHD and Lake Albert is approximately 0.70 m AHD. The difference is due to wind effects.

As of Tuesday 11 October 2022, the weekly releases were approximately 331 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 the table below.

Residents around the Lower Lakes may have noticed fluctuating water levels over the past few weeks. Often at this time of year high tides and swell have mean the barrages need to be closed to prevent sea water entering the Lower Lakes. With no outflow from the Lakes and large volumes of water coming into the Lakes from upstream, water levels can rise rapidly. The reverse can also happen when good barrage release conditions occur, water levels can drop rapidly as water is released out the barrages.

Number of barrage gates open each day for the week ending Tuesday 11 October 2022

Barrage (total number of gates)	Goolwa (120)	Mundoo (25)	Boundary Creek (5)	Ewe Island (110)	Tauwitchere (319)	Fishways
5 Oct 2022	18→15	3*→2*	1	58	181→179	Fishways at all barrages and at Hunters Creek (11 in total) were open during the entire week
6 Oct 2022	15→13	2*→1*	1	58	179	
7 Oct 2022	13	1*→0*→1*	1	58	178	
8 Oct 2022	13	1*	1	58	178	
9 Oct 2022	13	1*	1	58	178	
10 Oct 2022	13	1*	1	58	178	
11 Oct 2022	13	1*	1	58	178	
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.

Fish kills

River Murray and Lower Lakes residents may have observed dead fish washed up on riverbanks or seen recent media coverage about fish kills. The native species in question is mainly bony bream / bony herring, which commonly has small-moderate die-offs along the SA River Murray during colder months. Die-offs are more likely to be related to water temperature than salinity, as this species is very salt tolerant and can survive in the Coorong. Low dissolved oxygen in the main channel of the river is also an unlikely cause of death as DO levels have been adequate and relatively stable over last few months. While the die-off is being investigated, it is likely just a larger version of what is a common occurrence in the SA River Murray.

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. Please note that some SA River Murray surface water monitoring stations may be progressively removed as river flow increases and that data will be unavailable for those stations until they are reinstated.

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 or the Flood Awareness Map.

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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