SA River Murray Flow Report

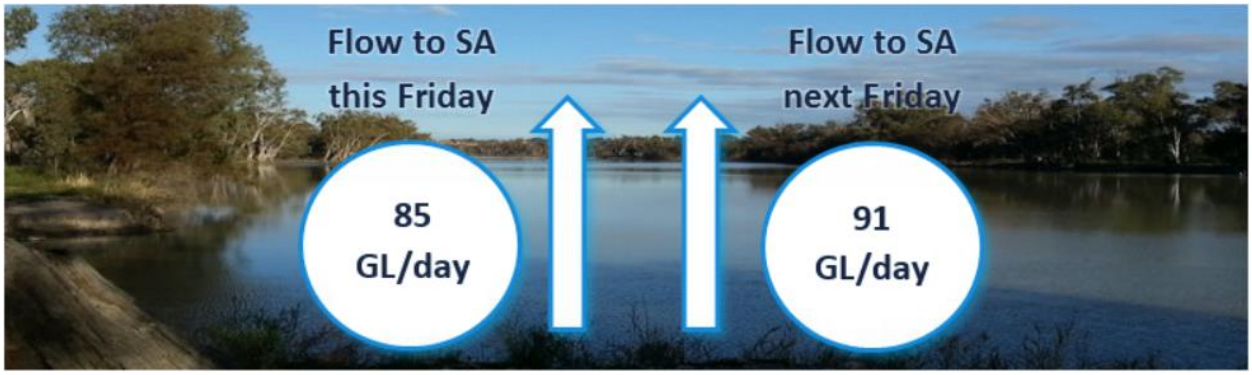
Government of South Australia
Department for Environment and Water

Report #42/2022

Issued 10:00 am 28 October 2022

This supersedes the previous Flow Report issued by the Department for Environment and Water (DEW) on 21 October 2022. The next Flow Report will be provided on Friday 4 November 2022.

Flow outlook



The flow at the South Australian border is approximately 85 GL/day and is forecast to increase to around 91 GL/day over the coming week.

The latest forecasts upstream of the South Australian border indicate that the flow to SA will continue increasing during November 2022. It is expected that:

- **the flow to SA will reach approximately 100 GL/day around 12 November 2022.**
- **the flow will reach a peak of approximately 135 GL/day in early December, classifying it as a moderate flood in South Australia.**

FLOOD INFORMATION AND WARNINGS

The South Australian State Emergency Service (SASES) is the control agency for flood and is responsible for providing public information and warnings for River Murray flood events in SA.

You can view the latest warning on the SASES website: https://www.ses.sa.gov.au/incidents-and-warnings/current-warning-list/

The SASES has provided information and links on River Murray high flow and flooding on its website here: https://www.ses.sa.gov.au/incidents-and-warnings/river-murray-high-flows-2022/

The SASES Infoline on 1800 362 361 can also be contacted between 9am and 5pm (weekdays) for further information.

The SASES has published locations where sandbags are available for collection on its website at: https://www.ses.sa.gov.au/incidents-and-warnings/sandbag-locations/

RIVER MURAY FLOW AND INUNDATION MAPPING

The SA Department for Environment and Water (DEW) has made it easier to find information on River Murray high flow and flooding, including new easily accessible inundation maps and Frequently Asked Questions (FAQs), via the following link: https://www.environment.sa.gov.au/topics/river-murray/river-murray-high-flows

The forecast peak has increased from advice provided on 21 October 2022 due to continued rainfall in the Murray-Darling Basin upstream of the SA border.

Forecasting of the size and timing of flows, particularly floods, to the South Australian border is particularly challenging due to the complex interaction of flows from multiple tributaries (including the Darling, Murrumbidgee, upper Murray and Goulburn Rivers) and the attenuating effect of water spreading out over floodplains and filling wetlands on its way to the South Australian border.

This forecast is based on water that is already in transit to South Australia and does not include forecast rainfall. Further increases are possible if there is more rainfall over the Murray-Darling Basin in the coming weeks, particularly if it falls in tributaries that are closer to the SA border, for example, the Loddon, Campaspe and Goulburn Rivers.

Due to the unavoidable uncertainty in the flow forecast, the community is encouraged to continue to plan and prepare for the possibility of an even higher flow.

FORECAST PEAK FLOW AND LIKELIHOOD

135 GL/day – High Probability of being reached. This flow is in the warning message.

150 GL/day – Medium Probability of being reached. This flow may occur with future rainfall and/or improved accuracy in forecasting in coming weeks

160 GL/day – Low Probability of being reached. There is a chance that this flow may occur with significant future rainfall. Be prepared for this flow and river levels "just in case"

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 flow over Lock 1 is approximately 63 GL/day and will increase to around 70 GL/day over the coming week.

Current and forecast water levels

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 140 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 26/10/22 (m AHD)	Water level is currently (m AHD)	Forecast water levels at ~140 GL/day (m AHD)	Estimated timing of peak	2016 High Water Level (m AHD)*
Lock 6	19.25	19.94	Rising	-	28 Nov – 12 Dec	20.19
Renmark	-	-	Rising	18.11		17.44
Lock 5	16.30	16.73	Rising	17.62		17.05
Lyrup	-	15.41	Rising	16.60	-	15.80
Berri	-	14.87	Rising	15.78	31 Nov – 15 Dec	15.21
Lock 4	13.20	14.43	Rising	15.05		14.73
Loxton	-	13.21	Rising	-	1 Dec – 16 Dec	13.54
Lock 3	9.80	10.27	Rising	12.52	3 Dec Nov – 18 Dec	10.98
Overland Corner	-	9.56	Rising	12.40	-	10.41
Waikerie	-	8.29	Rising	-	5 Dec – 20 Dec	9.20
Lock 2	6.10	7.40	Rising	10.06	6 Dec – 21 Dec	8.32
Cadell	-	6.04	Rising	-	-	7.01
Morgan	-	5.11	Rising	8.10	8 Dec – 23 Dec	6.38
Lock 1	3.20	3.64	Rising	6.10	9 Dec – 24 Dec	4.46
Swan Reach	0.75	2.40	Rising	5.34**	-	3.11
Mannum PS	0.75	0.75	Rising	2.44**	-	1.33
Murray Bridge	0.75	0.75	Rising	1.68**	15 Dec – 30 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.

** Water levels below Lock 1 can be difficult to forecast due to the influence of wind, the water level in the Lower Lakes and barrage operations

Potential higher forecast water levels

Expected water levels at 150 GL/day and 160 GL/day are provided in the table below.

*Water levels below Lock 1 can be difficult to forecast due to the influence of wind, the water level in the Lower Lakes and barrage operations

Location	Normal Pool Level (m AHD)	Forecast water levels at ~150 GL/day (m AHD)	Forecast water levels at ~160 GL/day (m AHD)	1974 High Water Level (m AHD)
Lock 6	19.25	20.63	20.87	21.01
Renmark	-	18.10	18.40	18.54
Lock 5	16.30	17.68	17.94	18.07
Lyrup	-	16.79	16.96	-
Berri	-	15.87	16.10	16.27
Lock 4	13.20	15.28	15.55	15.66
Loxton	-	14.54	14.89	15.04
Lock 3	9.80	12.55	13.29	13.17
Overland Corner	-	12.55	12.70	12.73
Waikerie	-	10.62	11.07	11.24
Lock 2	6.10	9.76	10.24	10.29
Cadell	-	8.62	8.97	9.16
Morgan	-	8.02	8.52	8.57
Lock 1	3.20	6.03	6.57	6.81
Swan Reach	0.75	5.34*	5.82*	6.04
Mannum PS	0.75	2.62*	2.90*	3.14
Murray Bridge	0.75	1.90*	1.98*	2.02

≠Note that the water levels presented are approximate and should be used as a guide. They are calculated using data from past high flow and modelled events. Each high flow event has factors which can cause it to vary from what has been observed during previous events. These include, how quickly water arrives in SA, the rate of inundation across the floodplain and the type of recession as water levels return to normal heights all affect what the peak water levels will be.

Flood inundation 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 view inundation maps prepared by DEW for a range of river flows.

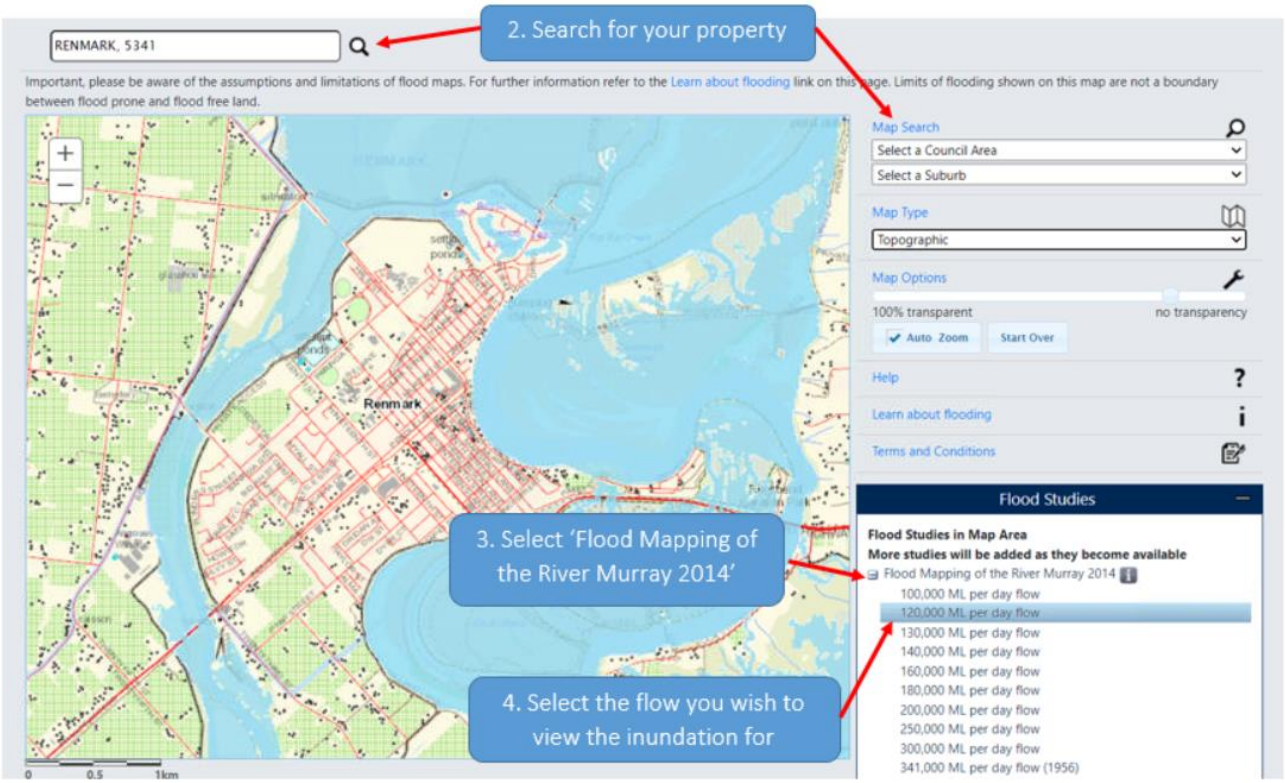
DEW has created a new dedicated web page to make it easier to find information on the River Murray high flow and flooding in South Australia, at https://www.environment.sa.gov.au/topics/river-murray/river-murray-high-flows.

This site includes **new inundation maps** of the major towns on the River Murray in an easily accessible, downloadable pdf format for flows of 120 GL/day, 140 GL/day and 160 GL/day.

Inundation mapping for the River Murray from north of Renmark to Wellington for flows ranging from 60 GL/day to the highest flood on record (341 GL – the 1956 flood) is also available via the Flood Awareness Map.

To use the Flood Awareness Map to see if your property is impacted at flows of 140 GL/day, follow the steps below (also shown 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 '*Flood Mapping of the River Murray 2014*';
4. Then select, '*140,000 ML per day flow*' (you can also select any of the other flow bands but this is the flow closest to the latest forecast).
5. (optional) Change Map Type to Aerial Photograph and use the Transparency Slider to improve the presentation.



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*).

More Information

More information can be found on the DEW website: https://www.environment.sa.gov.au/topics/river-murray/river-murray-high-flows

Decommissioning of River Murray River Vessel Waste Disposal Stations

As of Friday, 28 October 2022, waste disposal stations above Lock 1 are closed until further notice. Further information on timing of closures of disposal stations below Lock 1 to be confirmed. Closing of the disposal stations will ensure public safety, water quality and protection of infrastructure. We are being proactive in closing the infrastructure whilst we have a window of time and contractor availability. The closure is temporary so when the flows do recede, the systems can go back online in a timely manner without any issues. In the interim, houseboat operators can utilise commercial options temporarily while the disposal stations are closed.

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 provides 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.

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 23 October 2022, a total of approximately 8 708 213 m^3 of sand has been removed from the Murray Mouth. One dredge has been stood down for repairs while the other is operational Monday to Friday, 12 hours per day. Both dredges will soon be stood down for the period of high flow through the mouth.

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 0.76 m AHD and Lake Albert is approximately 0.75 m AHD. The difference is due to wind effects.

As of Tuesday 25 October 2022, the weekly releases were approximately 345 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.

Barrage (total number of gates)	Goolwa (120)	Mundoo (25)	Boundary Creek (5)	Ewe Island (110)	Tauwitchere (319)	Fishways
19 Oct 2022	16→13	2→1*	1	58	177	Fishways at all barrages and at Hunters Creek (11 in total) were open during the entire week
20 Oct 2022	13	1*	1	58	177	
21 Oct 2022	13	1*	1	58	177	
22 Oct 2022	13	1*	1	58	177	
23 Oct 2022	13	1*	1	58	177	
24 Oct 2022	13	1*→2*	1	58	177	
25 Oct 2022	13	2*	1	58	177	
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.

Number of barrage gates open each day for the week ending Tuesday 25 October 2022

**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.

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.

Blackwater

There have been recent reports of low dissolved oxygen levels and blackwater in the River Murray and its tributaries upstream of the border as a result of recent flooding.

Blackwater occurs naturally when floods wash leaves, grass and cropping material off riverbanks and floodplains into waterways. High levels of organic matter in waterways, combined with warm weather, can cause oxygen levels in the water to drop, potentially harming or killing fish and other creatures in the river. This is known as hypoxic (low oxygen) blackwater which can have a blackish colour and a strong, unpleasant smell.

The organic matter in blackwater plays an important role in the foodweb for the river. However, blackwater's low dissolved oxygen levels, generally below 4 mg/litre, can cause fish and crustaceans to become distressed or die. Blackwater may also require additional treatment when extracted for drinking water.

The SA River Murray is likely to be affected by blackwater in the coming weeks as more floodwaters approach the state. DEW and SA Water are working with other agencies across the basin to closely monitor conditions and plan river operations to mitigate the effects where possible. Due to the large scale of the event which was caused by widespread natural flooding in multiple catchments, it is almost certain that prevention will be impossible and mitigation will be limited.

Further information

The SA Department for Environment and Water (DEW) has made it easier to find information on the River Murray high flow and flooding, including new easily accessible inundation maps and Frequently Asked Questions (FAQs), via the following link: https://www.environment.sa.gov.au/topics/river-murray/river-murray-high-flows

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 Flood Awareness Map and 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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