



NSW COASTAL RAINFALL ANNUAL SUMMARY 2023–24

Report MHL3066
25 June 2025

Prepared for:

NSW Department of Climate Change, Energy, the Environment and Water -
Conservation Programs, Heritage and Regulation

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Foreword

Manly Hydraulics Laboratory (MHL) is a business unit within the Water Group of the NSW Department of Climate Change, Energy, the Environment and Water. The NSW rainfall database has been developed to support a number of programs associated with coastal, floodplain and estuary management for the NSW Department of Climate Change, Energy, the Environment and Water – Conservation Programs, Heritage and Regulation (DCCEEW CPHR).

This annual summary presents rainfall station measurements collected by MHL along NSW coastal estuaries and rivers from 1 July 2023 to 30 June 2024. It provides ready access to MHL's rainfall database and data analysis capabilities.

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Manly Hydraulics Laboratory
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- NSW Ocean and River Entrance Tidal Levels and Air Pressure Annual Summary 2023–24
Manly Hydraulics Laboratory
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- NSW Wave Climate Annual Summary 2023–24
Manly Hydraulics Laboratory
Report No. MHL3067
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- NSW Estuary and River Water Quality Annual Summary 2023–24
Manly Hydraulics Laboratory
Report No. MHL3068
ISSN: 2205-5614 (Online)

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Executive summary

The *NSW Coastal Rainfall Annual Summary 2023–24* presents rainfall station measurements collected by MHL along NSW coastal estuaries and rivers from 1 July 2023 to 30 June 2024. It provides an overview of MHL’s historical rainfall database and data analysis capabilities.

The overall data capture across the network was 98.4% (for data processed to within $\pm 10\%$ of calibration). The target recovery rate of 95% and above is achieved for the 2023–24 reporting period.

This report contains:

- a brief description of the coastal rainfall monitoring program
- guidelines on how to use this report and access the database
- a review of significant program developments and rainfall events in 2023–24
- a list of all stations for which MHL collected rainfall data in 2023–24 (**Table 4-1**)
- the annual data summaries for each station
- **Appendix A**, which details the rainfall data available
- **Appendix B**, a list of publications which may be of interest.

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1 Rainfall monitoring program

The network of automatic recorders and the associated analysis routines enable efficient delivery of near-real time rainfall data from stations across NSW. Extracts from the historical database of rainfall data can also be made available on request (refer to [Appendix A](#)).

The present program is based on a network of automatic rainfall recording stations installed at various coastal sites (see [Section 4 Rainfall monitoring summary](#)). The network consists of 72 permanent stations funded by the NSW Department of Climate Change, Energy, the Environment and Water – Conservation Programs, Heritage and Regulation (DCCEEW CPHR). The network supplements the coverage provided by the Bureau of Meteorology (BoM), water authorities, other agencies and local government rainfall networks. The system utilises 0.2 mm, 0.5 mm and 1.0 mm tipping buckets, data loggers, and telemetry techniques including internet protocols (IP) via cellular networks and event-reporting radio telemetry system (ERTS).

Rainfall data is transferred to MHL's collection, processing and storage system hosted on cloud computing platforms. The incoming raw data is then made available in near real time to external users to view online.

The raw data is also transferred in a separate process to an MHL database hosted in NSW Government Data Centres (GovDC) where it is subject to a quality assurance process which involves several control steps to maintain data quality as well as assignment of data quality codes. Computer programs are used to further format and analyse data.

Data is backed up daily and archived to long-term storage at regular intervals.

2 How to use this report and access the database

The NSW coastline is divided into geographic regions based on river systems to present water monitoring information. Location maps display the station locations and the annual plots confirm the availability and suitability of data for the particular period of interest. A list of rainfall station data collected and stored online is included in **Appendix A**.

2.1 Data request

Once a choice has been made for the period of information required, data and services can be obtained in a variety of formats, according to their intended use. All data presented in this report are in Australian Eastern Standard Time (AEST). Allowance for daylight saving time needs to be made by the user of the data if required.

Available rainfall products include:

Tabulated output

- daily totals
- intensity/duration tables
- time of tips of rain gauge or short period fixed time step data.

Graphical plots

- hourly, daily, monthly and yearly hyetographs (a graphical representation of rainfall distribution over a period of time)
- intensity-frequency-duration curves using *Australian Rainfall and Runoff 2019*.

2.2 Access data online

MHL provides a full online data access service via the internet for its clients, and a limited service for the general public at <http://www.mhl.nsw.gov.au/>.

Typically, the last seven days of data are available online in a non-quality controlled form to aid the fastest possible access to data records. The online service for clients can provide access to all data catalogued in **Appendix A**.

Quality controlled data may be ordered via the MHL web page (<http://www.mhl.nsw.gov.au/>), by emailing data-request@mhl.nsw.gov.au, or via customised decision support tools that can be provided on request.

2.3 Rainfall data provision

Rainfall data is provided to the public via the following methods:

- MHL's public website, providing near real time access to a limited sample of data.
- MHL provides DCCEEW CPHR, NSW State Emergency Service (SES) and BoM officers access to near real time environmental data and our 'quality assured' historical database through the DCCEEW CPHR information portal, which is password-protected.
- NSW SES officers also receive automated SMS and email notifications from flood warning systems in NSW.
- A web-based data request system is available where electronic requests can be submitted via MHL's homepage at <http://www.mhl.nsw.gov.au> under the data request menu.

Data access also continues to assist the BoM, local government, SES, NSW Police, WaterNSW, NSW Surf Life Saving Association, universities, the NSW court system, private consultancies and Transport for NSW.

3 Significant events and developments

In the 2023–24 fiscal year, the rainfall stations which recorded the highest rainfall for each of the 11 durations selected between 5 minutes and 72 hours are presented in **Table 3-1**. To estimate the significance of these rainfall events, the intensities are compared against the Annual Exceedance Probability (AEP) curves for each station location sourced through BoM's Intensity Frequency Duration (IFD) service

(<http://www.bom.gov.au/water/designRainfalls/revised-ifd/>). AEP is the probability that a given rainfall total accumulated over a given duration will be exceeded in any one year. An event with a 1% AEP is an event that has a 1% chance of being equalled or exceeded in any one year. Please note that estimated AEPs are often revised as additional data from extreme events become available.

Table 3-2 provides a summary of the number of rainfall stations that exceeded a total of 100 mm in 24 hours for any one day per month during 2023–24 on the NSW east coast. 100 mm of rain falling in a 24-hour period is adopted to illustrate a significant rain event.

Table 3-3 presents the maximum recorded rainfall for durations of 5 minutes to 72 hours at each station.

Table 3-1 Intensities of highest rainfall recorded for 11 durations

Duration	Station	Date	Rainfall (mm)	Rainfall (mm/hr)	AEP (%)
5min	Curl Curl	21/05/2024	17.0	204.00	5
10min	Russell Vale	6/04/2024	29.5	177.00	10
20min	Russell Vale	6/04/2024	56.5	169.50	2
30min	Russell Vale	6/04/2024	74.0	148.00	1
60min	Russell Vale	6/04/2024	112.5	112.50	0.5
3hrs	Russell Vale	6/04/2024	131.5	43.83	5
6hrs	Russell Vale	6/04/2024	168.0	28.00	5
12hrs	Dombarton Loop	6/04/2024	190.0	15.83	10
24hrs	Dombarton Loop	6/04/2024	251.0	10.46	20
48hrs	Dombarton Loop	6/04/2024	338.5	7.05	5
72hrs	Dombarton Loop	6/04/2024	341.5	4.74	20

**Table 3-2 Number of rainfall stations per region where rainfall exceeds 100 mm in 24 hours
at least once per month (2023–24)**

Region (No. of stations in region)	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24
Tweed and Brunswick Rivers (4)	*	*	*	*			4*			*	*	
Richmond River (1)				1	1		1					
Bellinger River (7)	*	*		2		4	6			1		
Nambucca River (2)										1		
Macleay and Hastings Rivers (3)					1				*	2		
Camden Haven (2)										1		
Karuah River (5)										5		
Hunter River (4)												
Macquarie-Tuggerah Lakes and Brisbane Water (20)	*	*	*	*	*	*	*			20	13	2
Hawkesbury River (3)										3		
Sydney Coastal (2)										2		1
Wollongong Coastal (15)					10		*	*		15	2	15
South Coast (3)					1							

*Data loss of 1% or more during each month at one or more stations.

Table 3-3 Maximum recorded rainfall (mm) 2023–24

Station	Duration											Total yearly rainfall
	5 min	10 min	20 min	30 min	60 min	3 hrs	6 hrs	12 hrs	24 hrs	48 hrs	72 hrs	
Cudgera ¹	28/09/2023 11.0	28/09/2023 18.0	15/01/2024 22.0	15/01/2024 24.5	16/01/2024 34.0	16/01/2024 55.5	16/01/2024 83.5	16/01/2024 100.5	16/01/2024 180.0	17/01/2024 205.0	18/01/2024 209.5	1405.0
Main Arm	8/01/2024 10.5	25/12/2023 17.5	8/01/2024 27.5	8/01/2024 33.5	8/01/2024 44.0	8/01/2024 62.5	8/01/2024 77.5	16/01/2024 90.5	16/01/2024 157.5	17/01/2024 190.5	17/01/2024 206.0	1850.5
Huonbrook ¹	31/12/2023 9.0	31/12/2023 14.0	24/02/2024 20.5	21/12/2023 24.0	21/12/2023 31.0	31/12/2023 50.5	31/12/2023 64.5	1/01/2024 77.0	1/01/2024 122.5	17/01/2024 165.0	17/01/2024 186.0	1680.5
Myocum	4/03/2024 7.0	4/03/2024 13.0	4/04/2024 23.0	21/12/2023 29.0	21/12/2023 44.0	31/12/2023 69.0	31/12/2023 104.5	1/01/2024 113.0	1/01/2024 114.5	17/01/2024 147.0	17/01/2024 154.0	1754.0
Lake Ainsworth	16/02/2024 8.5	15/01/2024 12.5	15/01/2024 19.0	15/01/2024 25.5	15/01/2024 34.0	7/04/2024 65.5	7/04/2024 79.5	7/04/2024 83.5	5/11/2023 122.5	6/11/2023 142.5	17/01/2024 149.0	1829.0
Wooli Sportsground ¹	31/12/2023 15.5	31/12/2023 25.0	31/12/2023 44.5	31/12/2023 64.0	31/12/2023 99.5	31/12/2023 119.0	31/12/2023 136.0	31/12/2023 143.0	1/01/2024 145.5	2/01/2024 149.0	1/01/2024 150.0	1437.5
Perry Drive	31/12/2023 8.5	18/04/2024 14.0	31/12/2023 21.0	31/12/2023 25.0	31/12/2023 30.5	15/01/2024 61.0	15/01/2024 75.0	16/01/2024 103.0	16/01/2024 143.0	16/01/2024 196.5	17/01/2024 200.0	1707.0
Red Hill	15/01/2024 8.0	31/12/2023 14.5	31/12/2023 25.0	31/12/2023 33.0	31/12/2023 45.5	31/12/2023 70.0	31/12/2023 87.0	15/01/2024 113.0	16/01/2024 175.5	16/01/2024 220.0	15/01/2024 8.0	1529.0
Newports Creek	31/12/2023 7.0	31/12/2023 14.0	31/12/2023 24.5	31/12/2023 33.5	31/12/2023 59.5	31/12/2023 104.0	31/12/2023 124.0	15/01/2024 134.0	15/01/2024 179.5	16/01/2024 225.5	31/12/2023 7.0	1741.5
Middle Boambee	30/12/2023 9.5	30/12/2023 18.0	24/02/2024 31.0	24/02/2024 35.0	31/12/2023 48.0	31/12/2023 106.5	31/12/2023 129.0	31/12/2023 132.0	31/12/2023 165.5	16/01/2024 191.0	30/12/2023 9.5	1748.0
North Bonville	25/12/2023 9.0	18/04/2024 17.0	4/11/2023 27.5	4/11/2023 33.0	15/01/2024 45.5	31/12/2023 78.5	31/12/2023 90.0	31/12/2023 92.0	31/12/2023 138.0	16/01/2024 174.5	25/12/2023 9.0	1736.0
Koorowwi Sharabel	19/02/2024 10.5	19/02/2024 18.0	19/02/2024 29.5	19/02/2024 37.5	2/03/2024 51.5	2/03/2024 84.5	15/01/2024 106.0	15/01/2024 152.0	16/01/2024 203.5	16/01/2024 256.0	19/02/2024 10.5	1296.0
Stuarts Island Downstream	16/04/2024 11.0	16/04/2024 20.0	16/04/2024 25.0	19/02/2024 38.0	19/02/2024 47.5	19/02/2024 56.5	4/04/2024 72.0	5/04/2024 80.0	5/04/2024 104.0	5/04/2024 132.5	16/04/2024 11.0	1077.5
Utungun	2/03/2024 12.5	2/03/2024 22.0	4/11/2023 35.0	4/11/2023 39.0	4/11/2023 41.0	4/11/2023 52.0	4/11/2023 53.0	5/11/2023 61.5	5/11/2023 86.0	6/11/2023 97.0	2/03/2024 12.5	932.5
Aldavilla Downstream	2/03/2024 9.0	27/01/2024 13.0	2/03/2024 18.0	2/03/2024 22.0	2/03/2024 22.0	4/11/2023 33.0	25/02/2024 44.0	5/04/2024 61.0	5/04/2024 91.0	5/04/2024 111.0	2/03/2024 9.0	848.0
Green Valley	18/01/2024 9.0	18/01/2024 16.0	18/01/2024 24.5	18/01/2024 33.0	18/01/2024 42.5	5/11/2023 57.0	5/11/2023 67.5	5/04/2024 92.5	6/04/2024 114.5	6/04/2024 152.0	18/01/2024 9.0	1192.0

Station	Duration											Total yearly rainfall
	5 min	10 min	20 min	30 min	60 min	3 hrs	6 hrs	12 hrs	24 hrs	48 hrs	72 hrs	
Telegraph Point ¹	18/04/2024 8.0	18/04/2024 13.0	25/02/2024 16.5	29/03/2024 20.5	25/02/2024 28.5	5/11/2023 51.0	5/11/2023 64.5	5/04/2024 99.5	5/04/2024 124.5	6/04/2024 156.5	18/04/2024 8.0	1053.0
Logans Crossing	20/03/2024 9.5	20/03/2024 14.0	5/04/2024 21.5	5/04/2024 24.0	5/04/2024 35.5	5/04/2024 51.5	25/02/2024 81.0	5/04/2024 103.0	5/04/2024 117.5	6/04/2024 137.0	20/03/2024 9.5	1160.0
Mount George	27/11/2023 9.0	27/11/2023 14.0	21/11/2023 20.5	21/11/2023 27.0	21/11/2023 34.0	21/11/2023 35.0	20/12/2023 37.0	5/04/2024 49.0	11/02/2024 68.0	5/04/2024 75.0	27/11/2023 9.0	936.0
Nabiac	14/02/2024 7.5	14/02/2024 14.5	14/02/2024 22.0	14/02/2024 25.5	14/02/2024 25.5	10/02/2024 38.5	5/04/2024 61.0	5/04/2024 98.5	6/04/2024 114.0	6/04/2024 143.5	14/02/2024 7.5	994.0
Tuncurry Downstream	19/02/2024 5.0	19/02/2024 9.0	19/02/2024 16.5	19/02/2024 24.0	19/02/2024 33.0	5/04/2024 51.0	5/04/2024 66.0	5/04/2024 104.5	5/04/2024 118.0	6/04/2024 173.0	19/02/2024 5.0	1108.5
Pacific Palms Wharf	4/11/2023 10.0	4/11/2023 19.5	4/11/2023 26.0	4/04/2024 32.5	4/04/2024 42.5	4/04/2024 72.5	4/04/2024 73.0	4/04/2024 94.5	4/04/2024 142.5	5/04/2024 248.0	4/11/2023 10.0	918.5
Tarbuck Bay	4/04/2024 8.5	4/04/2024 16.0	4/04/2024 24.0	4/04/2024 26.0	4/04/2024 30.0	4/04/2024 54.0	1/05/2024 60.5	5/04/2024 86.0	6/04/2024 115.0	5/04/2024 210.0	4/04/2024 8.5	1414.0
Bulahdelah	9/01/2024 7.5	9/01/2024 11.5	9/01/2024 17.5	19/02/2024 20.5	19/02/2024 26.5	5/04/2024 44.5	5/04/2024 84.0	5/04/2024 125.0	6/04/2024 151.5	6/04/2024 188.0	9/01/2024 7.5	1207.5
Gostwyck	2/03/2024 7.5	2/03/2024 12.0	2/03/2024 19.0	2/03/2024 21.5	2/03/2024 23.5	2/03/2024 31.5	2/03/2024 31.5	5/04/2024 40.0	6/04/2024 51.5	6/04/2024 71.5	2/03/2024 7.5	889.0
Seaham	19/12/2023 10.5	19/12/2023 17.0	19/02/2024 22.5	2/03/2024 30.0	19/12/2023 37.5	19/12/2023 38.5	5/04/2024 48.5	5/04/2024 70.0	6/04/2024 81.0	6/04/2024 107.5	19/12/2023 10.5	1001.0
Belmore Bridge	2/03/2024 8.0	2/03/2024 13.0	2/03/2024 18.5	2/03/2024 25.0	5/04/2024 33.0	5/04/2024 42.5	5/04/2024 54.5	5/04/2024 73.0	6/04/2024 83.5	6/04/2024 102.5	2/03/2024 8.0	824.5
Hexham Bridge	20/04/2024 7.0	15/02/2024 10.5	5/11/2023 15.0	5/11/2023 22.0	5/11/2023 39.5	5/11/2023 52.5	5/11/2023 105.0	5/04/2024 67.5	6/04/2024 86.5	6/04/2024 130.5	20/04/2024 7.0	1096.5
Barnsley	29/11/2024 9.0	14/02/2024 17.0	14/02/2024 25.5	14/02/2024 27.5	5/11/2023 32.0	5/04/2024 42.5	5/11/2023 75.0	5/04/2024 82.5	6/04/2024 105.0	6/04/2024 135.0	29/11/2024 9.0	1082.0
Martinsville	2/12/2024 8.0	2/12/2024 15.0	2/12/2024 23.0	2/12/2024 28.0	2/12/2024 29.5	5/04/2024 59.5	5/04/2024 73.0	5/04/2024 100.0	6/04/2024 134.0	6/04/2024 163.5	2/12/2024 8.0	1082.5
Mandalong	29/11/2024 7.0	29/11/2024 10.0	5/04/2024 15.5	5/04/2024 20.5	5/04/2024 26.0	5/04/2024 45.5	6/04/2024 60.5	6/04/2024 78.5	6/04/2024 124.0	6/04/2024 154.5	29/11/2024 7.0	1140.5
Wyee	19/02/2024 9.5	19/02/2024 15.0	19/02/2024 22.0	19/02/2024 26.0	19/02/2024 28.5	6/05/2024 51.5	6/04/2024 69.0	6/04/2024 93.5	6/04/2024 134.5	6/04/2024 187.0	19/02/2024 9.5	1431.0
Whitemans Ridge	20/02/2024 8.5	20/02/2024 12.5	5/11/2023 20.5	5/11/2023 27.0	5/11/2023 44.5	5/11/2023 75.5	5/11/2023 87.5	6/05/2024 123.0	6/05/2024 162.5	6/04/2024 204.0	20/02/2024 8.5	1210.0

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Station	Duration											Total yearly rainfall
	5 min	10 min	20 min	30 min	60 min	3 hrs	6 hrs	12 hrs	24 hrs	48 hrs	72 hrs	
Yarramalong ¹	20/02/2024 8.0	20/02/2024 16.0	20/02/2024 19.5	20/02/2024 20.5	5/04/2024 32.0	5/04/2024 55.0	6/04/2024 77.0	6/04/2024 101.0	6/04/2024 129.5	6/04/2024 200.5	20/02/2024 8.0	655.0
Kulnura at Pioneer Park	20/04/2024 5.0	20/04/2024 10.0	20/04/2024 12.5	9/11/2024 14.0	5/04/2024 22.0	5/04/2024 47.0	6/04/2024 62.0	6/04/2024 84.5	6/04/2024 111.0	6/04/2024 171.0	6/04/2024 171.5	844.5
Toukley	15/02/2024 7.5	15/02/2024 12.5	15/02/2024 24.5	15/02/2024 32.5	16/02/2024 42.0	16/02/2024 65.5	6/04/2024 82.5	6/04/2024 102.0	6/04/2024 128.0	6/04/2024 209.0	6/04/2024 210.0	1203.0
Hamlyn Terrace	30/04/2024 9.5	30/04/2024 15.0	5/05/2024 21.0	5/05/2024 29.5	5/05/2024 46.5	5/05/2024 87.0	6/05/2024 96.0	6/05/2024 162.0	6/05/2024 174.0	6/04/2024 216.5	6/04/2024 232.0	1387.0
Mardi Dam ¹	20/02/2024 9.0	20/02/2024 15.5	20/02/2024 25.0	20/02/2024 27.5	20/02/2024 28.5	5/05/2024 57.0	6/05/2024 93.0	6/05/2024 124.5	6/05/2024 159.0	6/04/2024 206.5	6/04/2024 236.0	1157.0
Sterland	24/12/2023 8.5	24/12/2023 16.0	24/12/2023 18.5	24/12/2023 18.5	4/04/2024 22.0	4/04/2024 47.5	6/05/2024 68.0	6/05/2024 92.0	6/04/2024 141.5	6/04/2024 231.5	6/04/2024 234.5	1184.5
Kangy Angy	30/04/2024 8.5	30/04/2024 11.0	5/05/2024 14.5	5/05/2024 21.5	5/05/2024 29.0	5/05/2024 52.0	6/05/2024 72.0	6/05/2024 100.5	6/05/2024 136.0	6/04/2024 205.0	6/04/2024 225.5	1277.0
Berkeley Vale	20/04/2024 8.5	20/04/2024 15.5	15/02/2024 26.5	15/02/2024 30.0	16/02/2024 49.0	16/02/2024 64.0	6/04/2024 86.5	6/05/2024 109.5	6/04/2024 154.0	6/04/2024 242.5	6/04/2024 269.5	1416.0
Bateau Bay	16/04/2024 8.5	5/04/2024 15.5	5/04/2024 22.5	5/04/2024 27.0	5/04/2024 34.5	6/04/2024 56.0	6/04/2024 80.5	6/04/2024 95.5	6/04/2024 140.5	6/04/2024 223.0	6/04/2024 250.5	1479.5
Lisarow	29/11/2023 9.0	5/05/2024 17.5	5/05/2024 26.0	5/05/2024 31.0	16/02/2024 40.5	6/04/2024 65.0	6/04/2024 96.5	6/04/2024 121.5	6/04/2024 179.5	6/04/2024 240.5	6/04/2024 248.5	1396.0
Strickland	24/12/2023 8.5	24/12/2023 16.0	24/12/2023 18.5	24/12/2023 18.5	4/04/2024 22.0	4/04/2024 47.5	6/05/2024 68.0	6/05/2024 92.0	6/04/2024 141.5	6/04/2024 231.5	6/04/2024 234.5	1257.0
Narara	20/02/2024 6.0	20/02/2024 11.5	20/02/2024 19.0	5/04/2024 22.5	6/04/2024 35.5	6/04/2024 64.5	6/04/2024 91.0	6/04/2024 117.0	6/04/2024 173.0	6/04/2024 222.5	6/04/2024 225.5	1235.5
Mount Elliot	5/05/2024 9.5	5/05/2024 18.0	5/05/2024 28.5	5/05/2024 31.5	16/02/2024 49.0	16/02/2024 63.5	6/05/2024 88.0	6/05/2024 110.0	6/04/2024 165.0	6/04/2024 238.5	6/04/2024 245.5	1496.5
Wyoming	5/11/2023 9.0	5/11/2023 12.5	5/11/2023 17.5	5/11/2023 21.5	6/04/2024 28.5	5/05/2024 61.0	6/05/2024 94.0	6/05/2024 113.0	6/04/2024 164.5	6/04/2024 223.0	6/04/2024 226.0	1373.5

Station	Duration											Total yearly rainfall
	5 min	10 min	20 min	30 min	60 min	3 hrs	6 hrs	12 hrs	24 hrs	48 hrs	72 hrs	
Kincumber	24/12/2024 9.5	24/12/2024 15.0	24/12/2024 27.5	24/12/2024 30.0	15/01/2024 47.0	6/04/2024 64.5	6/04/2024 105.0	6/04/2024 123.5	6/04/2024 174.5	6/04/2024 220.5	6/04/2024 222.0	1598.5
Webbs Creek	26/12/2023 10.4	26/12/2023 15.8	26/12/2023 22.0	26/12/2023 23.8	26/12/2023 25.2	6/04/2024 43.0	6/04/2024 68.0	6/04/2024 86.0	6/04/2024 115.0	6/04/2024 151.0	6/04/2024 151.0	763.8
Colo Junction	9/11/2023 13.4	9/11/2023 20.0	9/11/2023 28.2	9/11/2023 34.6	9/11/2023 36.6	6/04/2024 39.0	6/04/2024 67.0	6/04/2024 94.0	6/04/2024 128.0	6/04/2024 164.5	6/04/2024 164.0	805.2
Sackville Downstream	17/04/2024 11.4	17/04/2024 21.4	17/04/2024 34.0	17/04/2024 35.6	17/04/2024 35.8	6/04/2024 42.0	6/04/2024 75.5	6/04/2024 100.5	6/04/2024 138.5	6/04/2024 171.0	6/04/2024 170.5	908.6
Curl Curl	21/05/2024 17.0	21/05/2024 20.0	6/04/2024 23.5	6/04/2024 28.0	6/04/2024 29.0	6/04/2024 54.0	6/04/2024 80.0	6/04/2024 89.0	6/04/2024 167.5	6/04/2024 183.5	6/04/2024 183.5	1305.5
Kelso Creek	13/02/2024 9.0	13/02/2024 16.5	13/02/2024 28.5	13/02/2024 31.0	13/02/2024 32.0	6/04/2024 36.0	6/04/2024 61.5	6/04/2024 78.5	6/04/2024 114.0	6/04/2024 134.5	6/04/2024 134.5	894.5
Rixons Pass	25/12/2024 15.5	6/04/2024 27.0	6/04/2024 46.0	6/04/2024 59.0	6/04/2024 88.0	6/04/2024 106.0	6/04/2024 144.0	6/04/2024 160.5	6/04/2024 214.0	6/04/2024 253.0	6/04/2024 252.5	1900.0
Russell Vale	6/04/2024 15.0	6/04/2024 29.5	6/04/2024 56.5	6/04/2024 74.0	6/04/2024 112.5	6/04/2024 131.5	6/04/2024 168.0	6/04/2024 183.5	6/04/2024 233.0	6/04/2024 268.0	6/04/2024 268.0	1791.5
Mount Pleasant	6/04/2024 13.5	6/04/2024 26.5	6/04/2024 51.5	6/04/2024 65.0	6/04/2024 96.0	6/04/2024 119.0	6/04/2024 166.5	6/04/2024 185.5	6/04/2024 241.5	6/04/2024 299.5	6/04/2024 300.0	2013.5
Mount Kembla	6/04/2024 11.5	6/04/2024 22.5	6/04/2024 43.0	6/04/2024 57.0	6/04/2024 82.0	6/04/2024 98.5	6/04/2024 135.0	6/04/2024 155.5	6/04/2024 206.0	6/04/2024 268.5	6/04/2024 275.0	1678.0
Dombarton Loop	6/04/2024 10.5	6/04/2024 21.0	6/04/2024 32.5	6/04/2024 41.0	6/04/2024 61.5	6/04/2024 90.5	6/04/2024 151.0	6/04/2024 190.0	6/04/2024 251.0	6/04/2024 338.5	6/04/2024 341.5	1841.0
Wongawilli	6/04/2024 13.0	6/04/2024 22.5	6/04/2024 35.0	6/04/2024 42.0	6/04/2024 62.0	6/04/2024 84.0	6/04/2024 121.5	6/04/2024 147.5	6/04/2024 189.0	6/04/2024 255.5	6/04/2024 258.0	1412.0
Port Kembla	6/04/2024 12.0	6/04/2024 22.5	6/04/2024 34.0	6/04/2024 36.5	6/04/2024 59.0	6/06/2024 94.0	7/06/2024 140.5	7/06/2024 183.5	7/06/2024 205.5	7/06/2024 230.0	7/06/2024 230.0	1567.0
Cleveland Road	6/04/2024 11.5	6/04/2024 22.0	6/04/2024 39.5	6/04/2024 55.5	6/04/2024 84.0	6/04/2024 104.0	6/04/2024 135.0	6/04/2024 151.0	6/04/2024 195.5	6/04/2024 248.0	6/04/2024 250.0	144.5
Huntley Colliery	28/11/2023 11.5	28/11/2023 20.5	6/04/2024 31.5	6/04/2024 39.5	6/04/2024 58.0	6/04/2024 79.5	6/04/2024 122.0	6/04/2024 147.0	6/04/2024 204.0	6/04/2024 274.0	6/04/2024 274.5	1515.0

Station	Duration											Total yearly rainfall
	5 min	10 min	20 min	30 min	60 min	3 hrs	6 hrs	12 hrs	24 hrs	48 hrs	72 hrs	
Upper Calderwood ¹	25/12/2023 16.0	25/12/2023 24.5	25/12/2023 33.5	6/04/2024 35.0	6/04/2024 53.0	6/04/2024 72.0	6/04/2024 108.5	6/04/2024 130.5	6/04/2024 173.5	6/04/2024 242.0	6/04/2024 243.5	1130.5
Little Lake Entrance	25/12/2023 9.5	6/04/2024 16.5	6/04/2024 26.5	6/04/2024 30.0	6/04/2024 39.5	6/04/2024 64.5	6/06/2024 111.0	7/06/2024 159.0	7/06/2024 185.5	7/06/2024 215.5	8/06/2024 218.0	1576.0
Nurrewin	27/12/2023 10.0	28/11/2023 16.5	28/11/2023 27.0	28/11/2023 33.5	6/04/2024 43.0	6/04/2024 76.5	6/04/2024 139.5	6/04/2024 175.5	6/04/2024 239.5	6/04/2024 329.5	6/04/2024 332.5	1684.5
Clover Hill	27/12/2023 14.0	28/11/2023 17.0	28/11/2023 28.0	28/11/2023 34.0	28/11/2023 43.0	6/04/2024 64.0	6/04/2024 114.0	6/04/2024 145.5	6/04/2024 209.5	6/04/2024 302.0	6/04/2024 304.0	1714.0
North Macquarie	25/12/2024 9.5	6/04/2024 19.0	6/04/2024 33.0	6/04/2024 44.5	6/04/2024 73.0	6/04/2024 93.5	6/04/2024 118.5	6/04/2024 133.5	6/04/2024 172.0	6/04/2024 225.0	6/04/2024 225.5	1393.0
Yellow Rock Road	25/12/2024 10.0	6/04/2024 19.0	6/04/2024 36.0	6/04/2024 54.0	6/04/2024 90.0	6/04/2024 119.5	6/04/2024 149.0	6/04/2024 170.0	6/04/2024 224.5	6/04/2024 282.5	6/04/2024 283.0	1716.0
Lake Conjola Downstream	19/12/2023 10.5	19/12/2023 17.0	19/12/2023 28.0	19/12/2023 30.5	25/12/2023 40.0	25/12/2023 42.0	29/11/2023 60.0	29/11/2023 107.5	29/11/2023 145.5	29/11/2023 163.5	1/12/2023 165.0	1393.5
Barlows Bay	25/12/2023 10.5	25/12/2023 17.5	25/12/2023 25.0	25/12/2023 33.5	26/12/2023 52.0	26/12/2023 56.5	26/12/2023 67.5	27/12/2023 70.5	6/04/2024 86.0	27/12/2023 137.5	27/12/2023 142.0	935.0
Regatta Point	2/12/2023 8.0	25/12/2023 14.0	25/12/2023 25.0	25/12/2023 28.0	25/12/2023 39.0	25/12/2023 55.0	25/12/2023 64.5	26/12/2023 81.5	26/12/2023 90.5	27/12/2023 133.0	27/12/2023 149.0	846.5

¹ Some measure of data loss occurred at these stations. See individual plots for further details.

Note – the date listed refers to the time that the recorded total rainfall ends.

3.1 Data capture performance

Rainfall data presented by MHL is collected and analysed through a quality assurance process in accordance with MHL's internal standards and work instructions. Field verification of each rainfall gauge is performed by delivering a known volume of water in a controlled flow directly into the catch of the rain gauge using a field calibration device. The total number and rate of tips of the tipping bucket and the data recorded on the logger are then compared with the known volume. The percentage difference between the known volume and the recorded tips is used to assign a quality code to the data. Other observations such as any blockages in the rain gauge catch and comparison with nearby rainfall stations are also taken into consideration. **Table 3-1** presents definitions of the various quality codes.

During 2023–24, the overall data capture across the network, for data with a quality code of 105 or better, was 98.4%. **Table 4-1** provides data capture percentages for each rainfall region. Missing or 208 quality coded data can result in gaps in the data record. This can be caused by a range of reasons, such as equipment damage or failure, power failure, or site specific environmental issues.

Automatic recorded rainfall data is recorded to a resolution equal to the size of the tipping bucket (0.2 mm, 0.5 mm or 1.0 mm). Each record or tip of the bucket is triggered when the tipping bucket is filled, which may occur over a period of time.

Table 3-4 MHL data quality code descriptions

Quality code		Rainfall*
5	Records processed to	±3% of calibration
55	Records processed to	±5% of calibration
100	Data from previous MHL database, processed to	±3% of calibration
105	Records processed to	±10% of calibration
208	Records processed to greater than	<-10% or >10% of calibration
150	Uncoded – data not yet quality controlled	Raw data from the instrument with only preliminary quality checks performed
1, 204, 205, 206, 207, 255	Data loss/data missing	

* A quality code is assigned based on infield status verification checks.

4 Rainfall monitoring summary

This section documents locality maps and quality assured rainfall monitoring summaries for each station. **Table 4-1** provides an index to the figures presented. The rainfall plots shown in **Figure 4-1** to **Figure 4-87** are presented as daily rainfall totals from midnight to midnight.

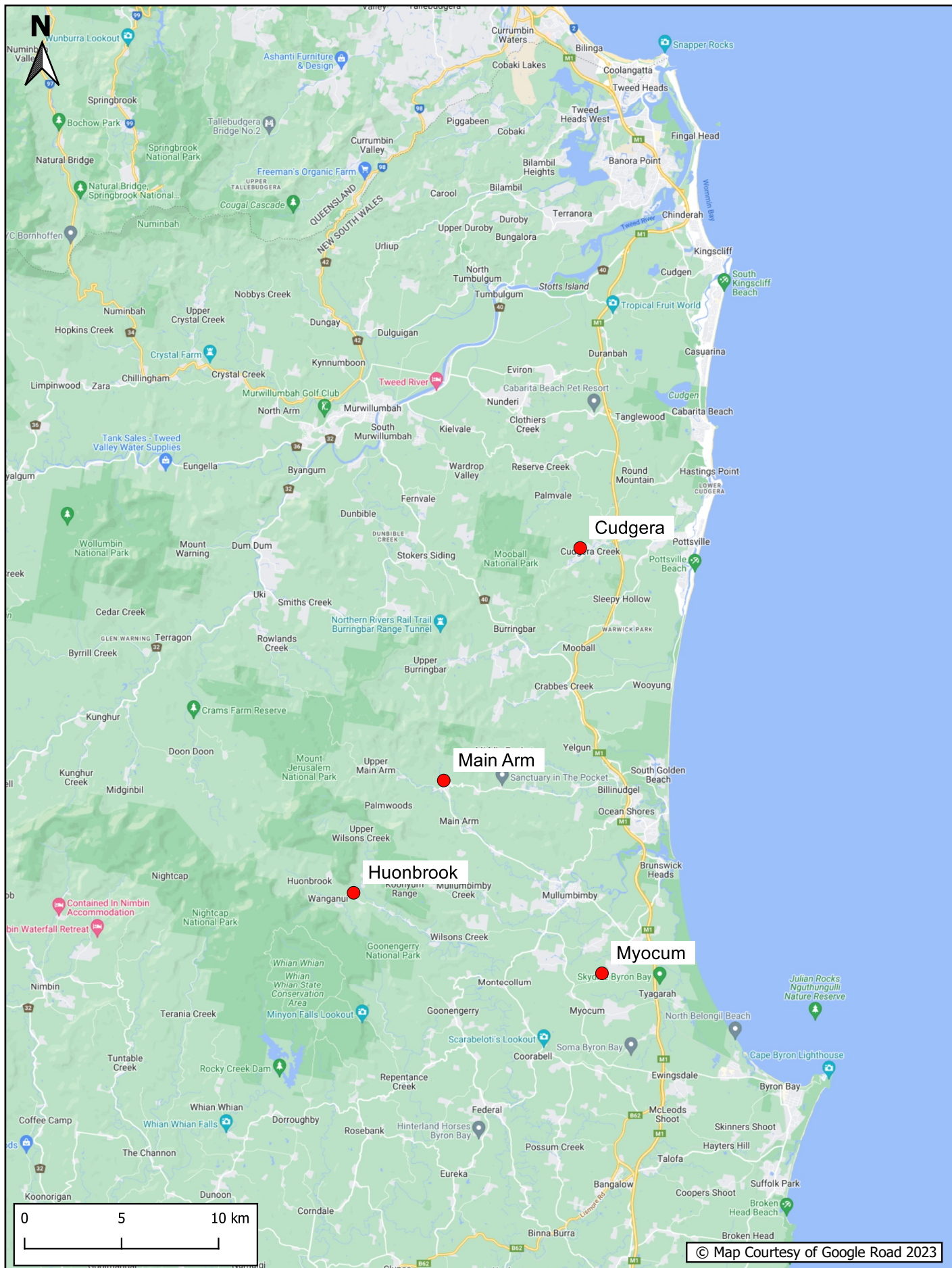
Table 4-1 Index of figures

Region	Station short name	Station no.	MGA	Easting	Northing	Capture %	Figure
Station Locality Map	Tweed River and Brunswick River Regions					89.5%	4-1
Tweed	Cudgera	558046	56	549668	6859164		4-2
Brunswick	Main Arm	558053	56	542469	6847276		4-3
Brunswick	Huonbrook	558049	56	537723	6841573		4-4
Brunswick	Myocum	558036	56	550528	6837390		4-5
Station Locality Map	Richmond River Region					100.0%	4-6
Richmond	Lake Ainsworth	203455	56	557863	6816160		4-7
Station Locality Map	Bellinger River Region (North)					94.0%	4-8
Bellinger	Wooli Sportsground	559071	56	525712	6696894		4-9
Station Locality Map	Bellinger River Region (South)					100.0%*	4-10
Bellinger	Perry Drive	559019	56	510142	6650416		4-11
Bellinger	Shephards Lane	559017	56	508196	6650884		*
Bellinger	Red Hill	559016	56	506635	6649672		4-12
Bellinger	Newports Creek	559051	56	505893	6646680		4-13
Bellinger	Middle Boambee	559048	56	504720	6645291		4-14
Bellinger	North Bonville	559050	56	500593	6641143		4-15
Bellinger	Kooroowi Sharabel	559008	56	482562	6629162		4-16
Station Locality Map	Nambucca River Region					100.0%	4-17
Nambucca	Stuarts Island Downstream	205466	56	499519	6608564		4-18
Nambucca	Utungun	205414	56	485800	6600344		4-19
Station Locality Map	Macleay River and Hastings River Regions					98.9%	4-20
Macleay	Aldavilla Downstream	206459	56	479318	6561231		4-21
Hastings	Green Valley	207406	56	486416	6540068		4-22
Hastings	Telegraph Point	207415	56	481082	6534512		4-23
Station Locality Map	Camden Haven Region					100.0%	4-24
Camden Haven	Logans Crossing	207428	56	470913	6502295		4-25
Manning	Mount George	208440	56	419229	6472262		4-26
Station Locality Map	Karuah River Region					100.0%	4-27
Karuah	Nabiac	209404	56	436831	6446432		4-28
Karuah	Tuncurry Downstream	209401D	56	450368	6441819		4-29
Karuah	Pacific Palms Wharf	209406	56	455401	6422551		4-30
Karuah	Tarback Bay	209465	56	451548	6417906		4-31
Karuah	Bulahdelah	209460	56	425442	6413407		4-32

Region	Station short name	Station no.	MGA	Easting	Northing	Capture %	Figure
Station Locality Map	Hunter River Region					100.0%	4-33
Hunter	Gostwyck	210402	56	369088	6396074		4-34
Hunter	Seaham	210462	56	381105	6385316		4-35
Hunter	Belmore Bridge	210458	56	364492	6377780		4-36
Hunter	Hexham Bridge	210448	56	376568	6368156		4-37
Station Locality Map	Macquarie-Tuggerah Lakes (North) Region					100.0%	4-38
Macquarie-Tuggerah Lakes	Barnsley	561067	56	367906	6355834		4-39
Macquarie-Tuggerah Lakes	Martinsville	561083	56	351239	6341583		4-40
Macquarie-Tuggerah Lakes	Mandalong	561081	56	355224	6335165		4-41
Macquarie-Tuggerah Lakes	Wyee	561097	56	358608	6328268		4-42
Station Locality Map	Macquarie-Tuggerah Lakes (South) and Brisbane Water Regions					96.4%	4-43
Macquarie-Tuggerah Lakes	Whitemans Ridge	561026	56	343653	6324899		4-44
Macquarie-Tuggerah Lakes	Yarramalong	561137	56	338869	6322377		4-45
Macquarie-Tuggerah Lakes	Kulnura at Pioneer Park	561078B	56	334371	6322157		4-46
Macquarie-Tuggerah Lakes	Toukley	211401	56	362599	6318531		4-47
Macquarie-Tuggerah Lakes	Hamlyn Terrace	561133	56	357399	6319854		4-48
Macquarie-Tuggerah Lakes	Mardi Dam	561082	56	351038	6314555		4-49
Macquarie-Tuggerah Lakes	Sterland	567138	56	342433	6315335		4-50
Macquarie-Tuggerah Lakes	Kangy Angy	561132	56	350168	6310609		4-51
Macquarie-Tuggerah Lakes	Berkeley Vale	561134	56	353191	6309376		4-52
Macquarie-Tuggerah Lakes	Bateau Bay	561069	56	358098	6305653		4-53
Macquarie-Tuggerah Lakes	Lisarow	561079	56	348900	6305317		4-54
Macquarie-Tuggerah Lakes	Strickland	561136	56	345377	6305541		4-55
Brisbane Water	Narara	561085	56	344310	6304220		4-56
Brisbane Water	Mount Elliot	561084	56	350646	6302980		4-57
Brisbane Water	Wyoming	561098	56	346415	6302026		4-58
Brisbane Water	Kincumber	561077	56	350387	6294461		4-59
Station Locality Map	Hawkesbury River Region					100.0%	4-60
Hawkesbury	Webbs Creek	212408	56	312331	6303939		4-61
Hawkesbury	Colo Junction	212407	56	303223	6298183		4-62
Hawkesbury	Sackville Downstream	212438	56	302769	6291566		4-63
Station Locality Map	Sydney Coastal Region					100.0%	4-64
Sydney Coastal	Curl Curl	213426	56	342094	6262459		4-65
Sydney Coastal	Kelso Creek	213430	56	313782	6241020		4-66
Station Locality Map	Wollongong Coastal Region					99.7%	4-67
Wollongong Coastal	Rixons Pass	568317	56	305281	6196889		4-68
Wollongong Coastal	Russell Vale	568318	56	306377	6196135		4-69
Wollongong Coastal	Mount Pleasant	568229	56	303026	6191630		4-70
Wollongong Coastal	Mount Kembla	568314	56	299550	6186441		4-71

Region	Station short name	Station no.	MGA	Easting	Northing	Capture %	Figure
Wollongong Coastal	Dombarton Loop	568307	56	294719	6185605		4-72
Wollongong Coastal	Wongawilli	568320	56	293261	6182388		4-73
Wollongong Coastal	Port Kembla	568316	56	306636	6182719		4-74
Wollongong Coastal	Cleveland Road	568308	56	295800	6179726		4-75
Wollongong Coastal	Huntley Colliery	568311	56	290648	6178905		4-76
Wollongong Coastal	Upper Calderwood	568319	56	288750	6175160		4-77
Wollongong Coastal	Little Lake Entrance	214467	56	304250	6173571		4-78
Wollongong Coastal	Nurrewin	568228	56	284567	6173437		4-79
Wollongong Coastal	Clover Hill	568310	56	284233	6172392		4-80
Wollongong Coastal	North Macquarie	568315	56	291440	6171492		4-81
Wollongong Coastal	Yellow Rock Road	568321	56	292886	6167649		4-82
Station Locality Map	South Coast (North) Region					100.0%	4-83
South Coast	Lake Conjola Downstream	216420	56	272446	6094316		4-84
Station Locality Map	South Coast (Mid) Region					100.0%	4-85
South Coast	Barlows Bay	218415	56	239464	5988955		4-86
South Coast	Regatta Point	219405	56	236881	5971060		4-87

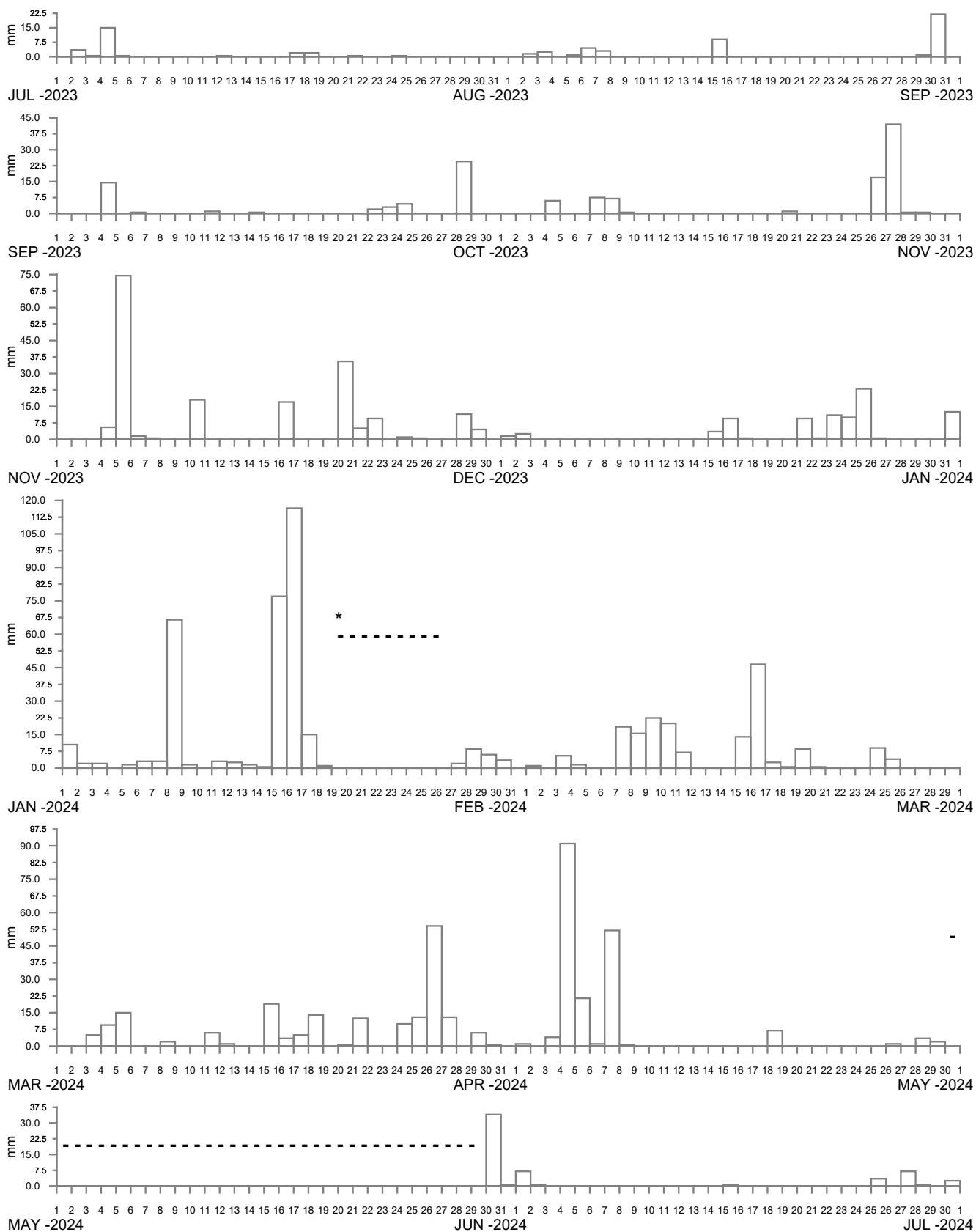
*Shephards Lane temporarily decommissioned due to Pacific Highway upgrade. Re-established on 29 October 2024.



RAINFALL STATION LOCATIONS TWEED RIVER AND BRUNSWICK RIVER REGIONS

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-1



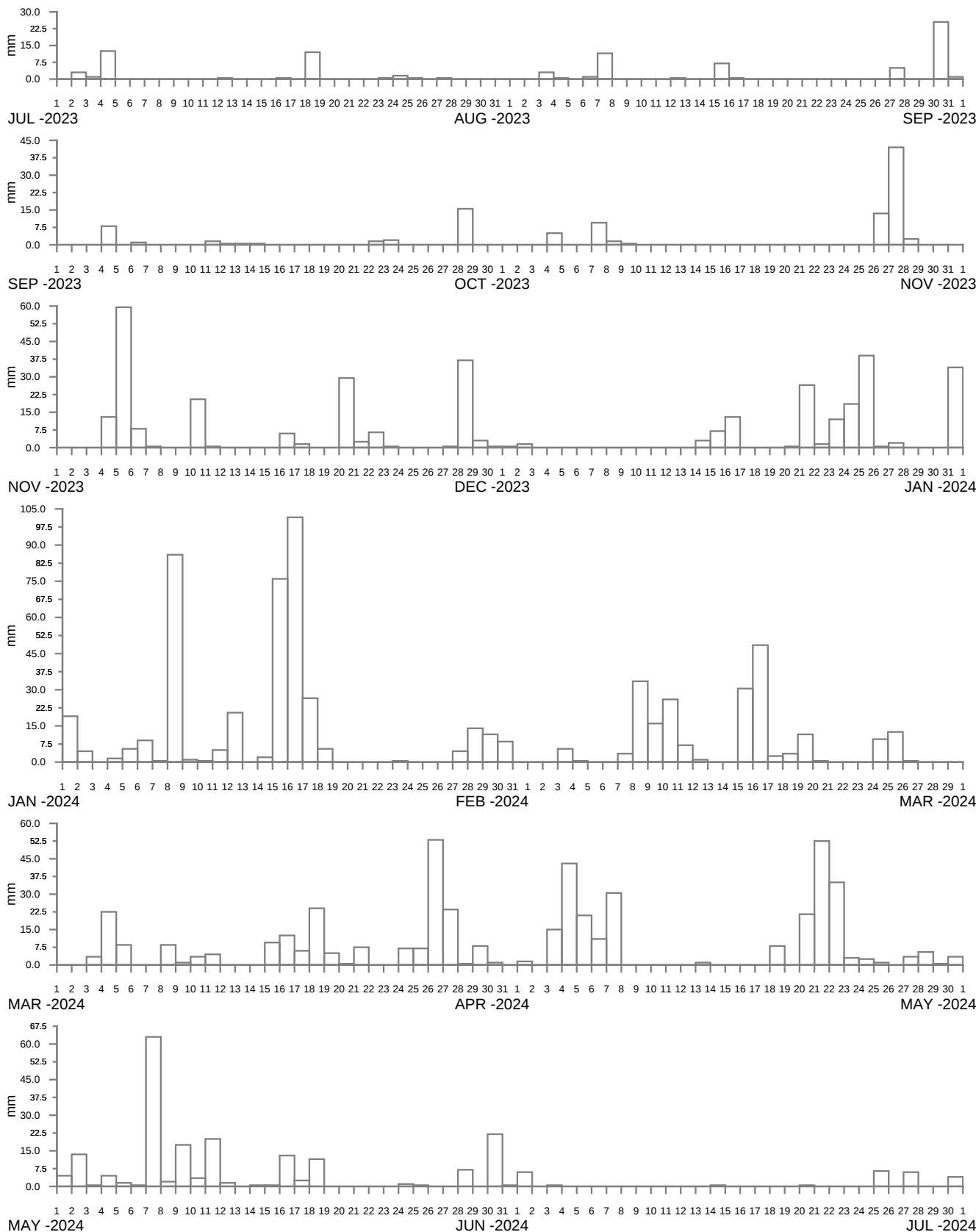
*Data loss due to tipping bucket blockage



CUDGERA AT CABBAGE GUM ROAD 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-2



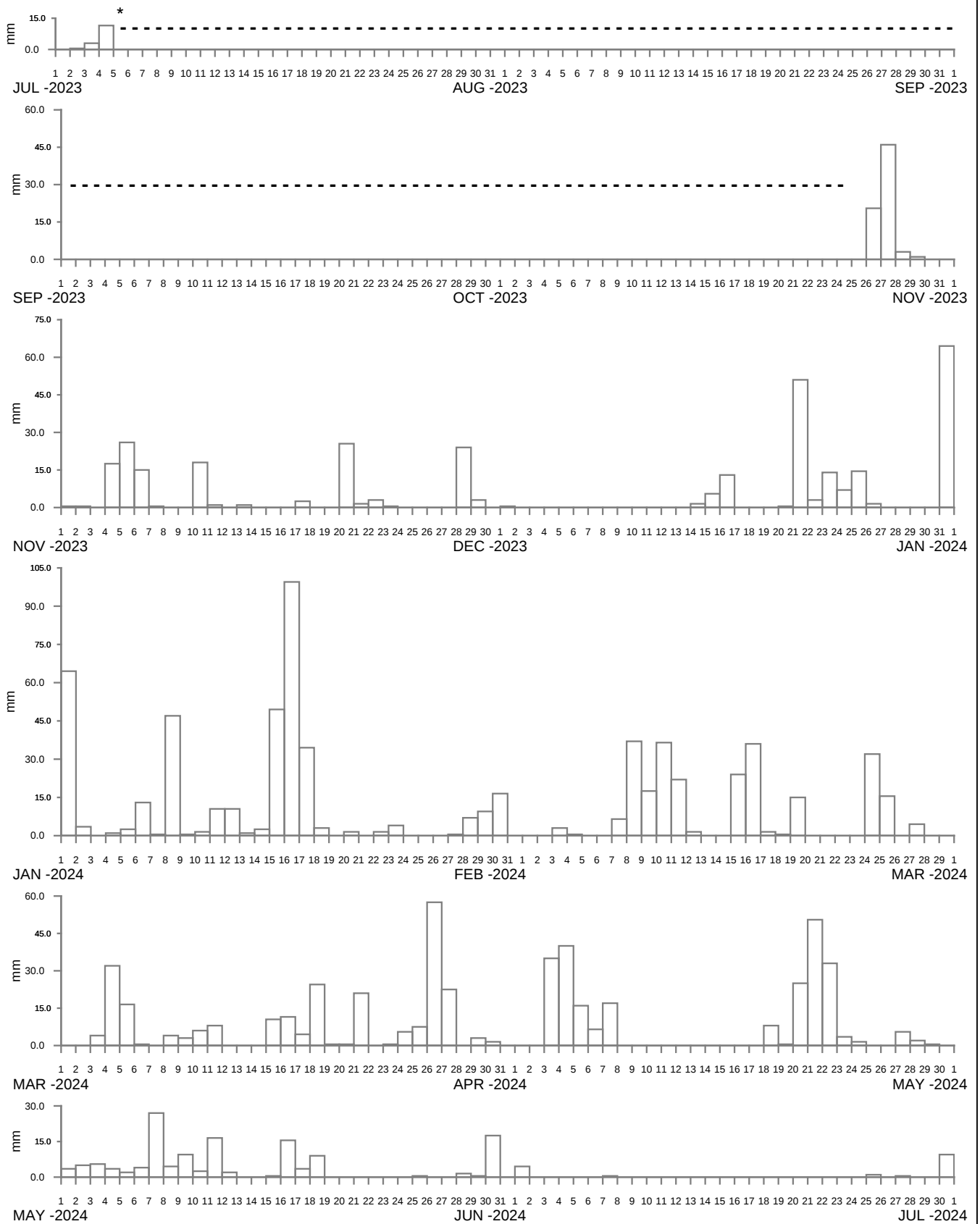
----- DATA LOSS



MAIN ARM AT MAIN ARM ROAD 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-3



----- DATA LOSS

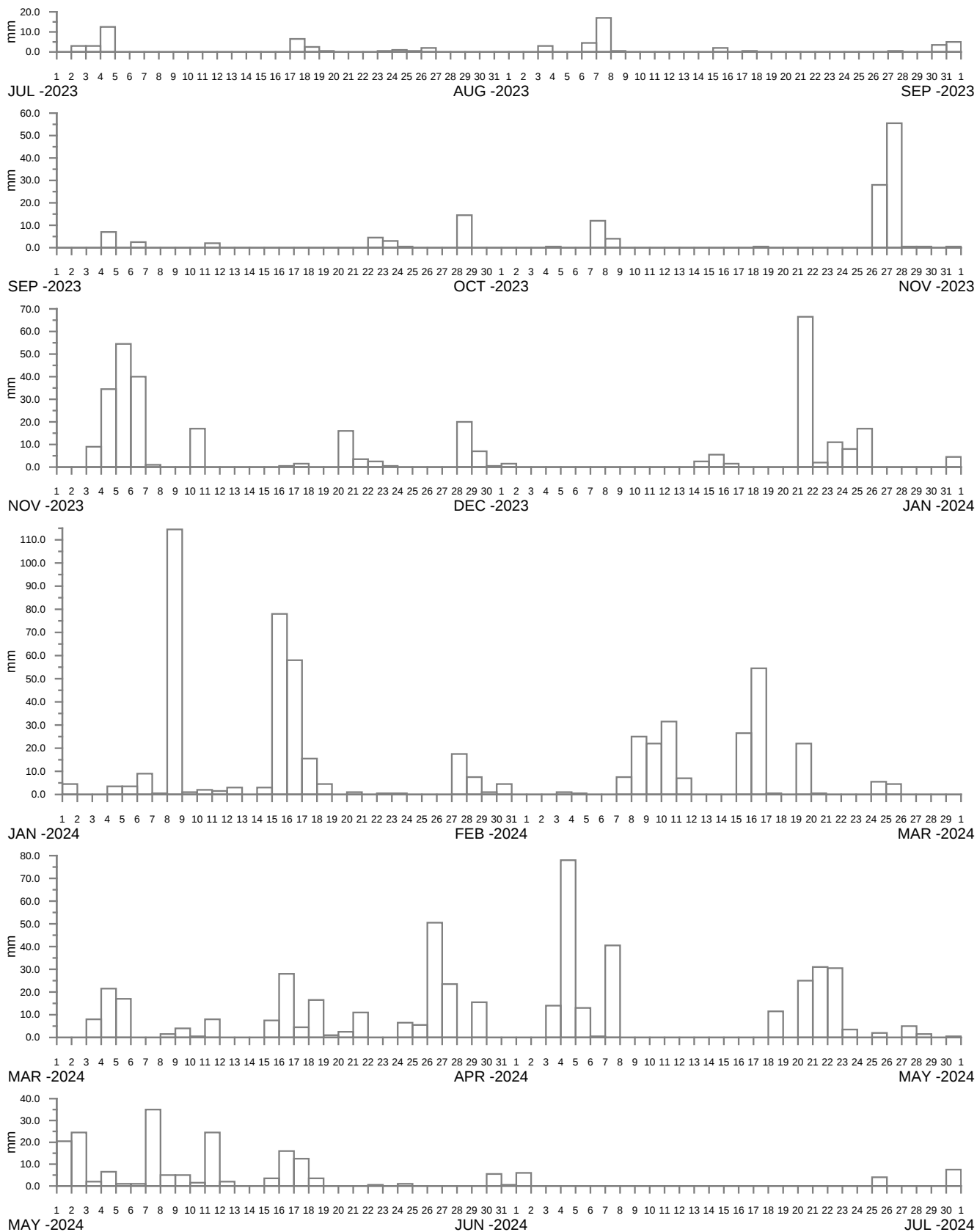
*Data loss due to tipping mechanism failure



HUONBROOK AT WILSONS CREEK ROAD 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-4



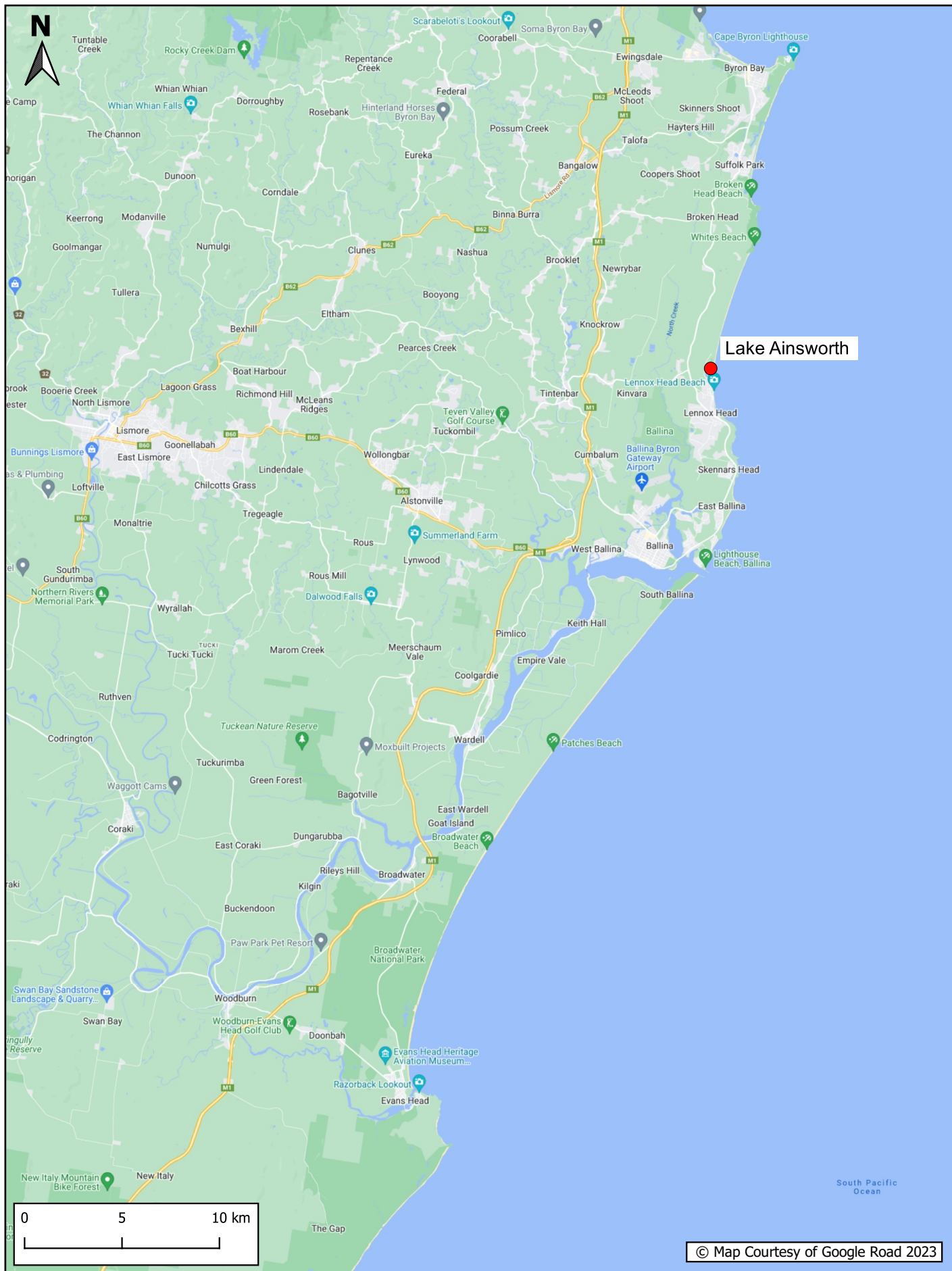
----- DATA LOSS



MYOCUM AT KINGSVALE ROAD 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-5



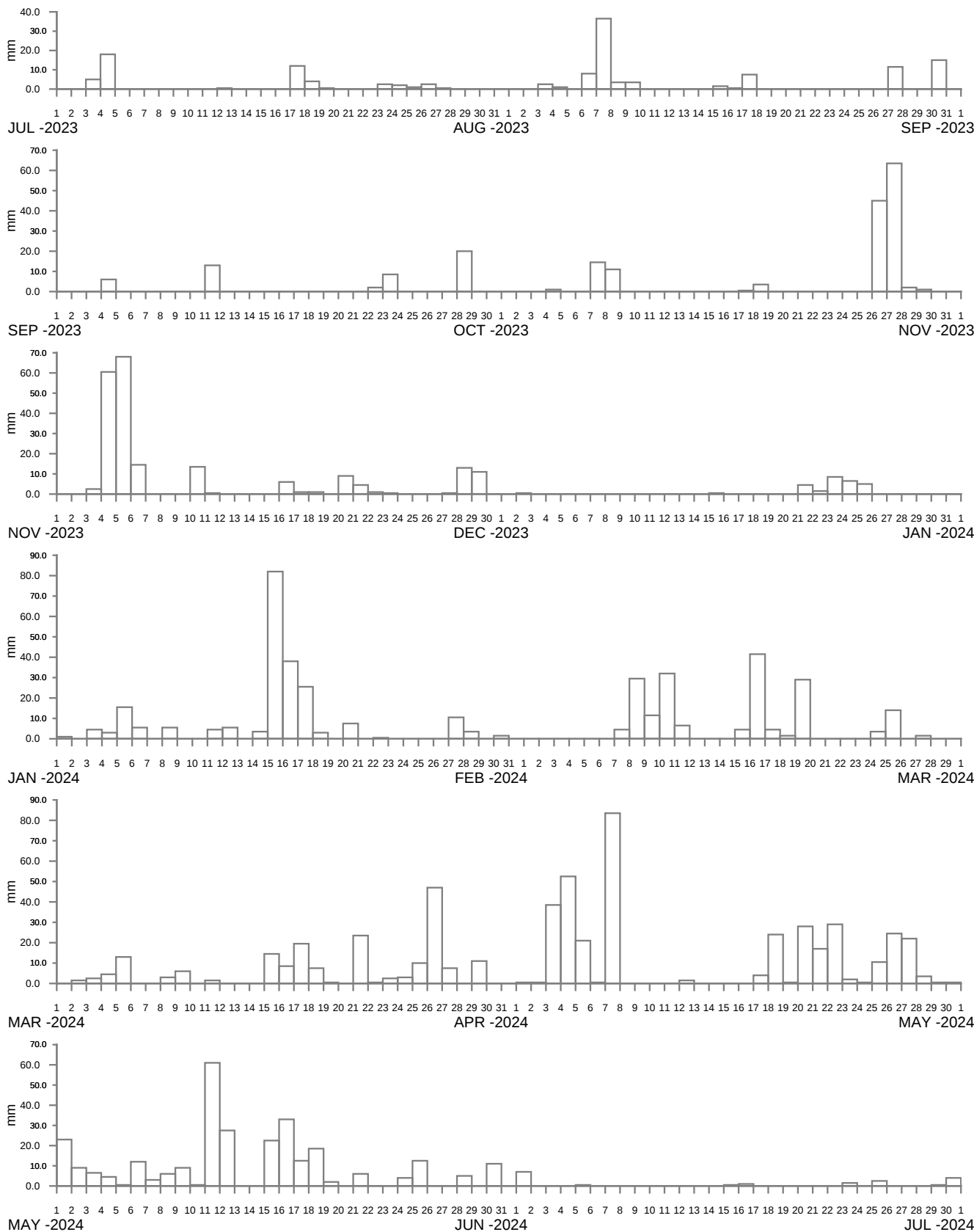
© Map Courtesy of Google Road 2023



RAINFALL STATION LOCATIONS RICHMOND RIVER REGION

**Manly
Hydraulics
Laboratory**

Report MHL3066
Figure
4-6



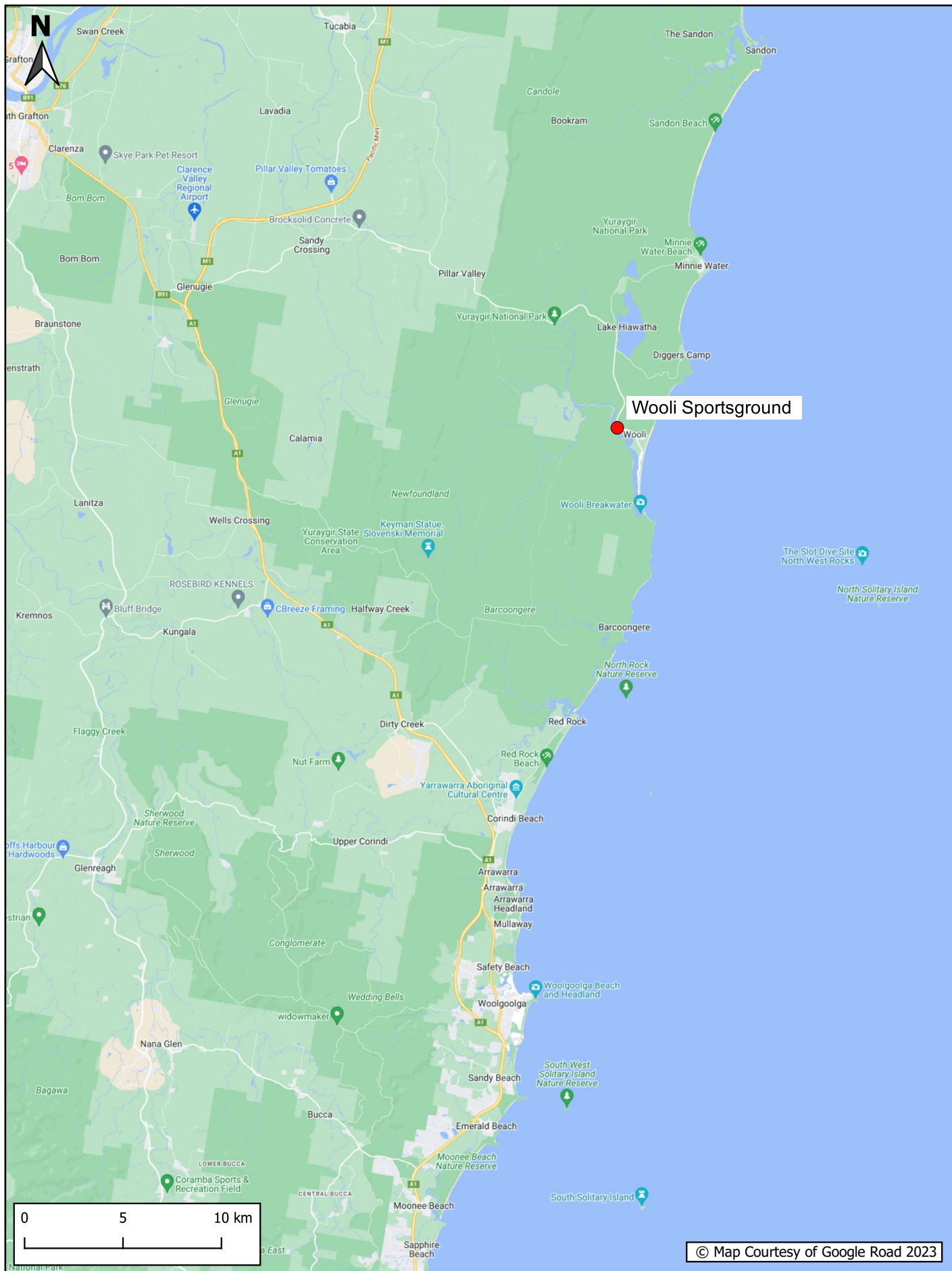
----- DATA LOSS



LAKE AINSWORTH AT LENNOX HEAD 2023-24

Manly
Hydraulics
Laboratory

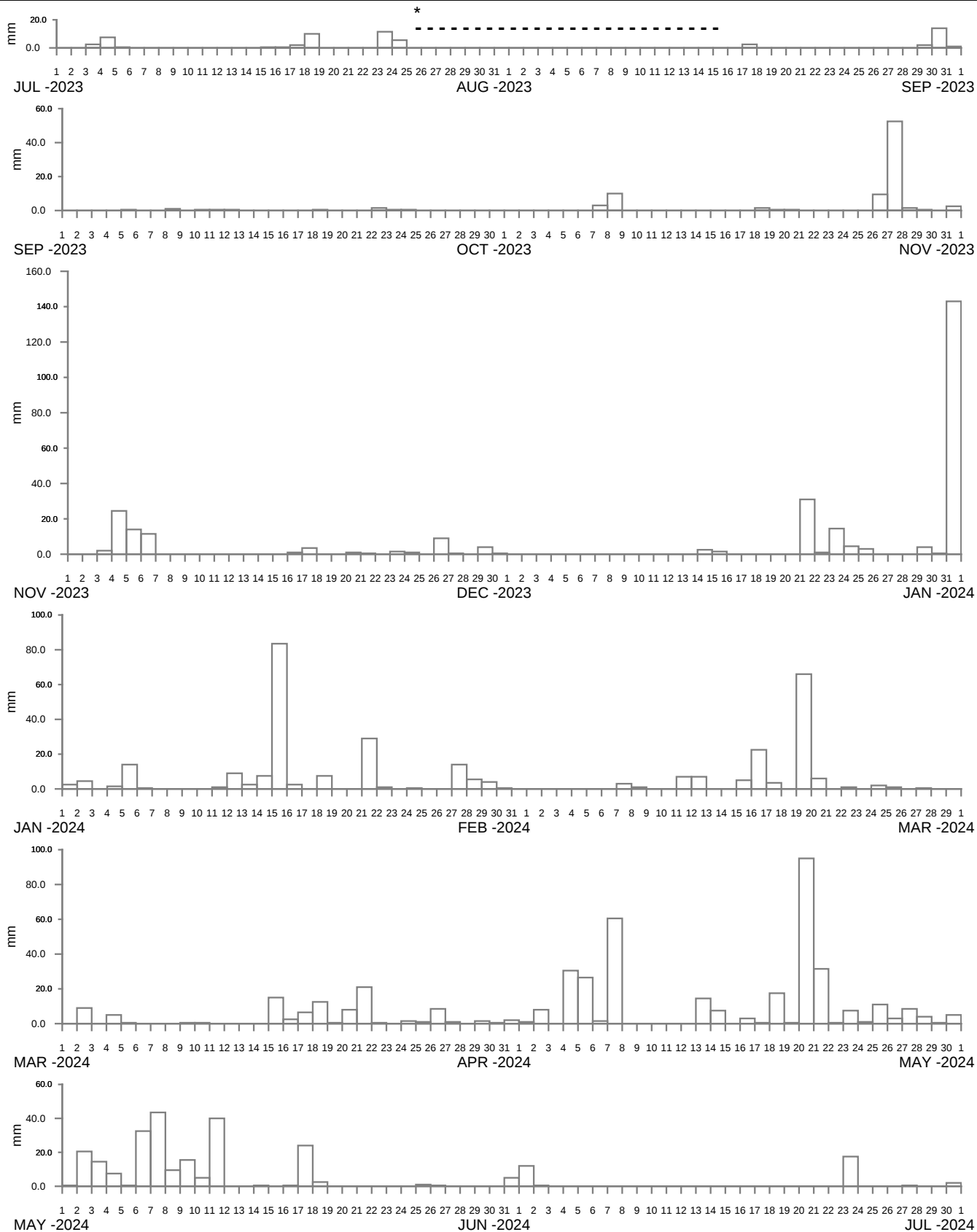
Report MHL3066
Figure
4-7



RAINFALL STATION LOCATIONS BELLINGER RIVER REGION (NORTH)

**Manly
Hydraulics
Laboratory**

Report MHL3066
Figure
4-8



----- DATA LOSS

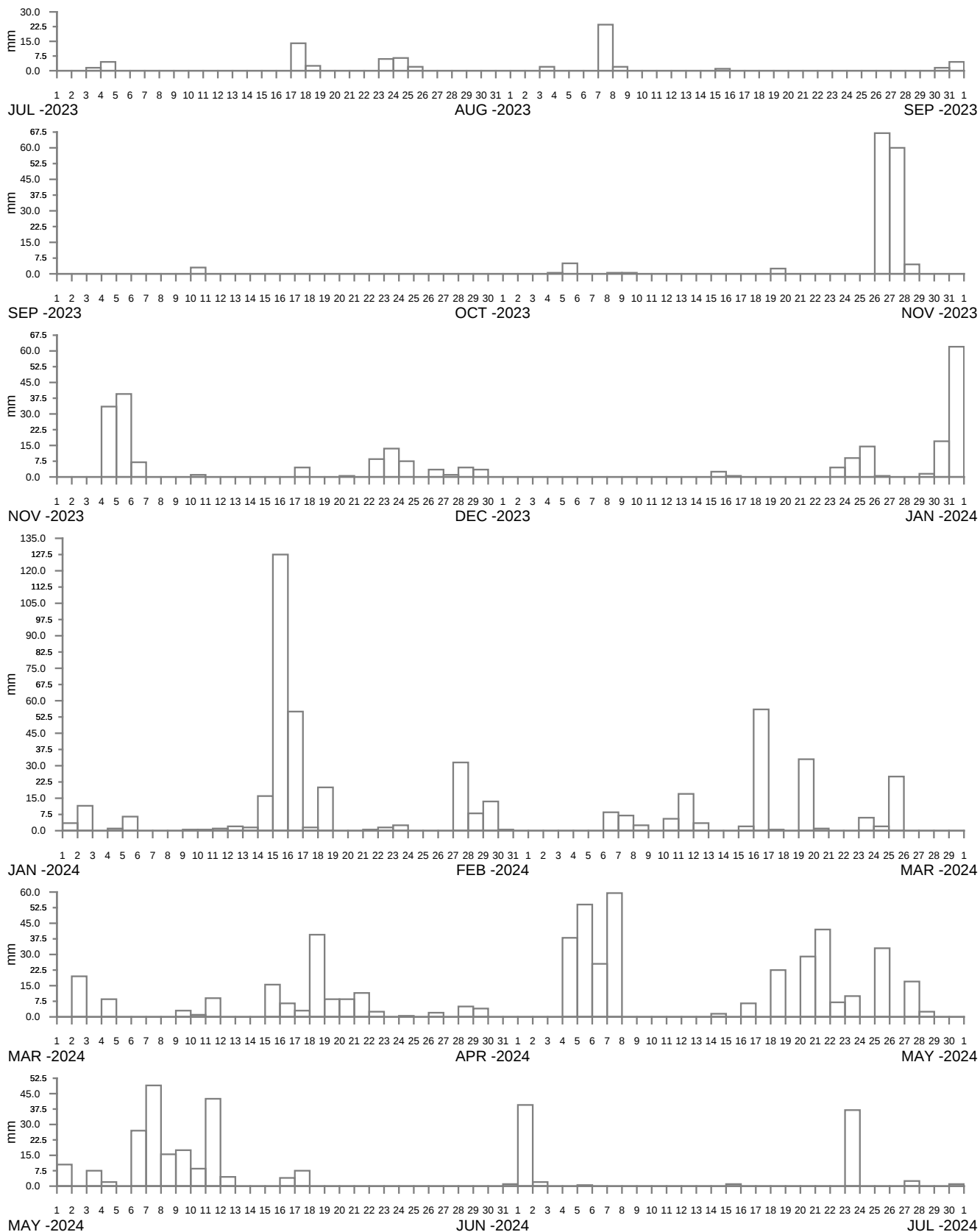
*Data loss due to battery failure



WOOLI SPORTSGROUND AT WOOLI RIVER 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-9



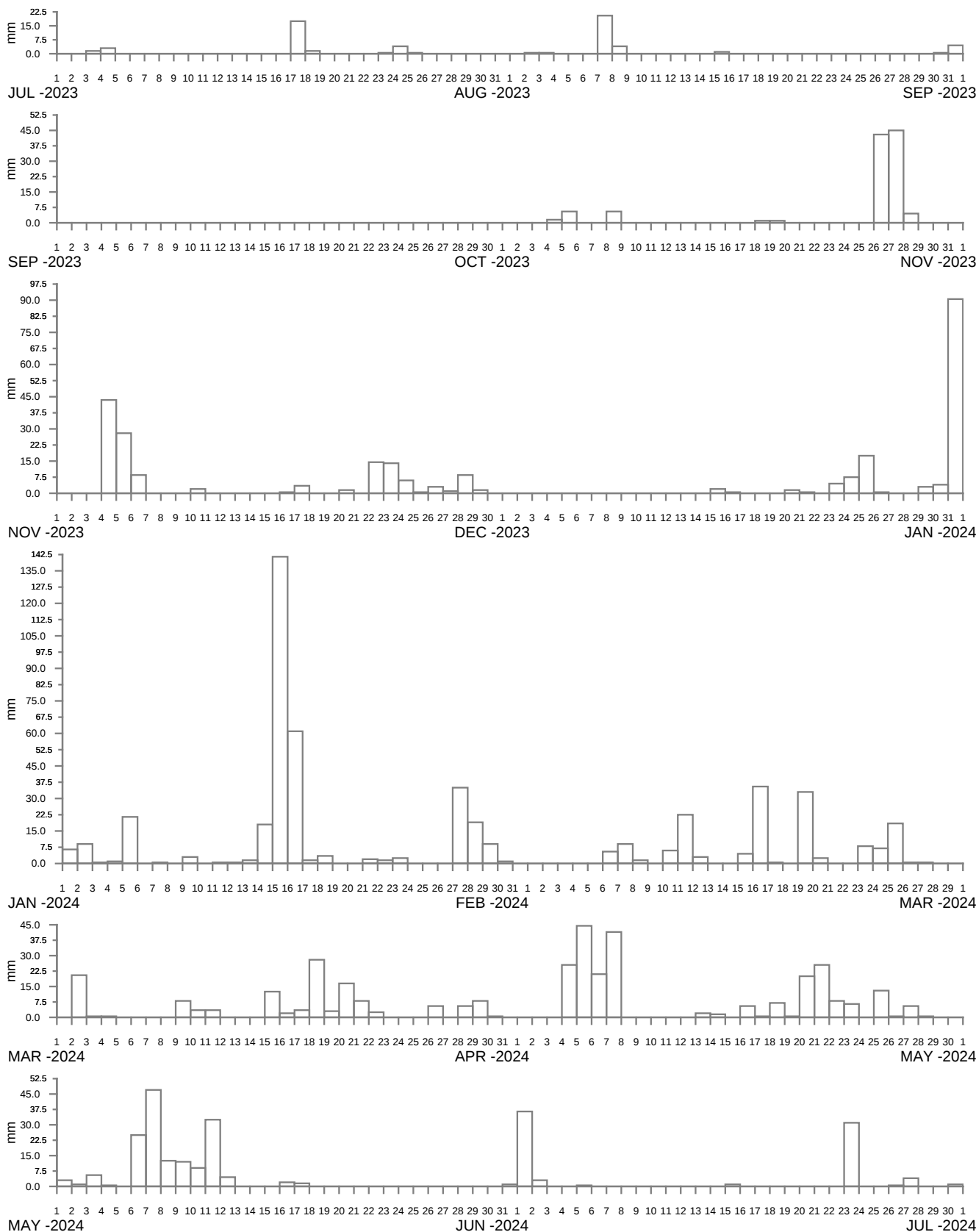
----- DATA LOSS



PERRY DRIVE AT COFFS HARBOUR 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-11



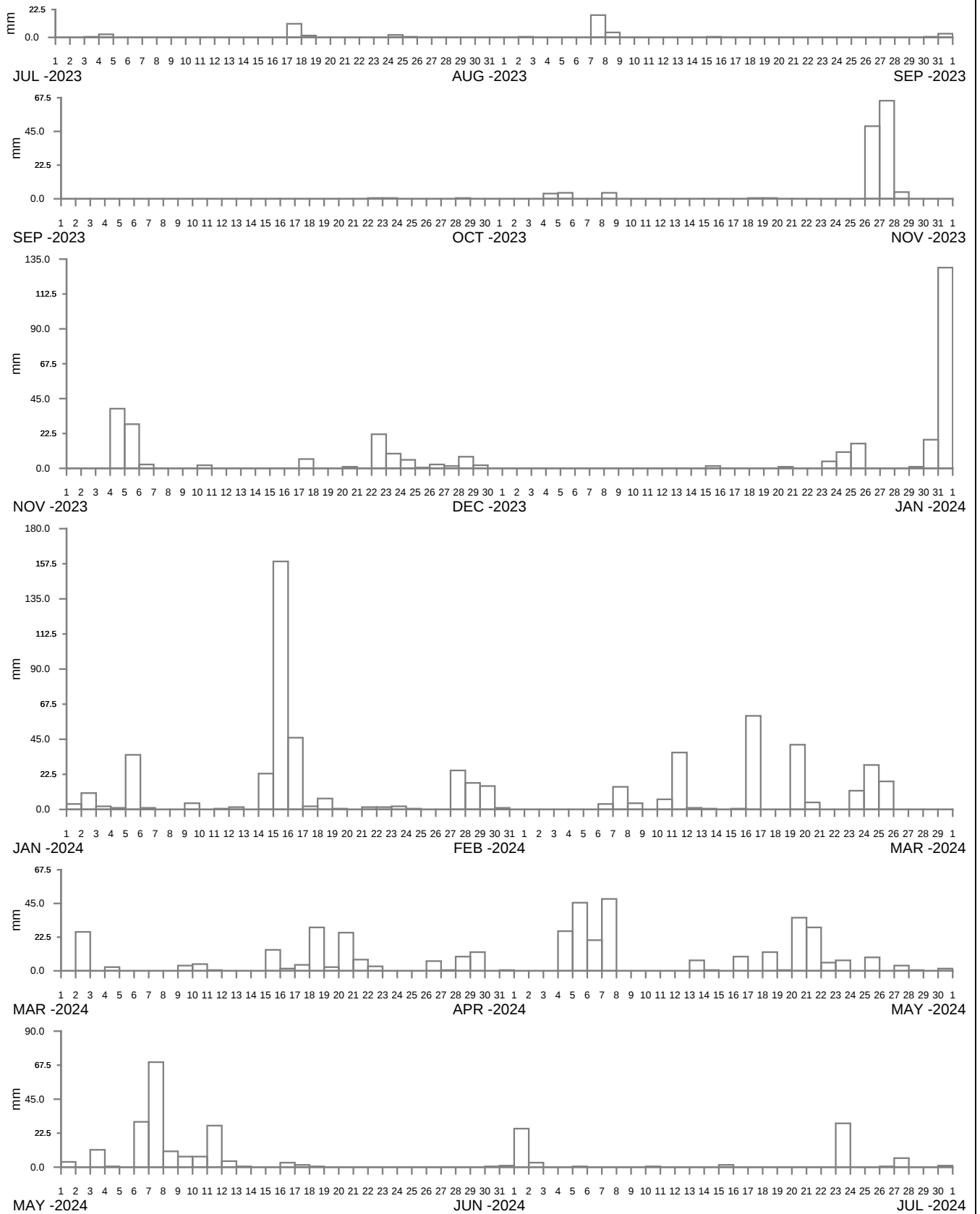
----- DATA LOSS



RED HILL AT COFFS HARBOUR 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-12



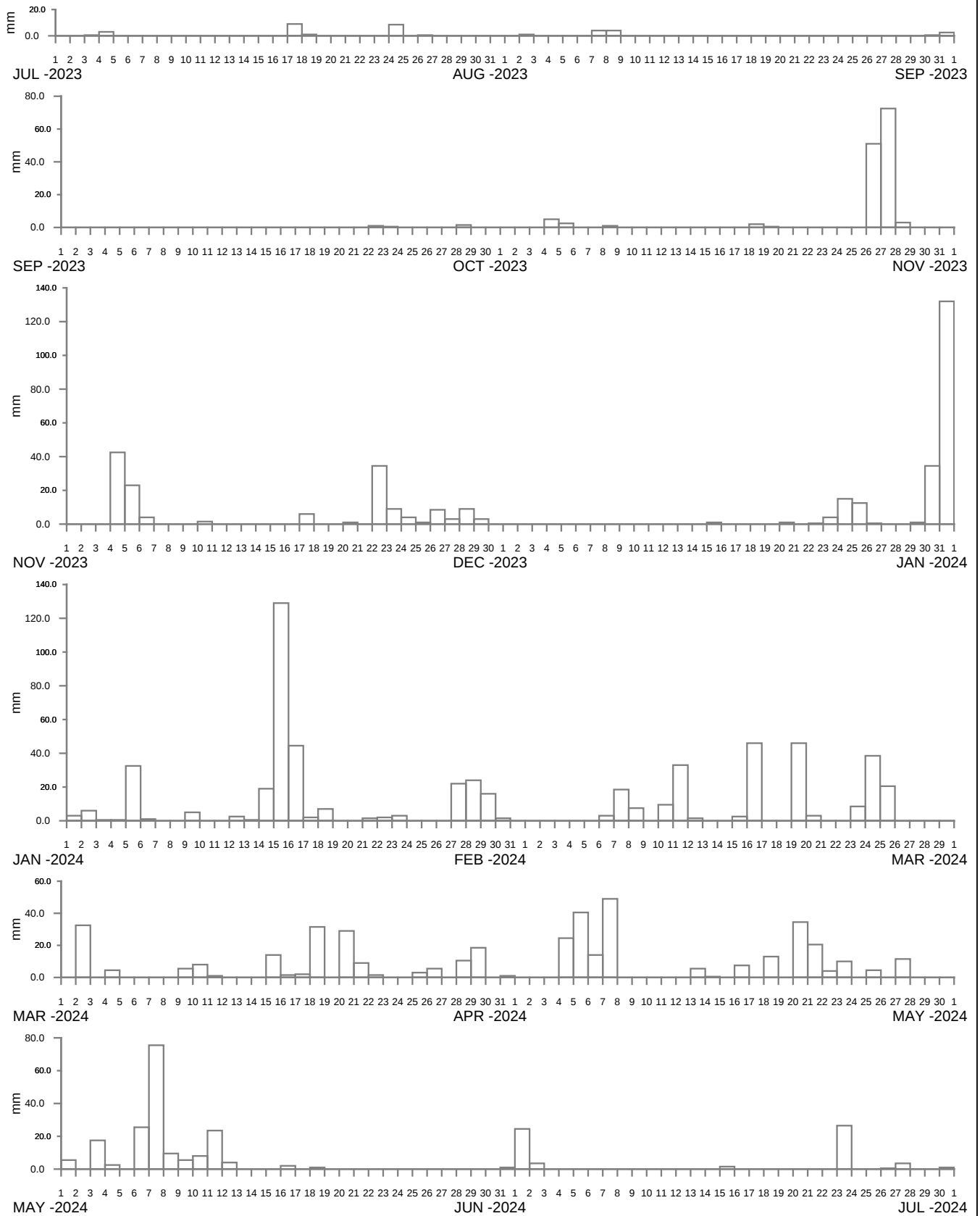
----- DATA LOSS



NEWPORTS CREEK AT ENGLANDS ROAD 2023-24

Manly
Hydraulics
Laboratory

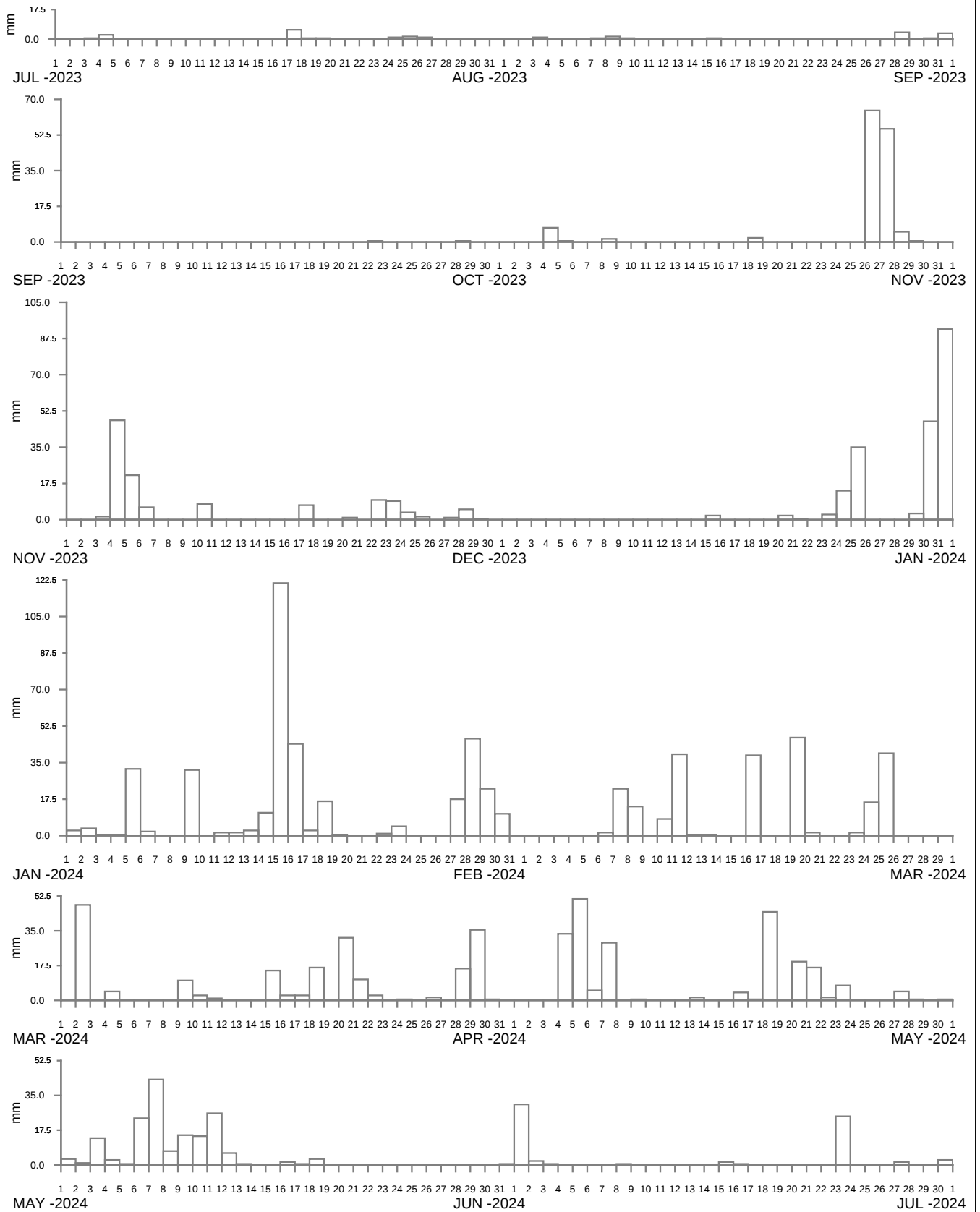
Report MHL3066
Figure
4-13



MIDDLE BOAMBEE AT CEDARVALE ROAD 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-14



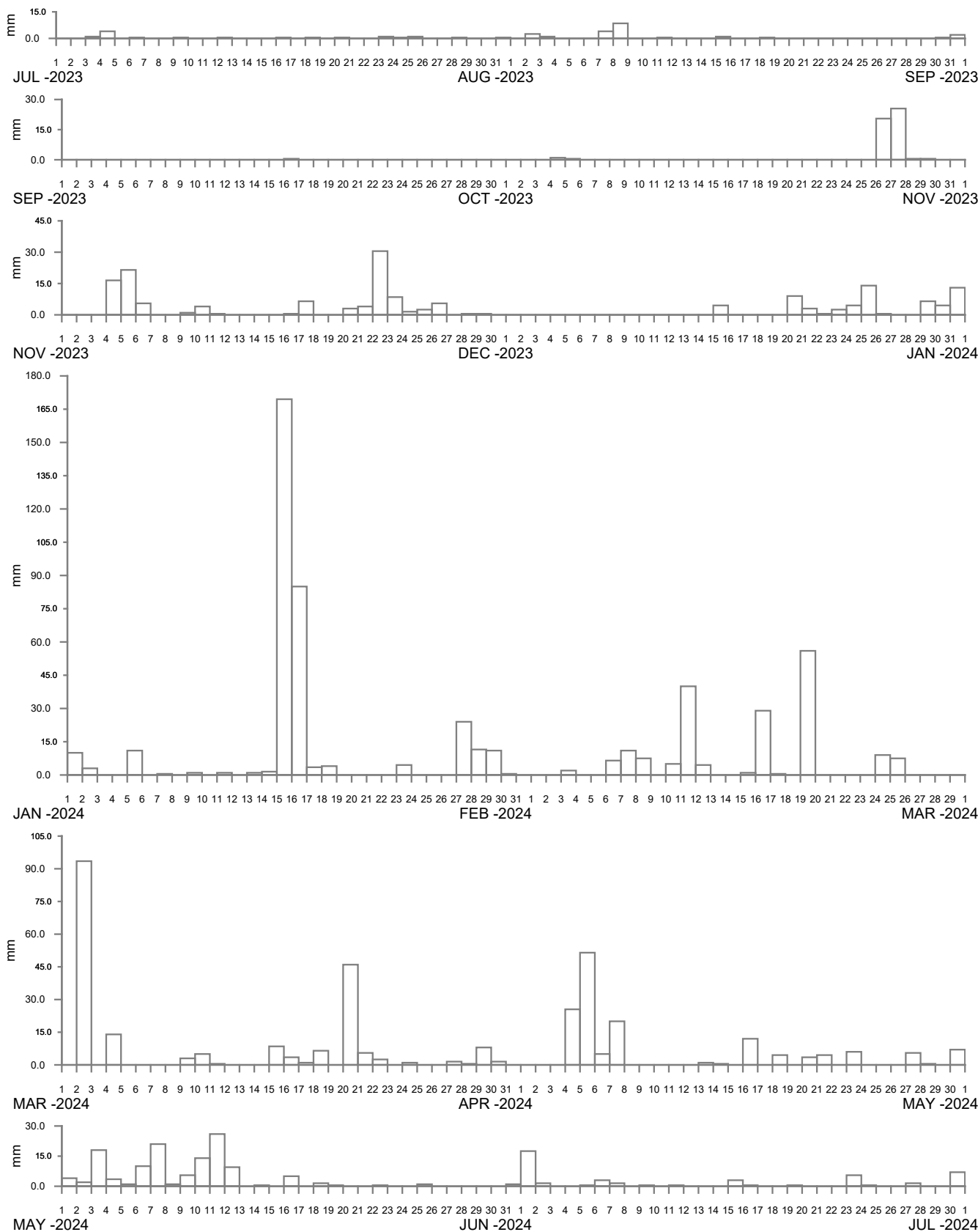
----- DATA LOSS



NORTH BONVILLE AT NORTH BONVILLE ROAD 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-15



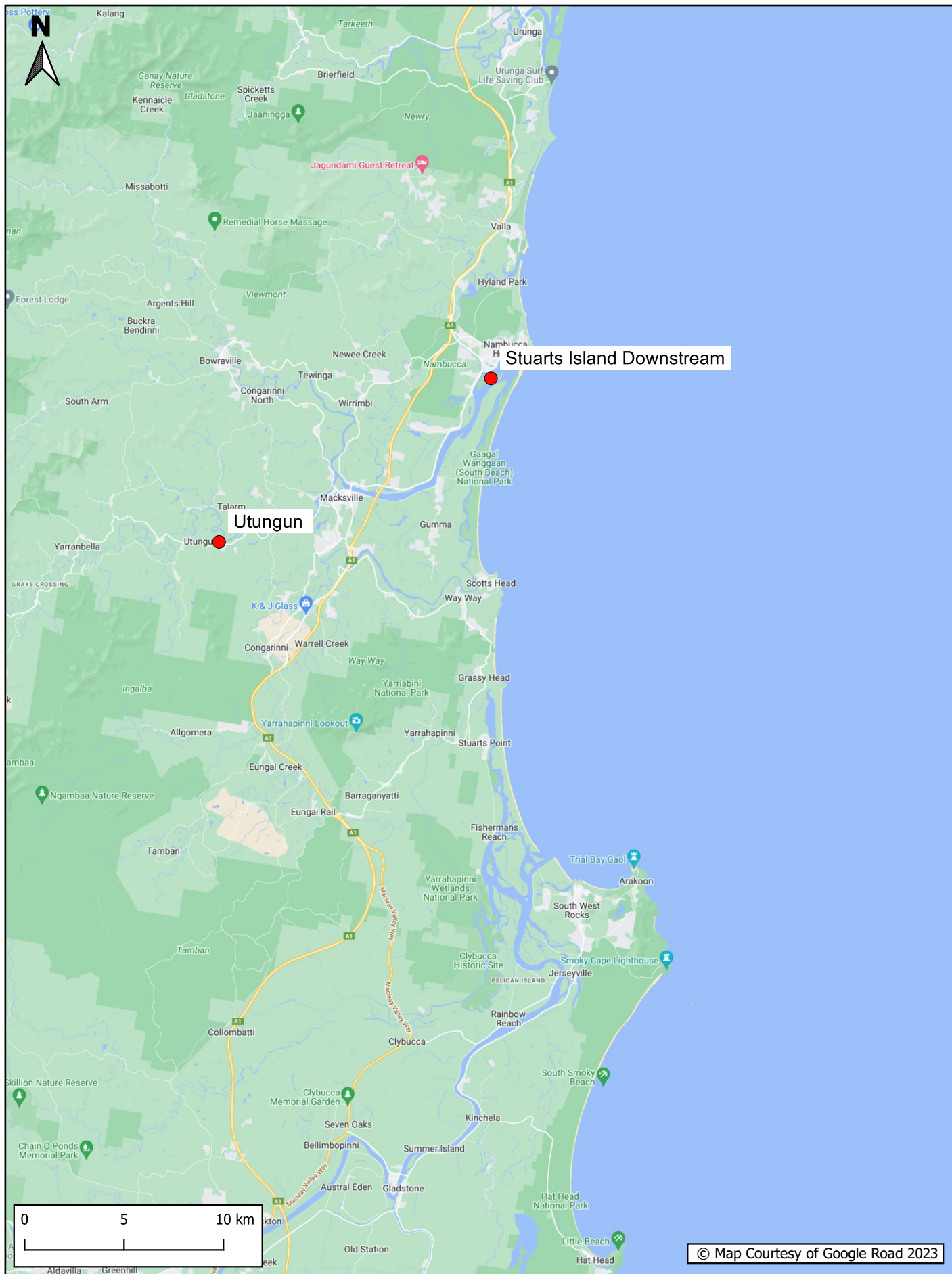
----- DATA LOSS



KOOROOWI SHARABEL AT KALANG ROAD
2023-24

Manly
Hydraulics
Laboratory

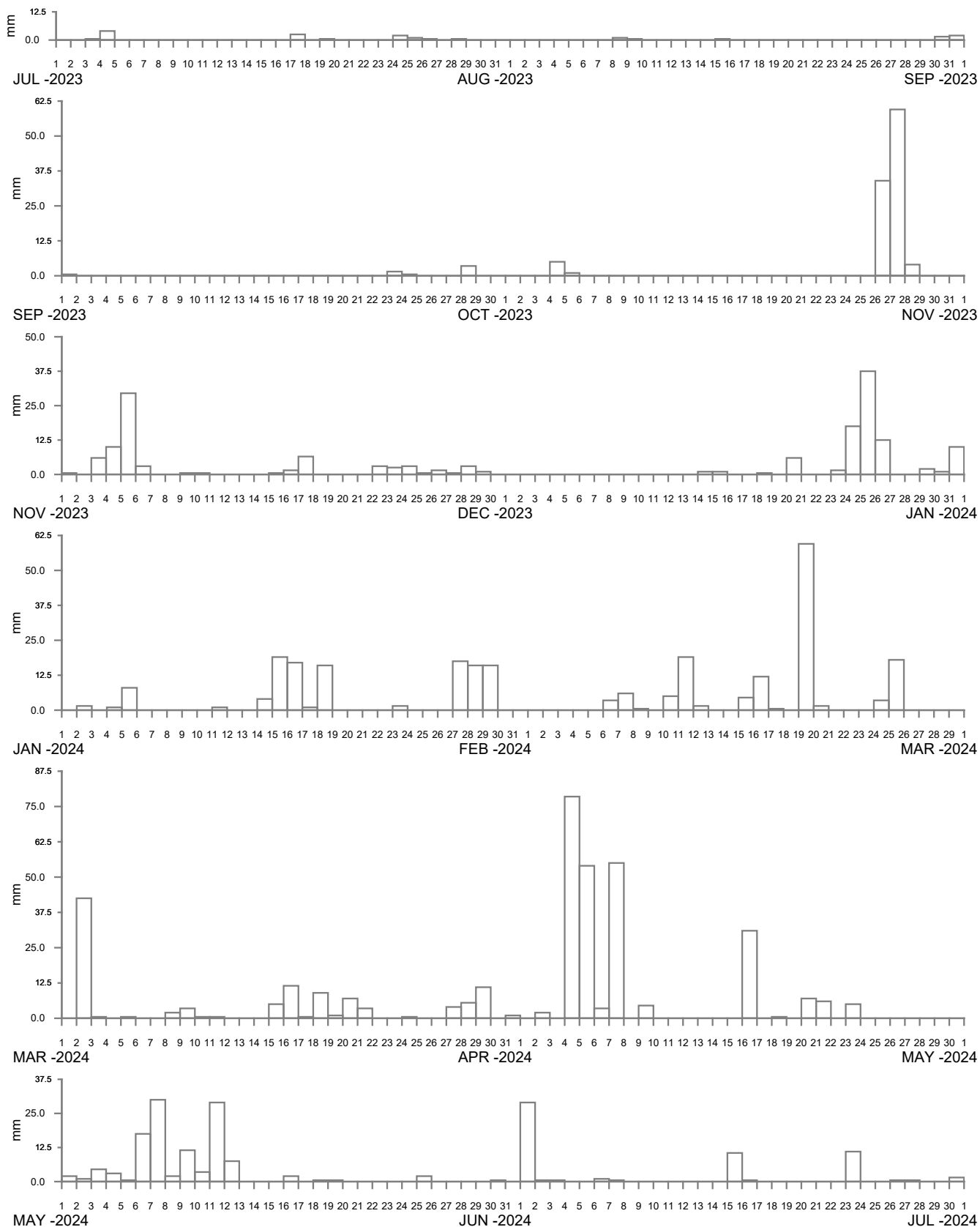
Report MHL3066
Figure
4-16



RAINFALL STATION LOCATIONS NAMBUCCA RIVER REGION

**Manly
Hydraulics
Laboratory**

Report MHL3066
Figure
4-17



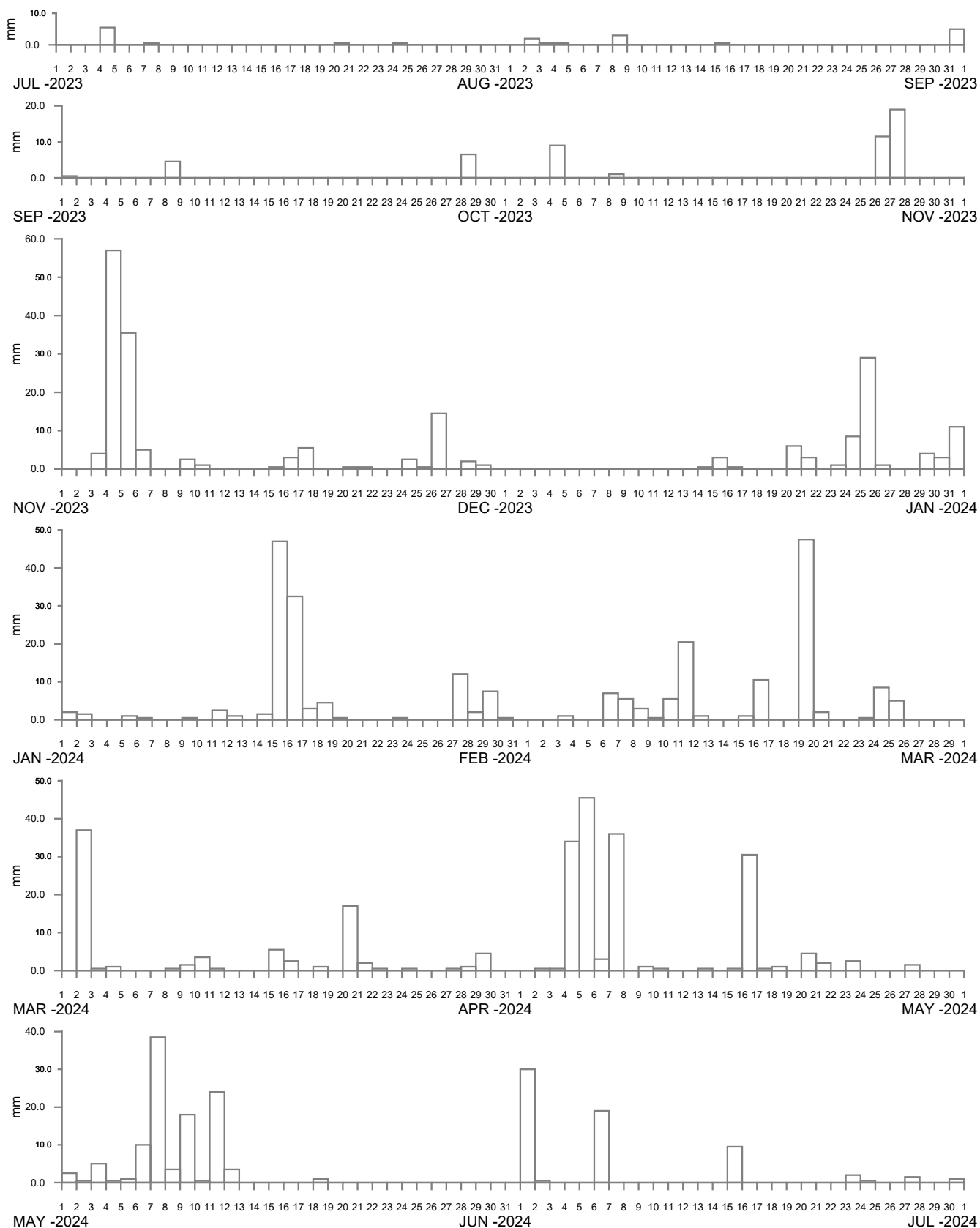
----- DATA LOSS



STUARTS ISLAND DOWNSTREAM AT NAMBUCCA RIVER 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-18



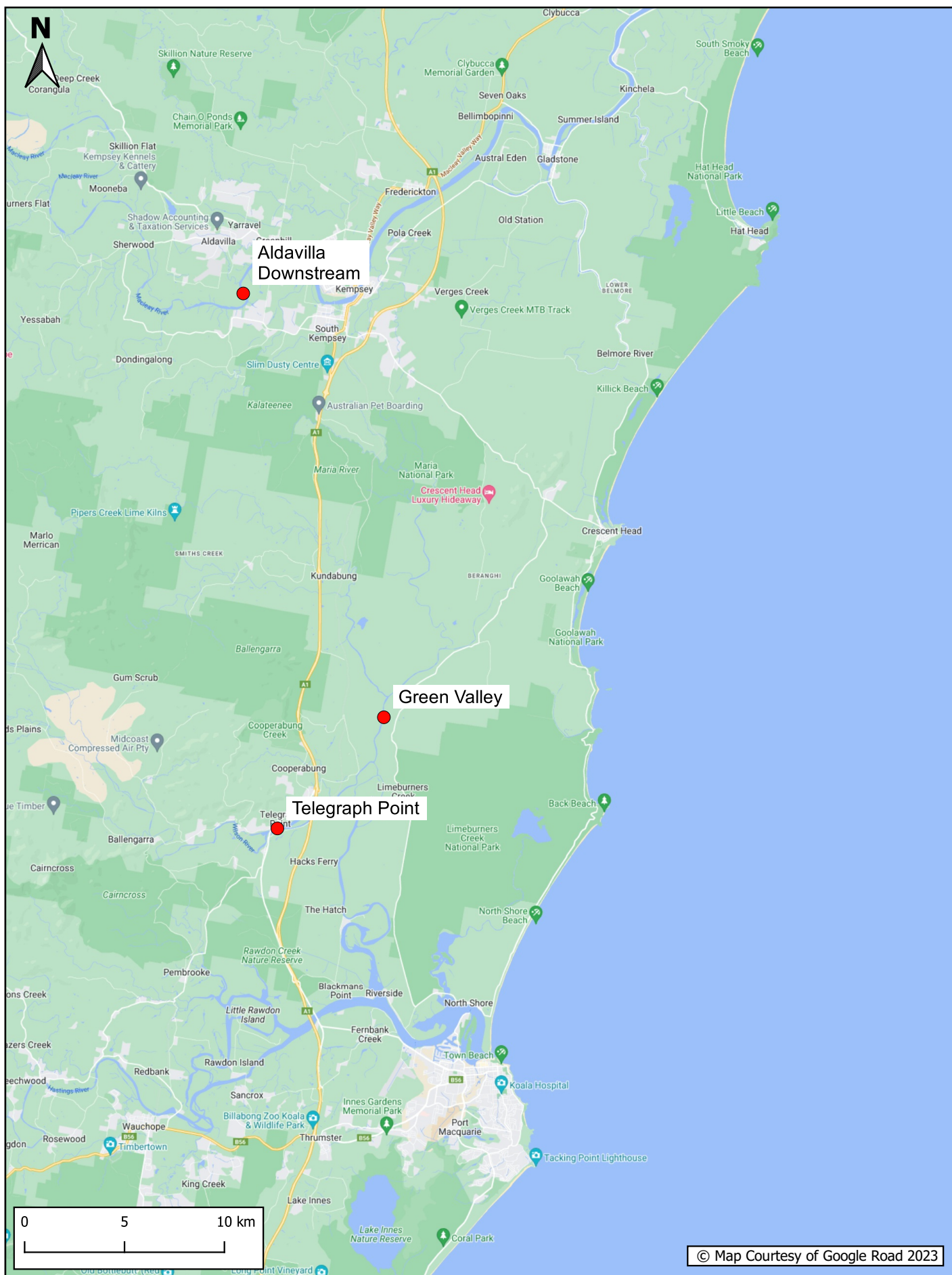
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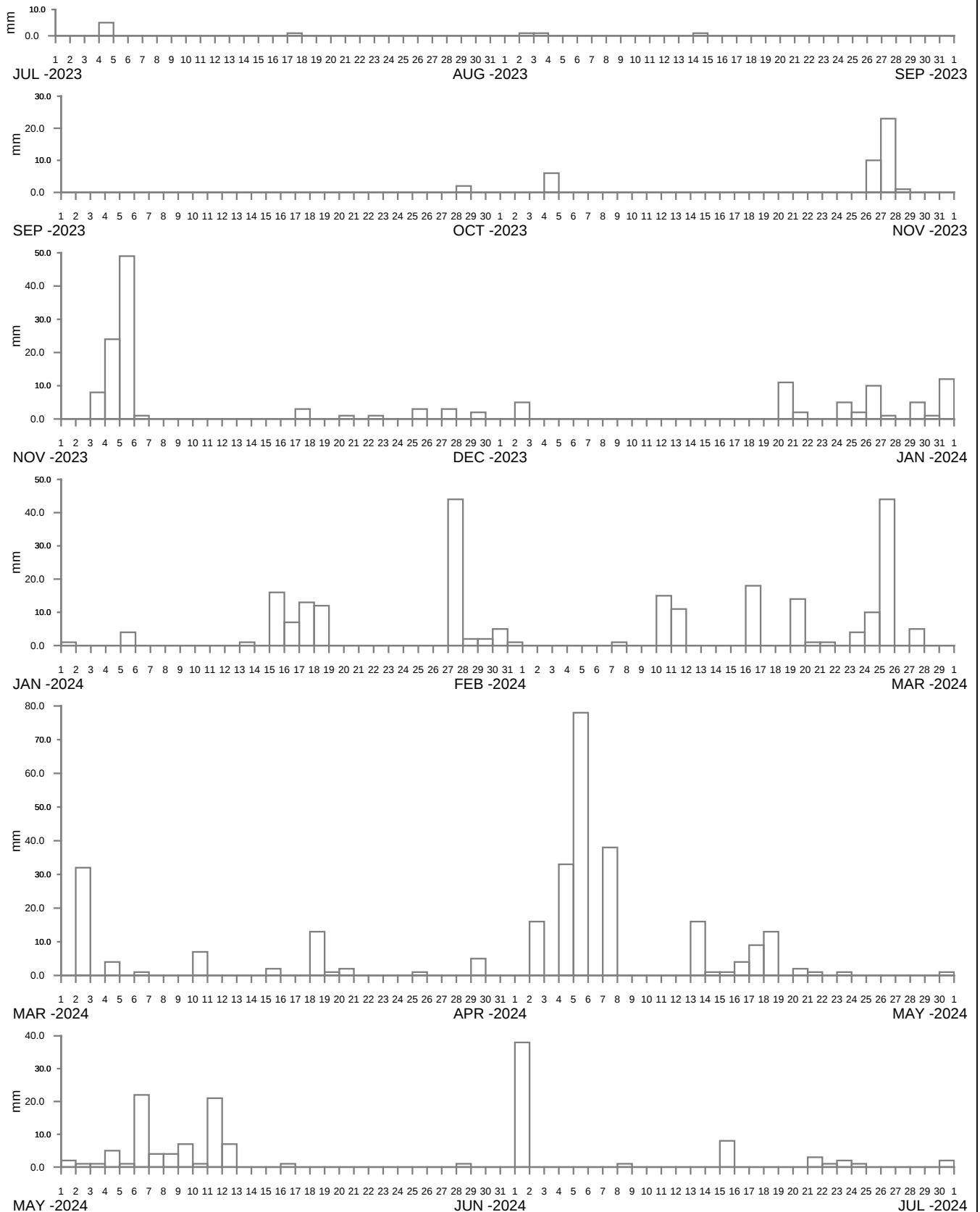


UTUNGUN AT TAYLORS ARM 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-19

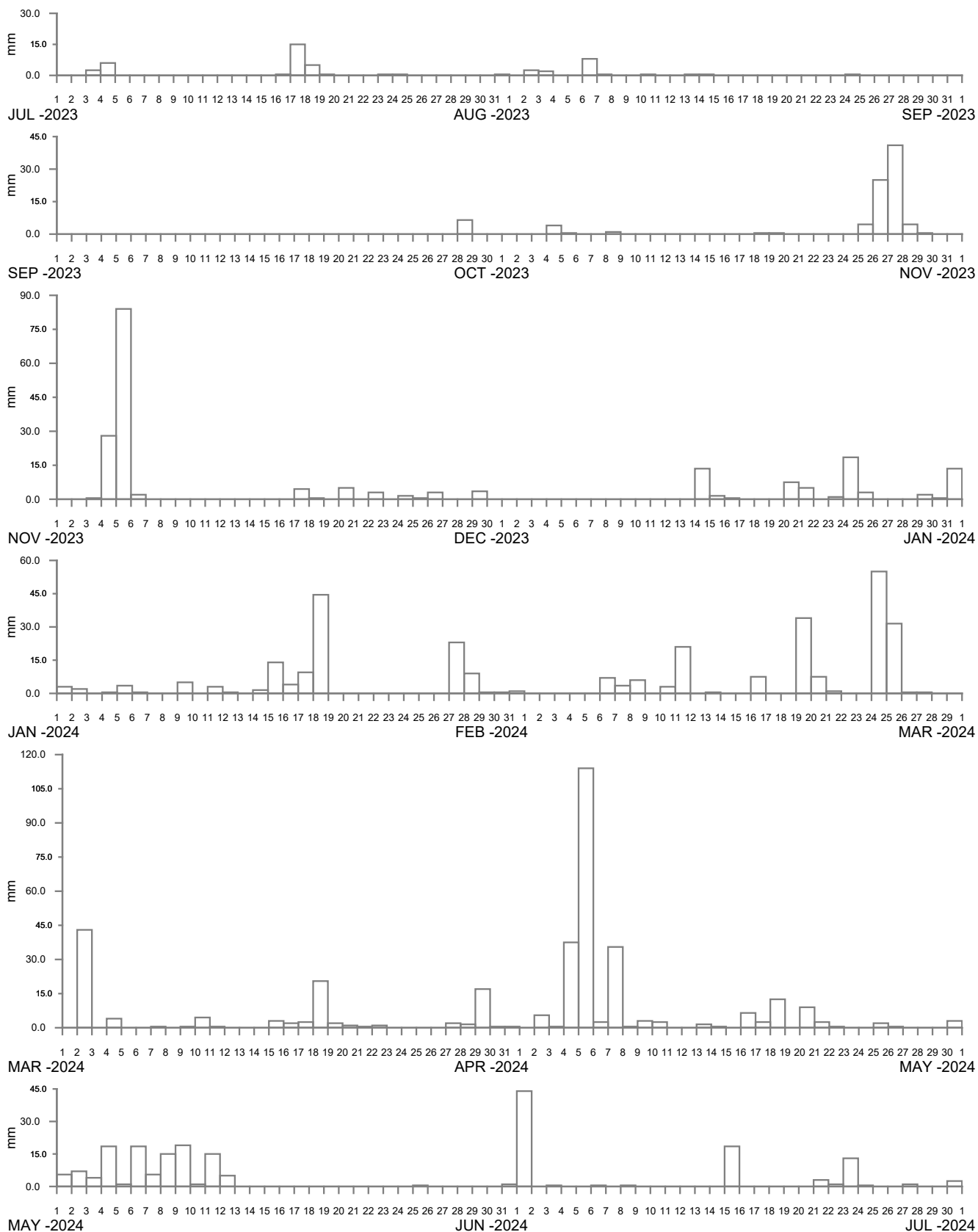


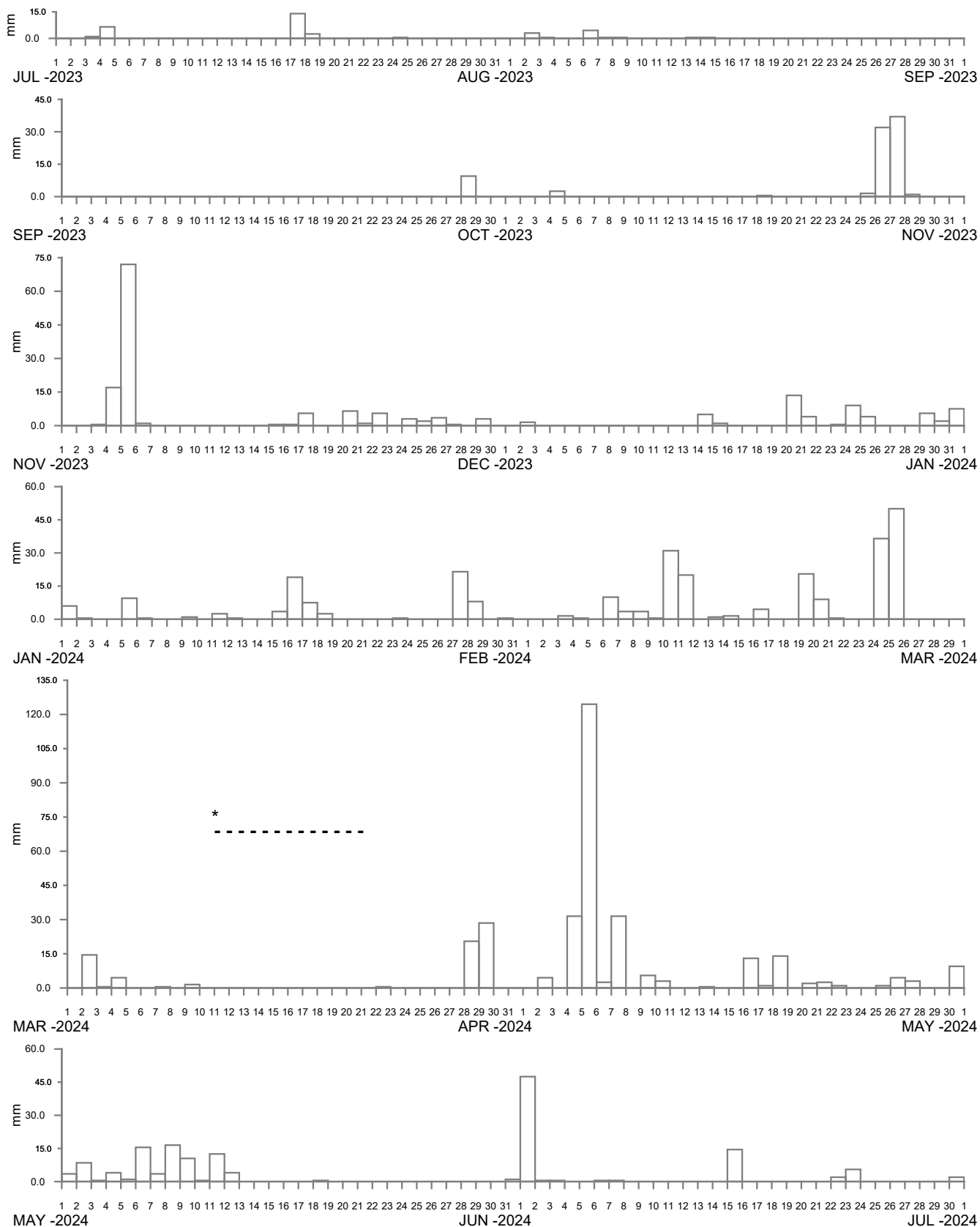


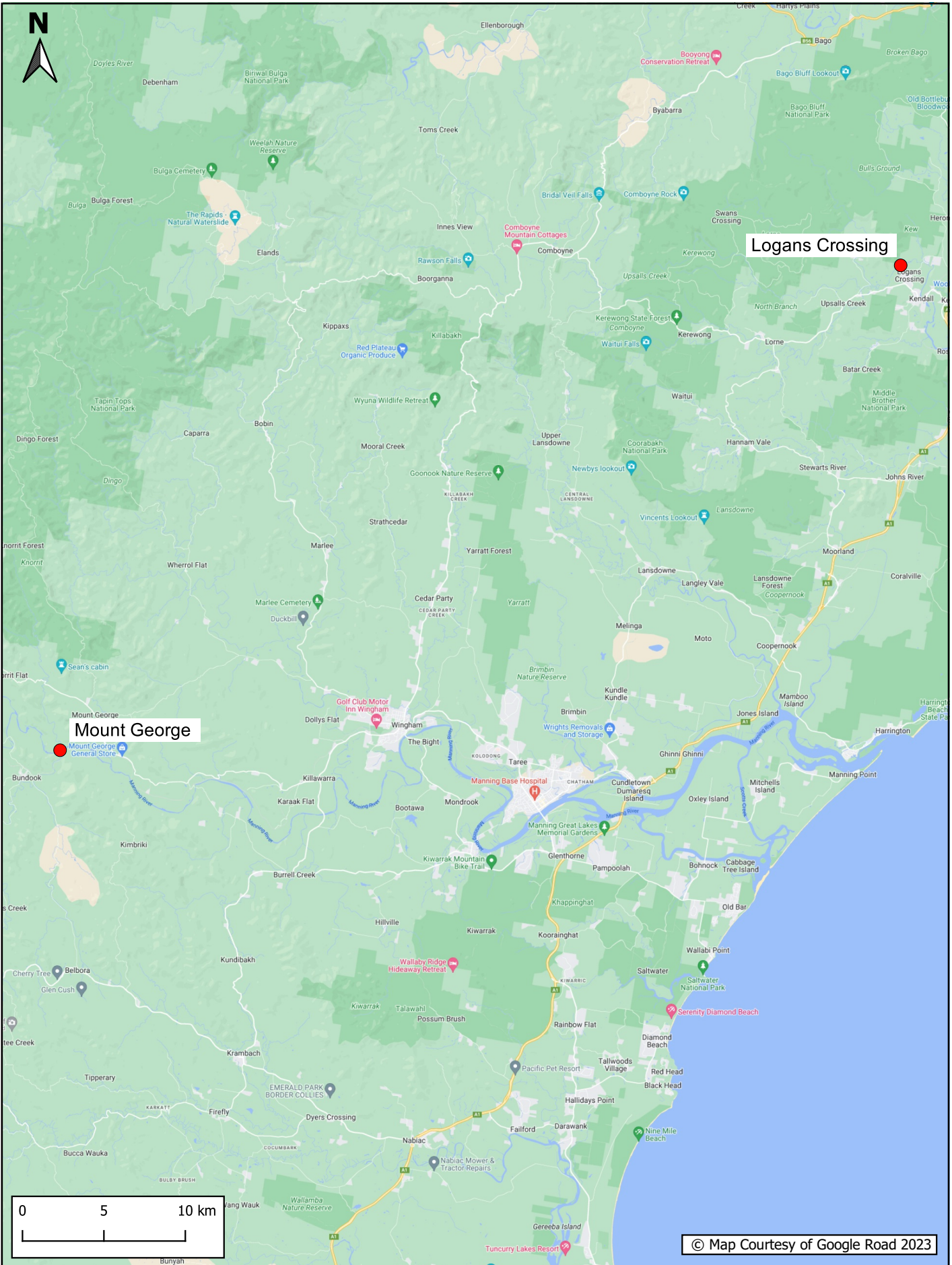
ALDAVILLA DOWNSTREAM AT MACLEAY RIVER 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-21



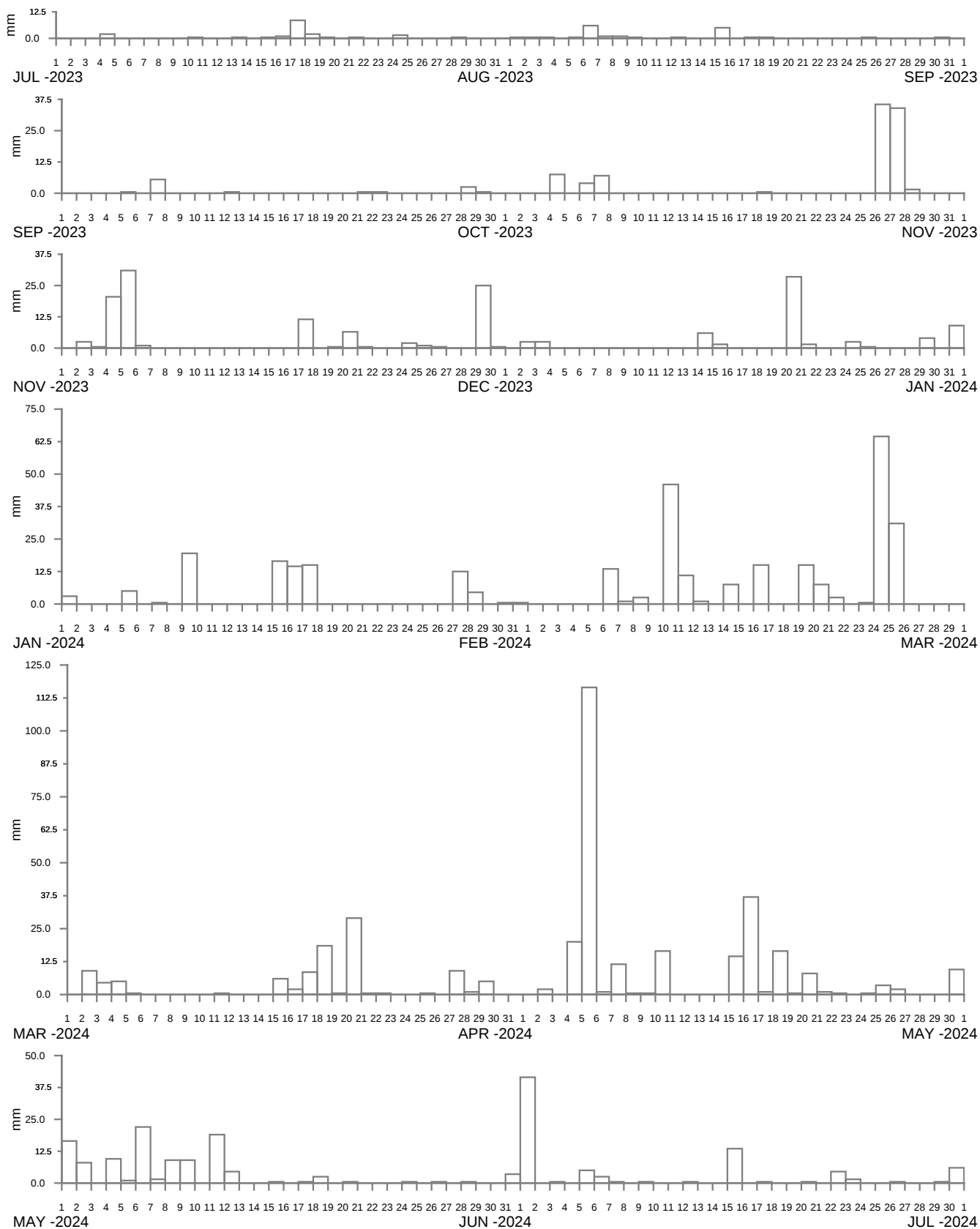




RAINFALL STATION LOCATIONS CAMDEN HAVEN REGION

**Manly
Hydraulics
Laboratory**

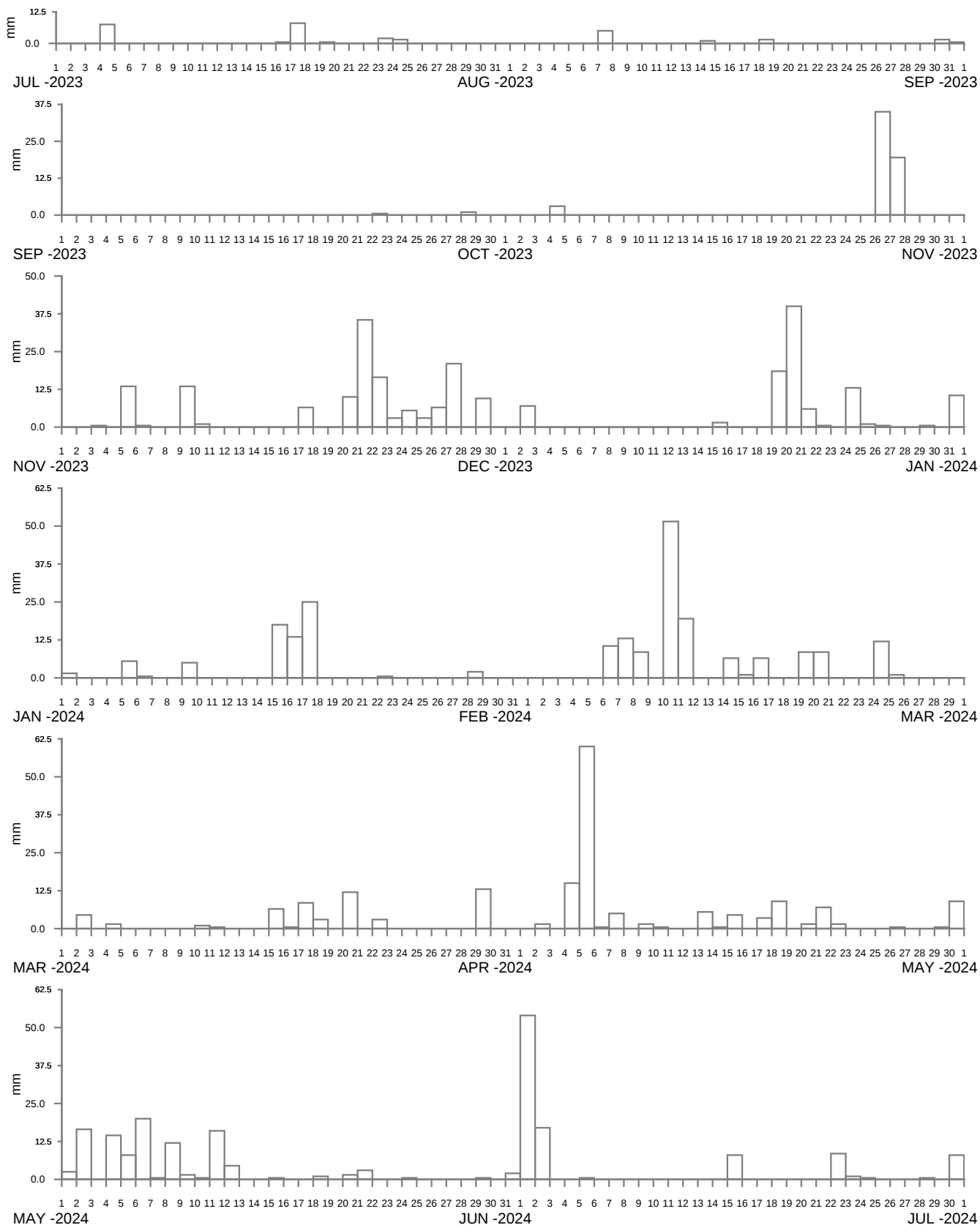
Report MHL3066
Figure
4-24



LOGANS CROSSING AT CAMDEN HAVEN RIVER 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-25



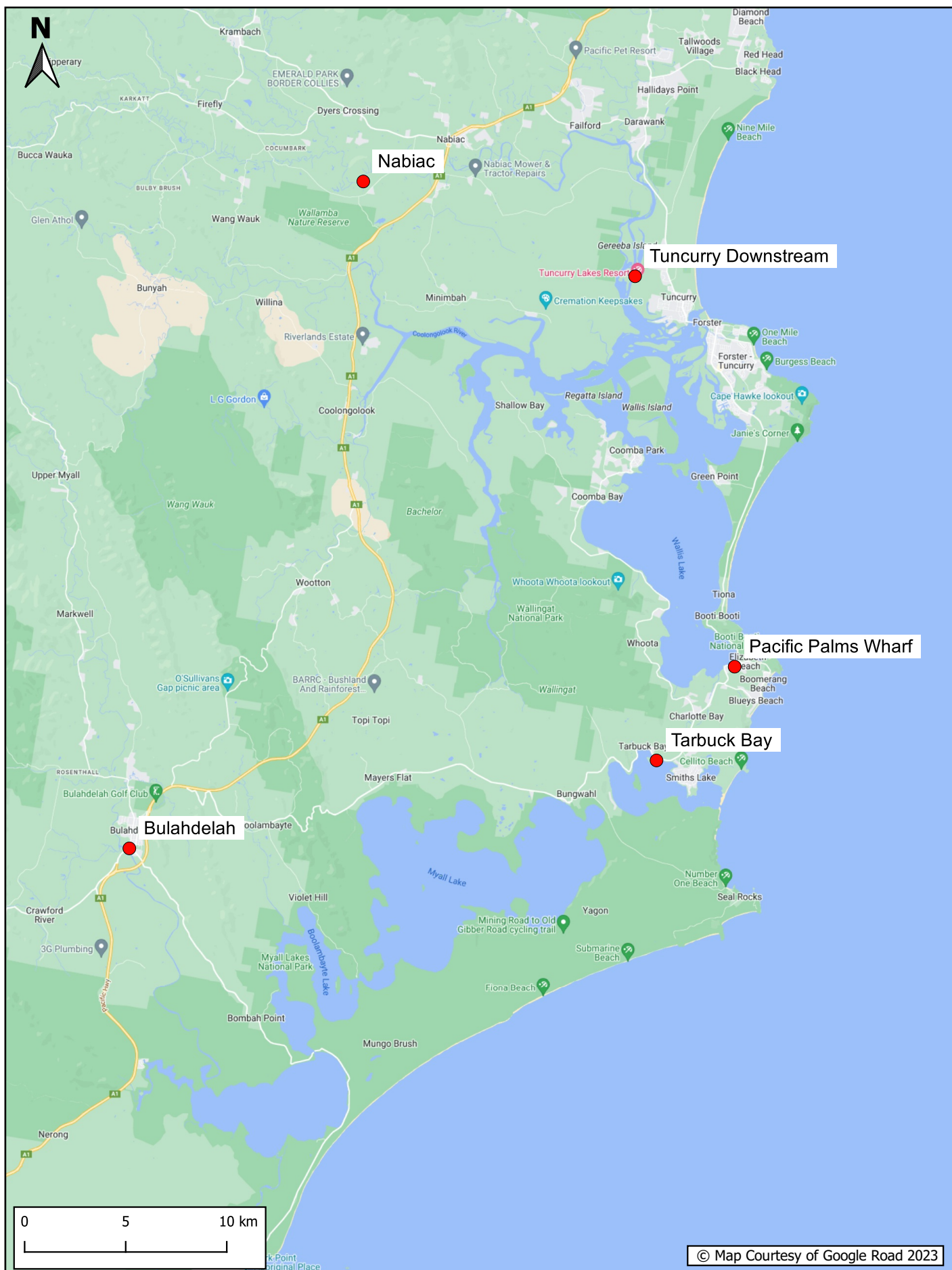
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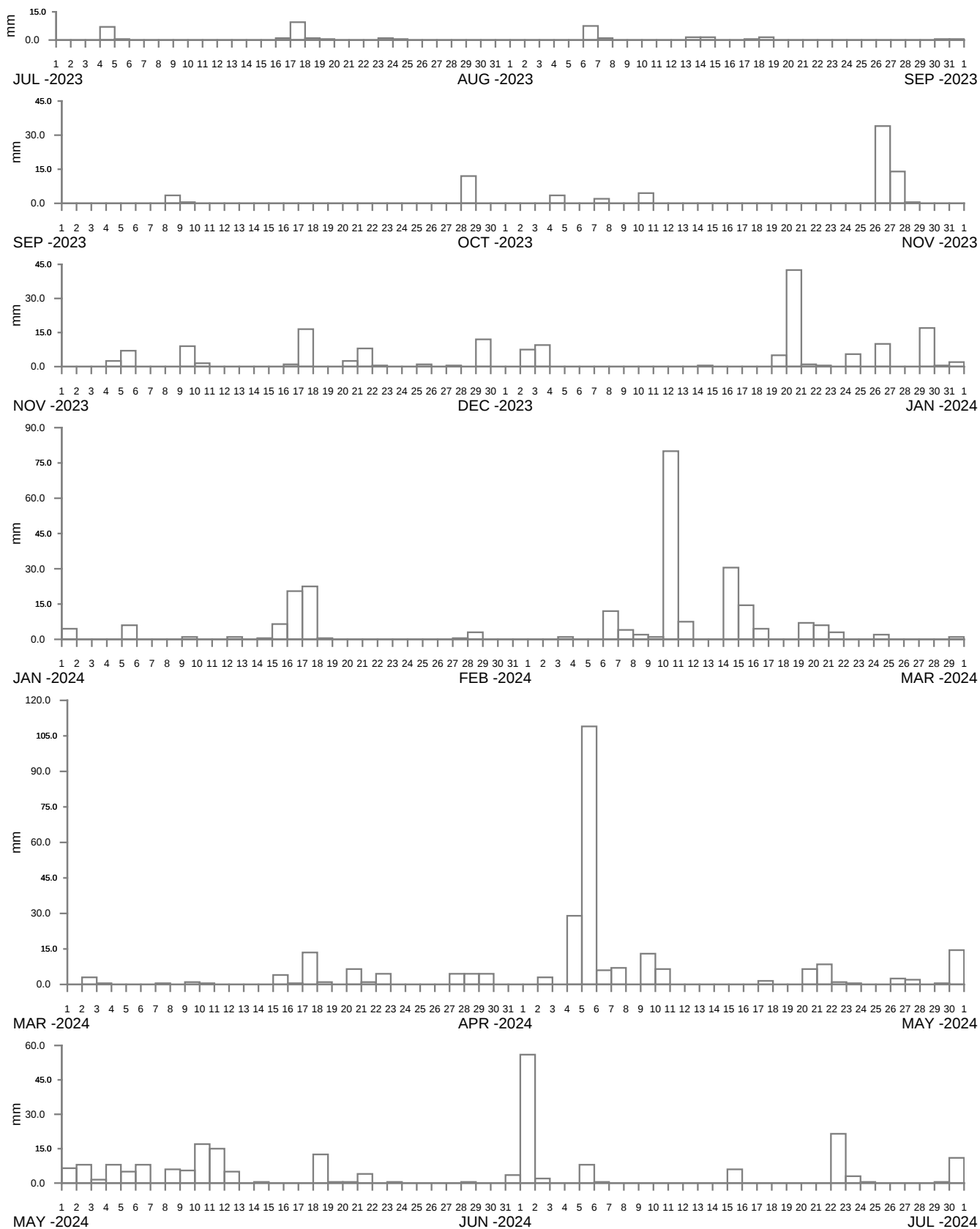


MOUNT GEORGE AT MANNING RIVER 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-26





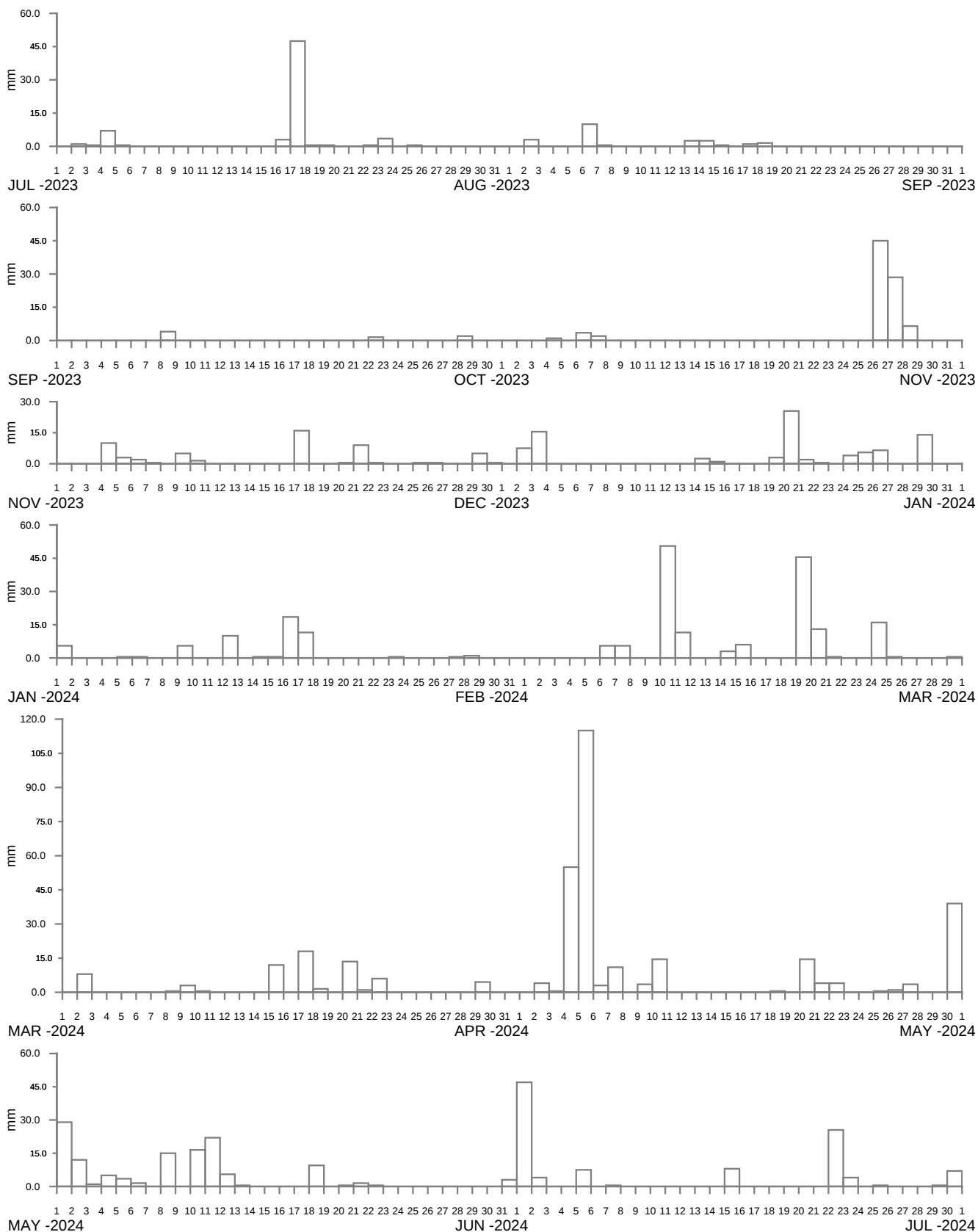
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NABIAC AT WALLAMBA RIVER 2023-24

Manly
Hydraulics
Laboratory

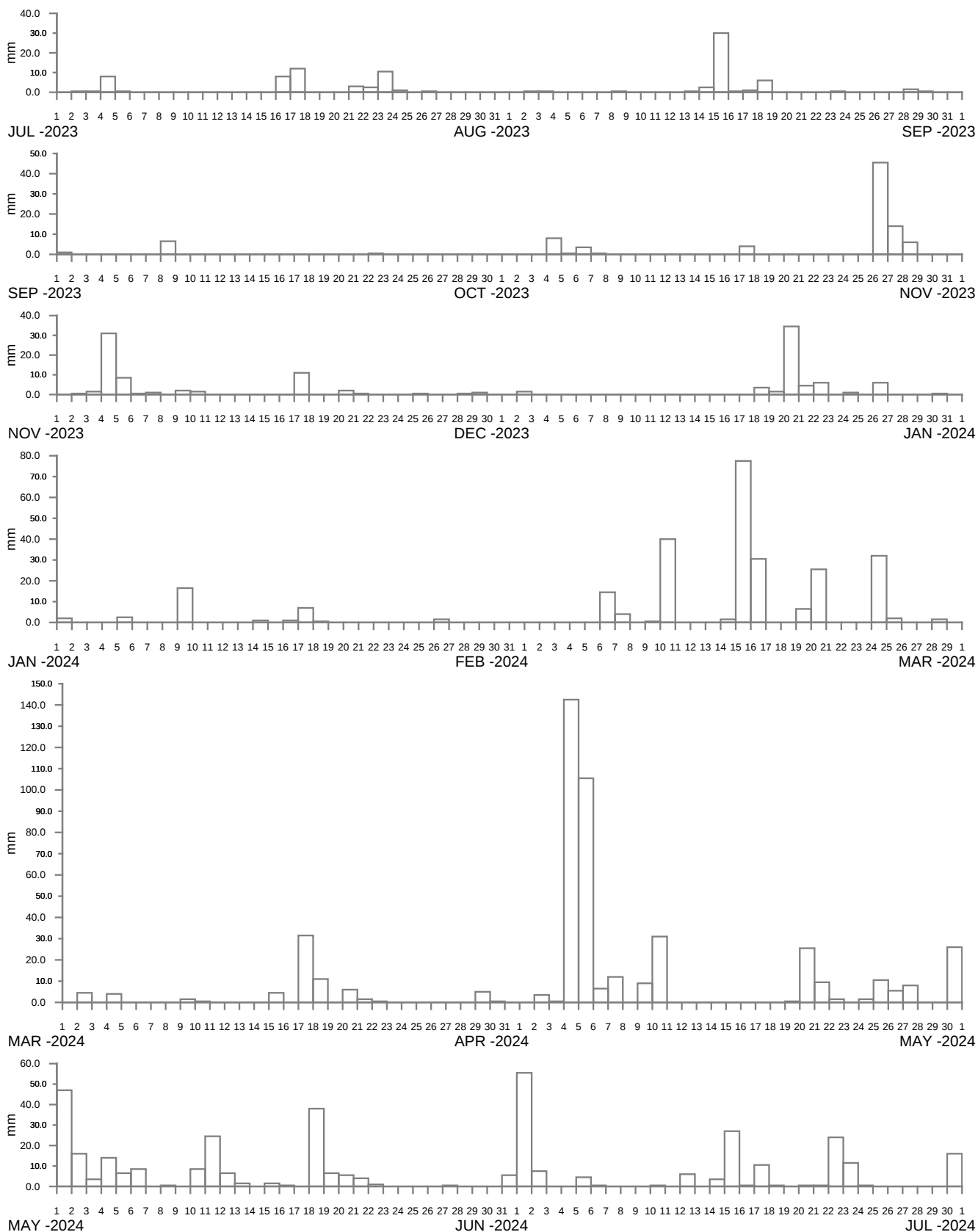
Report MHL3066
Figure
4-28



TUNCURRY DOWNSTREAM AT WALLAMBA RIVER 2023-24

Manly
Hydraulics
Laboratory

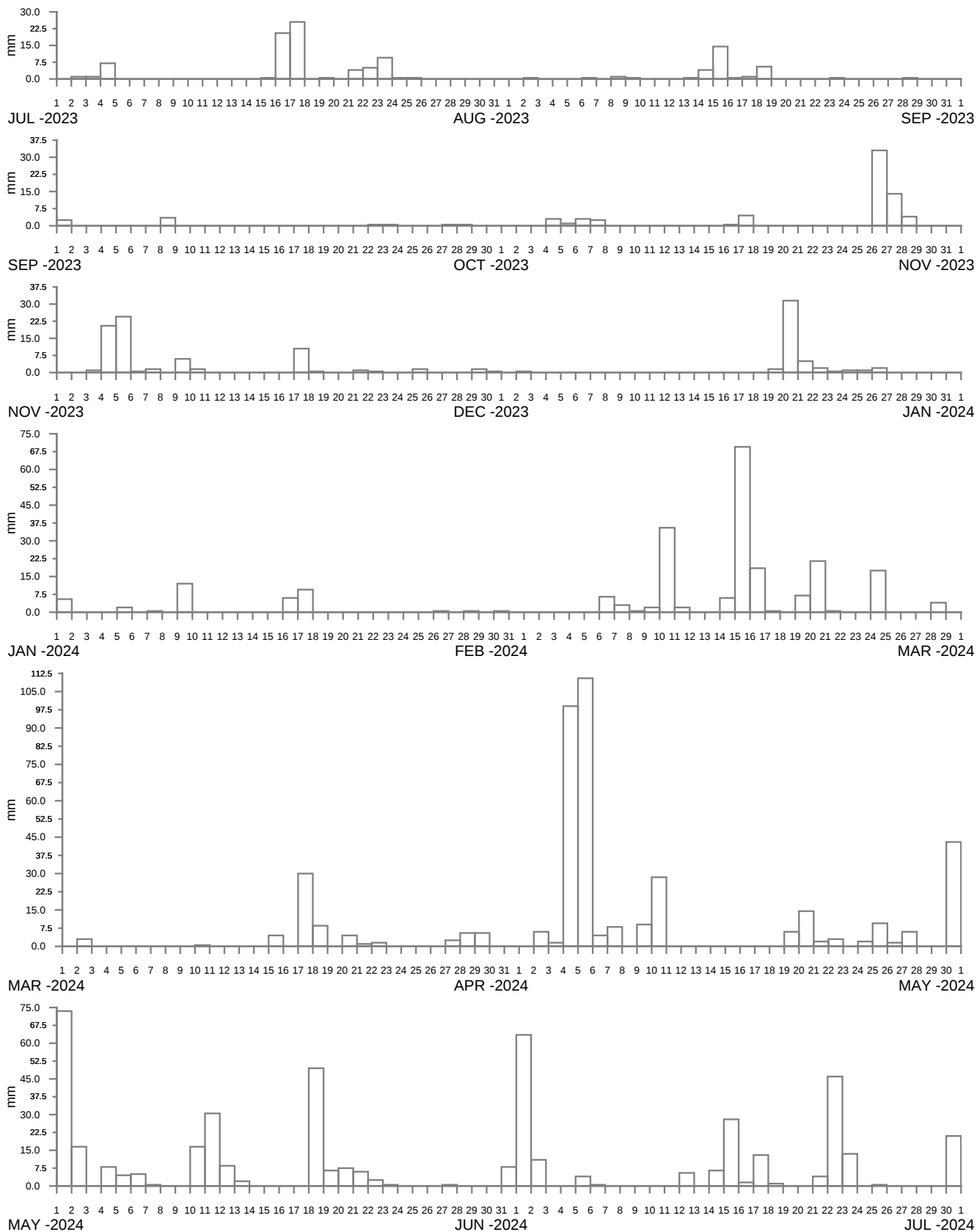
Report MHL3066
Figure
4-29



PACIFIC PALMS WHARF AT WALLIS LAKES 2023-24

Manly
Hydraulics
Laboratory

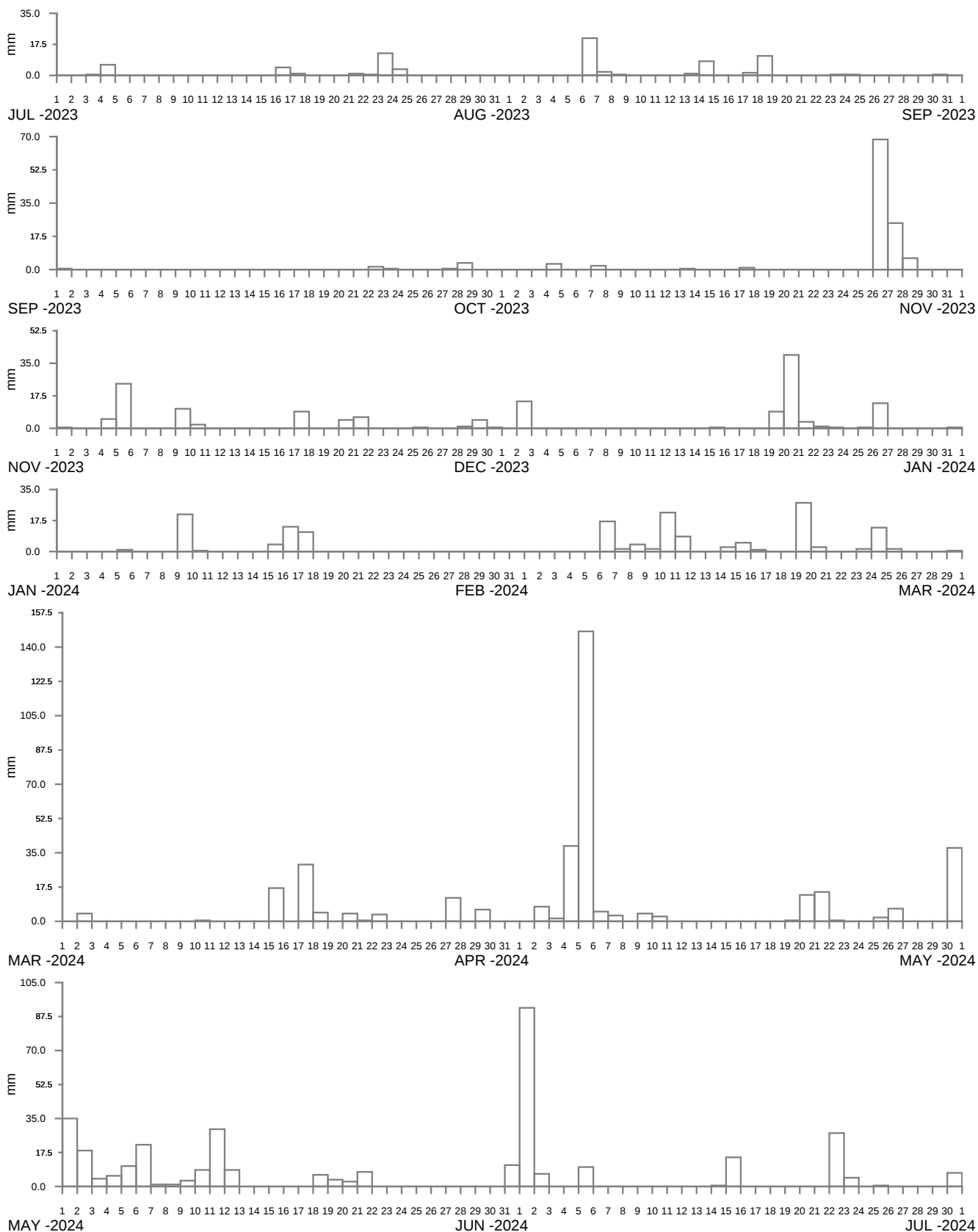
Report MHL3066
Figure
4-30

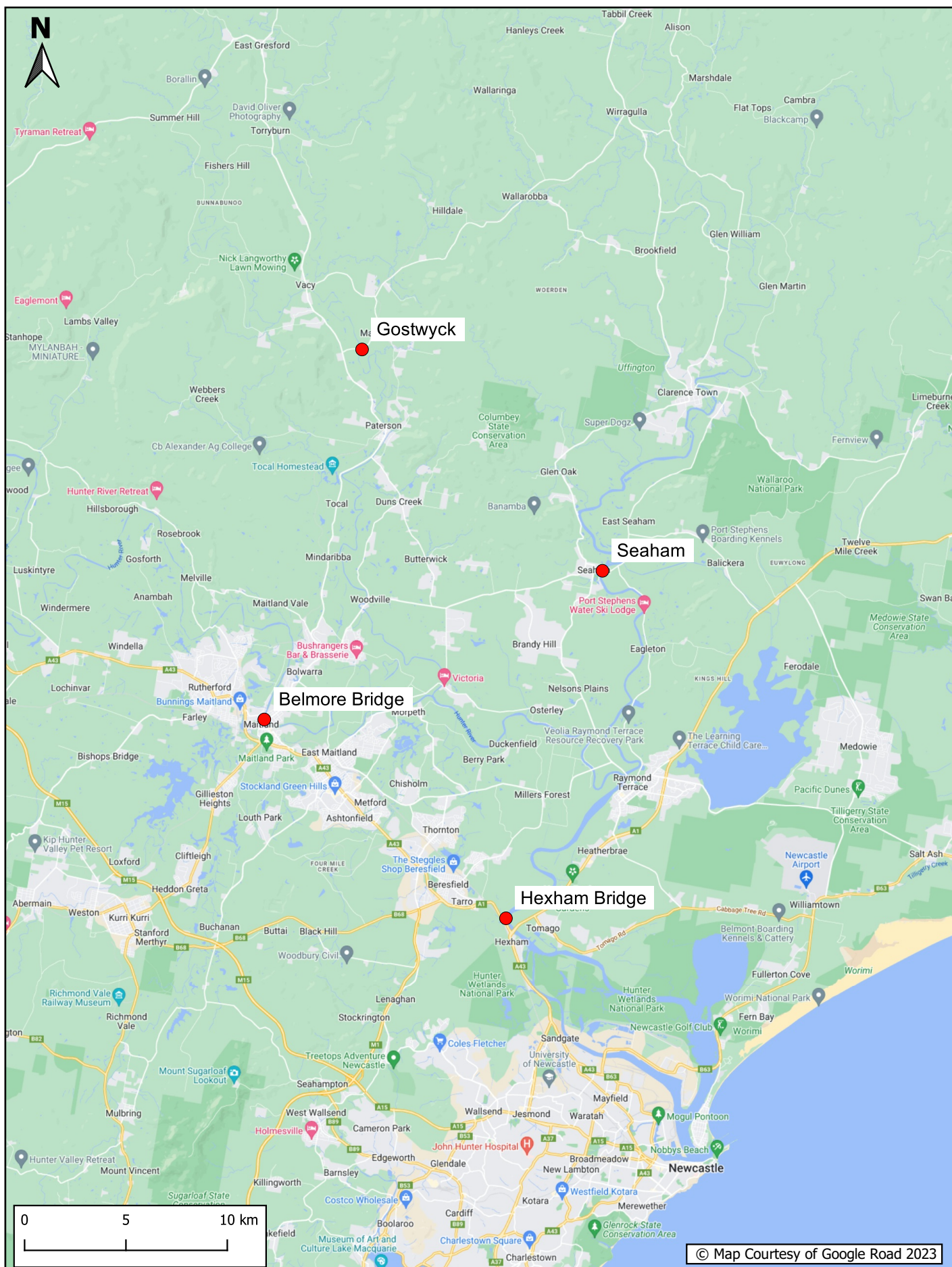


TARBUCK BAY AT SMITHS LAKE 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-31





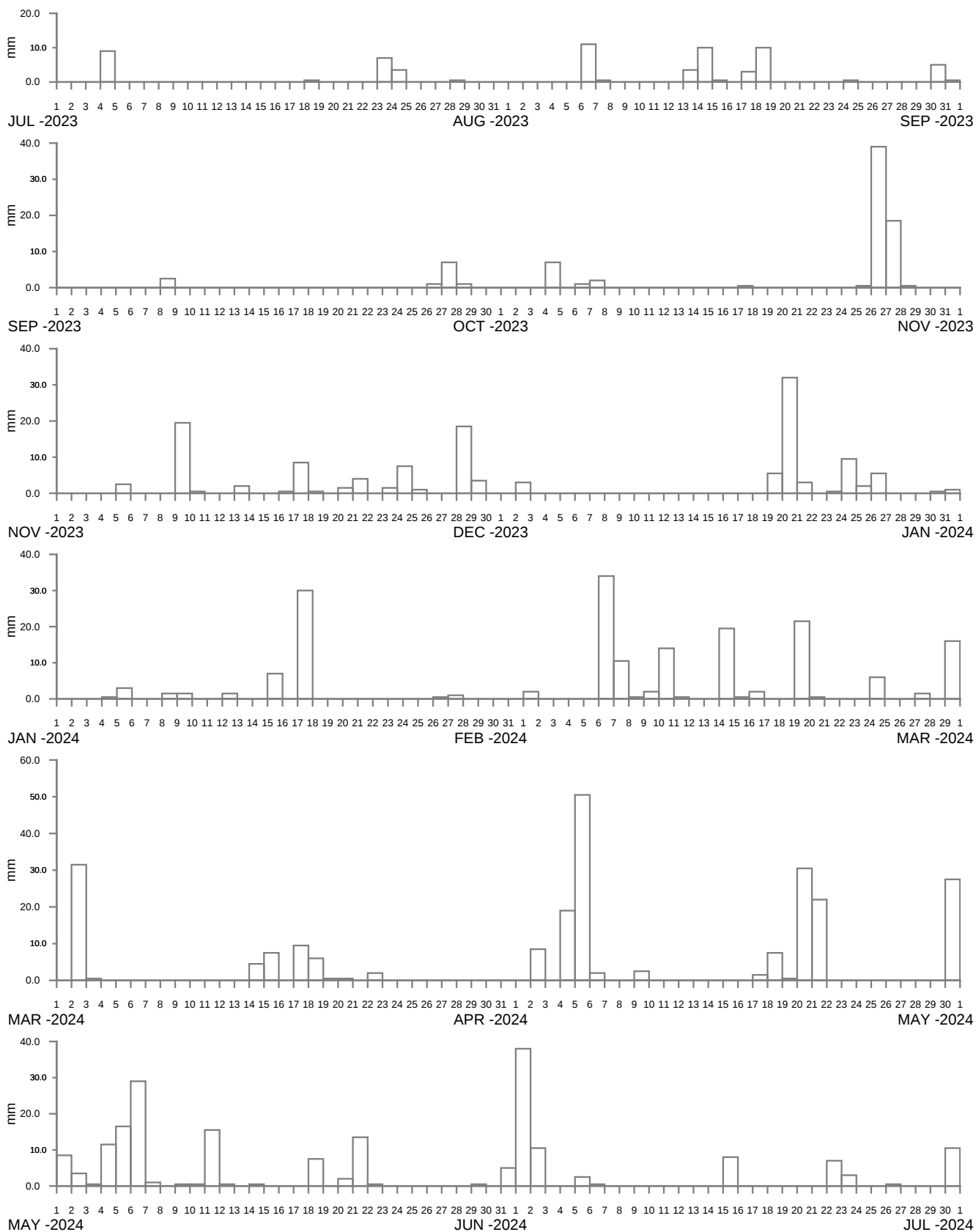
© Map Courtesy of Google Road 2023



RAINFALL STATION LOCATIONS HUNTER RIVER REGION

**Manly
Hydraulics
Laboratory**

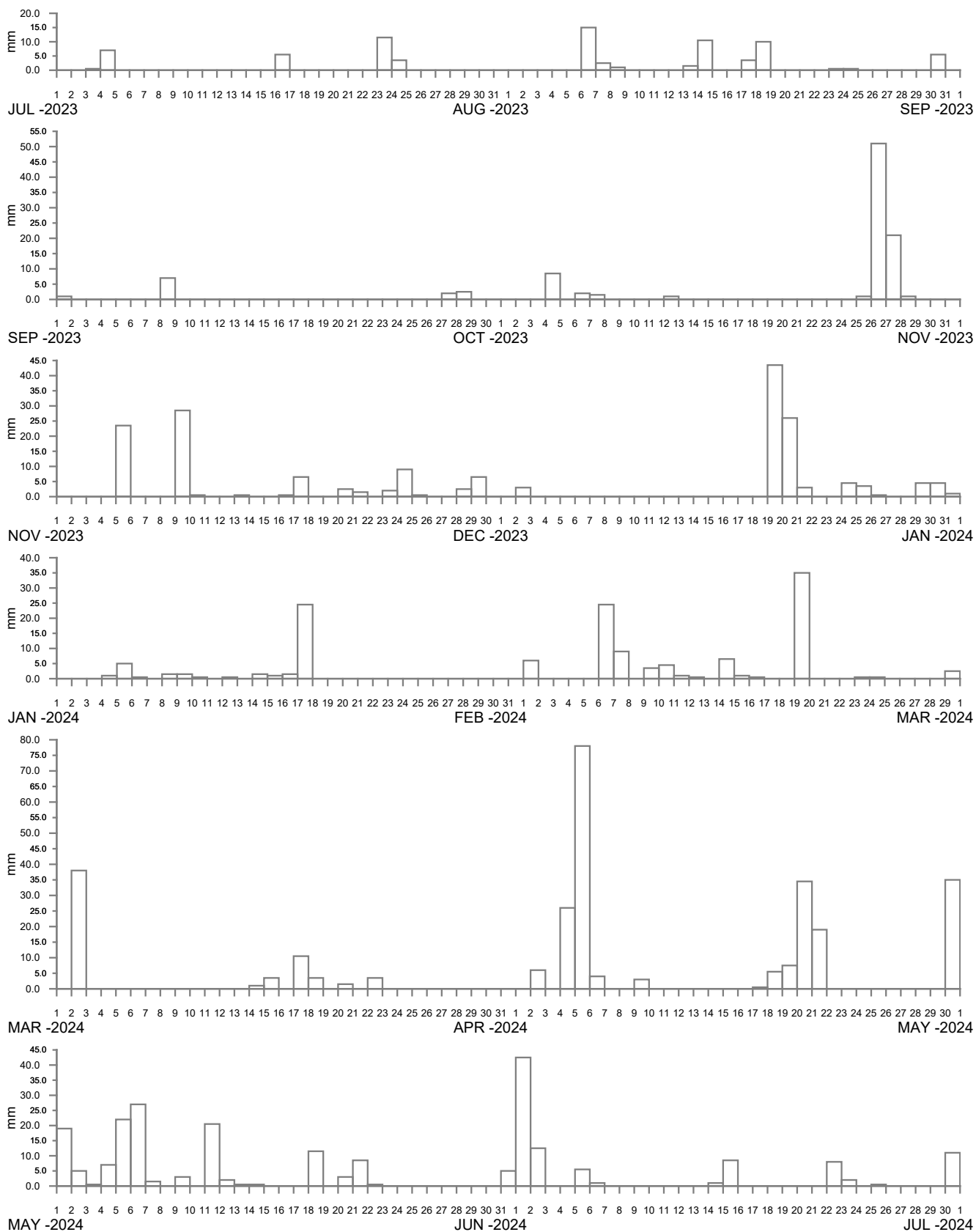
Report MHL3066
Figure
4-33

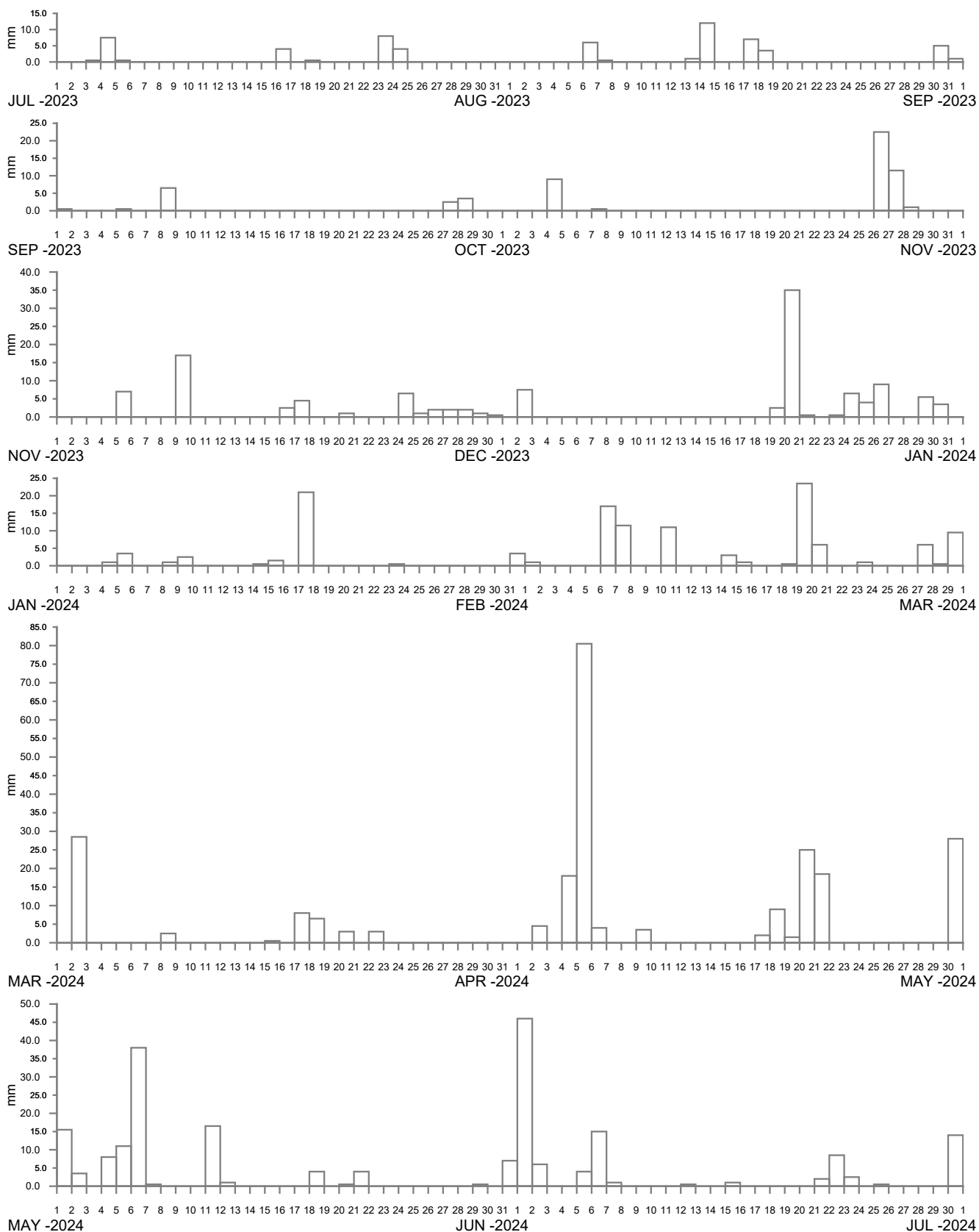


GOSTWYCK AT PATERSON RIVER 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-34

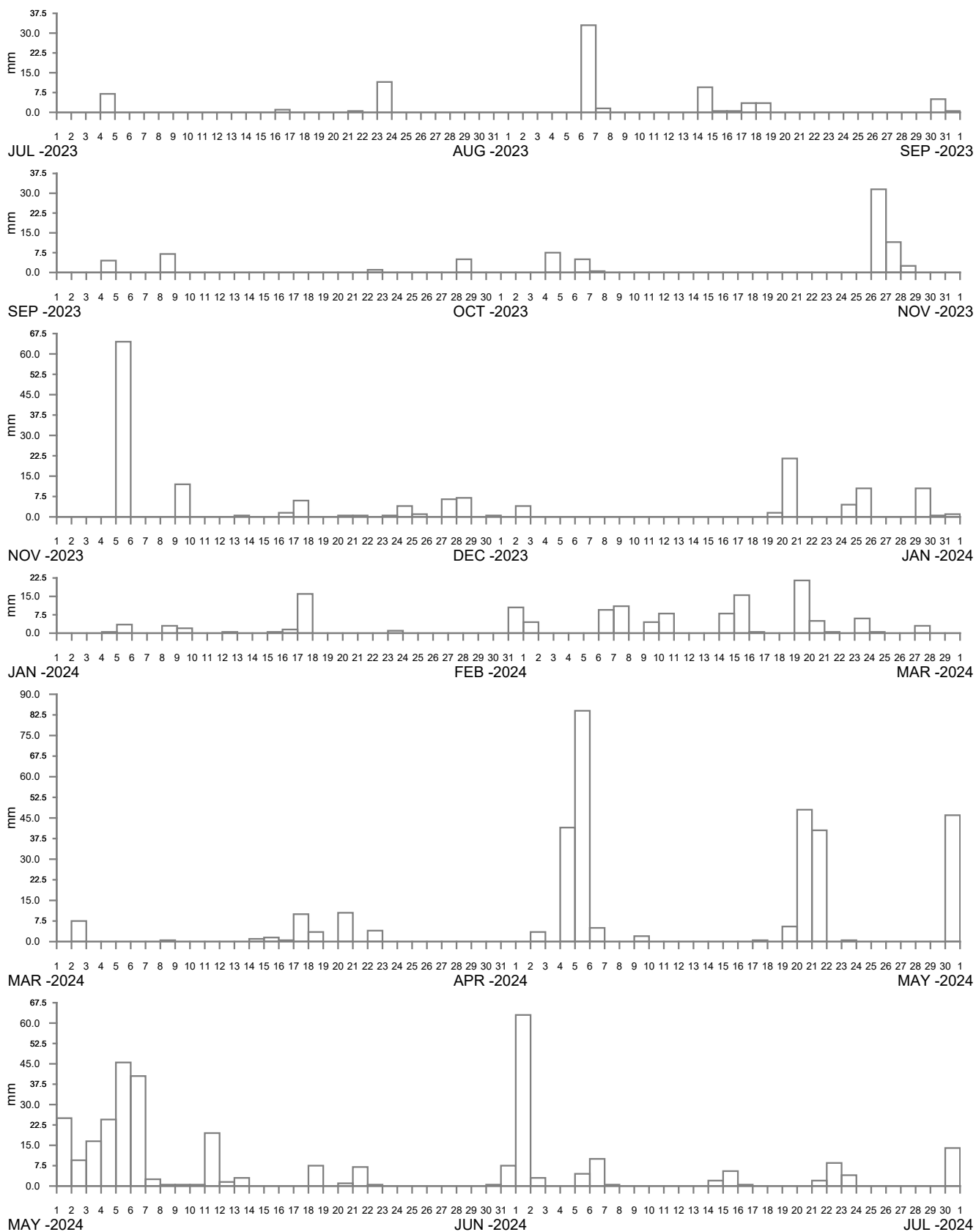




BELMORE BRIDGE AT HUNTER RIVER 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-36



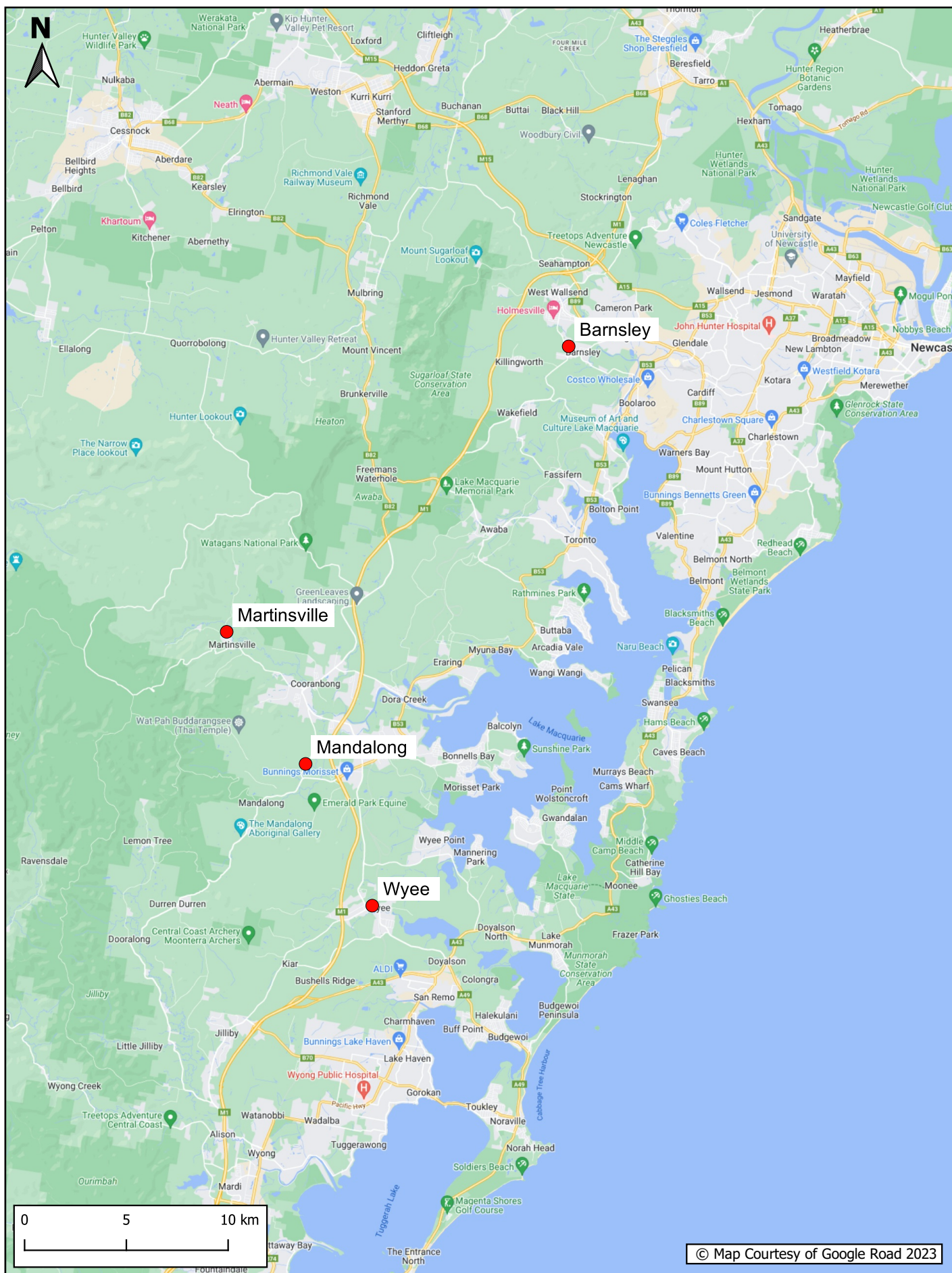
----- DATA LOSS



HEXHAM BRIDGE AT HUNTER RIVER 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-37



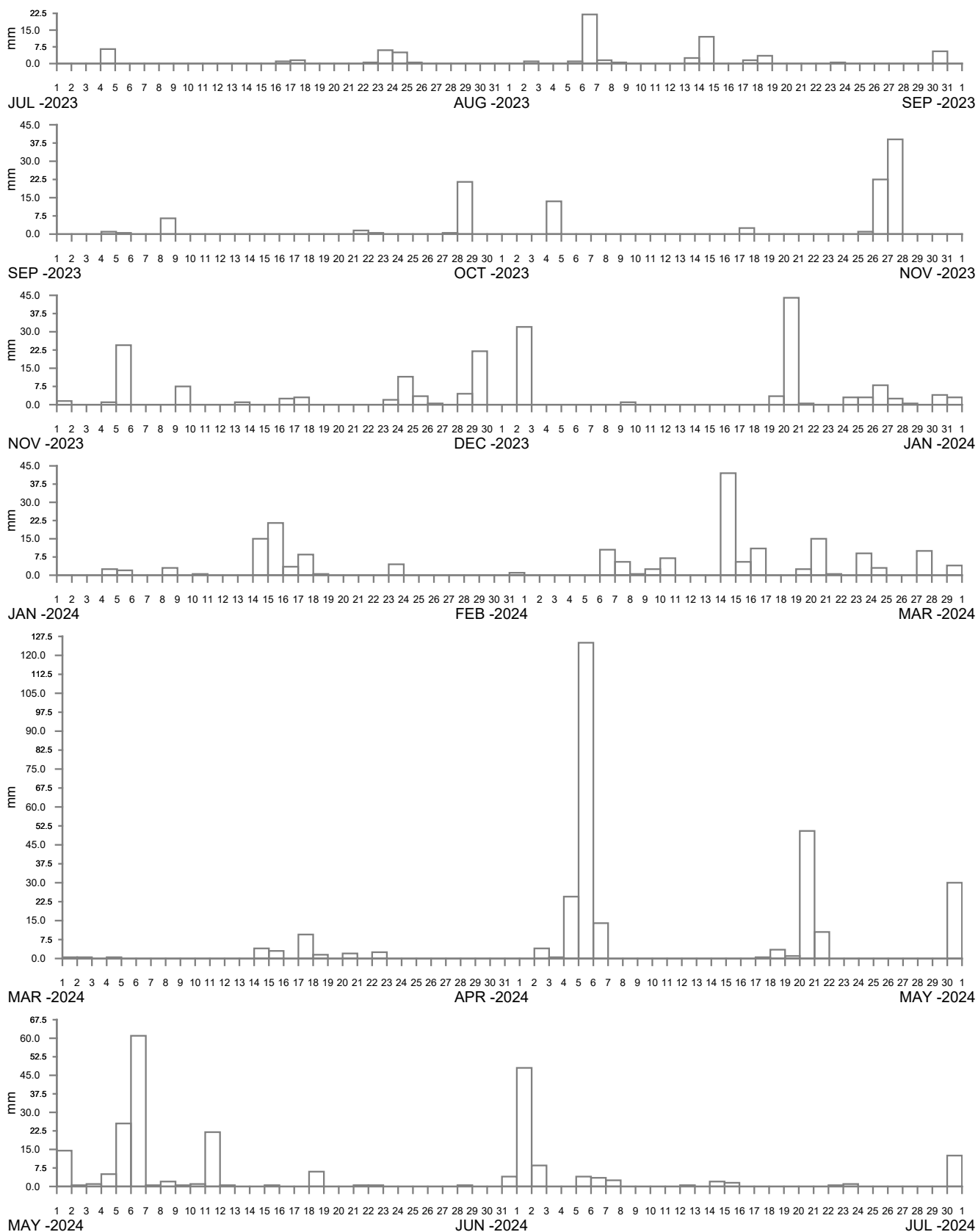
© Map Courtesy of Google Road 2023

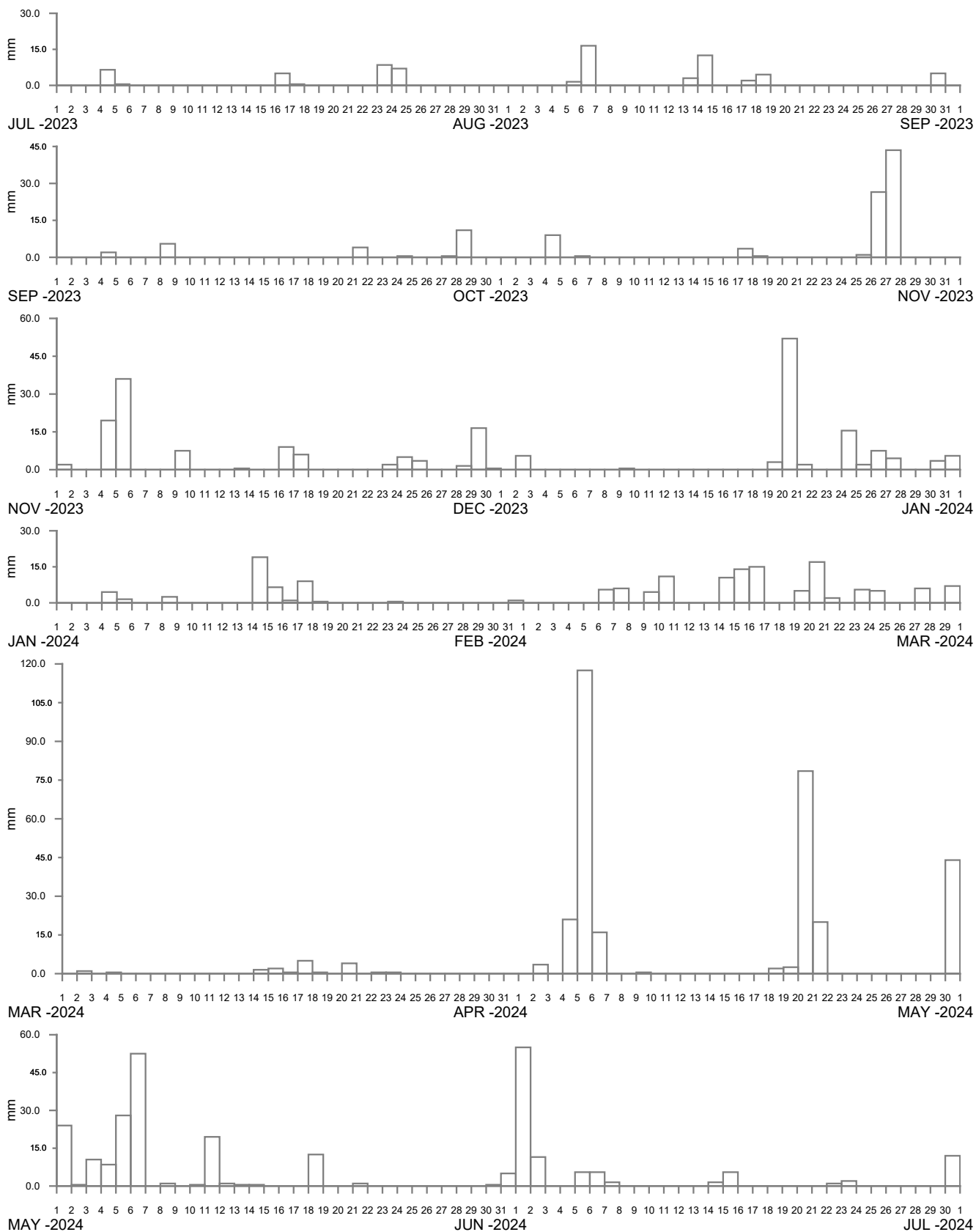


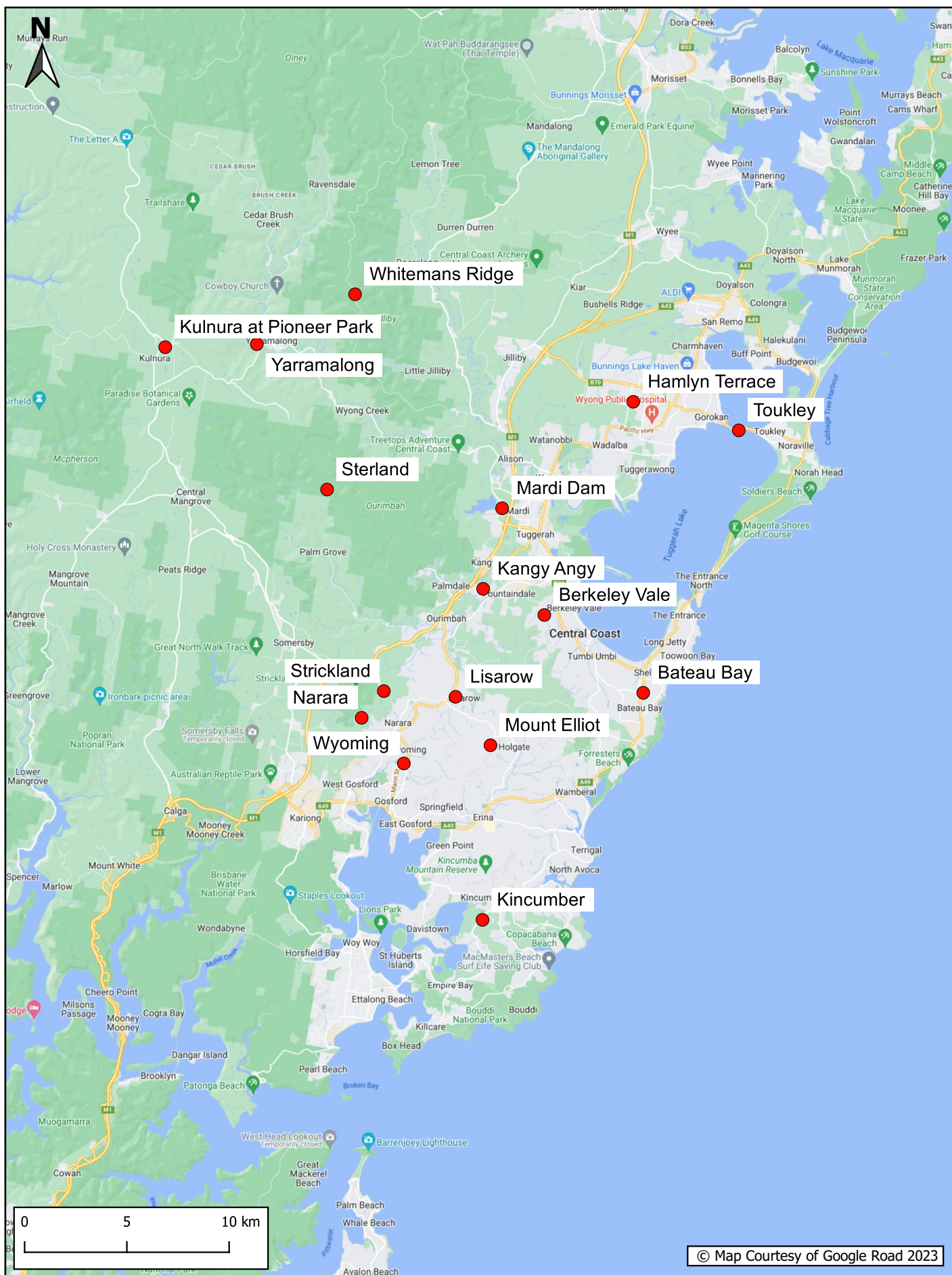
RAINFALL STATION LOCATIONS MACQUARIE-TUGGERAH LAKES (NORTH) REGION

**Manly
Hydraulics
Laboratory**

Report MHL3066
Figure
4-38



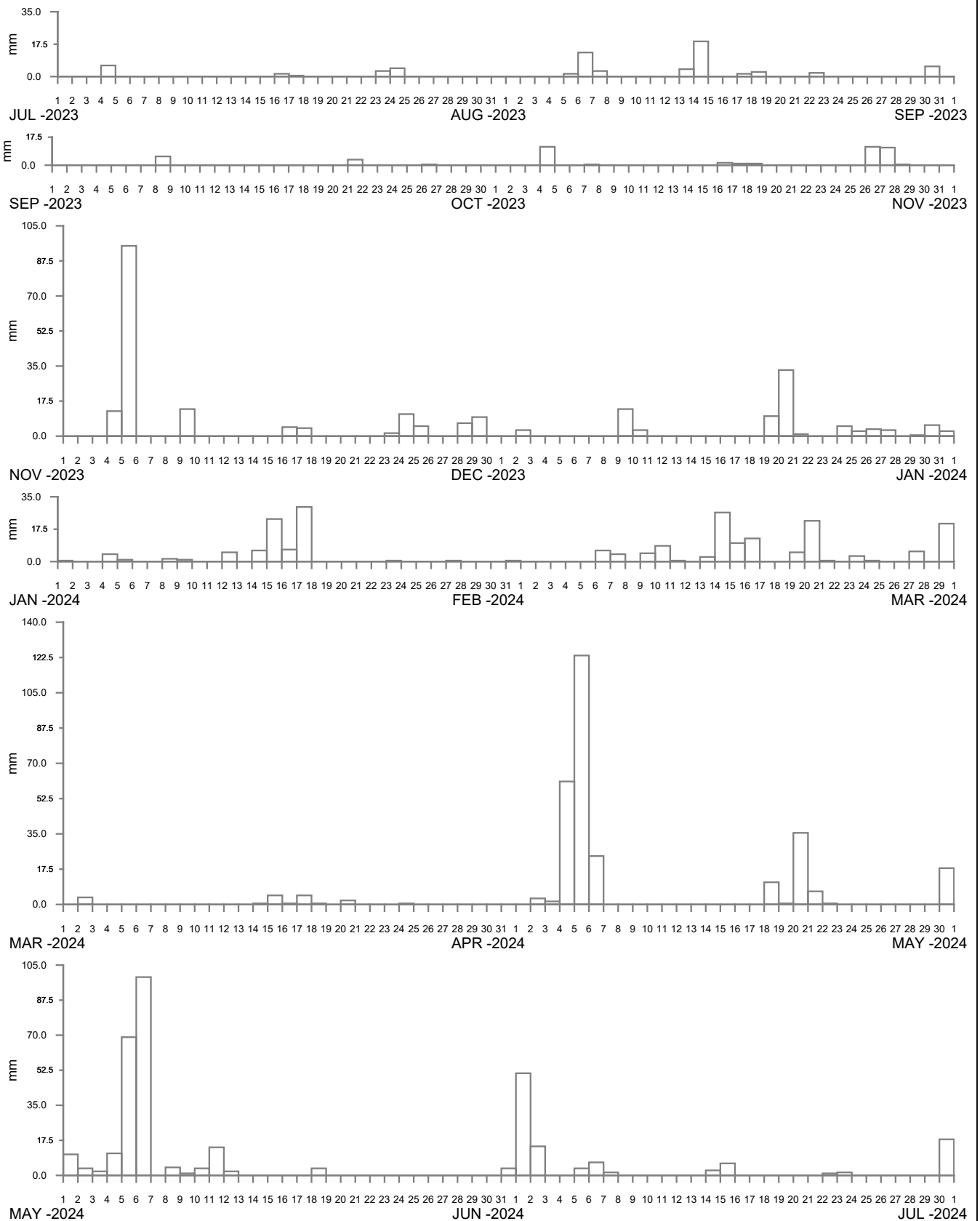




RAINFALL STATION LOCATIONS MACQUARIE-TUGGERAH LAKES (SOUTH) AND BRISBANE WATER REGIONS

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-43



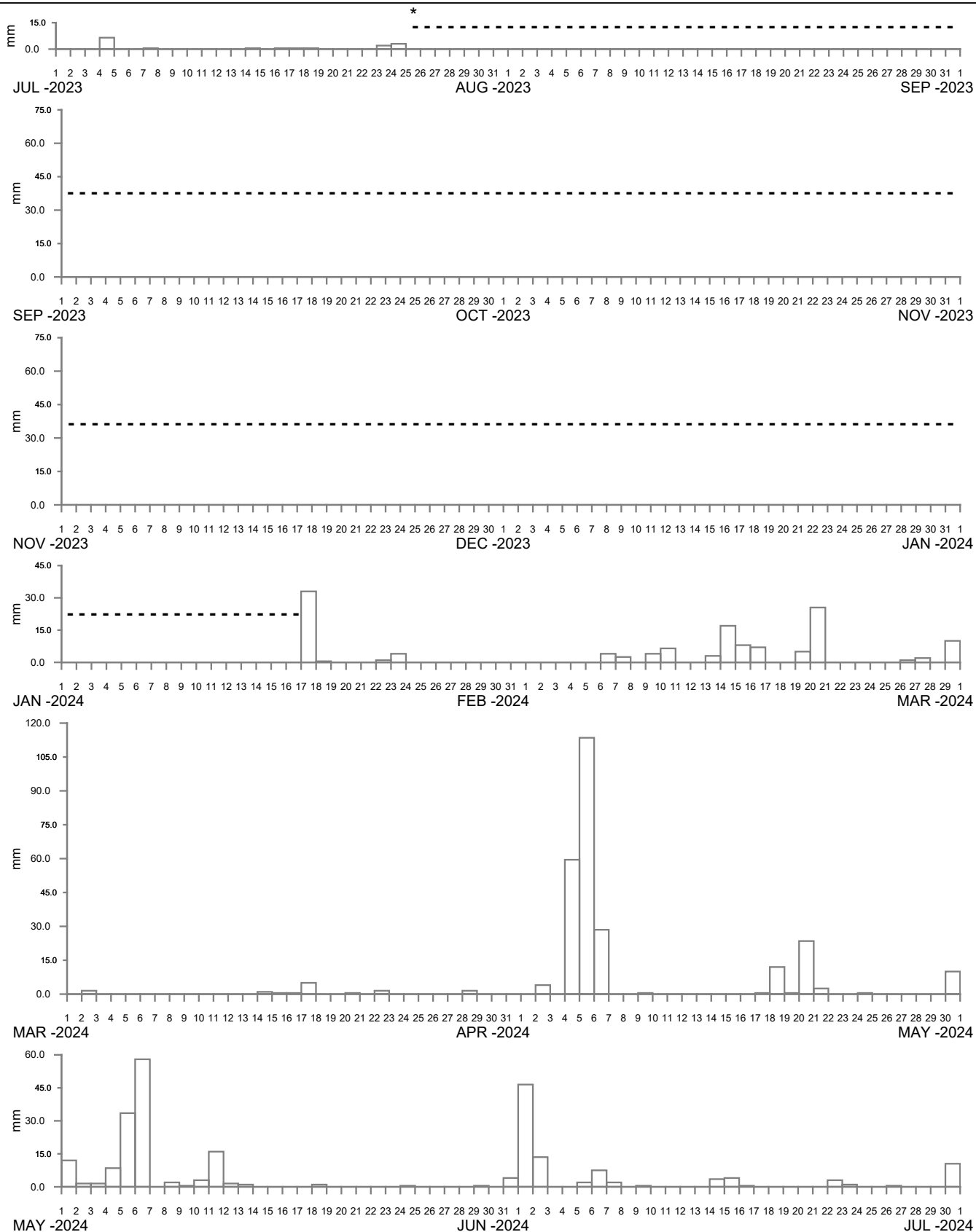
----- DATA LOSS



WHITEMANS RIDGE AT WATAGANS FOREST DRIVE 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-44



----- DATA LOSS

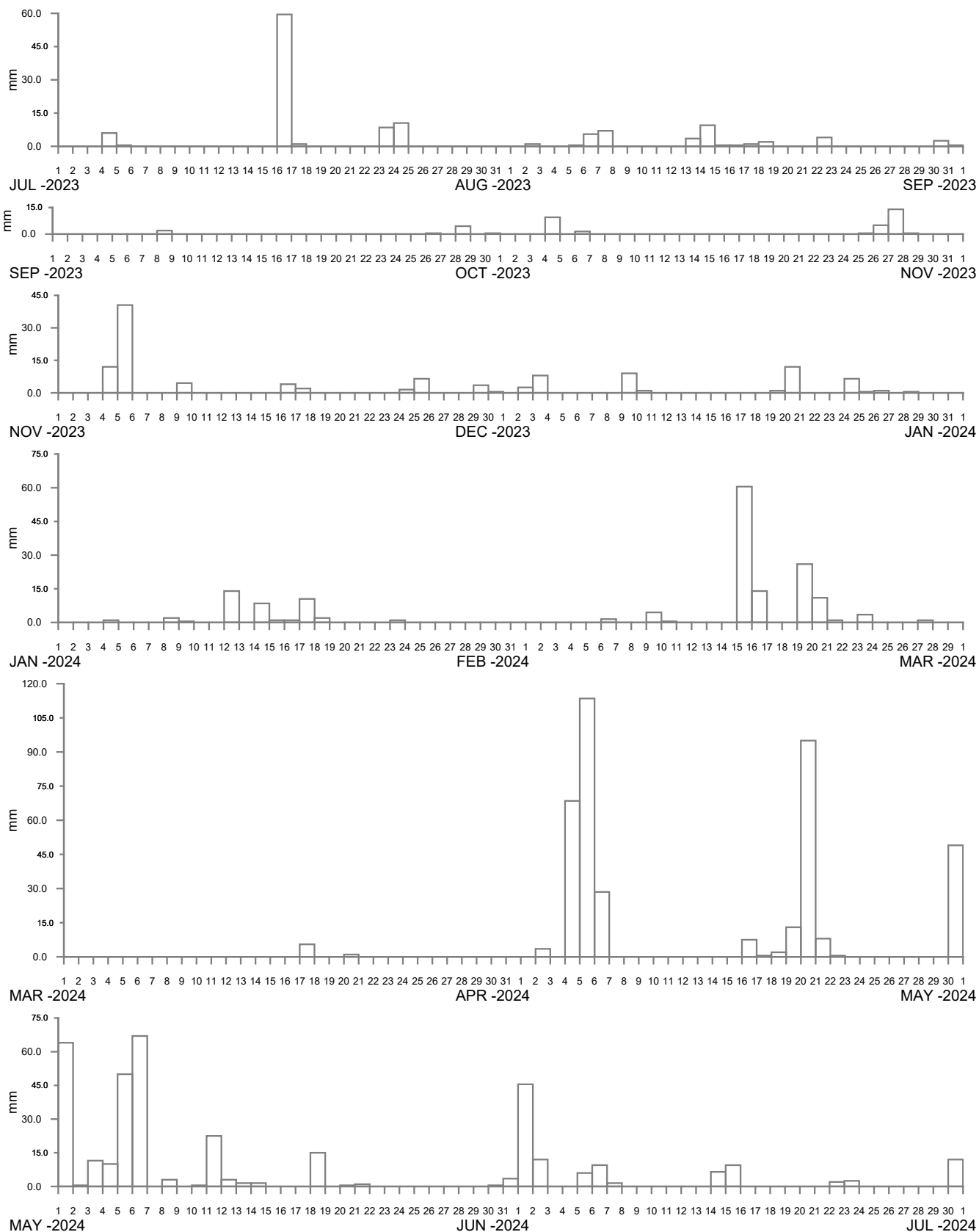
*Data loss due to tipping mechanism failure



YARRAMALONG AT BUMBLE HILL ROAD
2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-45



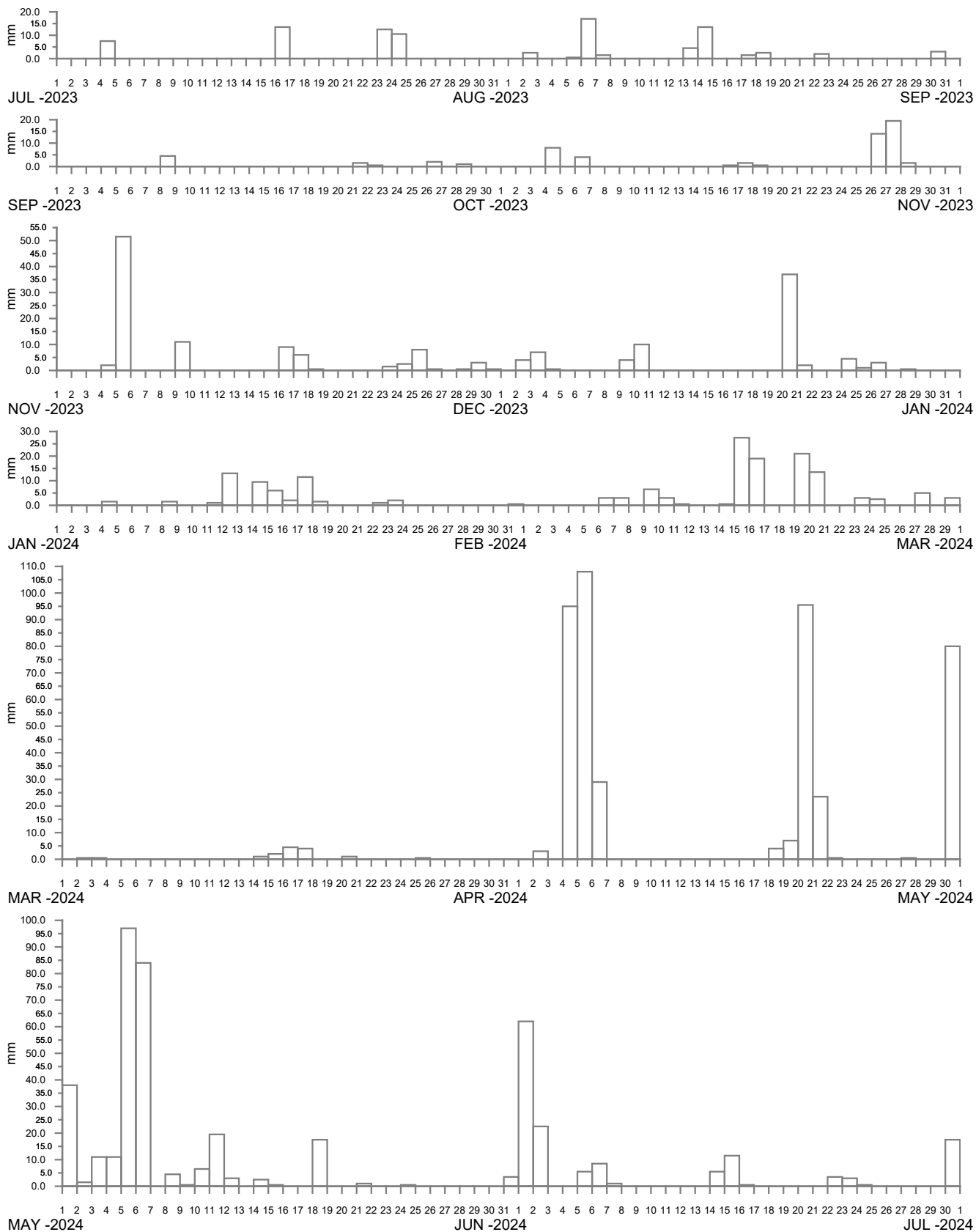
----- DATA LOSS



TOUKLEY AT TUGGERAH LAKE 2023-24

Manly
Hydraulics
Laboratory

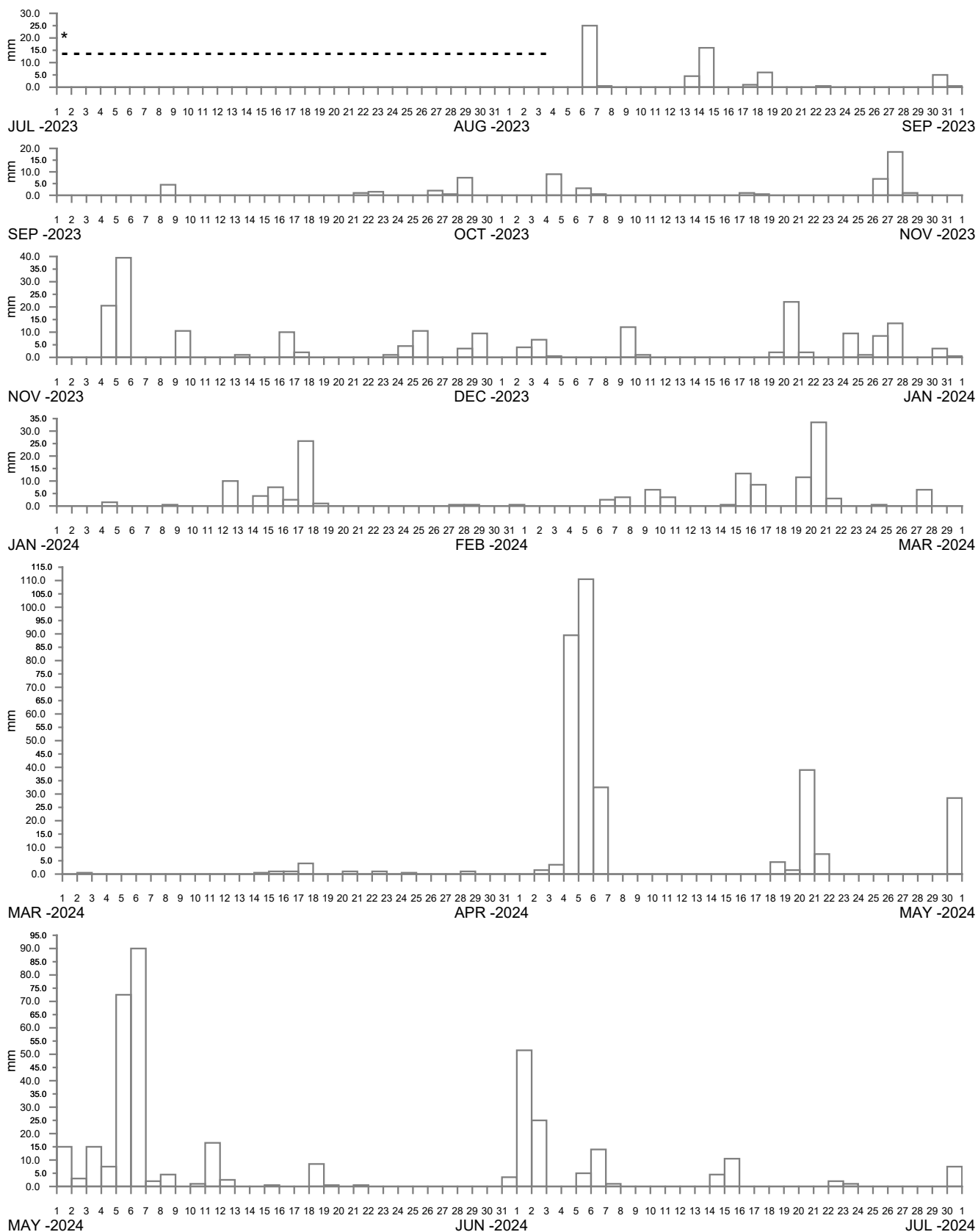
Report MHL3066
Figure
4-47



HAMLYN TERRACE AT WARNERVALE ROAD 2023-24

Manly
Hydraulics
Laboratory

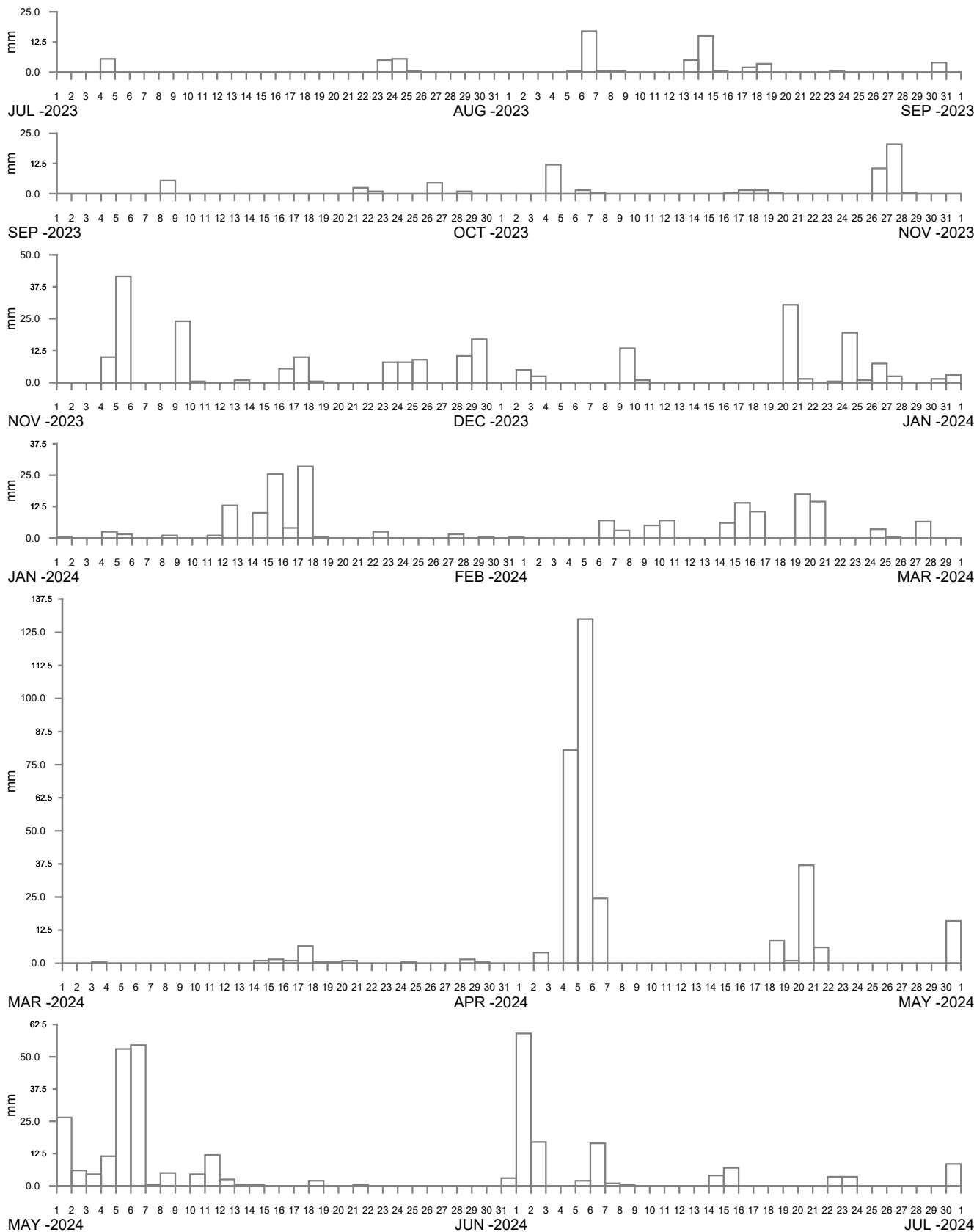
Report MHL3066
Figure
4-48



MARDI DAM AT OLD MAITLAND ROAD 2023-24

Manly
Hydraulics
Laboratory

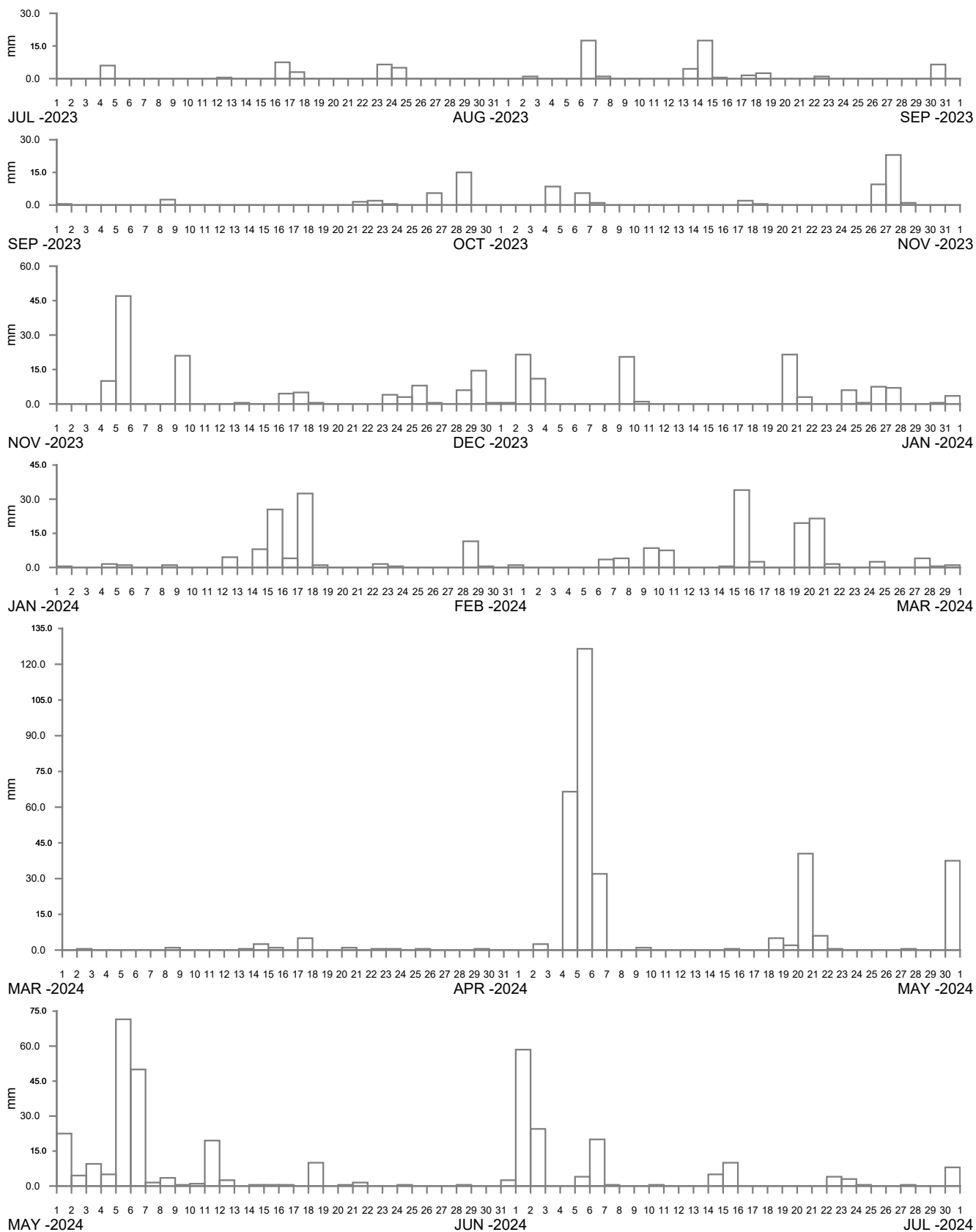
Report MHL3066
Figure
4-49

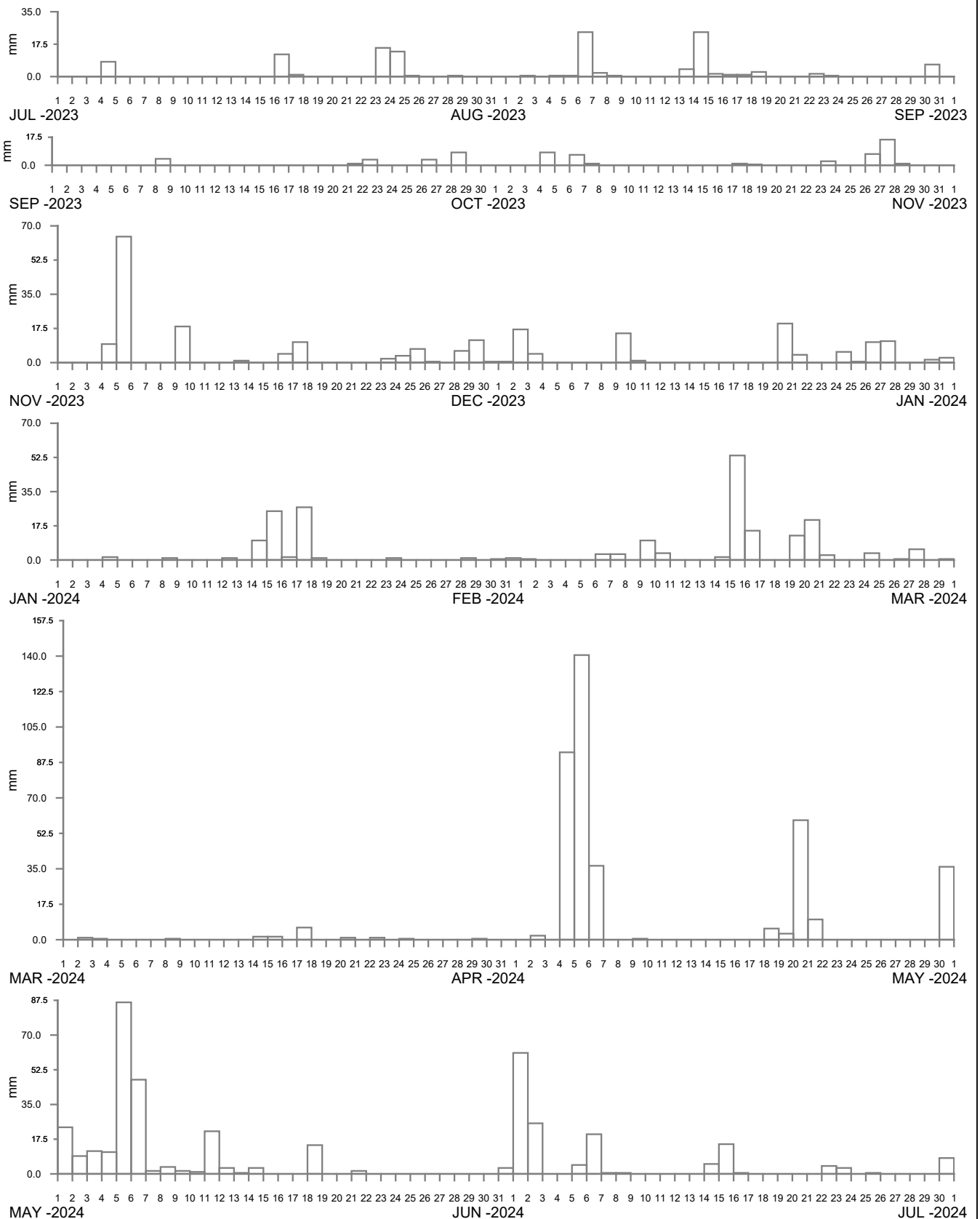


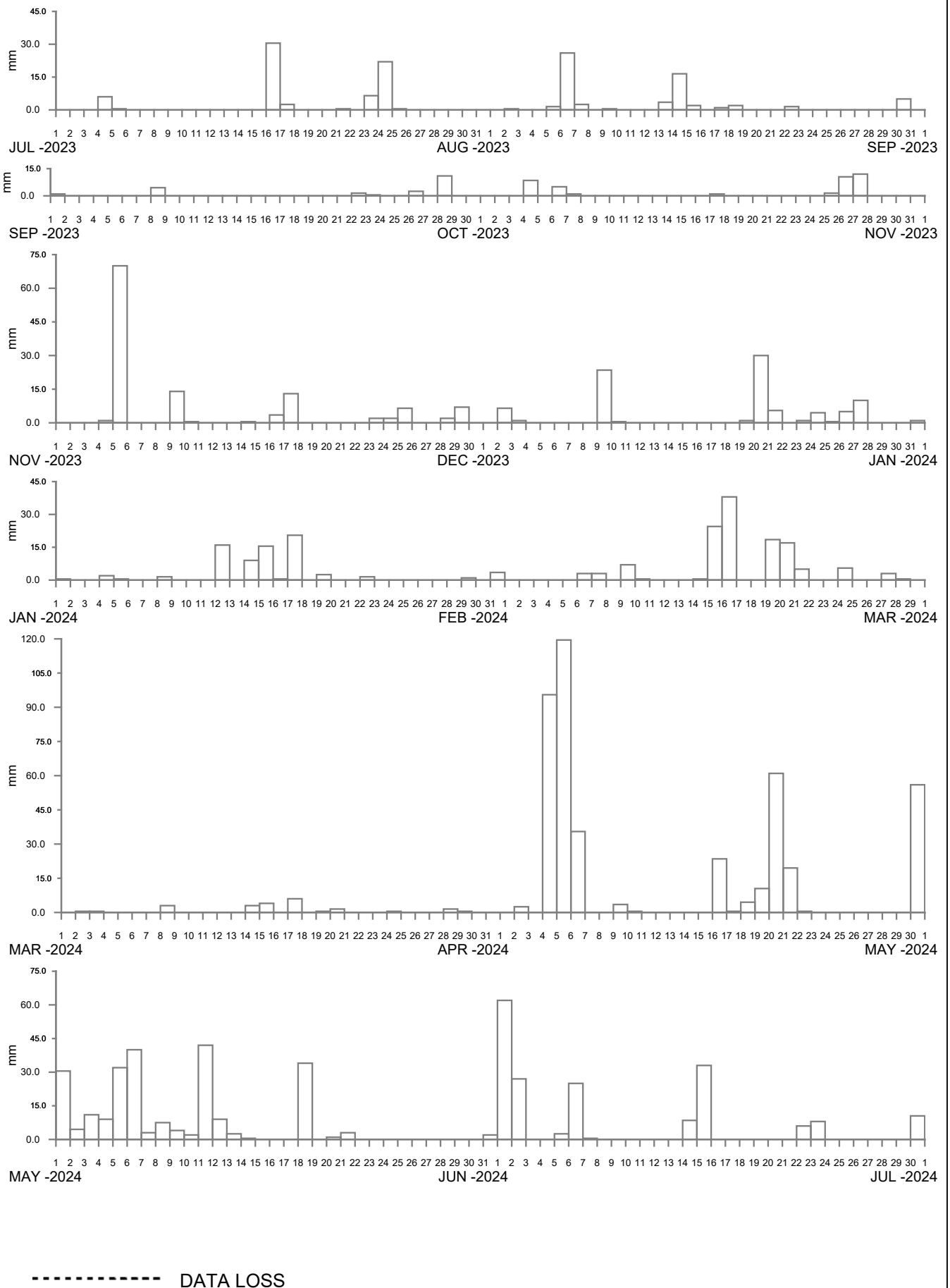
STERLAND AT RED HILL FOREST ROAD 2023-24

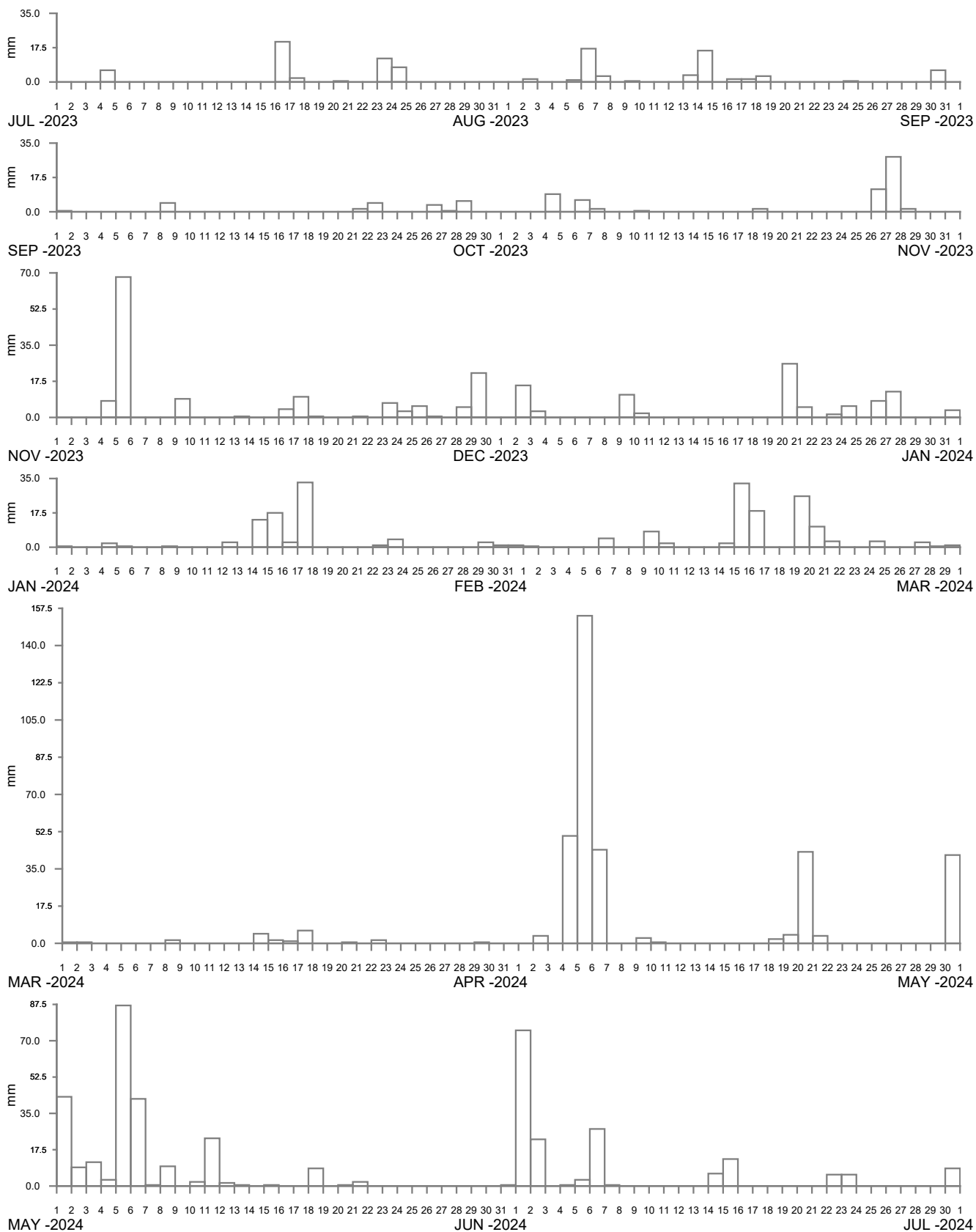
Manly
Hydraulics
Laboratory

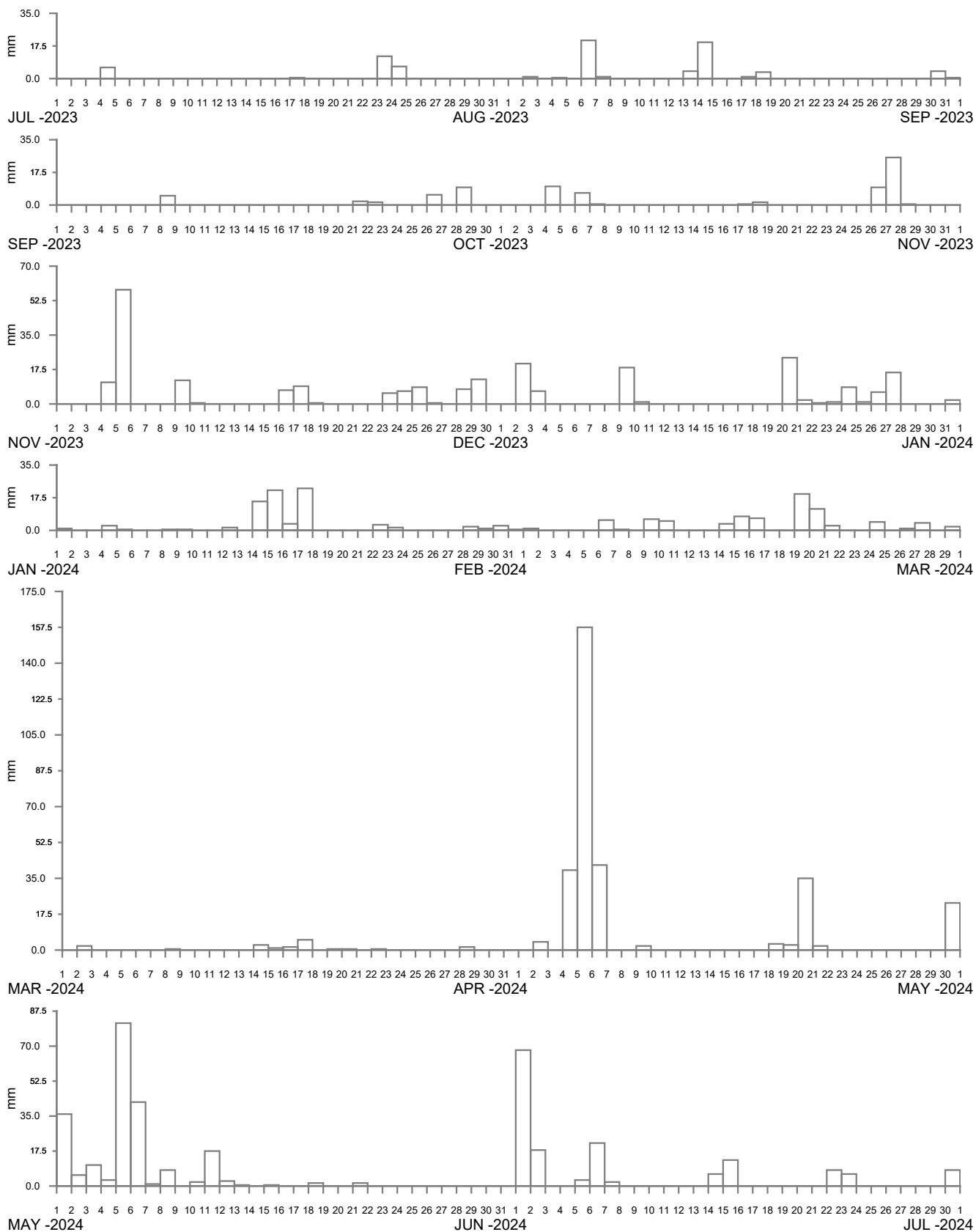
Report MHL3066
Figure
4-50











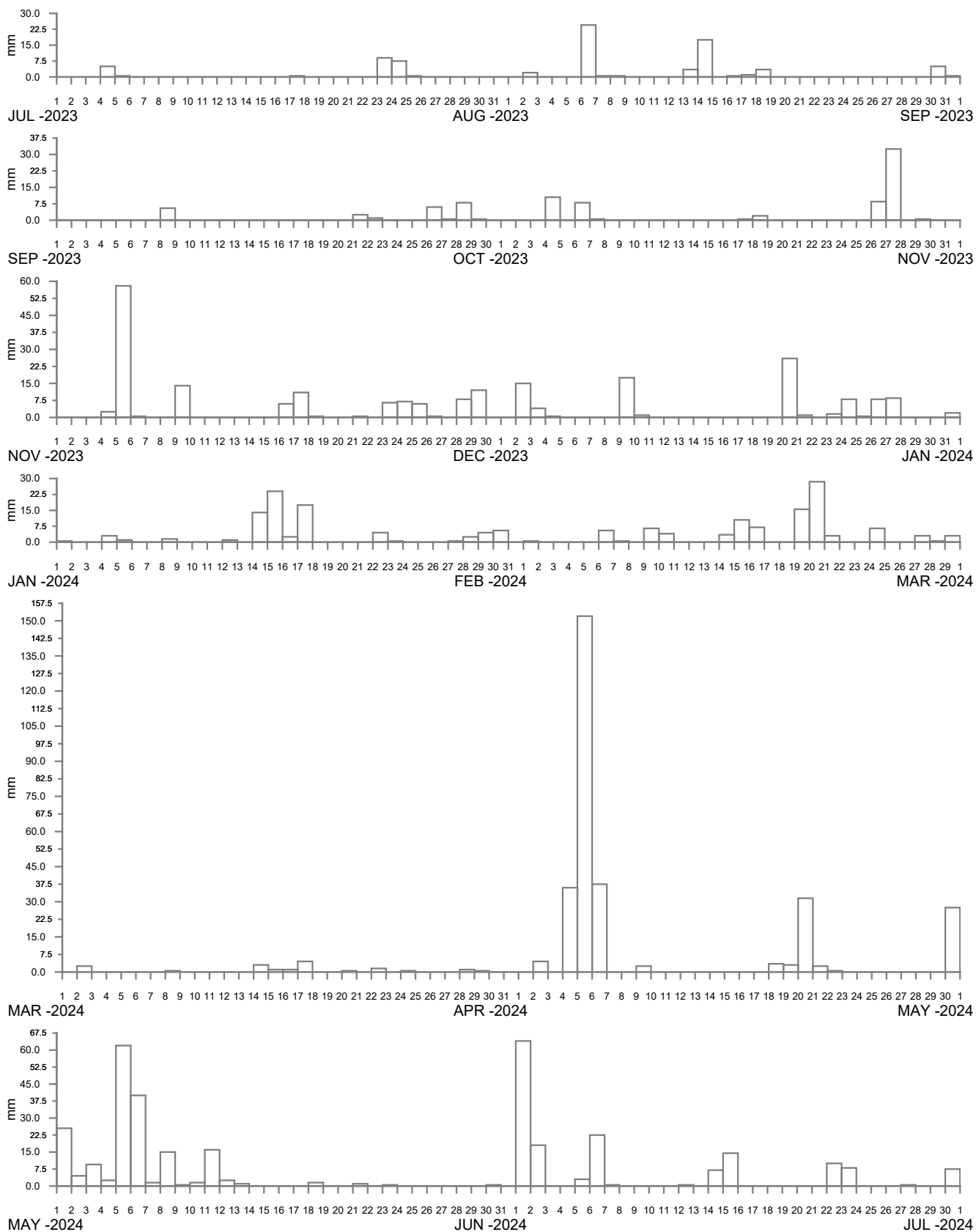
----- DATA LOSS



STRICKLAND AT MANGROVE ROAD 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-55



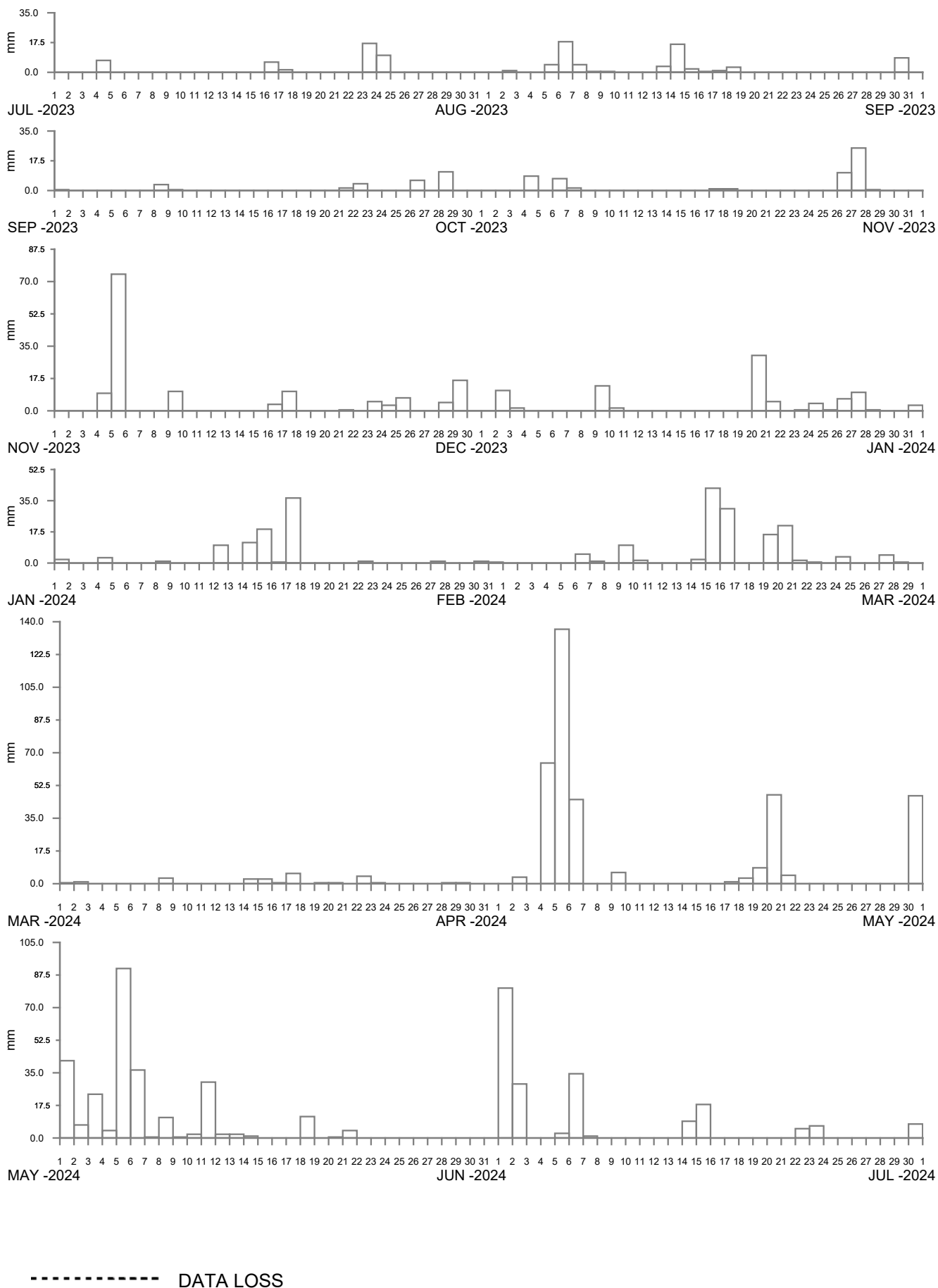
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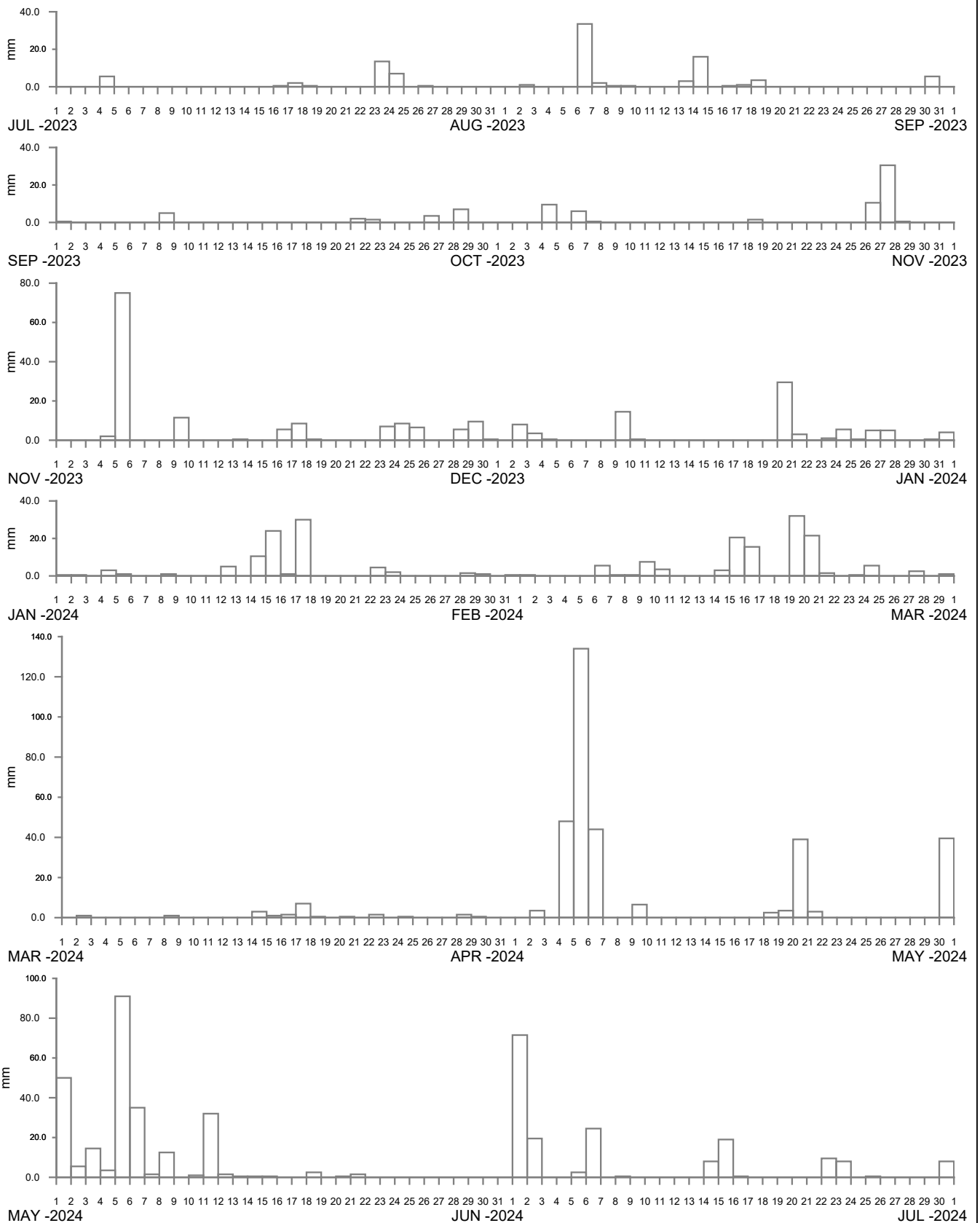


NARARA AT RESEARCH ROAD
2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-56

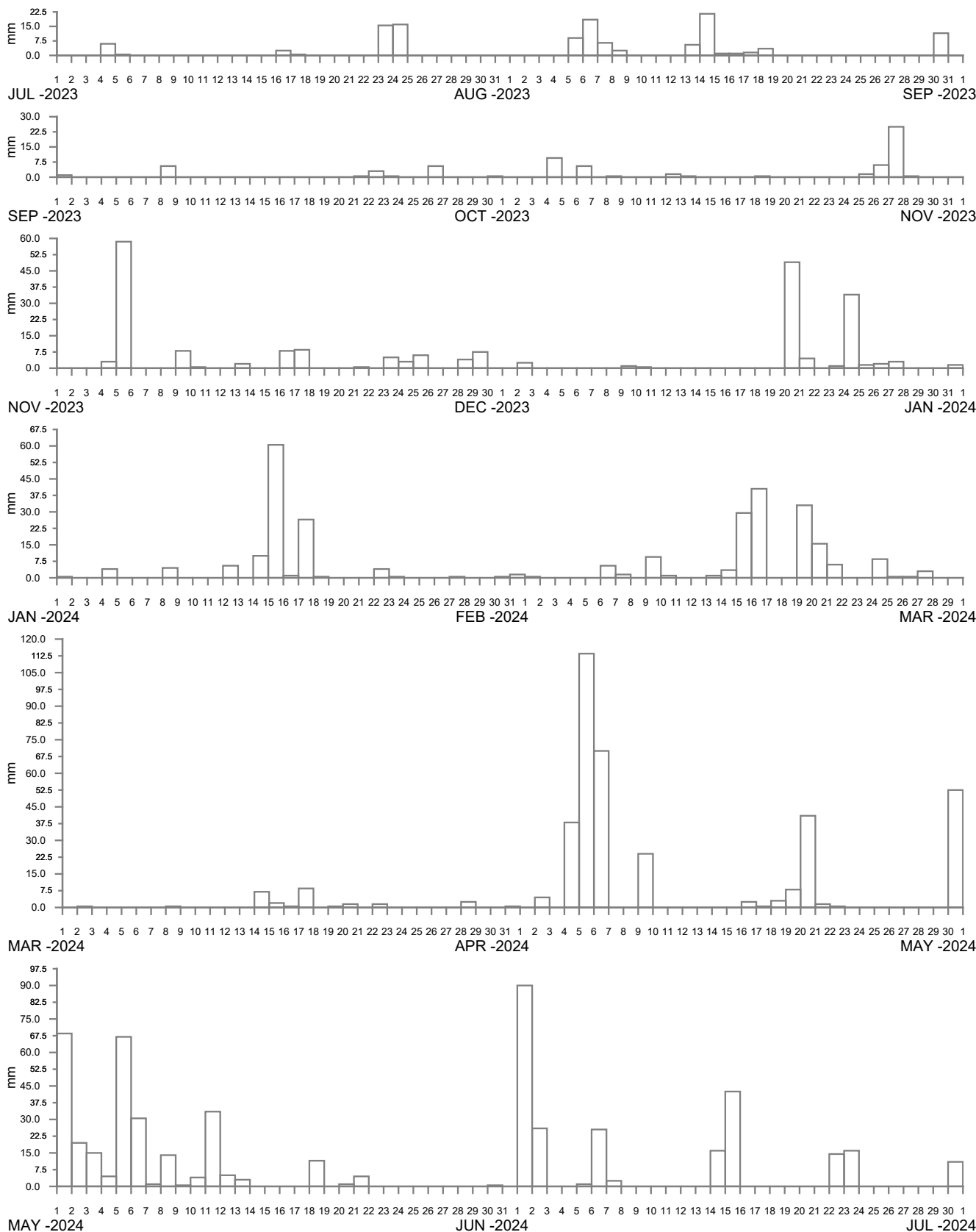




WYOMING AT LAYCOCK STREET 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-58



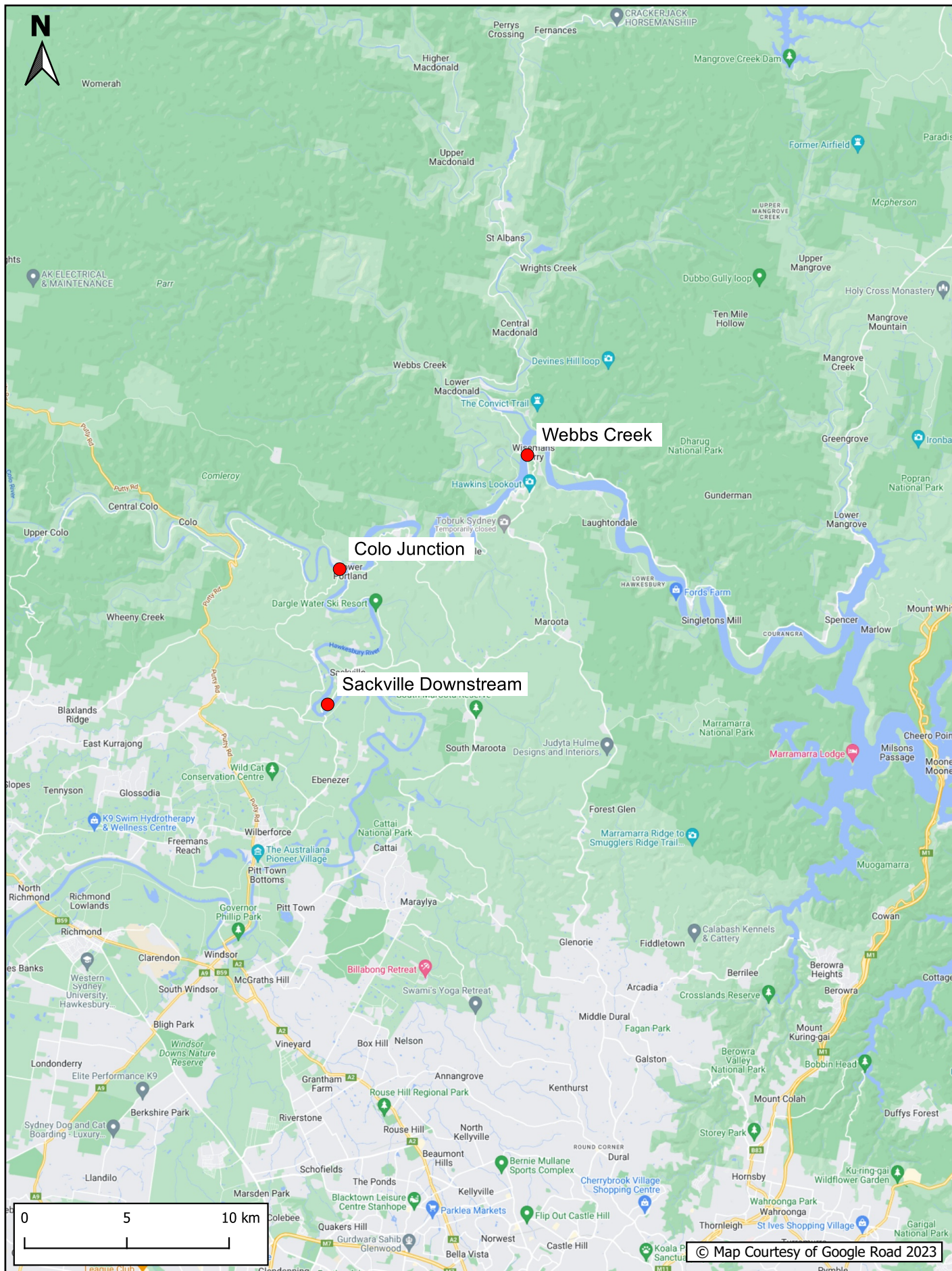
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KINCUMBER AT DOYLE STREET 2023-24

Manly
Hydraulics
Laboratory

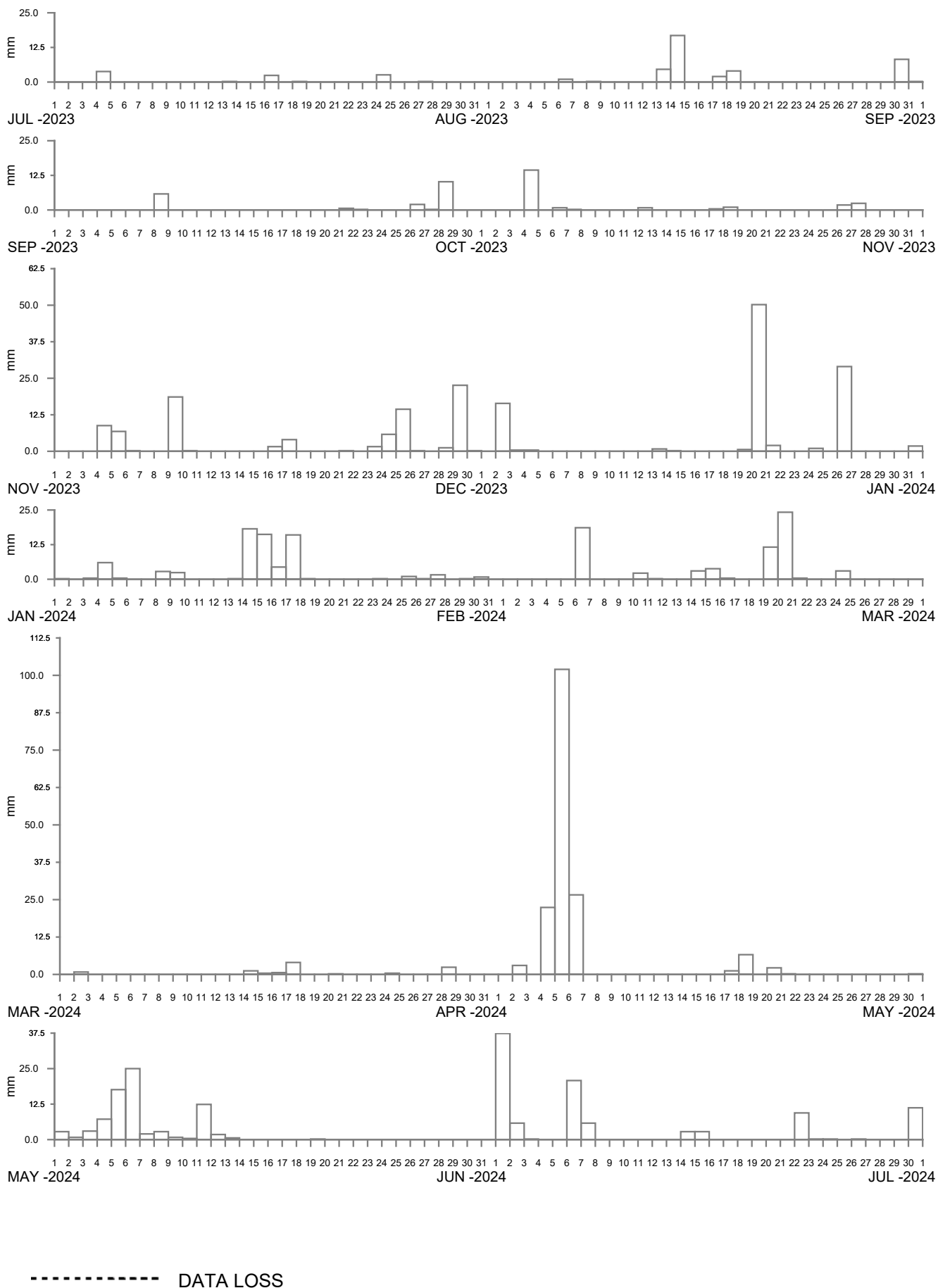
Report MHL3066
Figure
4-59



RAINFALL STATION LOCATIONS HAWKESBURY RIVER REGION

**Manly
Hydraulics
Laboratory**

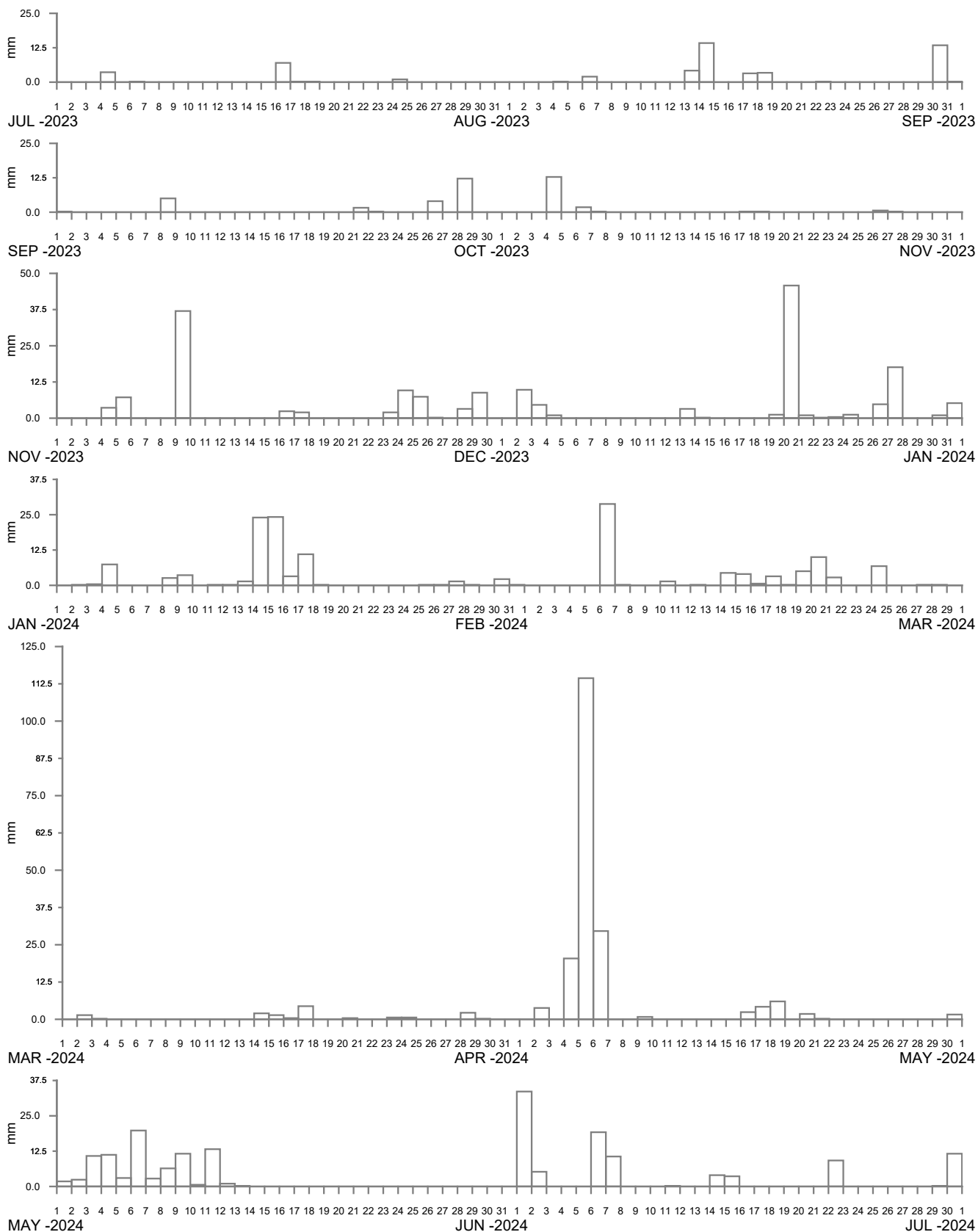
Report MHL3066
Figure
4-60



WEBBS CREEK AT HAWKESBURY RIVER 2023-24

Manly
Hydraulics
Laboratory

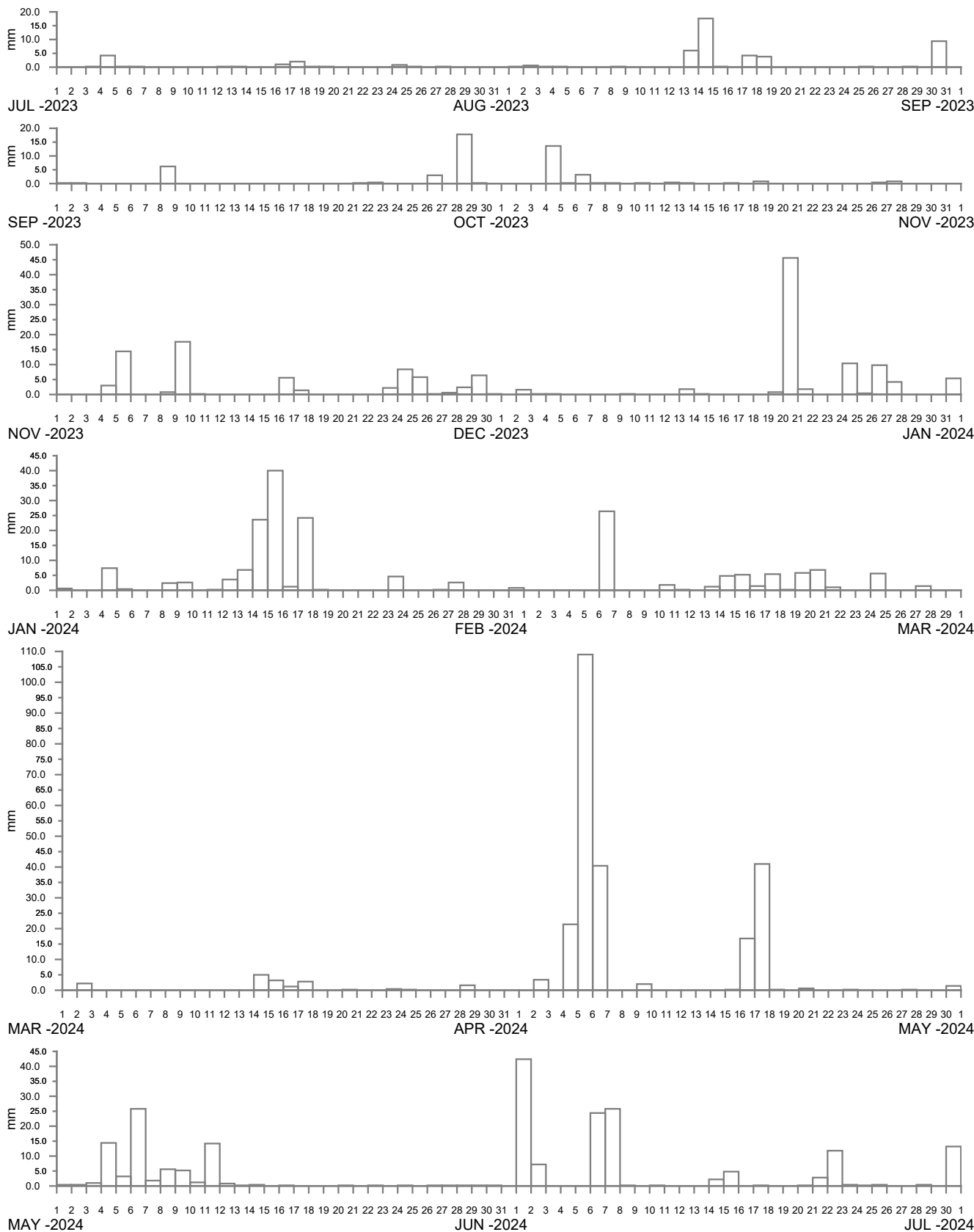
Report MHL3066
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4-61



COLO JUNCTION AT HAWKESBURY RIVER 2023-24

Manly
Hydraulics
Laboratory

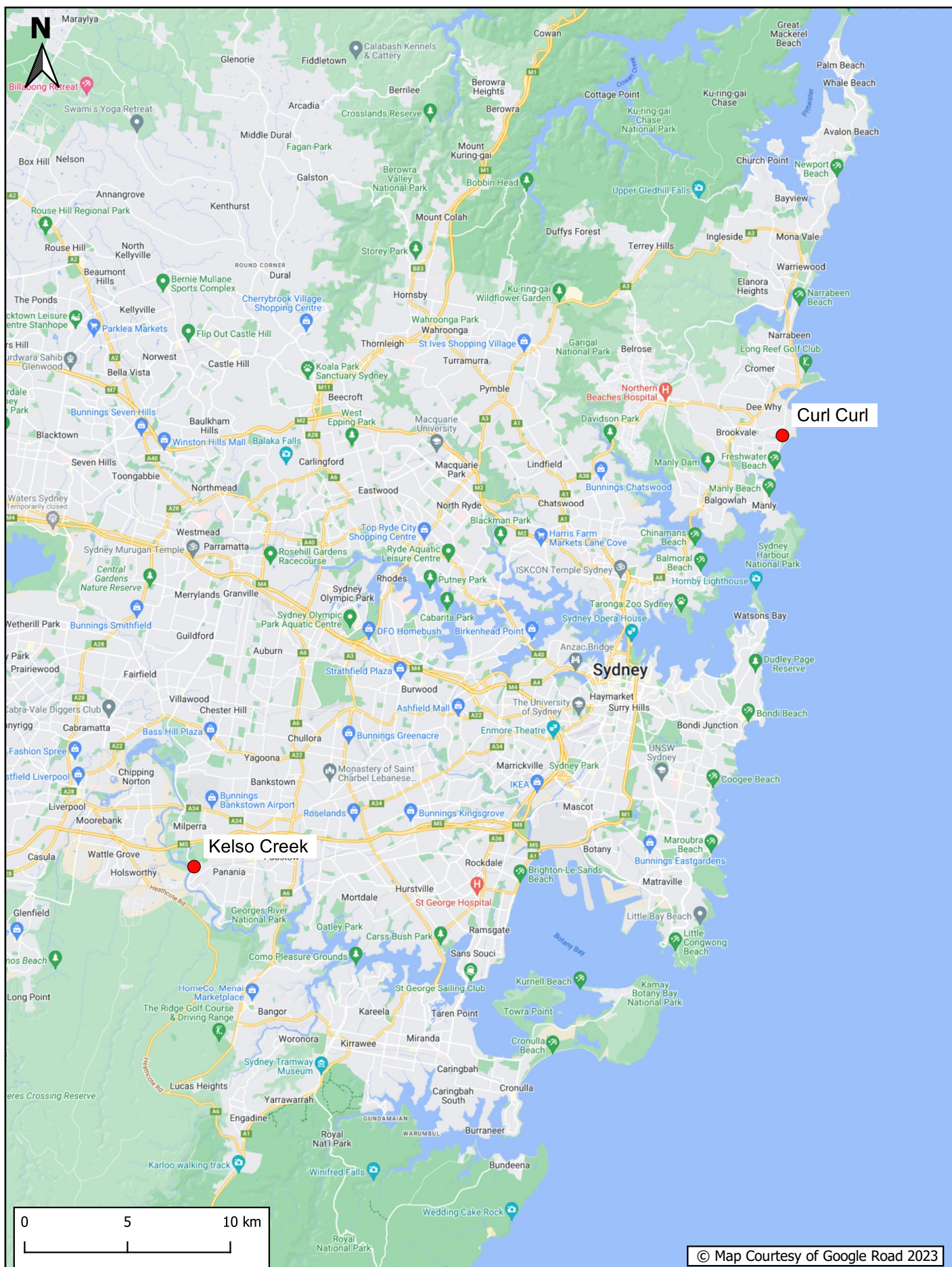
Report MHL3066
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4-62



SACKVILLE DOWNSTREAM AT HAWKESBURY RIVER 2023-24

Manly
Hydraulics
Laboratory

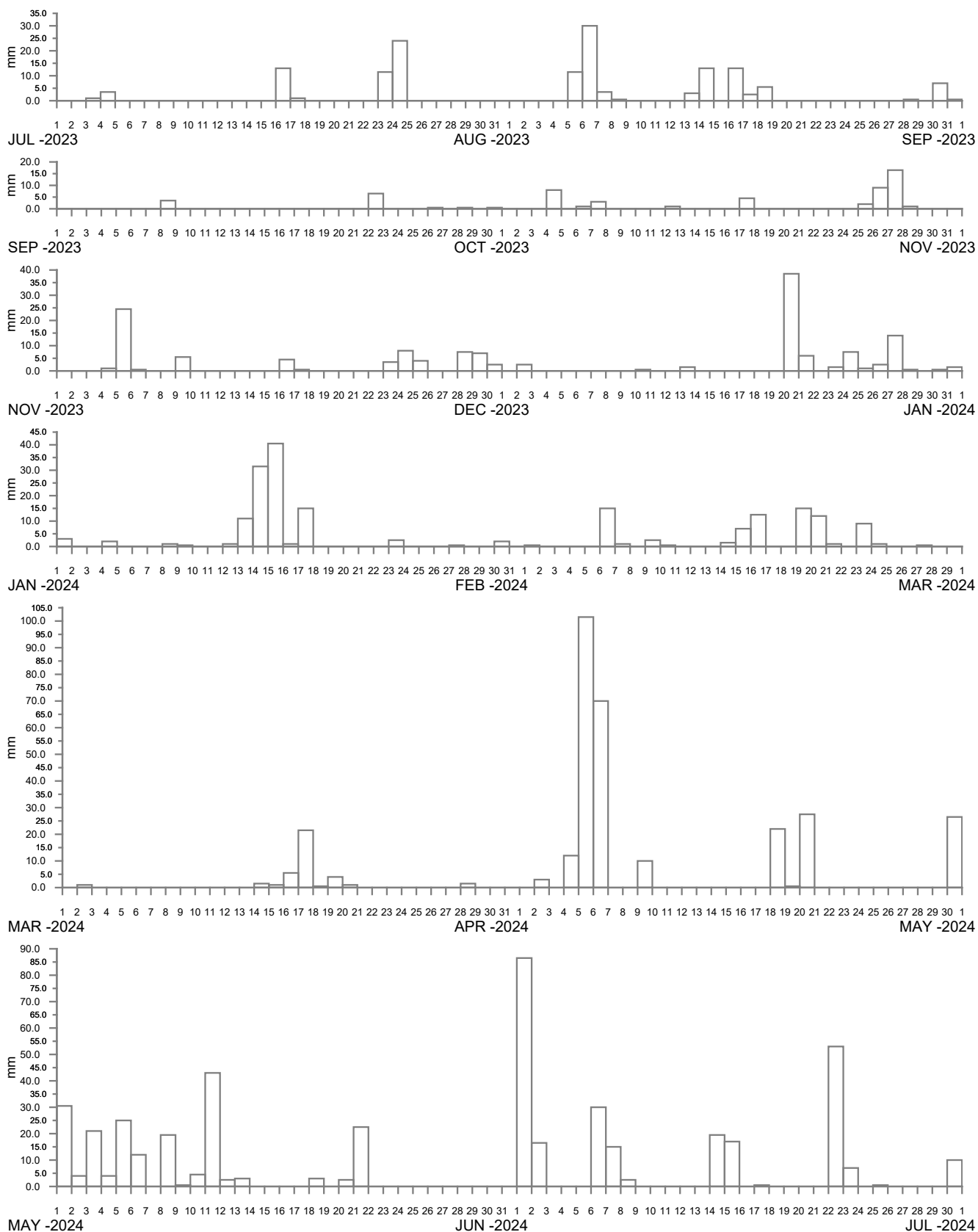
Report MHL3066
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4-63



RAINFALL STATION LOCATIONS SYDNEY COASTAL REGION

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Figure
4-64



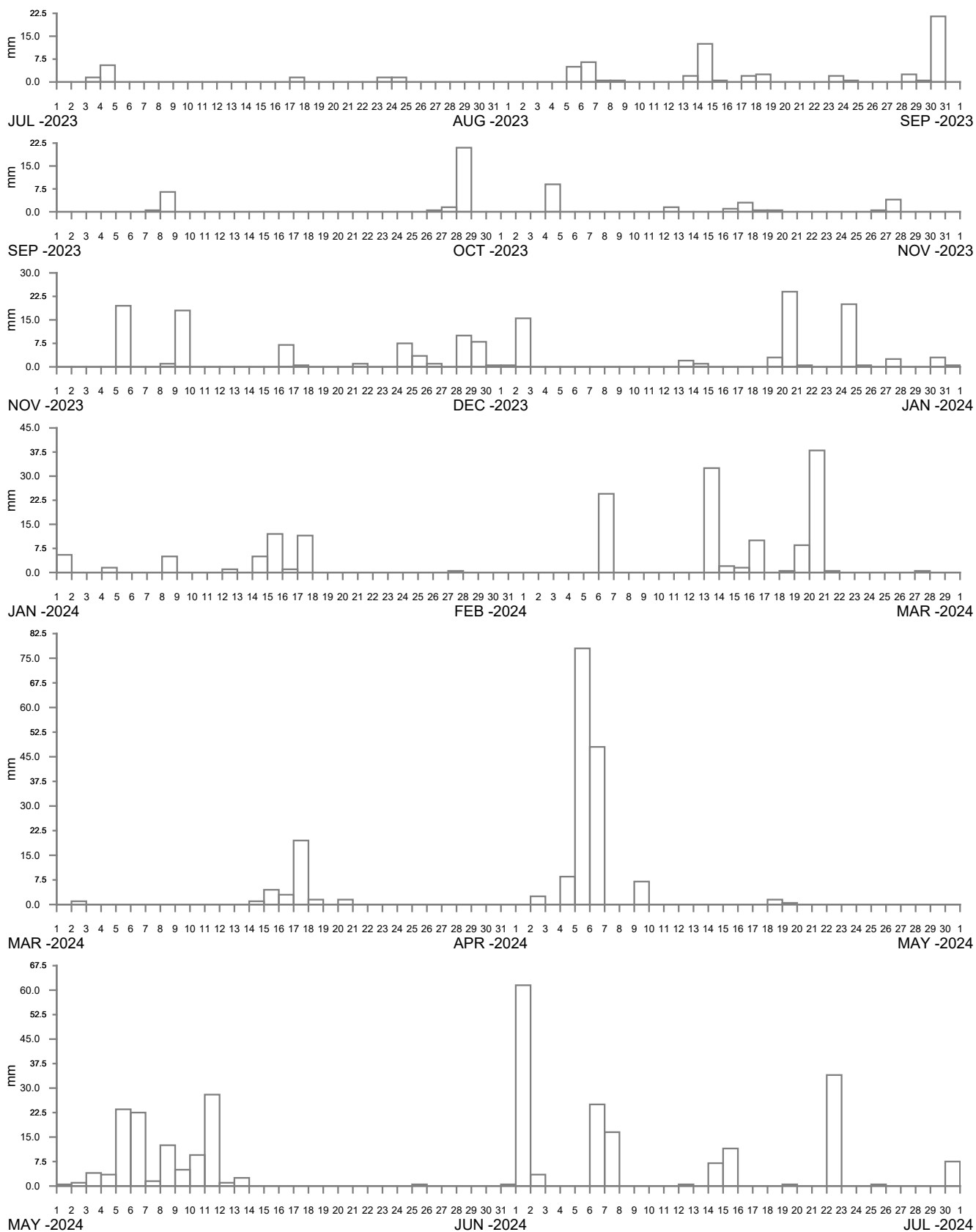
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CURL CURL AT CURL CURL LAGOON 2023-24

Manly
Hydraulics
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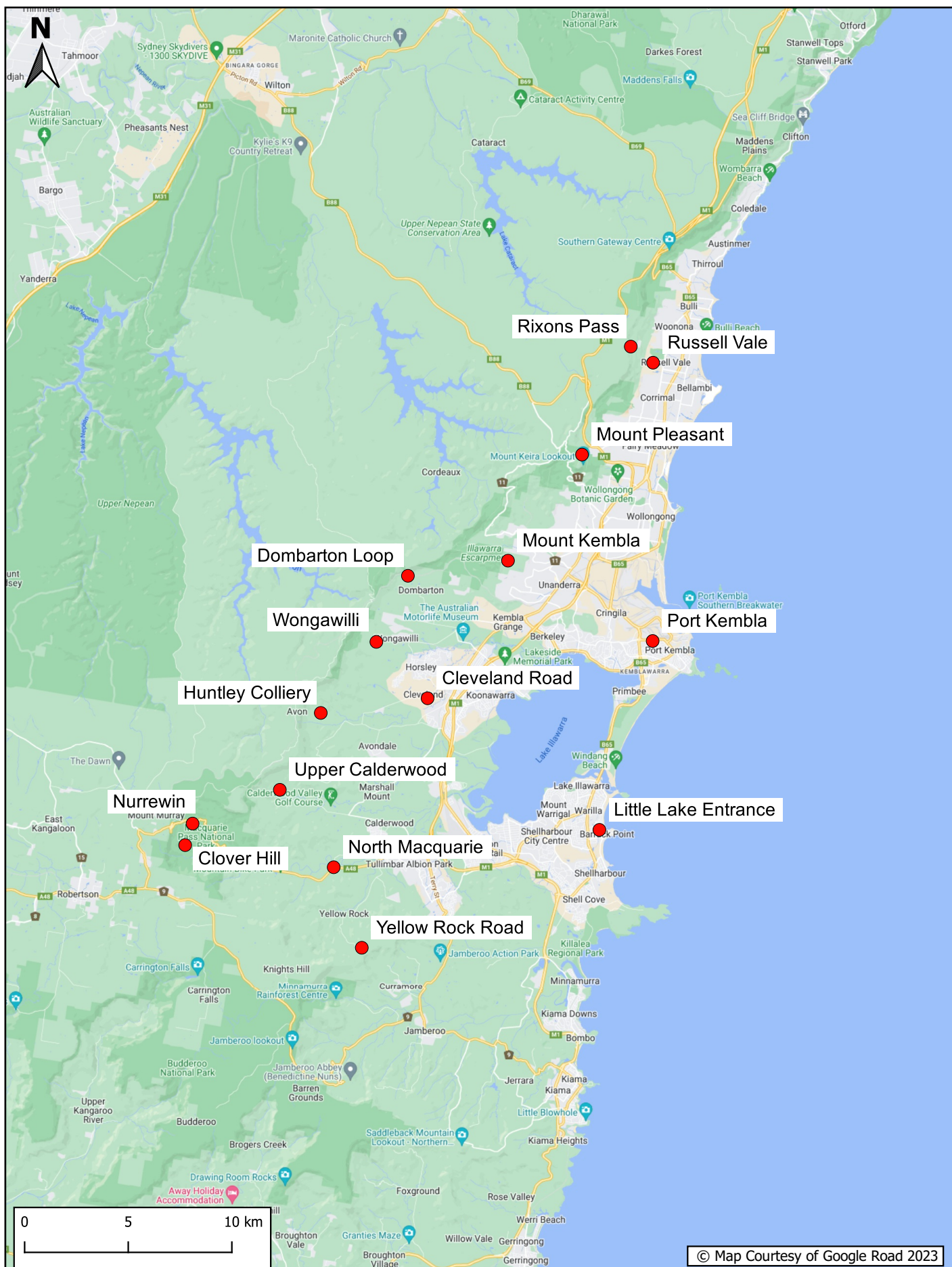
Report MHL3066
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4-65



KELSO CREEK AT KELSO CREEK 2023-24

Manly
Hydraulics
Laboratory

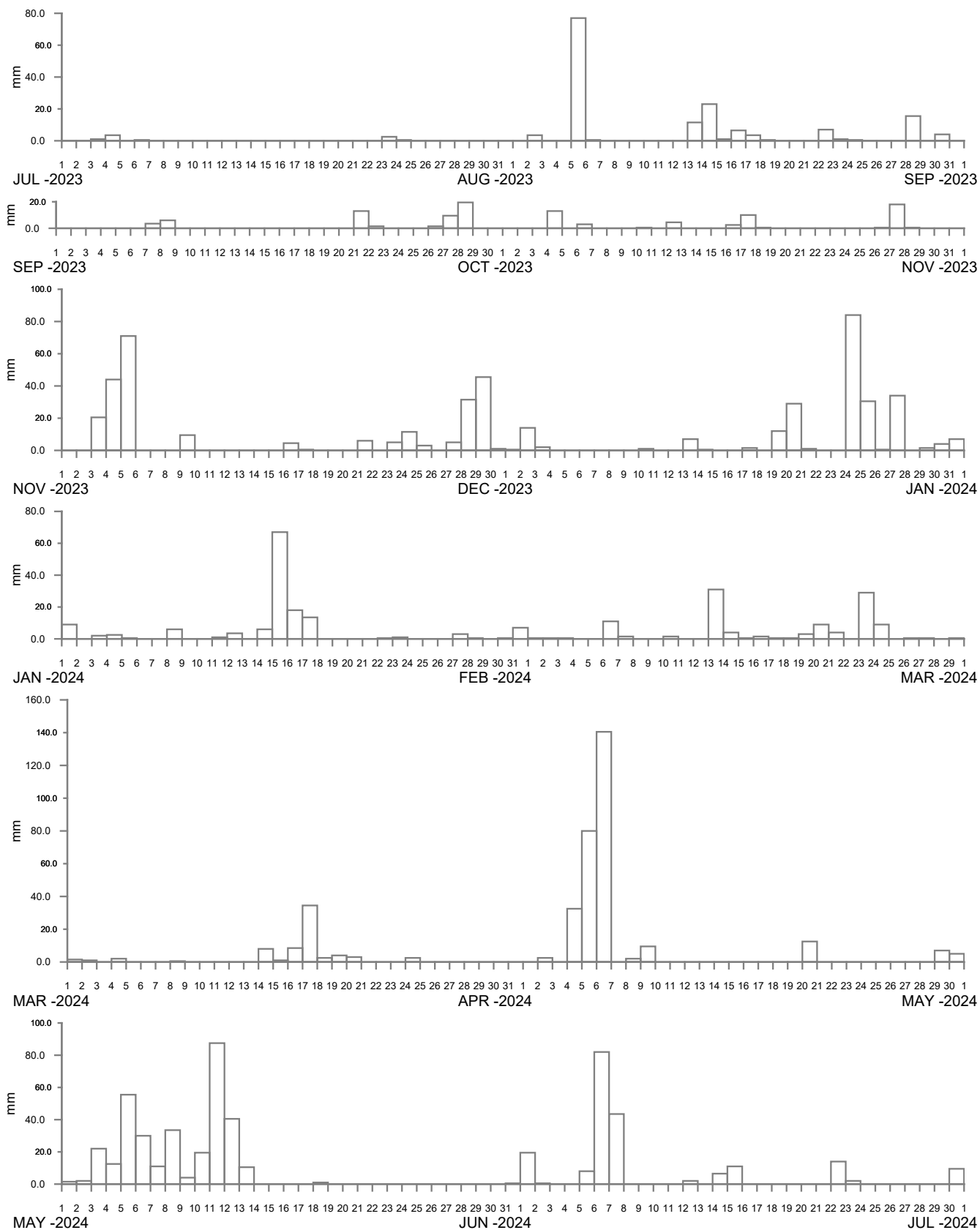
Report MHL3066
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4-66



RAINFALL STATION LOCATIONS WOLLONGONG COASTAL REGION

**Manly
Hydraulics
Laboratory**

Report MHL3066
Figure
4-67



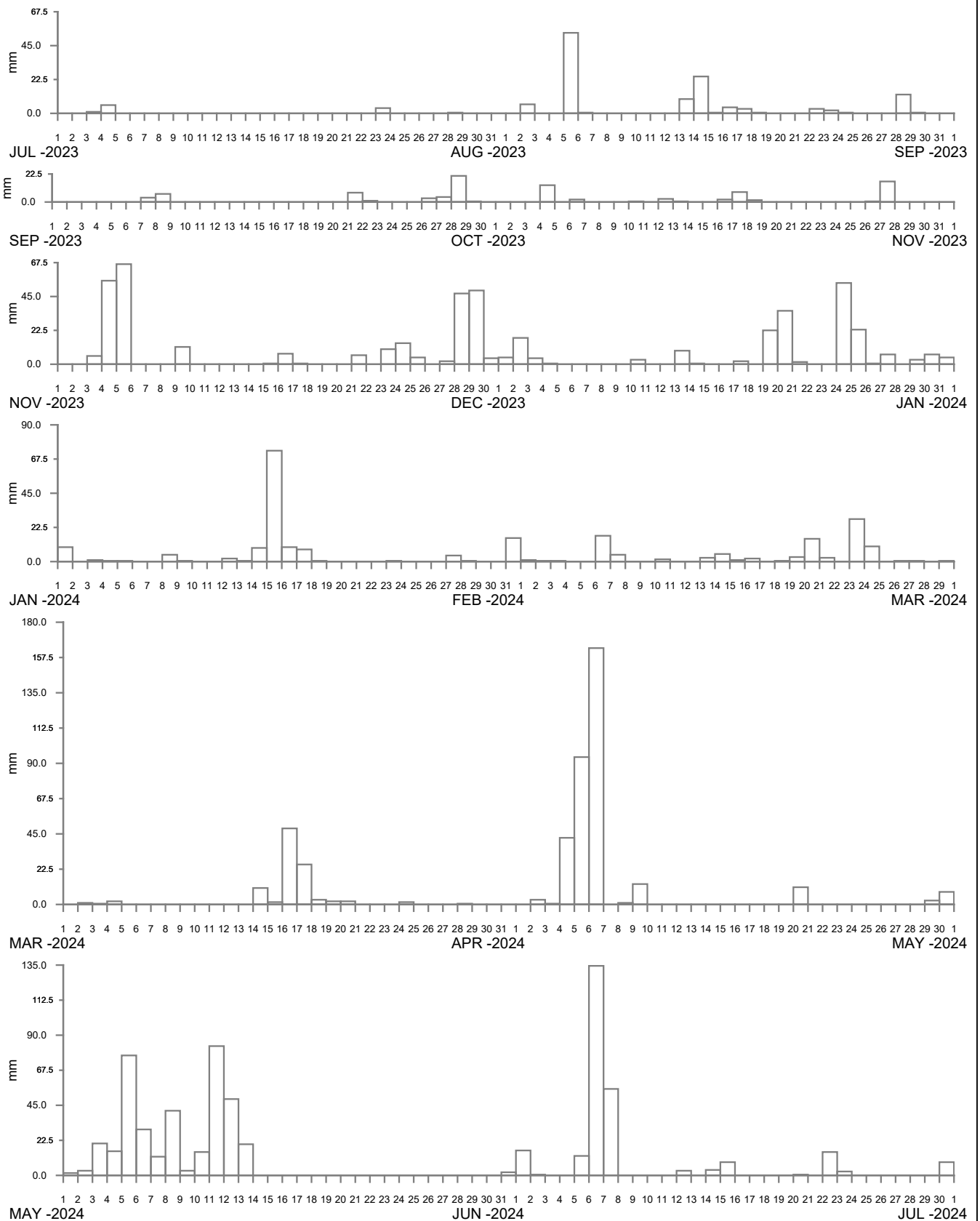
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RIXONS PASS AT RIXONS PASS ROAD 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-68



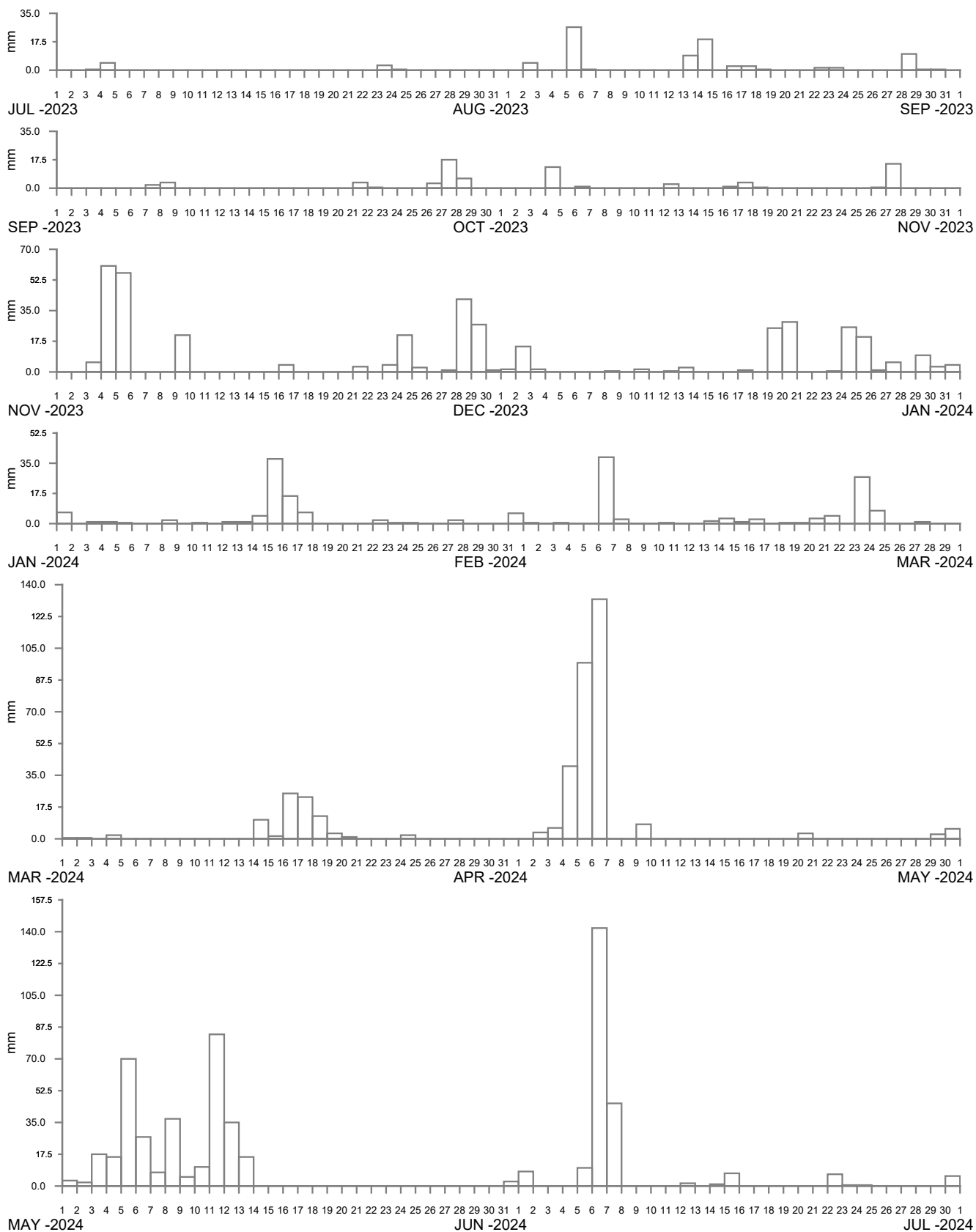
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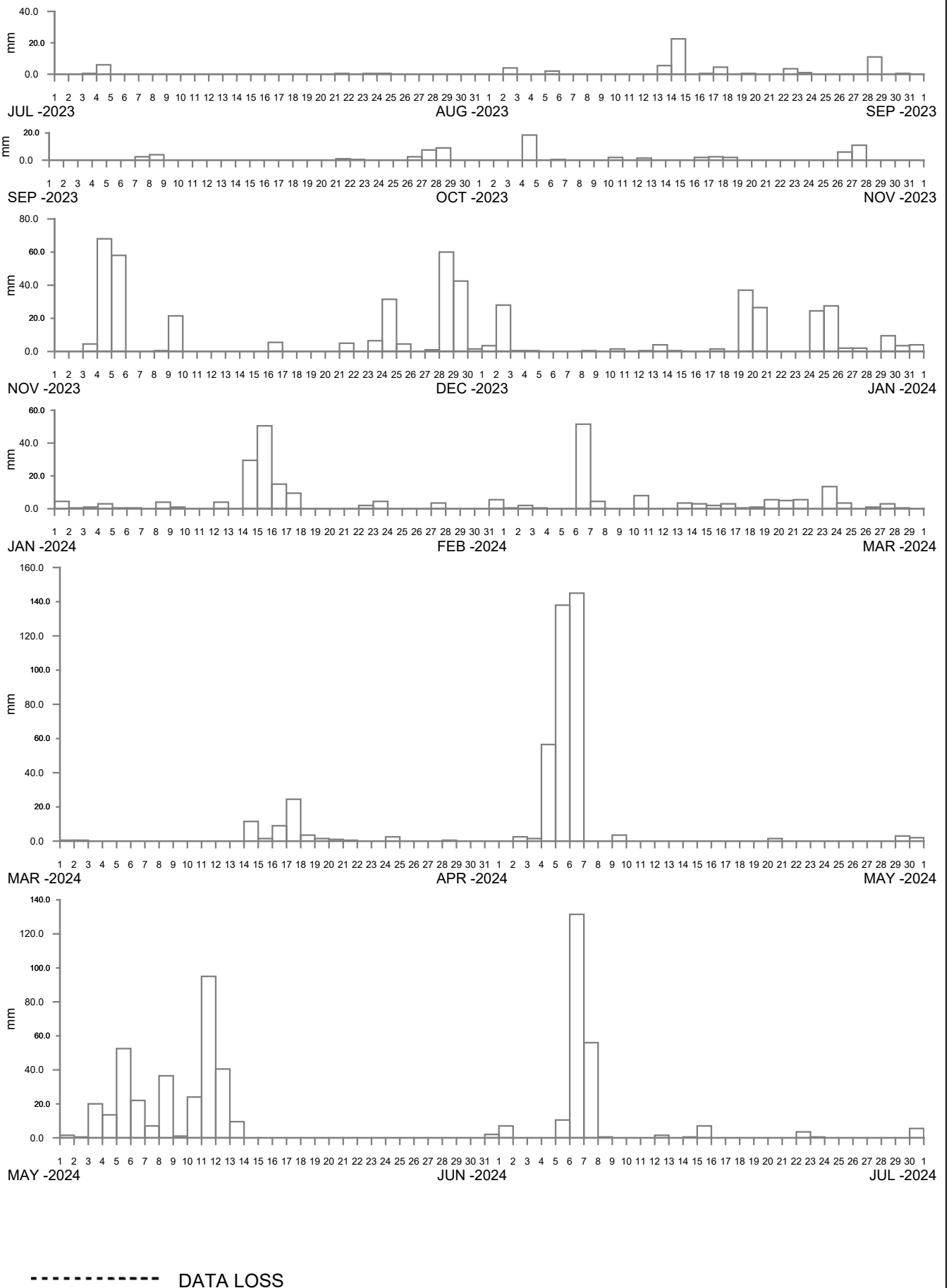


MOUNT PLEASANT AT PARRISH AVENUE 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-70

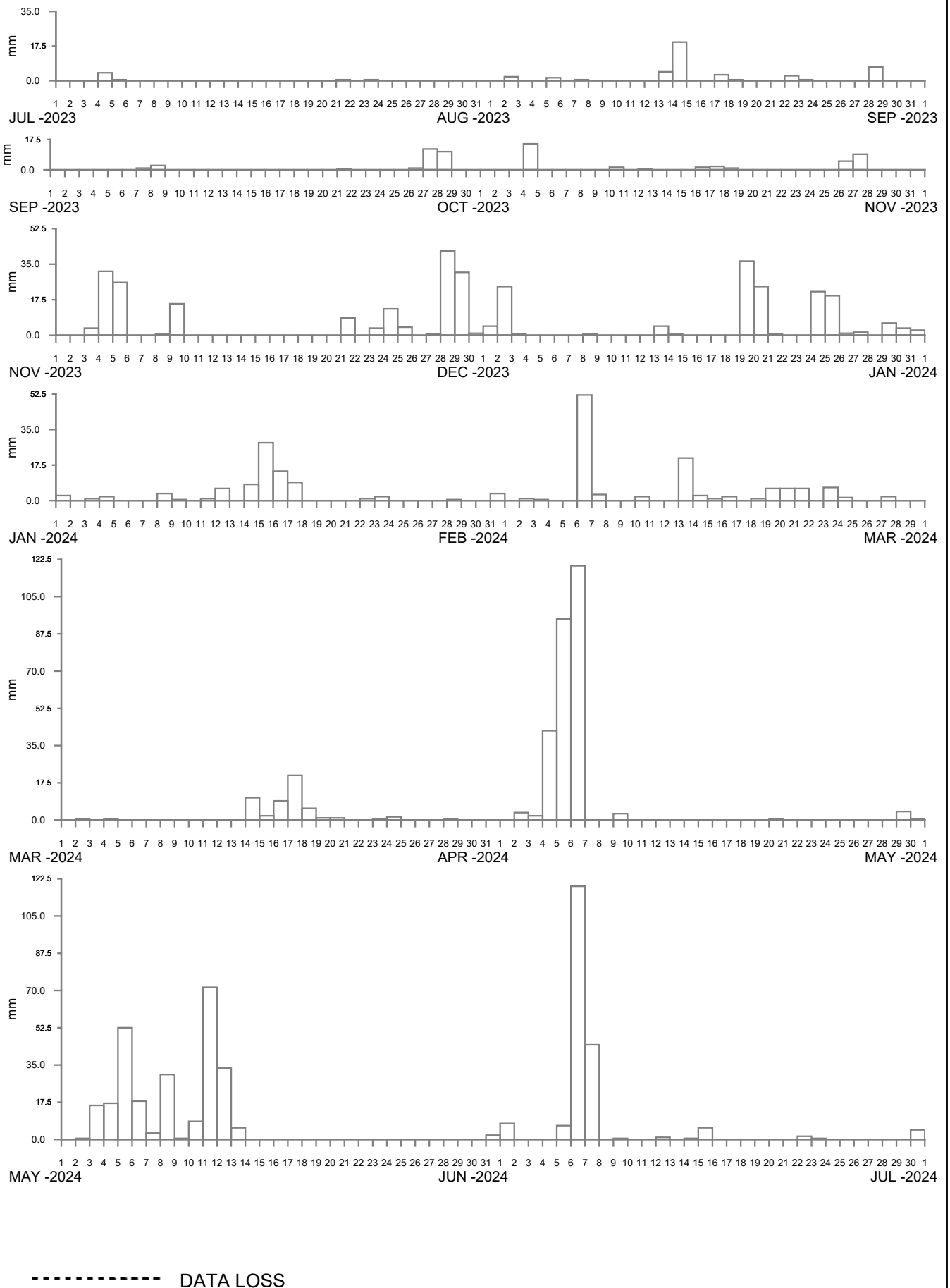




DOMBARTON LOOP AT PAYNES ROAD 2023-24

Manly
Hydraulics
Laboratory

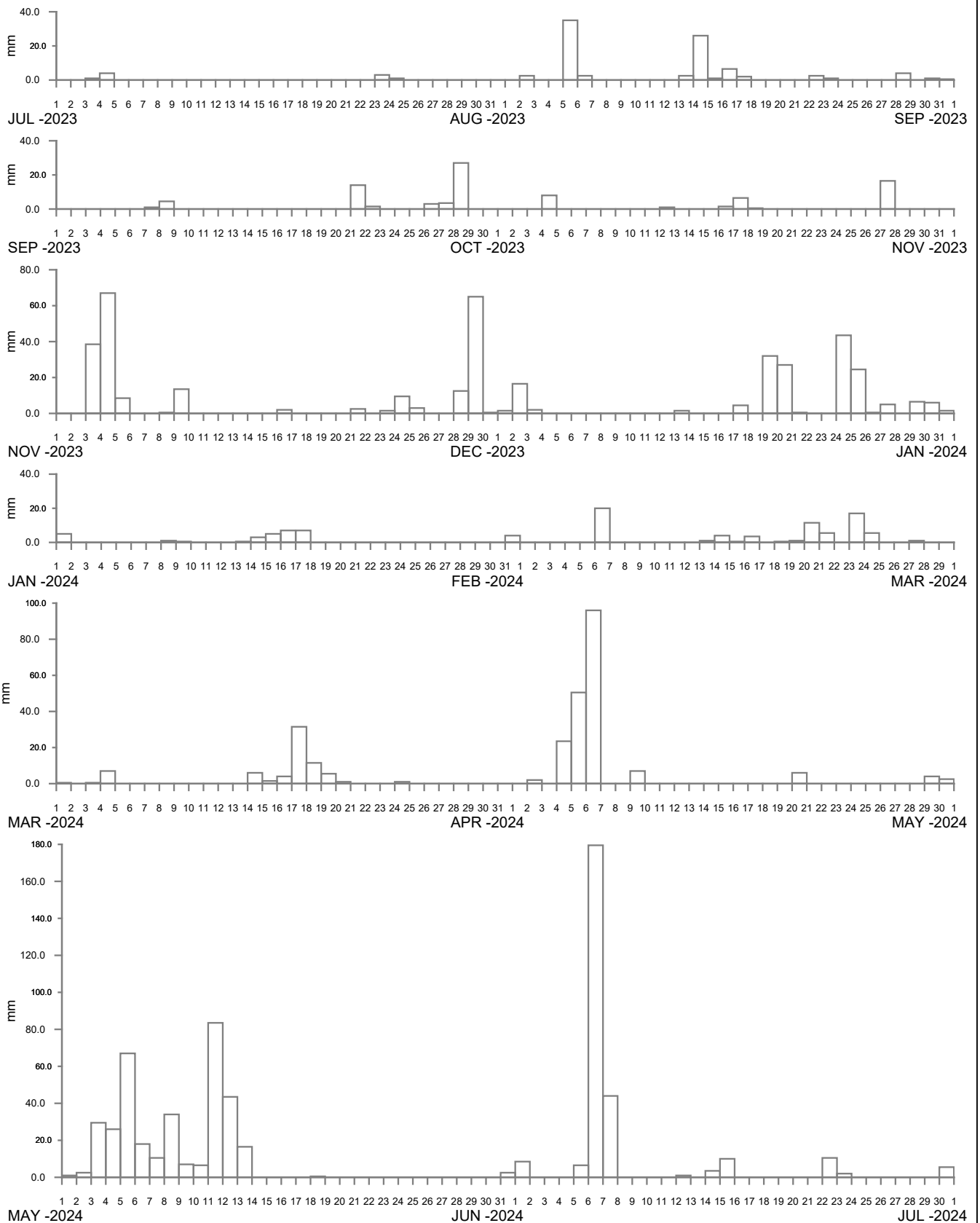
Report MHL3066
Figure
4-72



WONGAWILLI AT JERSEY FARM ROAD 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-73



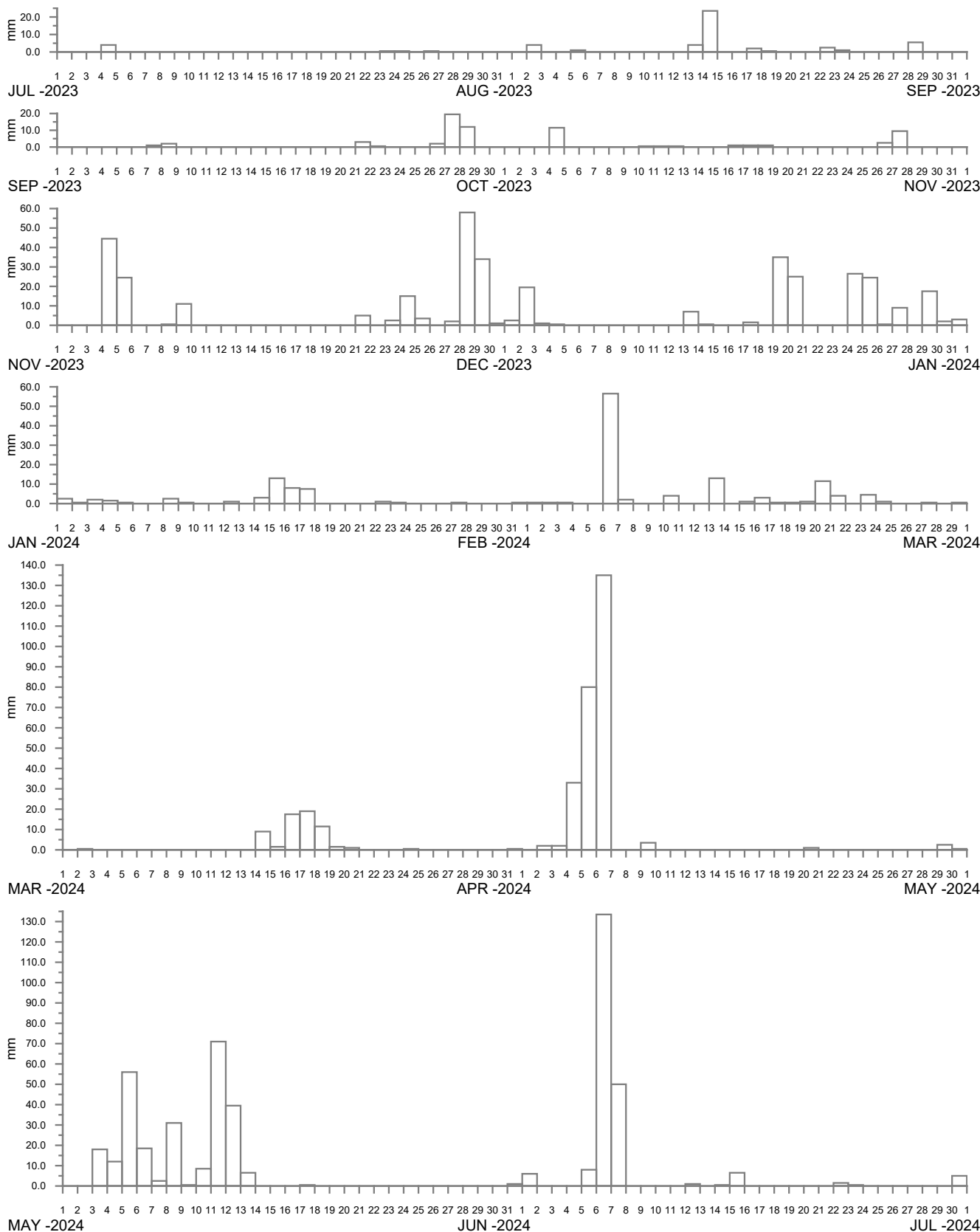
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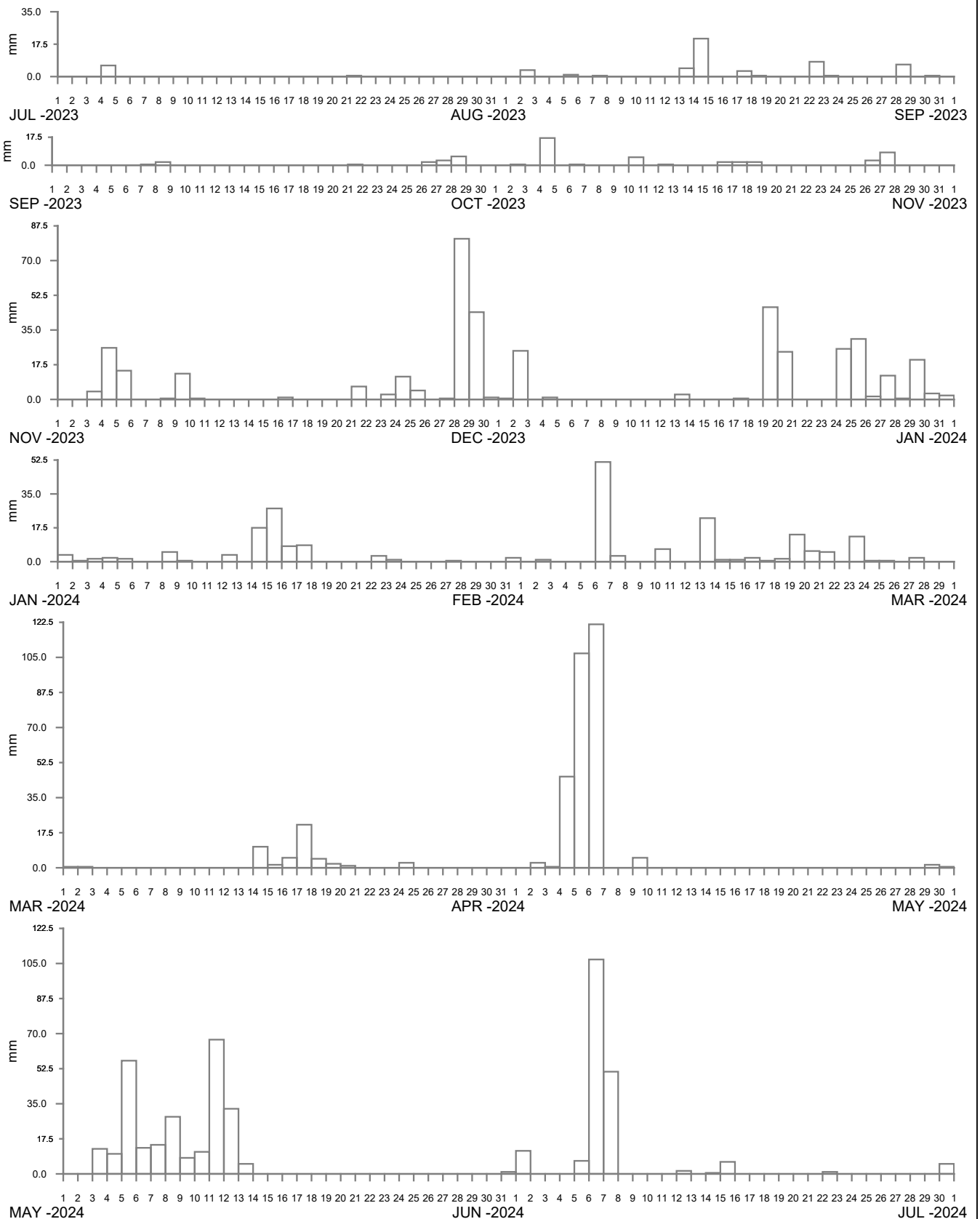


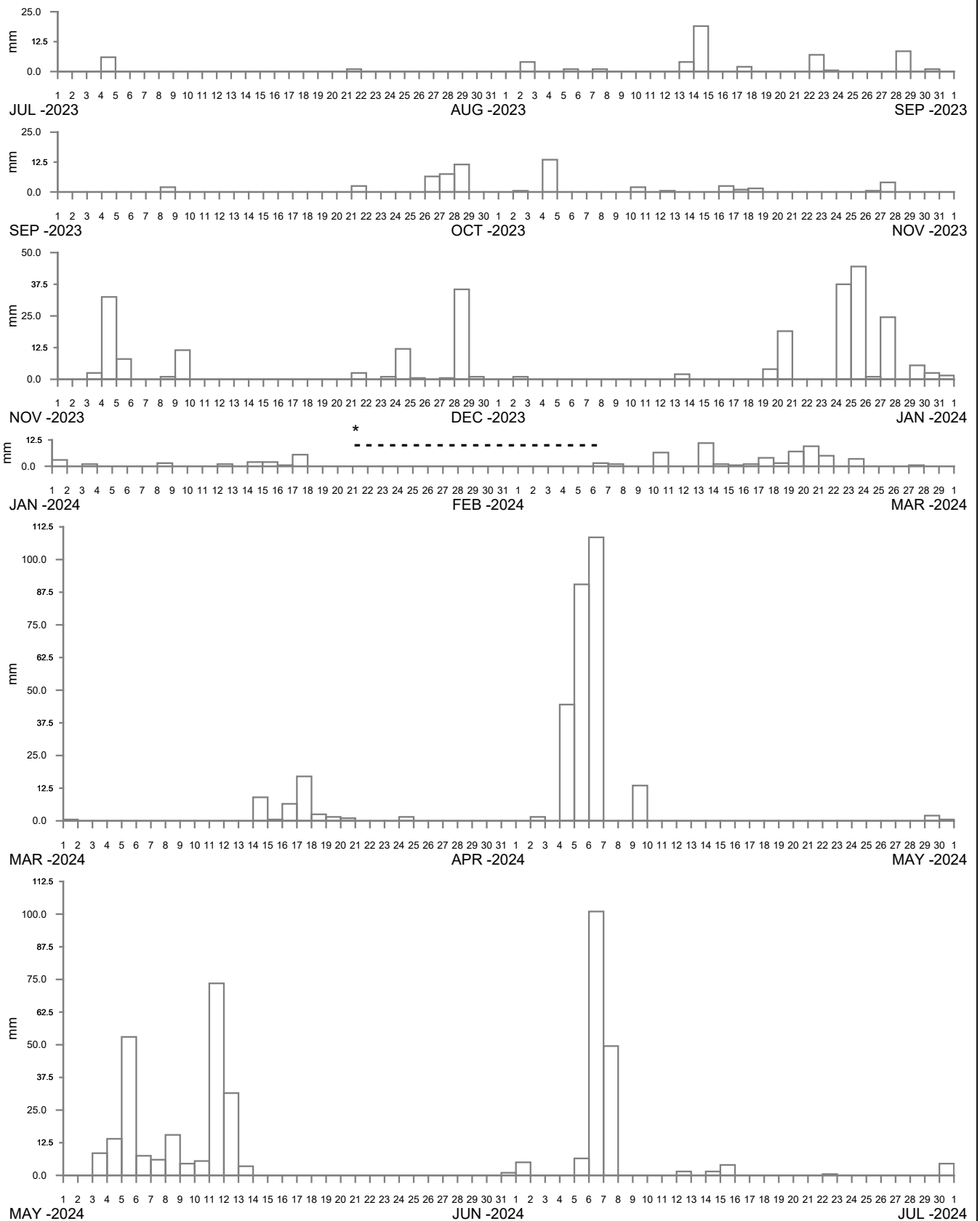
PORT KEMBLA AT FIVE ISLANDS ROAD 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-74







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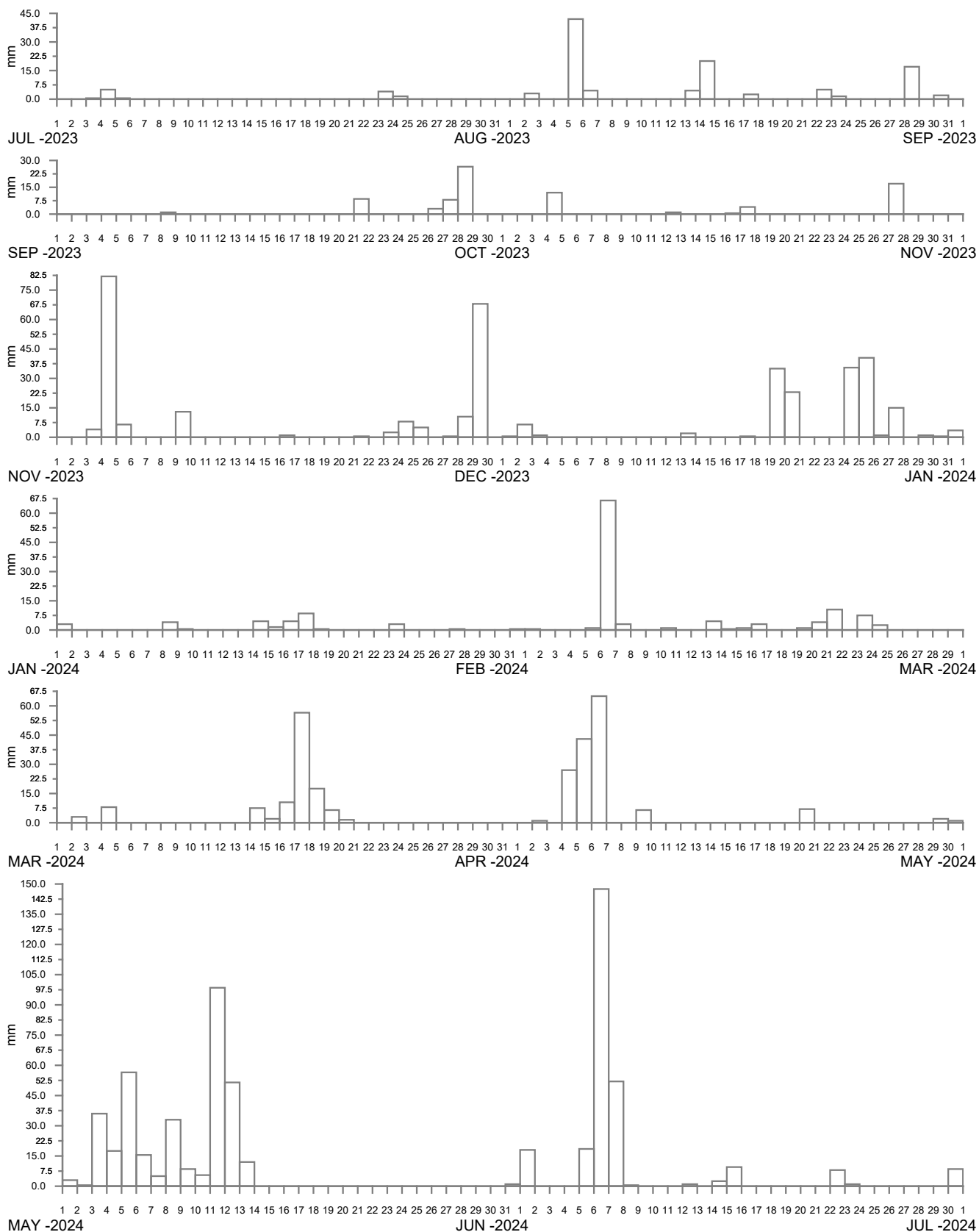
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UPPER CALDERWOOD AT CALDERWOOD ROAD 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-77



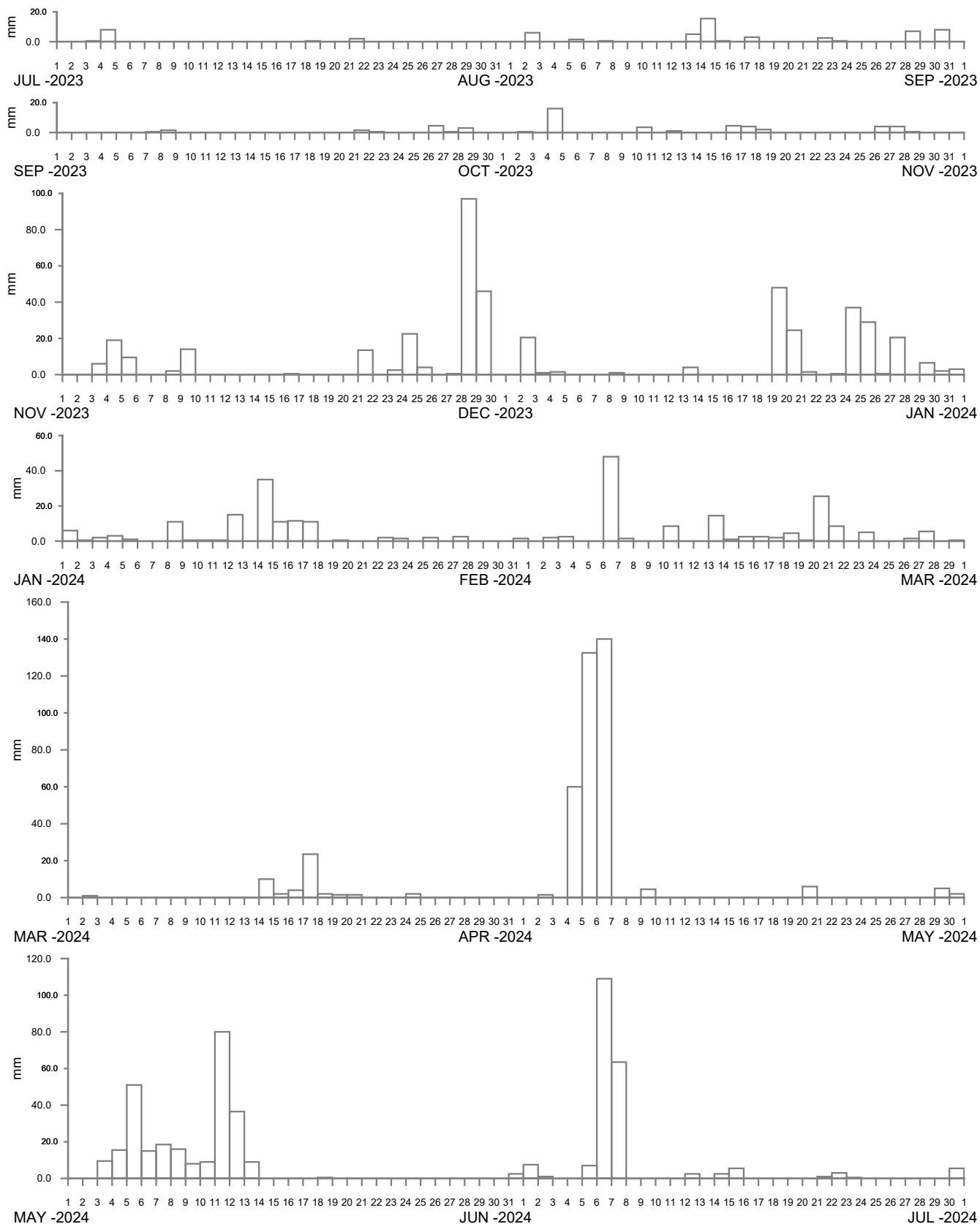
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LITTLE LAKE AT LITTLE LAKE ENTRANCE 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-78



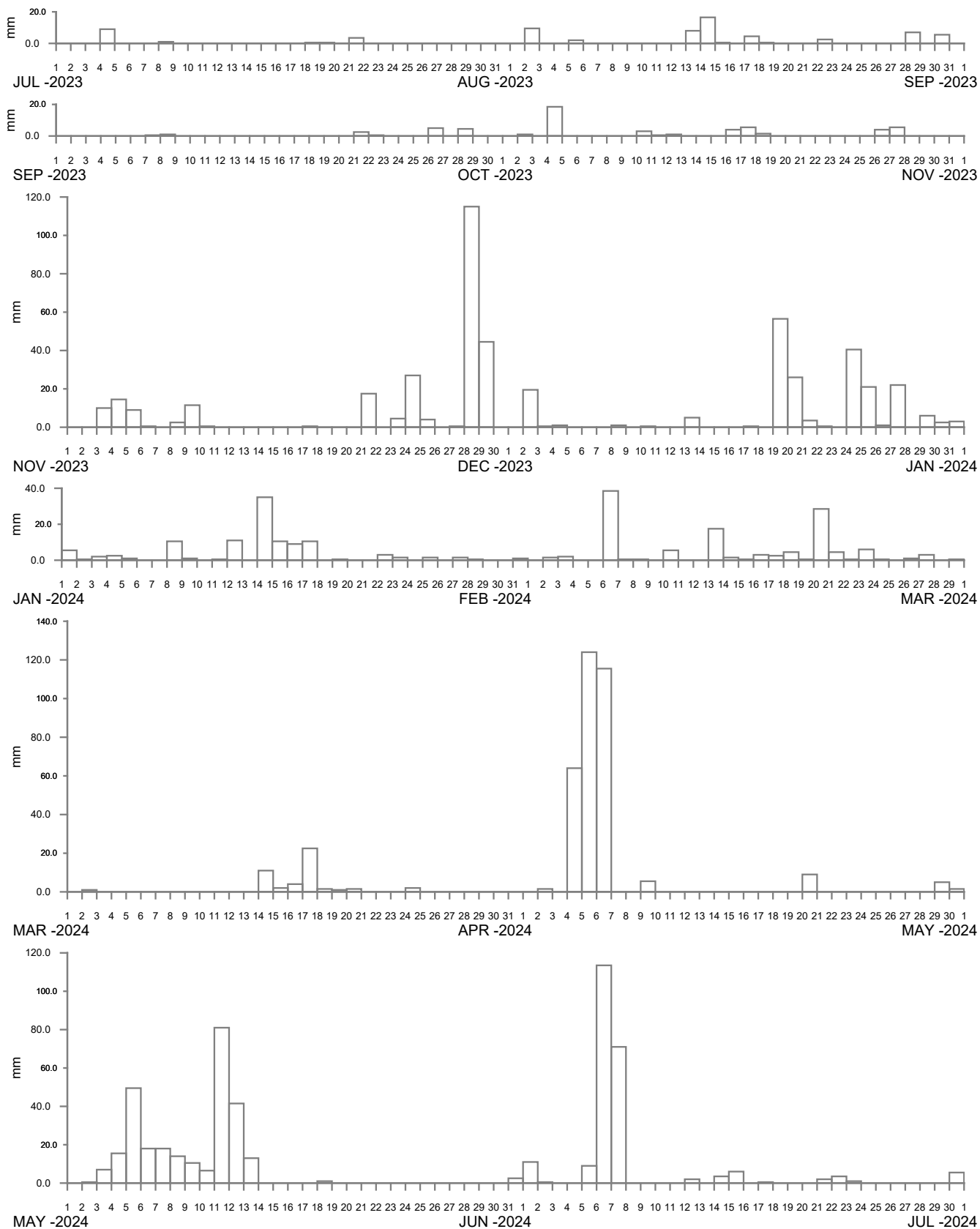
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NURREWIN AT ILLAWARRA HIGHWAY 2023-24

Manly
Hydraulics
Laboratory

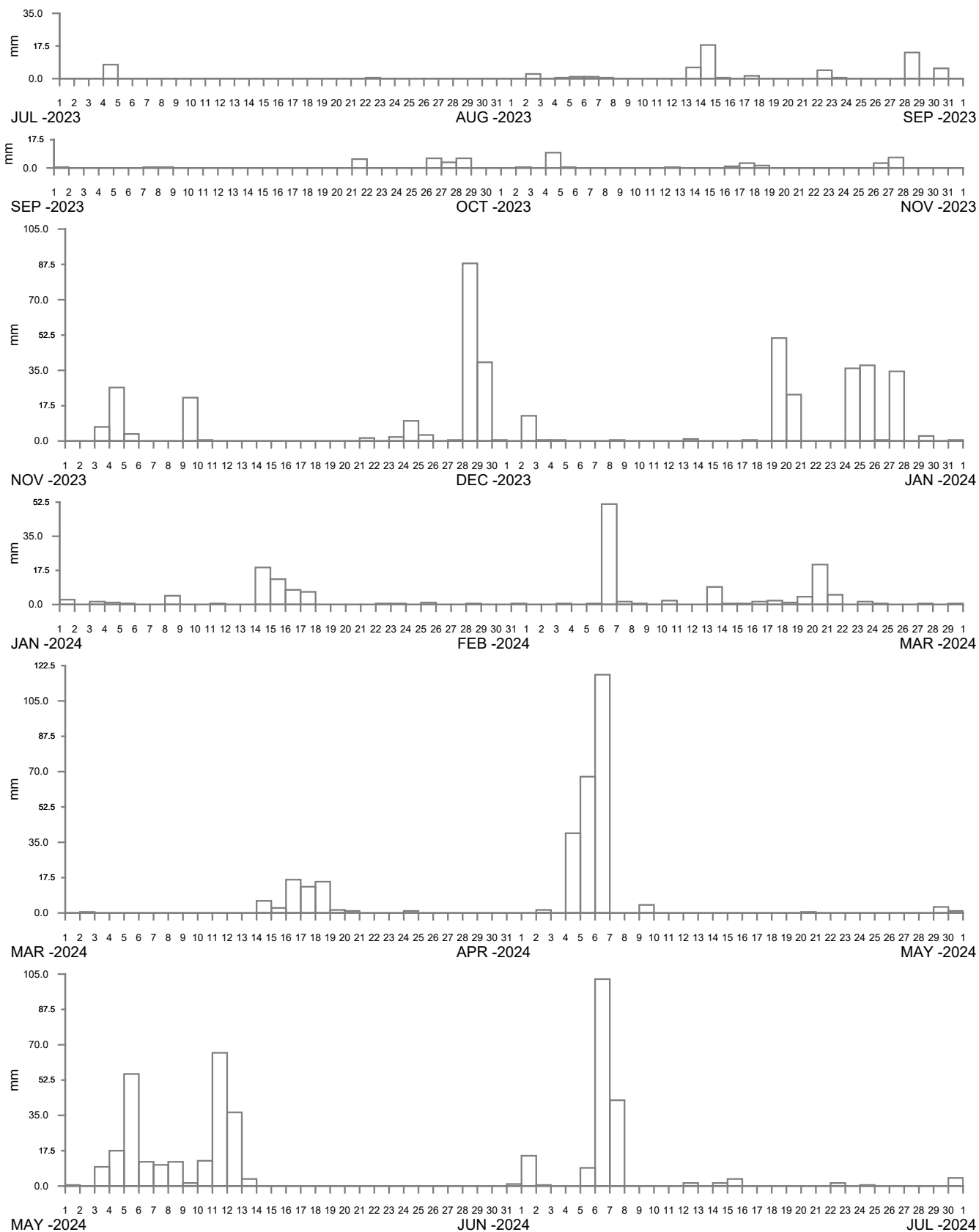
Report MHL3066
Figure
4-79



CLOVER HILL AT CLOVER HILL ROAD 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-80



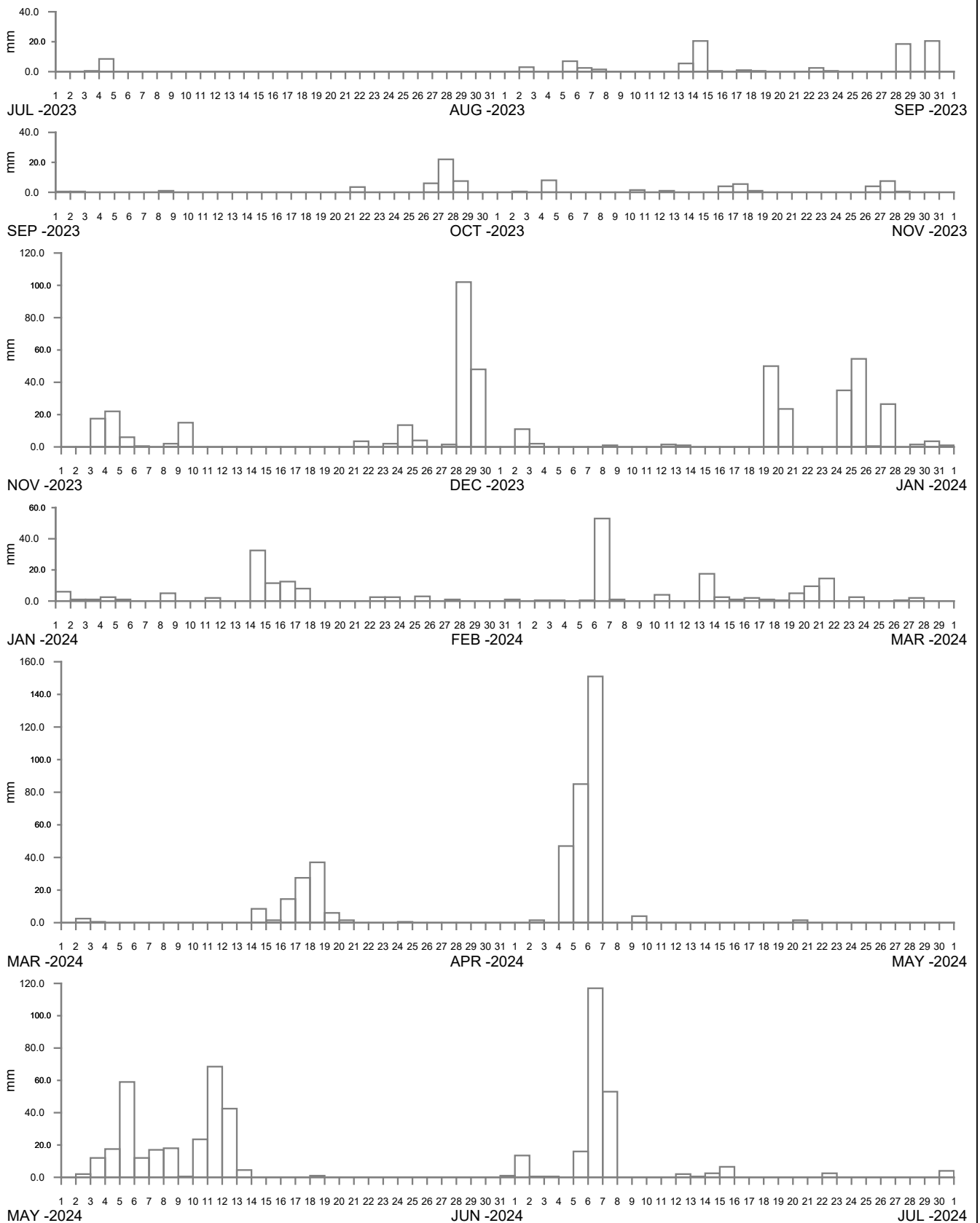
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NORTH MACQUARIE AT NORTH MACQUARIE RO 2023-24

Manly
Hydraulics
Laboratory

Report MHL3066
Figure
4-81



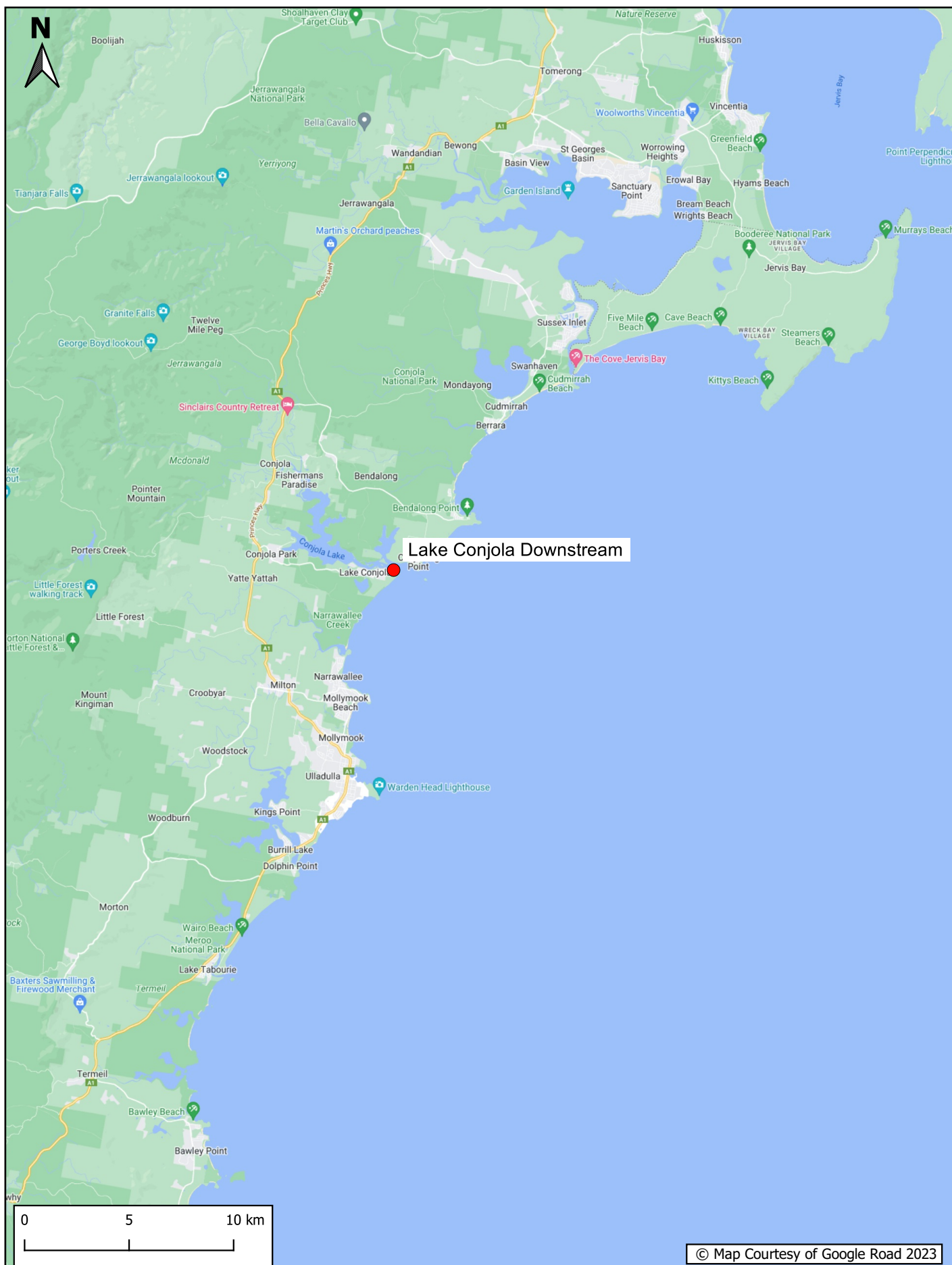
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YELLOW ROCK ROAD AT YELLOW ROCK ROAD 2023-24

Manly
Hydraulics
Laboratory

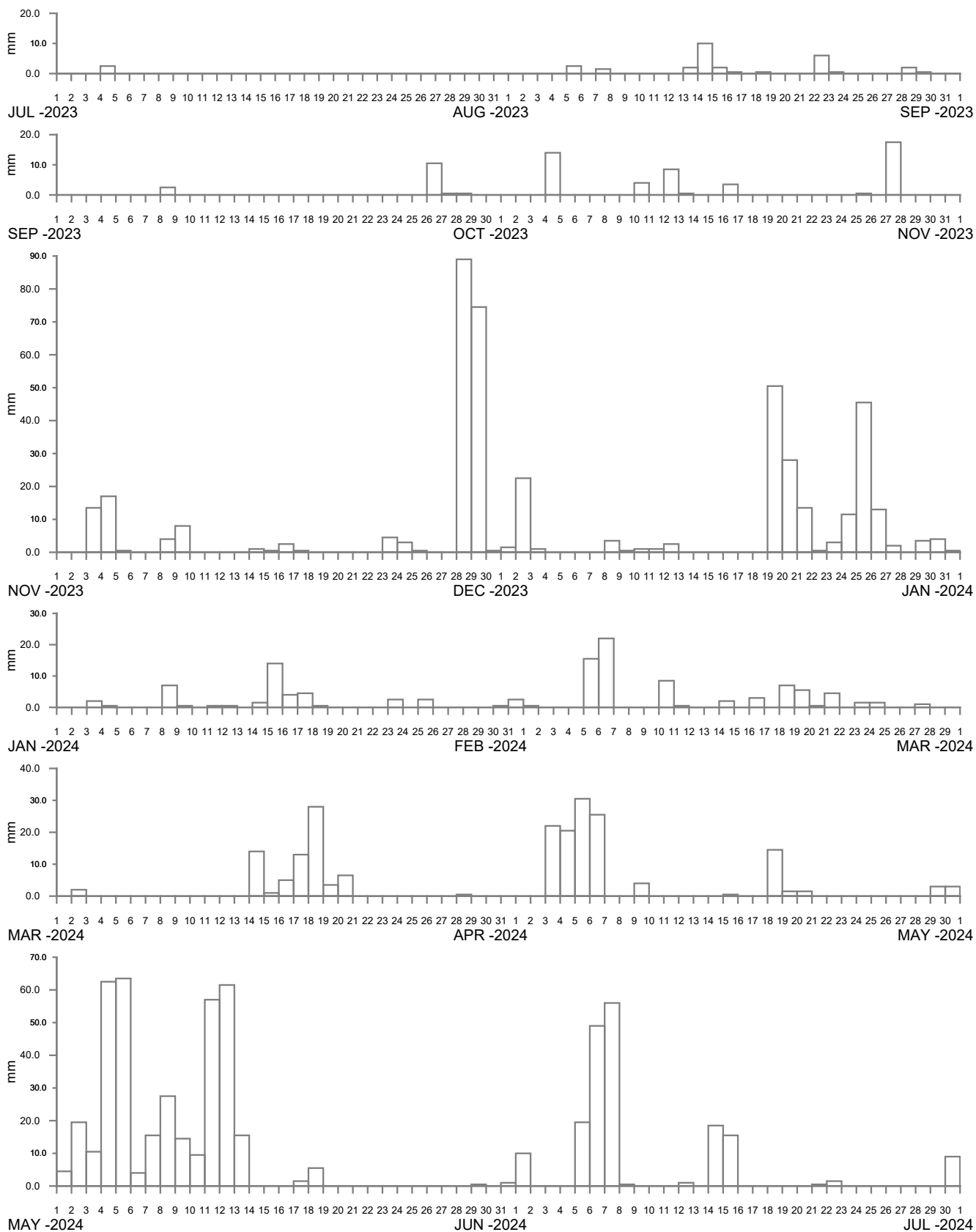
Report MHL3066
Figure
4-82



RAINFALL STATION LOCATIONS SOUTH COAST (NORTH) REGION

**Manly
Hydraulics
Laboratory**

Report MHL3066
Figure
4-83



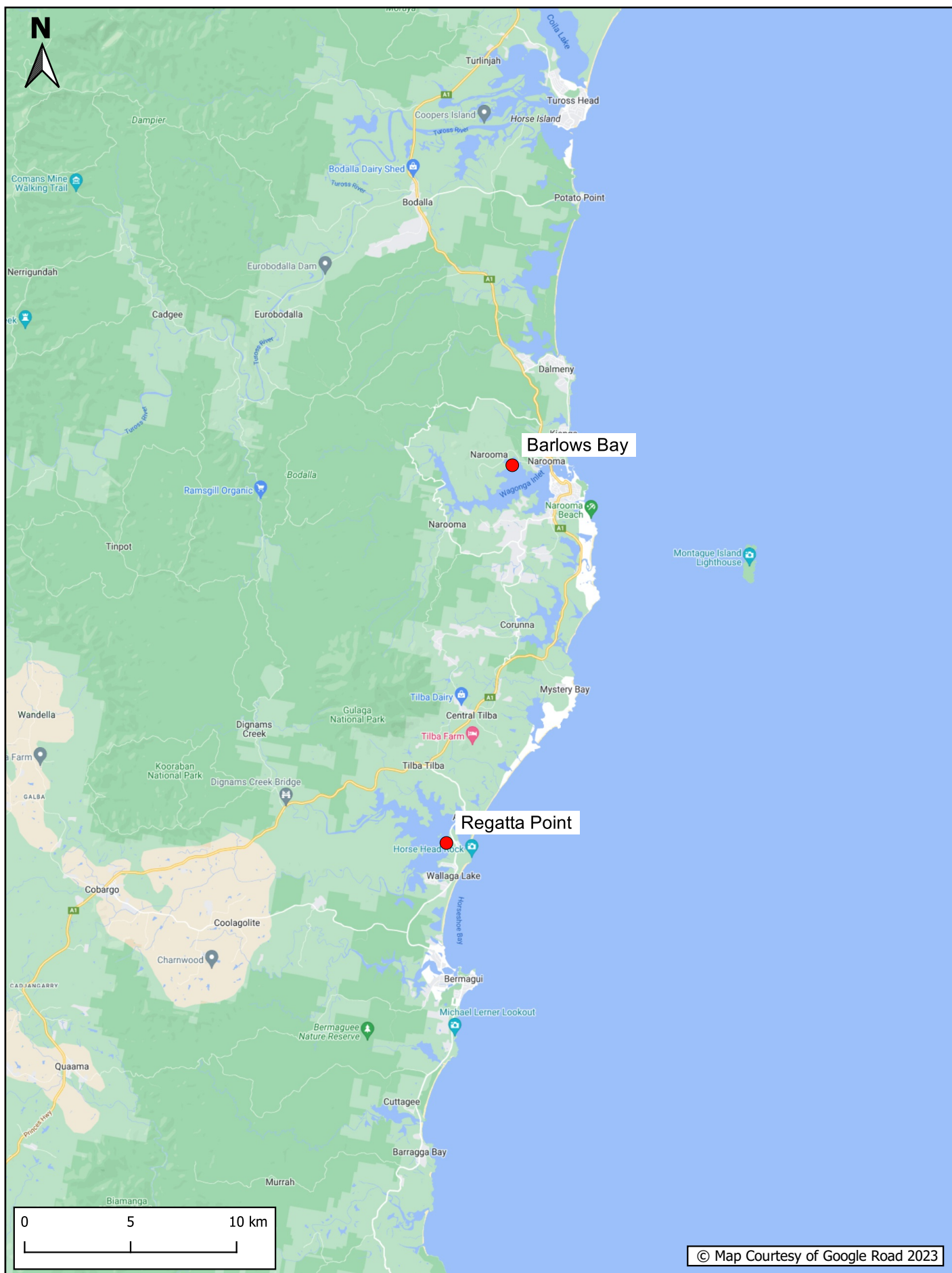
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LAKE CONJOLA DOWNSTREAM AT LAKE CONJOLA 2023-24

Manly
Hydraulics
Laboratory

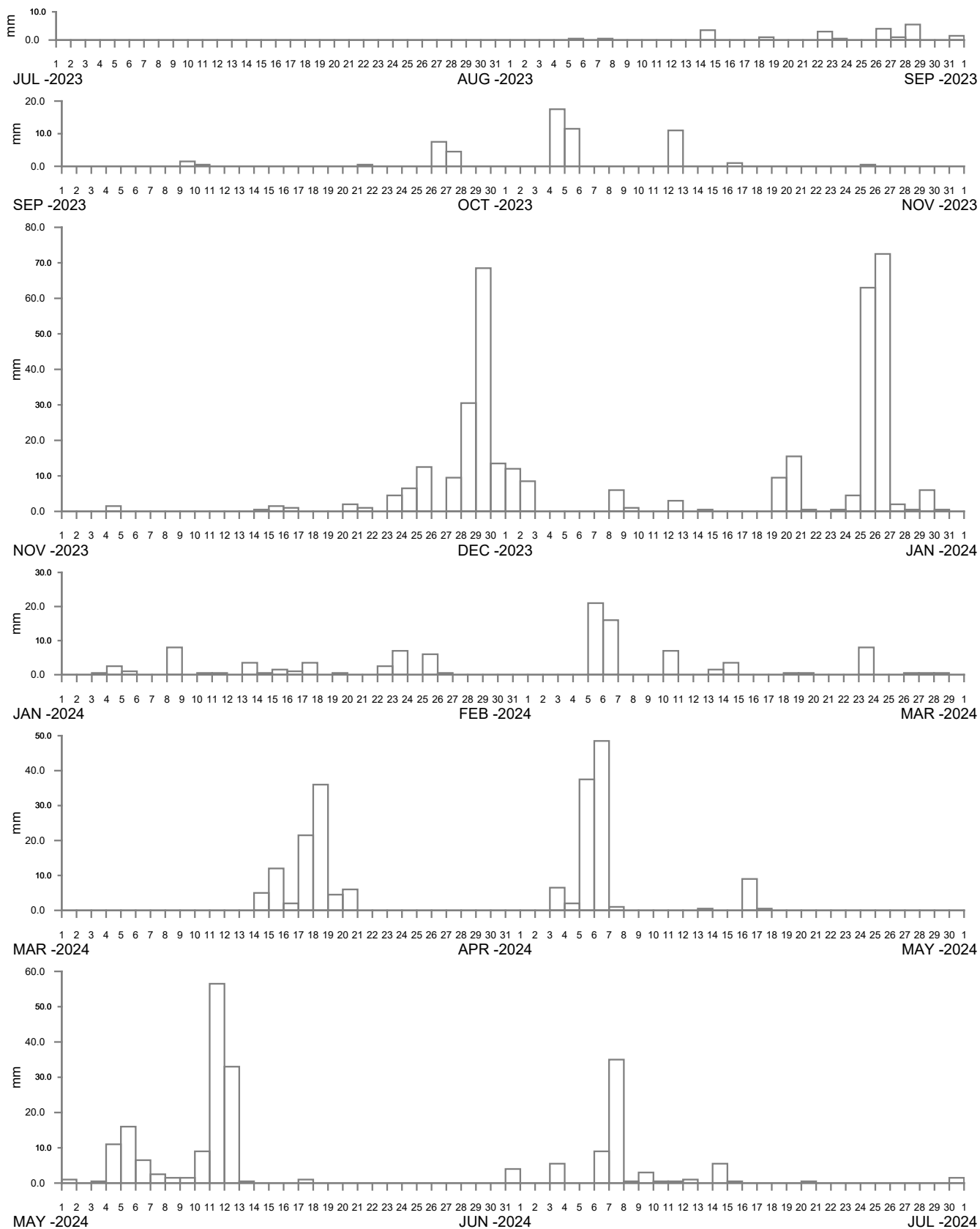
Report MHL3066
Figure
4-84

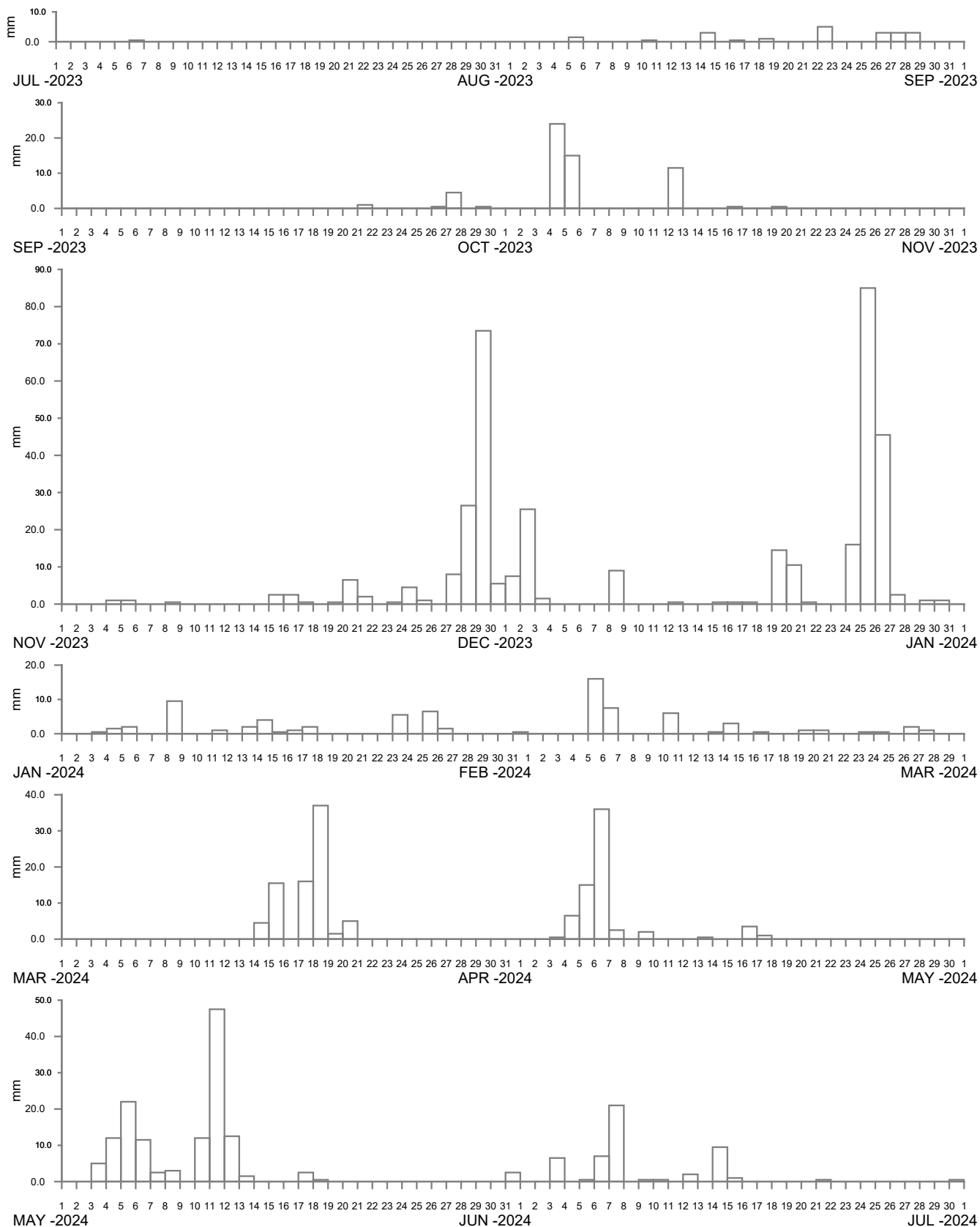


RAINFALL STATION LOCATIONS SOUTH COAST (MID) REGION

**Manly
Hydraulics
Laboratory**

Report MHL3066
Figure
4-85





Appendix A Station data online

Table A1 Station data online

Region	Station	Period of data
Tweed	Cudgera	Aug 1983–ongoing
Brunswick	Main Arm	Sep 1983–ongoing
Brunswick	Huonbrook	May 1986–ongoing
Brunswick	Myocum	Feb 1986–ongoing
Richmond	Lake Ainsworth	Oct 1994–ongoing
Richmond	Empire Vale	May 1998–Jul 2000
Richmond	Wollongbar	Jul 1992–Jul 1994
Clarence	Yamba	Apr 2002–ongoing
Clarence	Wyndora	Jan 1990–Jun 1991
Clarence	Roberts Creek	May 1994–Jun 1996
Clarence	Shannon Creek	Nov 2000–May 2008
Bellinger	Wooli Caravan Park	Jun 1997–Apr 2012
Bellinger	Wooli Sportsground	Apr 2012–ongoing
Bellinger	Perry Drive	Dec 1998–ongoing
Bellinger	Shephards Lane	Dec 1998–ongoing
Bellinger	Red Hill	Nov 1998–ongoing
Bellinger	Newports Creek	Dec 1990–ongoing
Bellinger	Middle Boambee	Dec 1990–ongoing
Bellinger	South Boambee	Apr 1991–April 2015
Bellinger	North Bonville	Dec 1990–ongoing
Bellinger	Gleniffer	Aug 1993–Feb 2007
Bellinger	Bellinger Council	Apr 1993–Jun 2001
Bellinger	Kooroowi	May 1991–Jun 2012
Bellinger	Kooroowi Sharabel	Jun 2012–ongoing
Bellinger	Thora	Feb 1993–ongoing
Nambucca	Bowraville	Jun 1993–Oct 2001
Nambucca	Stuarts Island Downstream	Oct 1998–ongoing
Nambucca	Utungun	Nov 1991–ongoing
Macleay	Euroka Upstream	Jul 1990–June 2011
Macleay	Aldavilla Downstream	Dec 2011–ongoing
Maria	Green Valley	Sep 1994–ongoing
Hastings	Telegraph Point	Nov 1990–ongoing
Hastings	Lake Cathie	Aug 1993–Jun 2001
Hastings	Ellenborough	Jun 1991–Sep 1999
Camden Haven	Logans Crossing	Dec 1989–ongoing
Manning	Mount George	Mar 1991–ongoing
Karuah	Nabiac	Jun 1983–ongoing
Karuah	Tuncurry	Aug 2002– Feb 2018
Karuah	Tuncurry Downstream	Jun 2016–ongoing
Karuah	Tiona	Jun 2002–Sep 2015
Karuah	Pacific Palms Wharf	Oct 2013–ongoing
Karuah	Tarback Bay	May 1996–ongoing
Karuah	Bulahdelah	Aug 1996–ongoing
Hunter	Gostwyck	Oct 1999–ongoing
Hunter	Seaham	Sep 1999–ongoing

Region	Station	Period of data
Hunter	Hexham Bridge	May 1998–ongoing
Hunter	Belmore Bridge	Sep 1995–ongoing
Hunter	Cardiff	Mar 1991–Dec 1995
Macquarie-Tuggerah Lakes	Barnsley	Jan 1988–ongoing
Macquarie-Tuggerah Lakes	Fassifern	Jan 1992–Dec 1997
Macquarie-Tuggerah Lakes	Dora Creek	May 1992–Jul 1999
Macquarie-Tuggerah Lakes	Martinsville	Mar 1988–ongoing
Macquarie-Tuggerah Lakes	Mandalong	Dec 1988–ongoing
Macquarie-Tuggerah Lakes	Wyee	May 1992–ongoing
Macquarie-Tuggerah Lakes	Whitemans Ridge	Apr 1989–ongoing
Macquarie-Tuggerah Lakes	Yarramalong	Nov 1988–ongoing
Macquarie-Tuggerah Lakes	Kulnura	Jun 1989–Jul 2023
Macquarie-Tuggerah Lakes	Kulnura at Pioneer Park	Mar 2023–ongoing
Macquarie-Tuggerah Lakes	Toukley	Feb 1985–ongoing
Macquarie-Tuggerah Lakes	Warnervale	Jan 1986–Apr 2010
Macquarie-Tuggerah lakes	Hamlyn Terrace	Mar 2010–ongoing
Macquarie-Tuggerah Lakes	Wyong Weir Upstream	Jan 1986–Apr 2008
Macquarie-Tuggerah Lakes	Wyong	Jan 1986–Apr 1991
Macquarie-Tuggerah Lakes	Kangy Angy	Aug 2010–ongoing
Macquarie-Tuggerah Lakes	Chittaway	Dec 1989–Aug 2010
Macquarie-Tuggerah Lakes	Berkeley Vale	Jun 1988–ongoing
Macquarie-Tuggerah Lakes	Mardi Dam	Oct 1988–ongoing
Macquarie-Tuggerah Lakes	Sterland	Apr 1989–ongoing
Macquarie-Tuggerah Lakes	Long Jetty	Sept 1992–Sept 1998
Macquarie-Tuggerah Lakes	Bateau Bay	Jan 1980–ongoing
Macquarie-Tuggerah Lakes	Lisarow	Apr 1989–ongoing
Brisbane Water	Strickland	Dec 1985–ongoing
Brisbane Water	Narara	Apr 1989–ongoing
Brisbane Water	Mount Elliot	Dec 1985–ongoing
Brisbane Water	Wyoming	Oct 1988–ongoing
Brisbane Water	Kincumber	May 1987–ongoing
Hawkesbury	Webbs Creek	Jul 1999–ongoing
Hawkesbury	Colo Junction	Jul 1999–ongoing
Hawkesbury	Sackville Downstream	Jun 1999–ongoing
Hawkesbury	Woy Woy	Jul 1991–Jul 1996
Hawkesbury	Brooklyn	Apr 1991–Dec 1995
Hawkesbury	Cowan	Jun 1991–Dec 1995
Hawkesbury	Penrith	Dec 1994–Jan 1995
Hawkesbury	Narellan Creek	Jan 1994–Sep 1996
Hawkesbury	Camden Life Centre	Mar 1994–Sep 1996
Hawkesbury	Mt Annan School	Feb 1994–Sep 1996
Blue Mountains	Mount Boyce	Nov 1992–Feb 1995
Blue Mountains	Clarence	Nov 1992–Feb 1995
Blue Mountains	Zig Zag	Nov 1992–Feb 1995
Sydney Coastal	Kuringai	Jan 1991–Sep 1996
Sydney Coastal	Wahroonga	Nov 1990–Dec 1995
Sydney Coastal	Beecroft	Sep 1992–Jul 1996
Sydney Coastal	Avalon	Jun 1994–ongoing
Sydney Coastal	Mona Vale	Jun 1994–ongoing
Sydney Coastal	Narrabeen Creek	May 1998–Sep 2010

Region	Station	Period of data
Sydney Coastal	Middle Creek	Apr 1995–ongoing
Sydney Coastal	Cromer	Mar 1994–ongoing
Sydney Coastal	Belrose	May 1994–ongoing
Sydney Coastal	Allambie	Jun 1999–ongoing
Sydney Coastal	Balgowlah	Aug 1999–Jul 2005
Sydney Coastal	Curl Curl	Feb 2014–ongoing
Sydney Coastal	North Manly	May 1995–ongoing
Sydney Coastal	Manly Dam	Nov 1995–ongoing
Sydney Coastal	Chatswood	Sep 1992–Jul 1996
Sydney Coastal	Denistone	Jan 1990–Jun 1996
Sydney Coastal	M4 Motorway	Jun 1993–Dec 1995
Sydney Coastal	Homebush Bay	Feb 1993–Mar 1994
Sydney Coastal	Kelso Creek	Nov 1996–ongoing
Wollongong Coastal	Bulli Pass	Jan 1983–Oct 1998
Wollongong Coastal	Rixons Pass	Jun 1985–ongoing
Wollongong Coastal	Russell Vale	Jul 1982–ongoing
Wollongong Coastal	Corrimal Colliery	Jun 1985–Dec 1993
Wollongong Coastal	Mount Pleasant	Jun 1997–ongoing
Wollongong Coastal	Mount Nebo	Nov 1982–Feb 1997
Wollongong Coastal	Mount Kembla	Jun 1985–ongoing
Wollongong Coastal	Dombarton Loop	Jun 1985–ongoing
Wollongong Coastal	Wongawilli	Jan 1983–ongoing
Wollongong Coastal	Port Kembla BHP	Jan 1993–ongoing
Wollongong Coastal	Port Kembla	Sep 1982–ongoing
Wollongong Coastal	Darkes Road	Feb 1994–Jun 2023
Wollongong Coastal	Cleveland Road	Jun 1985–ongoing
Wollongong Coastal	Huntley Colliery	Jan 1983–ongoing
Wollongong Coastal	Calderwood	Jan 1983–Jun 1985
Wollongong Coastal	Upper Calderwood	Jun 1985–ongoing
Wollongong Coastal	Little Lake	May 1992–Oct 2014
Wollongong Coastal	Little Lake Entrance	May 2014–ongoing
Wollongong Coastal	Airport	Jun 1991–Mar 1995
Wollongong Coastal	North Macquarie	Jul 1985–ongoing
Wollongong Coastal	Clover Hill	Dec 1985–ongoing
Wollongong Coastal	Nurrewin	Jan 2006–ongoing
Wollongong Coastal	Yellow Rock Road	Jan 1983–ongoing
Wollongong Coastal	Balgownie	Jul 1982–Jun 1987
Wollongong Coastal	Woonona	Jul 1982–Jun 1985
South Coast	Lake Wollumboola	Feb 1999–Oct 2000
South Coast	Lake Conjola Downstream	Jul 2016–ongoing
South Coast	Lake Conjola	Jan 1999–Jul 2017
South Coast	Barlows Bay (Narooma)	Jul 1999–ongoing
South Coast	Regatta Point	Jan 1999–ongoing
South Coast	Merimbula Wharf	Aug 1997–Sep 2001
South Coast	Agnew Wharf	Aug 1997–Jun 2000

Appendix B Publications of interest

Data reports

MHL annual coastal rainfall summaries available:

MHL Report Nos. 610 (90–91), 624 (91–92), 660 (92–93), 699 (93–94), 730 (94–95), 776 (95–96), 874 (96–97), 946 (97–98), 1015 (98–99), 1071 (99–00), 1131 (00–01), 1207 (01–02), 1278 (02–03), 1348 (03–04), 1424 (04–05), 1513 (05–06), 1765 (06–07), 1849 (07–08), 1934 (08–09), 2011 (09–10), 2090 (10–11), 2159 (11–12), 2220 (12–13), 2293 (13–14), 2385 (14–15), 2476 (15–16), 2575 (16–17), 2619 (17–18), 2694 (18–19), 2771 (19–20), 2857 (20–21), 2908 (21–22), 2996 (22–23).

MHL annual estuary and river water levels summaries available:

MHL Report Nos. 555 (87–88), 564 (88–89), 582 (89–90), 601 (90–91), 625 (91–92), 659 (92–93), 698 (93–94), 731 (94–95), 778 (95–96), 875 (96–97), 947 (97–98), 1014 (98–99), 1070 (99–00), 1130 (00–01), 1206 (01–02), 1276 (02–03), 1346 (03–04), 1422 (04–05), 1511 (05–06), 1763 (06–07), 1847 (07–08), 1932 (08–09), 2009 (09–10), 2088 (10–11), 2157 (11–12), 2218 (12–13), 2291 (13–14), 2383 (14–15), 2474 (15–16), 2573 (16–17), 2617 (17–18), 2692 (18–19), 2769 (19–20), 2855 (20–21), 2906 (21–22), 2994 (22–23).

MHL annual ocean tide levels summaries available:

MHL Report Nos. 515 (86–87), 544 (87–88), 563 (88–89), 585 (89–90), 602 (90–91), 628 (91–92), 658 (92–93), 697 (93–94), 732 (94–95), 777 (95–96), 876 (96–97), 947 (97–98), 1013 (98–99), 1069 (99–00), 1129 (00–01), 1205 (01–02), 1277 (02–03), 1347 (03–04), 1423 (04–05), 1512 (05–06), 1764 (06–07), 1848 (07–08), 1933 (08–09), 2010 (09–10), 2089 (10–11), 2158 (11–12), 2219 (12–13), 2292 (13–14), 2384 (14–15), 2475 (15–16), 2574 (16–17), 2618 (17–18), 2693 (18–19), 2770 (19–20), 2856 (20–21), 2907 (21–22), 2995 (22–23).

MHL annual wave climate and coastal air pressure summaries available:

MHL Report Nos. 547 (87–88), 560 (88–89), 581 (89–90), 600 (90–91), 627 (91–92), 655 (92–93), 695 (93–94), 733 (94–95), 779 (95–96), 877 (96–97), 948 (97–98), 1016 (98–99), 1072 (99–00), 1132 (00–01), 1208 (01–02), 1279 (02–03), 1349 (03–04), 1425 (04–05), 1514 (05–06), 1766 (06–07), 1850 (07–08), 1935 (08–09), 2012 (09–10), 2091 (10–11), 2160 (11–12), 2221 (12–13), 2294 (13–14), 2386 (14–15), 2477 (15–16), 2576 (16–17), 2620 (17–18), 2695 (18–19), 2772 (19–20), 2858 (20–21), 2909 (21–22), 2997 (22–23).

Flood reports

MHL flood reports:

- *New South Wales North Coast Flood Summary June 2005*, MHL Report No. 1426
- *Marshall's Creek Flood Event 30 June 2005*, MHL Report No. 1435
- *New South Wales North Coast January 2006 Flood Summary*, MHL Report No. 1469

- *New South Wales North Coast March 2006 Flood Summary*, MHL Report No. 1482
- *New South Wales Central Coast June 2007 Flood Summary*, MHL Report No. 1754
- *New South Wales Hunter Valley, Wallamba River and Myall River June 2007 Flood Summary*, MHL Report No. 1755
- *New South Wales Hawkesbury and Nepean June 2007 Flood Summary*, MHL Report No. 1756
- *New South Wales Tweed River January 2008 Flood Summary*, MHL Report No. 1801
- *New South Wales Richmond River January 2008 Flood Summary*, MHL Report No. 1802
- *New South Wales Clarence River January 2008 Flood Summary*, MHL Report No. 1803
- *New South Wales Coffs Harbour and Bellinger River Region January 2008 Flood Summary*, MHL Report No. 1804
- *New South Wales Coffs Harbour, Bellinger River and Nambucca River Regions February 2009 Flood Summary*, MHL Report No. 1908
- *New South Wales Coffs Harbour and Bellinger River Regions April 2009 Flood Summary*, MHL Report No. 1913
- *NSW Northern Rivers May 2009 Flood Report*, MHL Report No. 1965
- *NSW North Coast Flood Summary January–March 2013*, MHL Report No. 2202
- *NSW Hunter and Central Coast Flood Summary April–May 2015*, MHL Report No. 2364
- *NSW South Coast Flood Summary August 2015*, MHL Report No. 2397
- *NSW North Coast Flood Summary March 2017*, MHL Report No. 2535
- *NSW Coastal Flood Summary February 2020*, MHL Report No. 2752
- *NSW Coastal Flood Summary March 2021*, MHL Report No. 2809
- *NSW North Coast Flood Summary February/March 2022*, MHL Report No. 2880
- *NSW Brunswick, Wilsons and Richmond Rivers Flood Summary March/April 2022*, MHL Report No. 2895
- *NSW Coast Flood Summary February/March 2022*, MHL Report No. 2936

Other references

Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I, (Editors) 2019, *Australian Rainfall and Runoff: A Guide to Flood Estimation*, Commonwealth of Australia,

The Institution of Engineers, Australia 1987, *Australian Rainfall and Runoff: A Guide to Flood Estimation*, Institute of Engineers Australia



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