HIGHFIRE RISK PROJECT

BLOW-UP FIRE EVENT (BUFE) POTENTIAL SOUTH-EAST AUSTRALIA

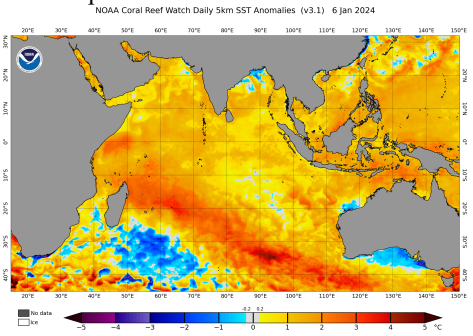
--The Hierarchical Predictive Framework--

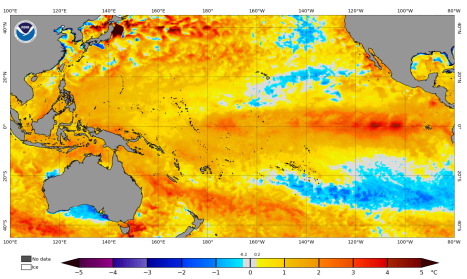
Level 1: ; Level 2:

This page shows current Alerts
for
Blow-Up Fire Event potential.

ISSUE DATE: 24 DECEMBER 2023.

Current SSTA charts
(NOAA Coral Reef Watch)
Click maps to see at full size on NOAA site.





This is an Operational Trial.
It is intended to be an intelligence product to aid in informed decision making, and should not be used in any other way.
Recent pyroCbs (2023b, Nymboida, 25 October; 2023d, Pilliga, 9 Dec; & 2023e, Pilliga, 18 Dec) were fully consistent with HPF Alerts.

A REQUEST

If anyone uses this draft model operationally, can they please send their results to the author:
Rick McRae

UNSW CANBERRA

LEVEL 1 CANBERRA DIPOLE

Current Alert Status:

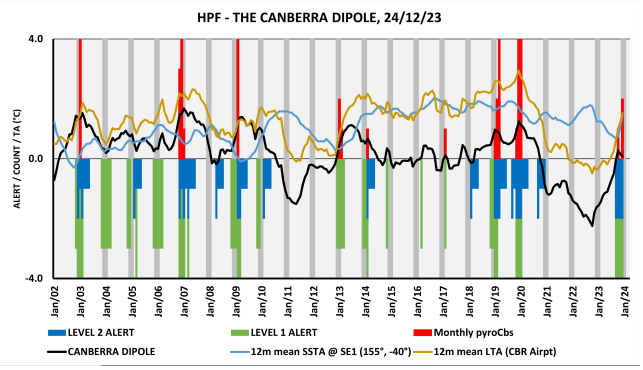
LEVEL 1 ALERT DOWNGRADED.

This reflects interactions between land and sea that influence synoptic patterns conducive to wildfires (or

rain).

Data:

- Sea Surface Temperature Anomalies (SSTAs) - NOAA Coral Reef Watch;
- Land Temperature Anomalies (LTAs) & River flows - Bureau of Meteorology;
- PyroCbs - Australian pyroCb Register.



[Click on image to enlarge.]

ANALYSIS:

There has been a Level 1 Alert in place due to river drying events. This is being downgraded as rainfalls continue.

UPDATE: A Level 2 Alert has been dowgraded as stream flows rise after heavy rains.
A series of major rain events indicates a full reversal is underway. The key drivers are lower temperatures and the increase in positive SSTAs around most of Australia. Offshore from the SE of Australia there is a Coral Reef Bleaching Alert Level 1 in place from NOAA (See their map).

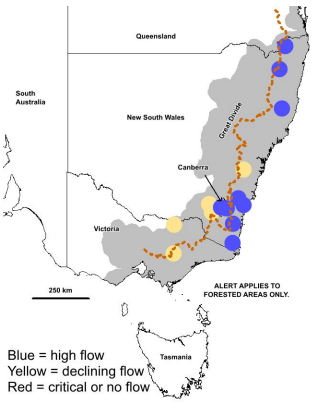
LEVEL 2 RIVER DRYING EVENTS

During a Level 1 Alert, an on-going drought may cause key river flows to cease. If enough of these are drying out it indicates a real potential for a BUFE or a pyroCb during the coming month.

Current Alert Status:

LEVEL 2 ALERT ENDING

ANALYSIS: Heavy rainfall events have caused the base flows of many rivers to increase. Further forecast falls will do more of that. As such the active part of the Level 2 Alert has ceased, but it may take a week or so for the regional hydrology to fully re-equilibrate.
NOTE: A Level 2 Alert persists for up to a month after flows recover, due to the timelag in moisture getting into large fuels.



Given the lack of low-flows (no red dots in the map), and the continued high dew point weather (heavy rainfalls) it is likely that the effects recent low-flows will quickly dissipate. The Level 2 Alert has been downgraded.

LEVEL 3 BLOW-UP FIRE OUTLOOK

With a Level 2 Alert downgraded, the bushfire threat is less likely to include Extreme Wildfires.
Operations at Level 3 require a trained FBAN or equivalent Technical Expert to use the BUFO2 model to assess the potential for a Blow-Up Fire Event during an on-going fire. This requires a series of data feeds specified in the model. It is suggested that, as a return to dry conditions may occur this summer, FBANs should skill-up on using the BUFO2 model.

Click here for the BUFO2 worksheet.

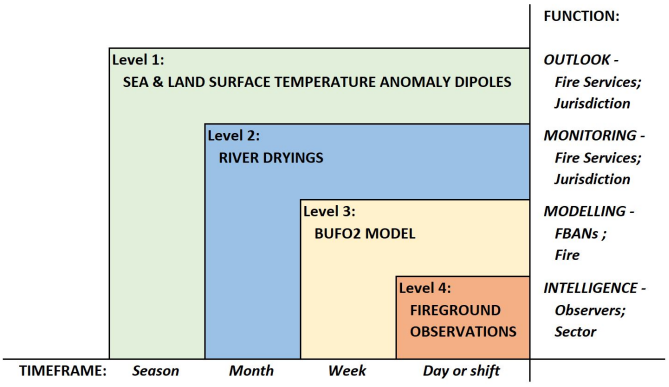
Click here for a PowerPoint presentation on BUFO2, from a workshop at the AFAC21 Conference.

Could anyone using the spreadsheet during the HPF trail please copy their results to us.

Page prepared by:
Adjunct Professor Rick McRae
UNSW Canberra
School of Science
Bushfire Research Group
r.mcrae@adfa.edu.au

BASIS

This work is based on analyses of data from Black Summer. The structure of the four-tier Hierarchical Prediction System is designed to progress into smaller-scales of timeframe and function, shifting from seasonal outlook to incident operations:



HPF is described in a peer-reviewed paper in the October 2023 edition of the Australian Journal of Emergency Management.

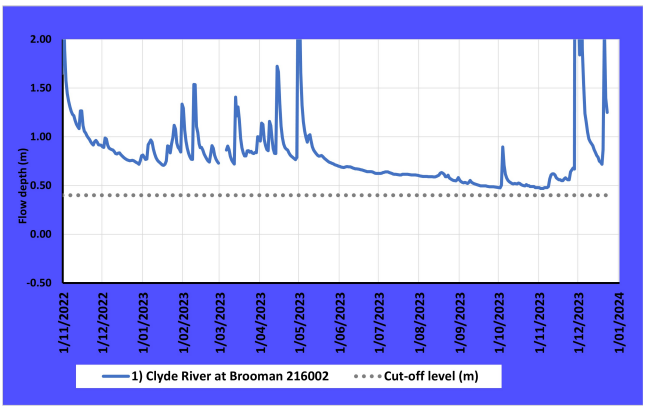
LEVEL 2 SOURCE DATA

The table and map below describe the stream flow reference sites used.

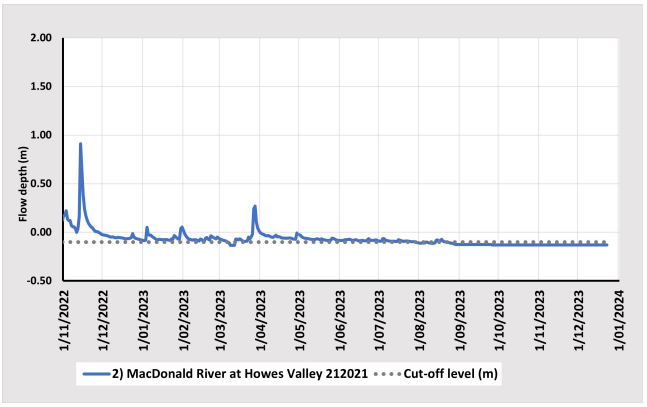
No.	Site Code	Name	Latitude	Longitude	Owner	1st date on record	Minimum level (m)
1	216002	Clyde River at Brooman	-35.4681	150.2394	NSW DILW	8/07/1960	0.17
2	212021	MacDonald River at Howes Valley	-32.8611	150.8611	NSW DILW	9/02/1976	-0.20
3	41000261	Goobarragandra River at Mac's Crossing	-35.4183	148.4357	NSW DILW	13/06/2012	0.86
4	225219	MacAlister River at Glencairn	-37.5162	146.5665	Vic DELWP	7/04/1967	0.25
5	220004	Towamba River at Towamba	-37.0715	149.6593	NSW DILW	5/04/1970	0.35
6	212260	Kowmung River at Cedar Ford	-33.9481	150.2431	NSW DILW	17/05/1968	0.17
7	204014	Mann River at Mitchell	-29.6931	152.106	NSW DILW	10/05/1972	0.35
8	204051	Clarence River at Paddys Flat	-28.7198	152.4198	NSW DILW	26/03/1976	0.60
9	207015	Hastings River at Mt Seaview	-31.3683	152.2425	NSW DILW	31/05/1984	0.55
10	208001	Barrington River at Bob's Crossing	-32.0284	151.4671	NSW DILW	31/01/1944	0.47
11	410535	Murrumbidgee River above Tantangara Reservoir	-35.7706	148.5703	Snowy Hydro	2/05/1960	0.45
12	401554	Tooma River above Tooma Reservoir	-36.1	148.26	Snowy Hydro	19/09/1968	0.44
13	215208	Shoalhaven River at Hillview	-35.1845	149.9536	NSW DILW	6/11/1973	0.37
14	410734	Queanbeyan River at Tinderry	-35.6144	149.35	Icon Water	2/08/1966	0.65
15	403221	Reedy Creek	-36.3109	146.6012	Vic DELWP	11/11/1964	0.25
16	218007	Wadbilliga River at Wadbilliga	-36.257	149.6926	NSW DILW	12/06/1974	0.65
17	410731	Gudgenby River at Mt Tennent	-35.5722	149.0683	Icon Water	12/11/1964	0.35

- These plots are of data from the Bureau of Meteorology (BoM) and WaterNSW (https://realtimedata.waternsw.com.au/water.stm).
- These sites do not reflect risk to life or property, rather they are from streams with long records that are not dammed or otherwise signficantly modified, and are intended to reflect underlying hydrological dynamics. Elevated levels or concave drying trends indicate wet landscapes. Near minimum flows or low flows decaying in a convex curve are indicators of a River Drying Event.
- Note that minimum flows are not zero flows - the value reflects the circumstances at the flow measuring station.
- Also note that many catchments burnt out during Black Summer, and this may cause anomalous flow dynamics.
- There are currently some disruptions to data provision, causing gaps in the graphs. These may be updated as datasets are updated.

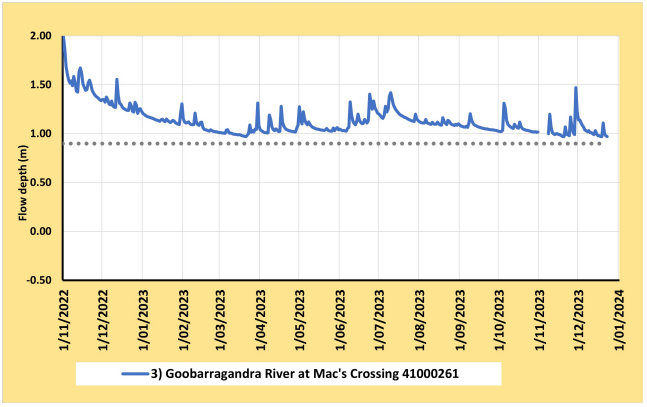
1. Clyde R at Brooman (site ID 216002)
Min. level = 0.40 m.



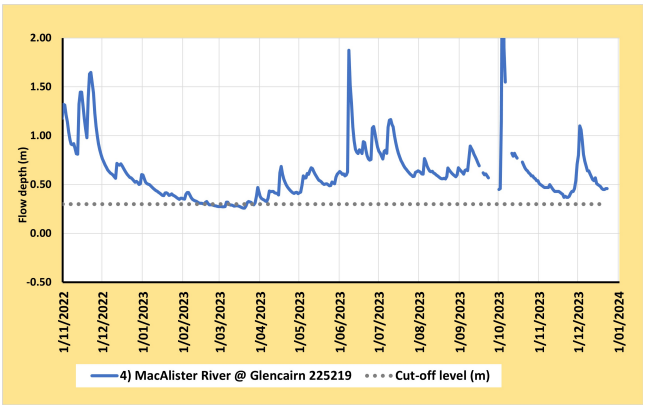
2. Macdonald R at Howes Valley (site ID 212021)
Min. level = -0.10 m.
This site has questionable data - the river is notorious for silting up after major wildfires.



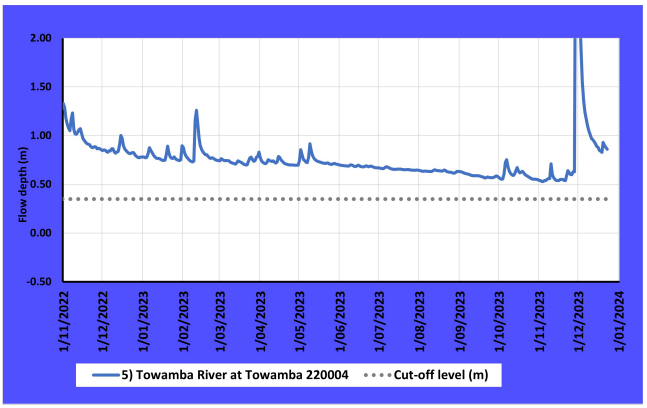
3. Goobarragandra R at Macs Crossing (site ID 41000261)
Min. level = 0.90 m.



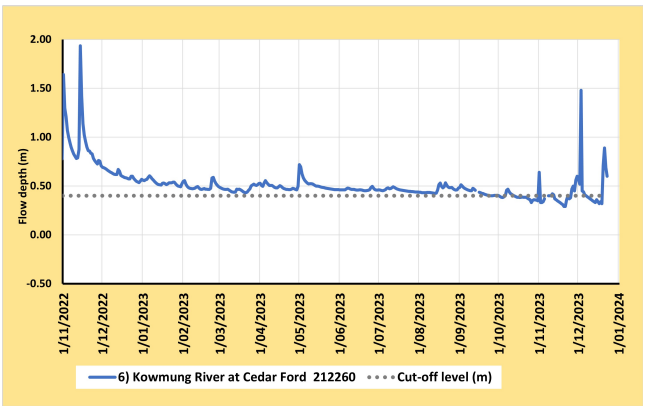
4. Macalister R at Glencairn (site ID 225219)
Min. level = 0.30 m.



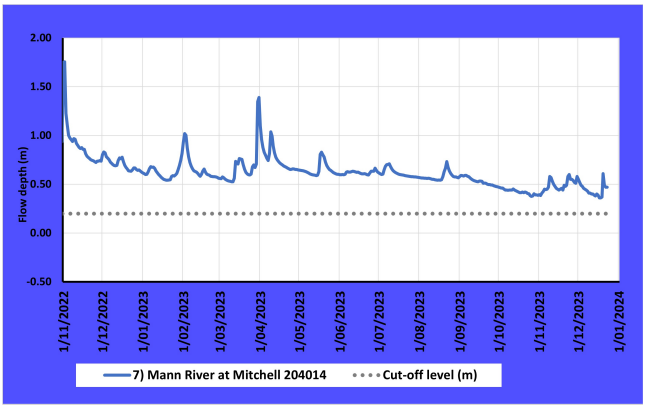
5. Towamba R at Towamba (site ID 220004)
Min. level = 0.35 m.



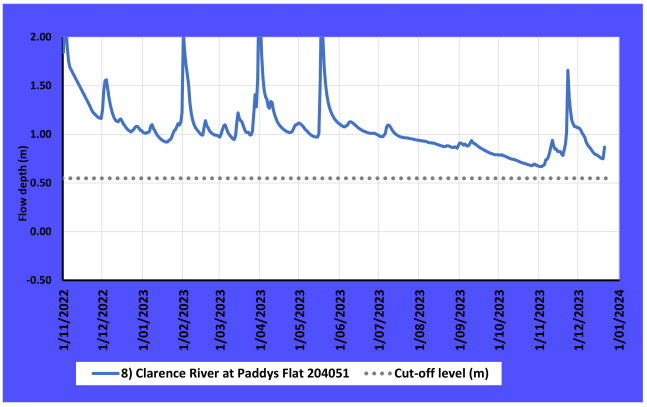
6. Kowmung R at Cedar Ford (site ID 212260)
Min. level = 0.40 m.



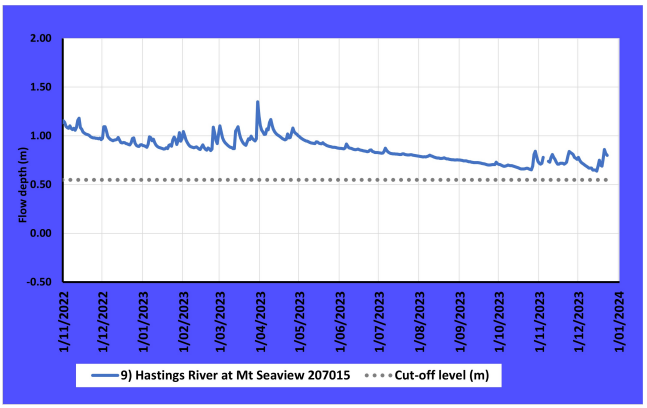
7. Mann R at Mitchell (site ID 204014)
Min. level = 0.20 m.



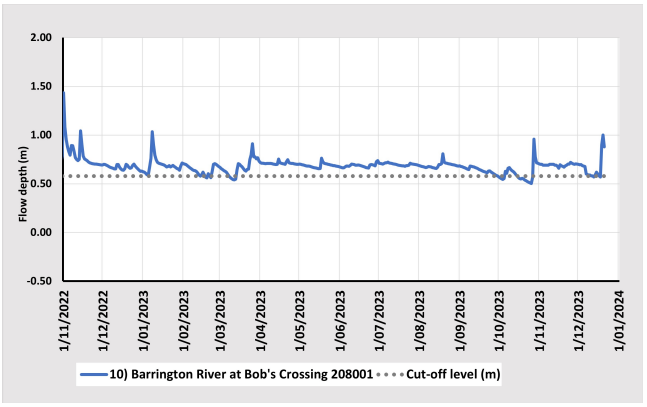
8. Clarence R at Paddys Flat (site ID 204051)
Min. level = 0.55 m.



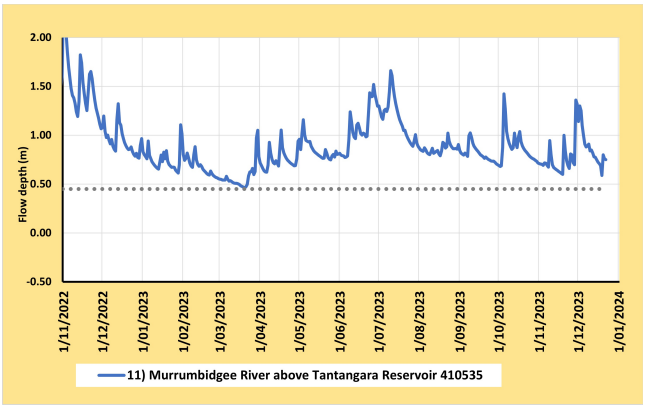
9. Hastings R at Mt Seaview (site ID 207015
Min. level = 0.55 m.



10. Barrington R at Bobs Crossing (site ID 208001)
Min. level = 0.58 m.

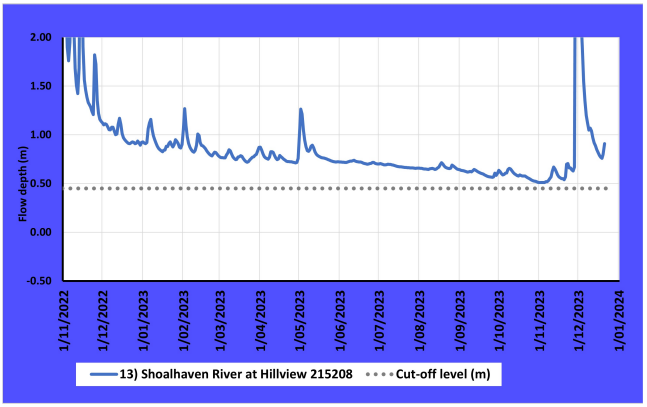


11. Murrumbidgee R above Tantangara Reservoir (site ID 410535)
Min. level = 0.45 m.

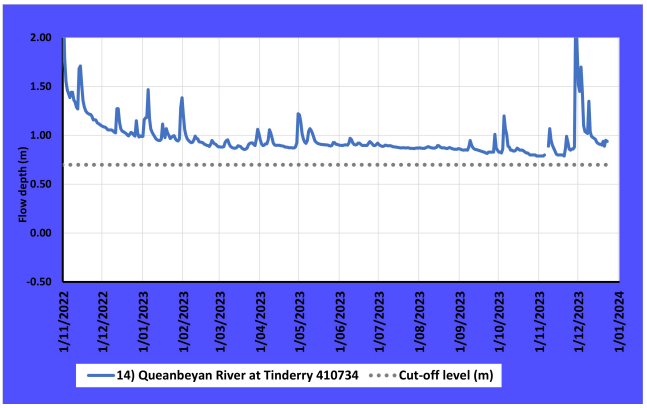


12. Tooma R above Tooma Reservoir (site ID 401554)
Min. level = 0.45 m.
The Federal Government has gazetted this site as a Commercially Sensitive Site under the Water Regulations 2008. It has been removed from this site.

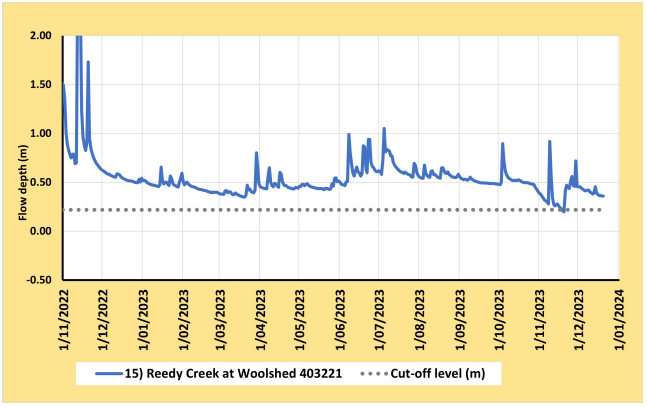
13. Shoalhaven R at Hillview (site ID 215208)
Min. level = 0.45 m.



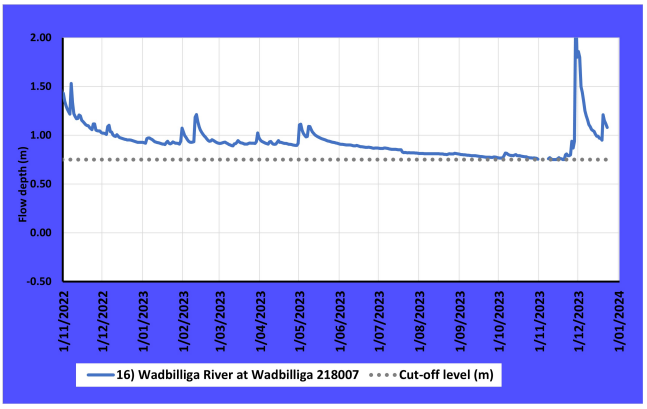
14. Queanbeyan R at Tinderry (site ID 410734)
Min. level = 0.70 m.



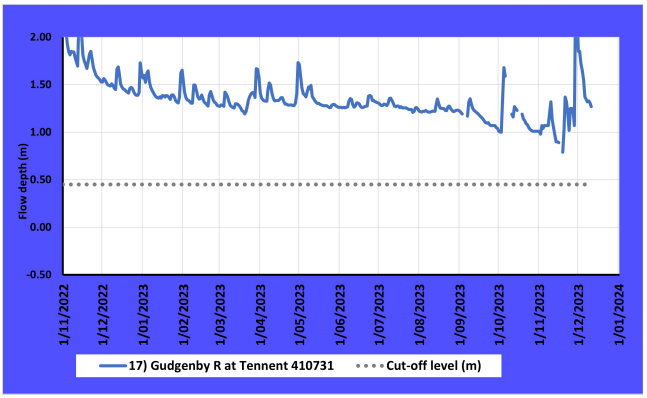
15. Reedy Creek (site ID 403221)
Min. level = 0.22 m.



16. Wadbilliga R at Wadbilliga (site ID 218007)
Min. level = 0.75 m.



17. Gudgenby R at Mt Tennent (site ID 410731) Min. level = 0.45 m.



ARCHIVE

End of September 2023
End of October 2023
Early December 2023