

NSW TIDE CHARTS

2016

November 26, 2015
to
January 4, 2017



Office of
Environment
and Heritage



Public Works
Manly Hydraulics Laboratory

Technical data supplied by:

NSW Department of Finance, Services and Innovation

NSW Public Works

NSW Water Solutions

Manly Hydraulics Laboratory

110B King Street

Manly Vale NSW 2093

Australia

T: (02) 9949 0200

F: (02) 9948 6185

W: www.mhl.nsw.gov.au

Enquiries to: The Principal Engineer

The publisher of this booklet, NSW Department of Finance, Services and Innovation, advises readers that the information contained in this booklet is in the nature of a general guide only and should not be relied upon in any critical situation, nor used for navigation.

ISSN: 1039 - 1231

© Crown in right of NSW through the Department of Finance, Services and Innovation 2016

The NSW Department of Finance, Services and Innovation and the NSW Office of Environment and Heritage permit this material to be reproduced, for educational or non-commercial use, in whole or in part, provided the meaning is unchanged and its source, publisher and authorship are acknowledged.

While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

CONTENTS

How to get the best from these charts	5	July 7–13, 2016	24
Tidal terms	6	July 14–20, 2016	25
November 26–December 2, 2015	14	July 21–27, 2016	25
December 3–9, 2015.....	14	July 28–August 3, 2016.....	25
December 10–16, 2015.....	14	August 4–10, 2016	26
December 17–23, 2015.....	15	August 11–17, 2016	26
December 24–30, 201.....	15	August 18–24, 2016	26
December 31–January 6, 2016.....	15	August 25–31, 2016	27
January 7–13, 2016	16	September 1–7, 2016.....	27
January 14–20, 2016	16	September 8–14, 2016.....	27
January 21–27, 2016	16	September 15–21, 2016.....	28
January 28–February 3, 2016	17	September 22–28, 2016.....	28
February 4–10, 2016.....	17	September 29–October 5, 2016	28
February 11–17, 2016.....	17	October 6–12, 2016.....	29
February 18–24, 2016.....	18	October 13–19, 2016.....	29
February 25–March 2, 2016.....	18	October 20–26, 2016.....	29
March 3–9, 2016	18	October 27–November 2, 2016	30
March 10–16, 2016	19	November 3–9, 2016	30
March 17–23, 2016	19	November 10–16, 2016.....	30
March 24–30, 2016	19	November 17–23, 2016.....	31
March 31–April 6, 2016.....	20	November 24–30, 2016.....	31
April 7–13, 2016	20	December 1–7, 2016.....	31
April 14–20, 2016	20	December 8–14, 2016	32
April 21–27, 2016	21	December 15–21, 2016.....	32
April 28–May 4, 2016	21	December 22–28, 2016.....	32
May 5–11, 2016	21	December 29–January 4, 2017	33
May 12–18, 2016	22	Time differences for secondary locations	34
May 19–25, 2016	22		
May 26–June 1, 2016.....	22		
June 2–8, 2016	23		
June 9–15, 2016	23		
June 16–22, 2016	23		
June 23–29, 2016	24		
June 30–July 6, 2016.....	24		

NEW SOUTH WALES
TIDE CHARTS

November 26, 2015 to January 4, 2017

The following pages of charted tidal predictions for New South Wales are based on data from water level recorders managed by the Environmental Programs Branch of the **NSW Office of Environment and Heritage**, and operated by **Manly Hydraulics Laboratory**, a team within NSW Water Solutions, a business unit within NSW Public Works. The charts are produced by a Foreman¹ analysis of the historical water levels recorded by the tide gauge located at Middle Head, Sydney Harbour (Latitude 33°50' South; Longitude 151°15' East; Time Zone 1000).

Manly Hydraulics Laboratory has adopted Middle Head as the primary reference station for obtaining and monitoring tidal data in NSW. The time differences between the primary and secondary locations in NSW were obtained from an analysis of levels recorded by the gauges at each of the secondary locations. (The secondary locations and their respective time differences are tabled at the back of this booklet.)

DO NOT ADJUST FOR DAYLIGHT SAVING TIMES. Chart times are stated to Australian Eastern Standard Time or Daylight Saving Time where applicable. Daylight Saving periods begin on the first Sunday in October and end on the first Sunday in April.

Sunrise, Sunset, Moonrise and Moonset times for Sydney are included in this booklet. The corresponding times for the secondary locations throughout NSW will vary from those at Sydney. Tide levels are listed in metres. Predicted tidal levels for NSW ocean locations will vary from those at Sydney but the variation will generally not be more than 0.2 metres. The actual tide may differ from the predicted tide due to meteorological and oceanographic conditions. Zero on the tide charts is approximately Indian Spring Low Water.

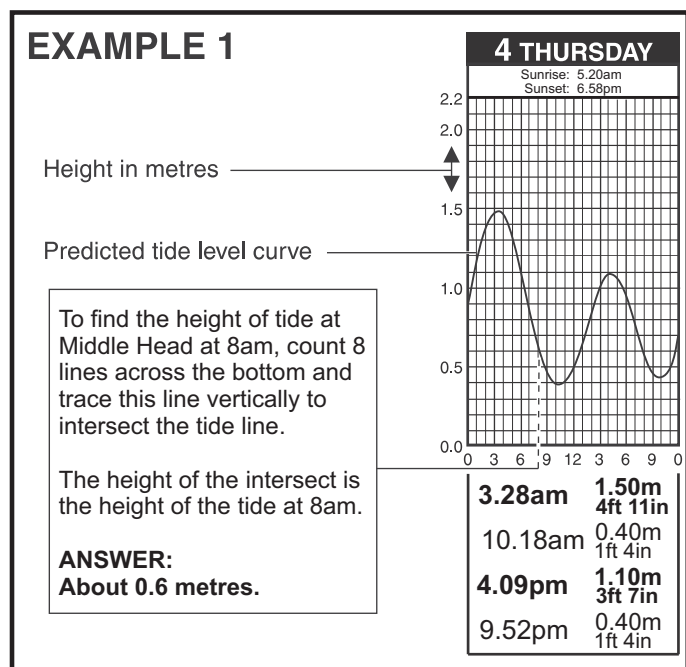
The tidal analyses have been carried out using data from the Sydney gauge and the secondary ocean and river gauges to determine the approximate time differences of high and low water from those at Sydney. For each river basin, locations are generally given starting from a downstream location on the estuary/river and working progressively upstream. Locations are on the main estuary, river or channel arm unless otherwise stated. In general, the time differences will progressively increase and tidal ranges will progressively decrease the higher the secondary location is upstream in estuaries, rivers and lakes.

The time differences for the secondary locations are average values over the lunar cycle and will vary throughout that cycle and throughout the year. Other variations may occur at the primary location or the secondary locations, or both, due to unpredictable meteorological, oceanographic and hydrological conditions. The following tidal predictions and accompanying table for secondary locations must therefore be regarded as a guide only.

1. Foreman, M.G.G., 1977. Manual for Tidal Heights Analysis and Prediction. Pacific Marine Science Report 77-10, Institute of Ocean Sciences, Patricia Bay, Sidney, B.C., 58 pp. (2004 revision).

HOW TO GET THE BEST FROM THESE CHARTS

These charts, based on data obtained from the primary tide gauge located at Middle Head, Sydney Harbour, enable the user to predict the height of tide at any time on any day at Middle Head or one of the secondary locations tabled at the back of this booklet. The charts show the range or height of tide measured in metres, scaled vertically at left from 0.0 metres to 2.2 metres in increments of 0.1 metre (one decimetre). Every 0.5 metres of scale is shown with a thicker line. Each day begins from midnight and is scaled in hourly increments marked horizontally across the bottom of each day's chart, with every three-hourly interval numbered, e.g. 0 = midnight, 12 = midday, the first 6 = 6am, the second 6 = 6pm, etc. Every three-hour period is shown with a thicker line. All times in these examples are to Australian Eastern Standard Time (AEST).



EXAMPLE 1: Primary Location

To determine the height of tide at the primary reference location, Middle Head in Sydney Harbour, at 8am on Thursday, the 4th: Count 8 vertical lines across from the zero at left on that day's chart and trace up the line to where it intersects the tide line. The intersect marks the height of tide at this time, which can be read off the vertical scale – about 0.6 metres. The flow of the tide curve chronologically from left to right indicates the tide is falling. Counting down from the intersect to the horizontal line intersecting the bottom of the tide curve shows the tide has about another 0.2 metres to fall to reach low tide.

EXAMPLE 2: To find the tide height at Port Macquarie at 8:30am

Add the time difference for Port Macquarie shown in the table at the back of this book to the stated time for the first tidal extreme before 8.30am, in this case a high of 1.5 metres at 3.28am.

The difference for Port Macquarie = +0:19.

Time of corresponding tide at Port Macquarie = 3:28 + 0:19 = 3:47am.

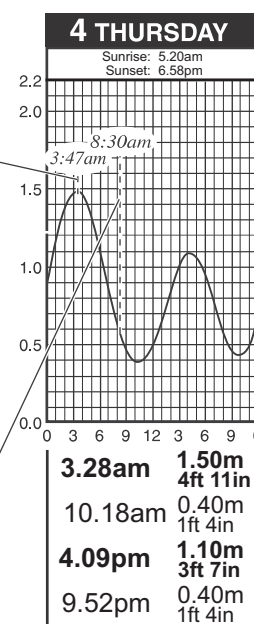
Mark the top of the tide curve as 3.47am.

Hours until 8:30am = 8:30 - 3:47
= 4 hours 43 minutes, say 4³/₄ hours.

Count across from the mark at the top of the tide curve the equivalent distance of 4³/₄ hours and draw a line vertically down the graph until it intersects the tide line.

The height of the intersect is the height of the tide at Port Macquarie at 8:30am.

ANSWER: 0.6 metres.



To find the approximate height of tide at a secondary location, turn to the Secondary Locations table at the back of this booklet and note the listed time difference for the required location. Time differences are shown in hours and minutes separated by a colon, and identified as either plus (+) or minus (-). Plus values should be added to and minus values subtracted from the stated tide times on the charts to find the predicted time for the secondary location.

To determine the height of tide at Port Macquarie at 8.30am in the example above, look up Port Macquarie in the Secondary Locations table (listed as part of the Hastings River Basin). Port Macquarie's time difference is shown as +0:19 (zero hours and 19 minutes). Add this to the time of the required high or low for the day shown on the chart, in this case a high of 1.5 metres at 03:28 hours. The time for the corresponding tide at Port Macquarie then becomes 3:47am.

Draw a line at the top of the tide shown at 03:28 hours and mark it as 3:47am. Subtract the 3:47 from the required 8.30am, which leaves about four and three-quarter hours. Now count across four and three quarters of the one-hour increments to locate the line which relates to 8.30am for Port Macquarie, then trace down to where it intersects the tide curve, and count off the height – about 0.6 metres. The flow of the chart indicates the tide is falling, with about 0.2 metres to the next low tide.

It is not recommended that this method be used to estimate tidal heights for upstream stations, but rather as a means of estimating the occurrence of high or low tide. However, where the time difference from Sydney is 60 minutes or less, the method may be used to gain an approximation of the tidal level.

TIDAL TERMS

Australian Height Datum (AHD): is a single reference point set by the National Mapping Council to relate all vertical measurements throughout Australia as part of the Geocentric Datum of Australia (GDA) which is now being phased in by the Intergovernmental Committee on Surveying and Mapping to unify all the different mapping datum across Australia into one homogenous datum. The Australian Height Datum is based on the Mean Sea Level.

Charted Depth: is the vertical measurement of water from the ocean floor to a standard level from which the soundings printed on charts are calculated, known as Datum.

Datum: is the zero reference point from which tidal heights (measured up) and chart soundings (measured down) are calculated.

Depth of Water: can be calculated at any given time in any given place by adding the height of tide at that time and place to the Charted Depth as recorded on the chart for that place.

Diurnal Tides: occur once a day; i.e. one high tide and one low tide on average in any one 24-hour period.

Highest Astronomical Tide (HAT): is the highest tide which can be predicted under any combination of astronomical conditions and average meteorological conditions. Higher tides can occur under extreme meteorological and oceanographic conditions.

Indian Spring Lower Water (ISLW): is the lowest level to which a tide will fall under exceptional, predictable, astronomical conditions. It seldom occurs. Meteorological and oceanographical influences, which cannot be predicted, can cause the tide to fall even lower.

King Tide: is a layman's term for the highest of the Spring tides which usually occurs during the day on the New or Full Moon in January and again, at night, on the New or Full Moon in July.

Lowest Astronomical Tide (LAT): is the lowest tide which can be predicted under any combination of astronomical conditions and average meteorological conditions. Lower tides can occur.

Mean High Water Springs (MHWS): is the average level of the Spring high tides which occur on the New and Full Moons.

Mean Low Water Springs (MLWS): is the average level of the Spring low tides.

Mean High Water Neaps (MHWN): is the average level of the Neap high tides which occur on the Quarter Moons.

Mean Low Water Neaps (MLWN): is the average level of the Neap low tides.

Mean Sea Level (MSL): is the average level of the sea surface over a 19-year period, and is approximately the level where the water would settle if there were no tides.

Neap Tides: are those which occur on the Quarter Moons (first or last) when the high tides are relatively small (a low "high") and the low tides are relatively high (a high "low").

Semi-diurnal Tides: occur twice a day, i.e., two high tides and two low tides on average in any one 24-hour period. Of the two highs, one will be higher than the other (daytime in summer, night time in winter). Of the two lows, one will be lower than the other.

Slack Water: is when a tidal current ceases to flow before reversing direction. It does not necessarily occur at the same time as the time of high or low tide. It is governed by geographical and hydrological influences as well as the tide itself.

Spring Tides: are those which occur on the New or Full Moon when the high tides are very high (a high "high") and the low tides are very low (a low "low"). Not to be confused with the season also known as spring.

Tidal Current: is the horizontal movement of water caused by the rise or fall of the tide.

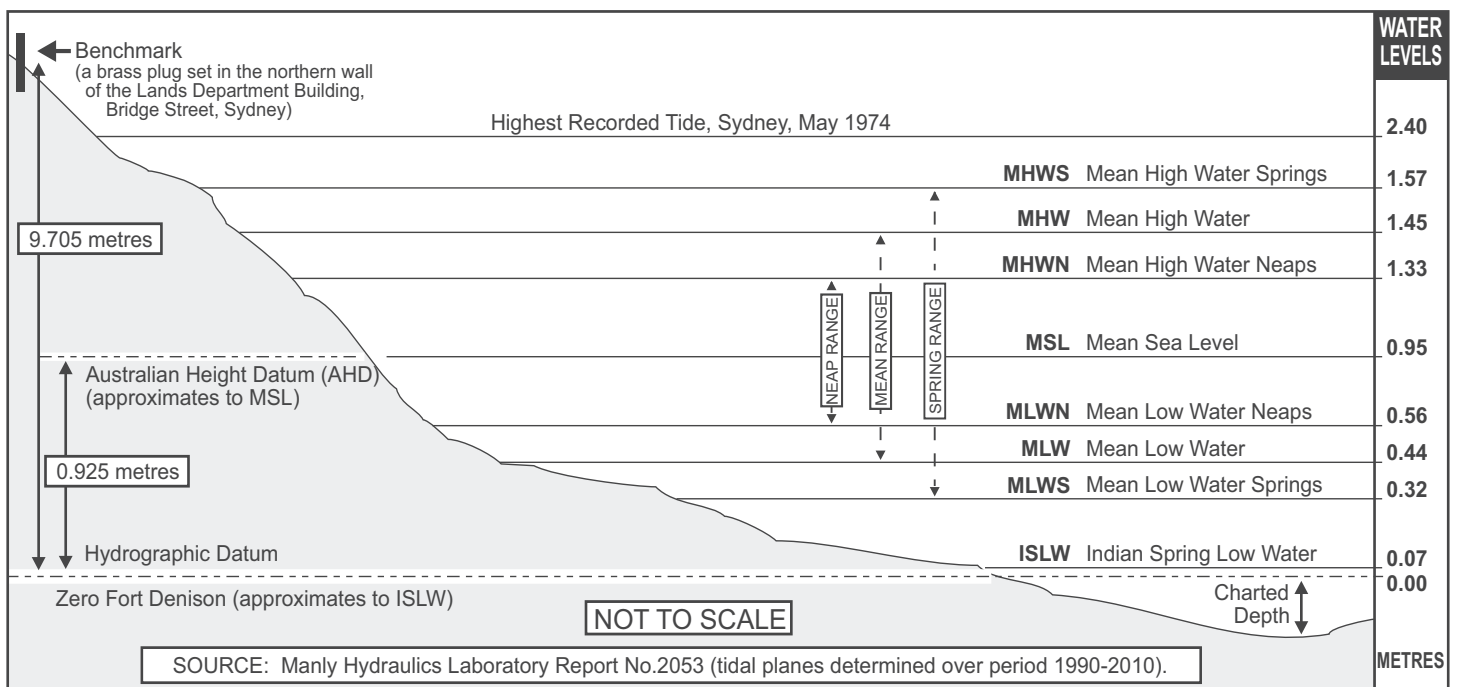
Tidal Epoch: has been set in Australia as a 20-year period (based on the Lunar Cycle of 18.6 Earth years) over which all recordings of tidal variations and influences are analysed and reviewed.

Tidal Range: is the difference in height between two sequential tidal extremes (a low tide of 0.29 metres followed by a high tide of 1.63 metres will cause a tidal range of 1.34 metres ($1.63 - 0.29 = 1.34$)).

DAYLIGHT SAVING PERIODS

Daylight Saving Time began in New South Wales, the Australian Capital Territory, Victoria, Tasmania and South Australia at 2am on Sunday, October 4, 2015, when clocks should have been turned forward one hour to read 3am. Daylight Saving Time ends at 3am on Sunday, April 3, 2016, when clocks should be turned back one hour to read 2am. In 2016, Daylight Saving begins in New South Wales, the Australian Capital Territory, Victoria, South Australia and Tasmania at 2am on Sunday, October 2. Daylight Saving Time ends at 3am on Sunday, April 2, 2017. Queensland, Western Australia and the Northern Territory do not participate in Daylight Saving Time.

NOTE: Prediction times in this book are to Australian Eastern Standard Time or Daylight Saving Time where applicable. No adjustment is needed.



JANUARY 2016

DAY	MOON RISE	MOON SET	NOTES
1		12:01 pm	
2	12:25 am	12:54 pm	☾
3	12:56 am	1:47 pm	
4	1:29 am	2:40 pm	
5	2:04 am	3:34 pm	
6	2:41 am	4:29 pm	
7	3:23 am	5:24 pm	
8	4:09 am	6:19 pm	
9	5:00 am	7:12 pm	
10	5:56 am	8:03 pm	●
11	6:56 am	8:51 pm	
12	7:59 am	9:35 pm	
13	9:03 am	10:17 pm	
14	10:08 am	10:57 pm	
15	11:13 am	11:36 pm	
16	12:17 pm		
17	1:22 pm	12:15 am	☾
18	2:26 pm	12:56 am	
19	3:30 pm	1:39 am	
20	4:31 pm	2:26 am	
21	5:30 pm	3:16 am	
22	6:25 pm	4:10 am	
23	7:14 pm	5:06 am	
24	7:59 pm	6:04 am	☽
25	8:40 pm	7:02 am	
26	9:17 pm	7:59 am	
27	9:52 pm	8:55 am	
28	10:24 pm	9:50 am	
29	10:56 pm	10:43 am	
30	11:29 pm	11:37 am	
31		12:29 pm	

FEBRUARY 2016

DAY	MOON RISE	MOON SET	NOTES
1	12:02 am	1:23 pm	☾
2	12:38 am	2:16 pm	
3	1:17 am	3:10 pm	
4	2:00 am	4:05 pm	
5	2:47 am	4:58 pm	
6	3:41 am	5:50 pm	
7	4:39 am	6:40 pm	
8	5:41 am	7:27 pm	
9	6:46 am	8:12 pm	●
10	7:53 am	8:54 pm	
11	9:00 am	9:35 pm	
12	10:07 am	10:15 pm	
13	11:13 am	10:56 pm	
14	12:19 pm	11:39 pm	
15	1:23 pm		☾
16	2:25 pm	12:25 am	
17	3:24 pm	1:13 am	
18	4:19 pm	2:05 am	
19	5:10 pm	3:00 am	
20	5:56 pm	3:56 am	
21	6:37 pm	4:53 am	
22	7:15 pm	5:49 am	
23	7:51 pm	6:45 am	☽
24	8:24 pm	7:40 am	
25	8:56 pm	8:35 am	
26	9:29 pm	9:28 am	
27	10:01 pm	10:21 am	
28	10:36 pm	11:14 am	
29	11:13 pm	12:07 pm	

MARCH 2016

DAY	MOON RISE	MOON SET	NOTES
1	11:54 pm	1:00 pm	
2		1:53 pm	☾
3	12:38 am	2:46 pm	
4	1:27 am	3:37 pm	
5	2:22 am	4:27 pm	
6	3:21 am	5:15 pm	
7	4:24 am	6:01 pm	
8	5:30 am	6:44 pm	
9	6:38 am	7:27 pm	●
10	7:47 am	8:08 pm	
11	8:56 am	8:51 pm	
12	10:04 am	9:35 pm	
13	11:12 am	10:21 pm	
14	12:17 pm	11:10 pm	
15	1:18 pm		
16	2:15 pm	12:02 am	☾
17	3:08 pm	12:56 am	
18	3:55 pm	1:51 am	
19	4:37 pm	2:48 am	
20	5:16 pm	3:44 am	
21	5:51 pm	4:39 am	
22	6:25 pm	5:34 am	
23	6:57 pm	6:28 am	☽
24	7:29 pm	7:21 am	
25	8:02 pm	8:15 am	
26	8:36 pm	9:08 am	
27	9:12 pm	10:01 am	
28	9:51 pm	10:53 am	
29	10:33 pm	11:46 am	
30	11:20 pm	12:38 pm	
31		1:29 pm	

APRIL 2016

DAY	MOON RISE	MOON SET	NOTES
1	12:11 am	2:18 pm	☾
2	1:06 am	3:05 pm	
3	2:05 am	2:50 pm	
4	2:08 am	3:34 pm	
5	3:14 am	4:16 pm	
6	4:21 am	4:58 pm	
7	5:30 am	5:40 pm	●
8	6:41 am	6:24 pm	
9	7:51 am	7:10 pm	
10	9:00 am	8:00 pm	
11	10:06 am	8:52 pm	
12	11:07 am	9:48 pm	
13	12:03 pm	10:44 pm	
14	12:52 pm	11:42 pm	☾
15	1:37 pm		
16	2:17 pm	12:39 am	
17	2:53 pm	1:34 am	
18	3:27 pm	2:29 am	
19	4:00 pm	3:23 am	
20	4:31 pm	4:17 am	
21	5:04 pm	5:10 am	
22	5:37 pm	6:03 am	☽
23	6:12 pm	6:56 am	
24	6:50 pm	7:49 am	
25	7:31 pm	8:42 am	
26	8:16 pm	9:34 am	
27	9:05 pm	10:25 am	
28	9:58 pm	11:14 am	
29	10:54 pm	12:01 pm	
30	11:54 pm	12:46 pm	☾

MAY 2016

DAY	MOON RISE	MOON SET	NOTES
1		1:28 pm	
2	12:56 am	2:09 pm	
3	2:01 am	2:49 pm	
4	3:07 am	3:30 pm	
5	4:15 am	4:12 pm	
6	5:25 am	4:57 pm	
7	6:35 am	5:45 pm	●
8	7:44 am	6:37 pm	
9	8:50 am	7:33 pm	
10	9:51 am	8:31 pm	
11	10:45 am	9:30 pm	
12	11:33 am	10:29 pm	
13	12:16 pm	11:27 pm	
14	12:54 pm		◐
15	1:29 pm	12:23 am	
16	2:02 pm	1:18 am	
17	2:34 pm	2:11 am	
18	3:06 pm	3:05 am	
19	3:38 pm	3:57 am	
20	4:13 pm	4:51 am	
21	4:50 pm	5:44 am	
22	5:30 pm	6:37 am	○
23	6:14 pm	7:31 am	
24	7:02 pm	8:23 am	
25	7:53 pm	9:13 am	
26	8:49 pm	10:01 am	
27	9:47 pm	10:46 am	
28	10:47 pm	11:28 am	
29	11:49 pm	12:08 pm	◐
30		12:47 pm	
31	12:52 am	1:26 pm	

JUNE 2016

DAY	MOON RISE	MOON SET	NOTES
1	1:58 am	2:06 pm	
2	3:04 am	2:48 pm	
3	4:13 am	3:33 pm	
4	5:21 am	4:22 pm	
5	6:29 am	5:15 pm	●
6	7:33 am	6:13 pm	
7	8:32 am	7:13 pm	
8	9:24 am	8:14 pm	
9	10:11 am	9:14 pm	
10	10:52 am	10:12 pm	
11	11:29 am	11:09 pm	
12	12:03 pm		◐
13	12:36 pm	12:04 am	
14	1:08 pm	12:58 am	
15	1:40 pm	1:51 am	
16	2:13 pm	2:44 am	
17	2:49 pm	3:37 am	
18	3:28 pm	4:31 am	
19	4:10 pm	5:24 am	
20	4:57 pm	6:17 am	○
21	5:48 pm	7:09 am	
22	6:43 pm	7:59 am	
23	7:41 pm	8:45 am	
24	8:41 pm	9:29 am	
25	9:42 pm	10:10 am	
26	10:45 pm	10:49 am	
27	11:48 pm	11:27 am	
28		12:06 pm	◐
29	12:53 am	12:45 pm	
30	1:58 am	1:27 pm	

JULY 2016

DAY	MOON RISE	MOON SET	NOTES
1	3:05 am	2:13 pm	
2	4:11 am	3:03 pm	
3	5:15 am	3:57 pm	
4	6:16 am	4:56 pm	●
5	7:12 am	5:56 pm	
6	8:02 am	6:57 pm	
7	8:46 am	7:58 pm	
8	9:26 am	8:56 pm	
9	10:02 am	9:53 pm	
10	10:36 am	10:48 pm	
11	11:08 am	11:42 pm	
12	11:40 am		☾
13	12:13 pm	12:35 am	
14	12:48 pm	1:28 am	
15	1:25 pm	2:21 am	
16	2:06 pm	3:15 am	
17	2:51 pm	4:08 am	
18	3:40 pm	5:01 am	
19	4:34 pm	5:52 am	
20	5:32 pm	6:41 am	☽
21	6:32 pm	7:27 am	
22	7:35 pm	8:10 am	
23	8:38 pm	8:50 am	
24	9:42 pm	9:29 am	
25	10:46 pm	10:08 am	
26	11:51 pm	10:47 am	
27		11:27 am	☽
28	12:56 am	12:10 pm	
29	2:00 am	12:57 pm	
30	3:04 am	1:49 pm	
31	4:05 am	2:44 pm	

AUGUST 2016

DAY	MOON RISE	MOON SET	NOTES
1	5:01 am	3:42 pm	
2	5:53 am	4:43 pm	
3	6:39 am	5:43 pm	●
4	7:21 am	6:42 pm	
5	7:59 am	7:40 pm	
6	8:34 am	8:36 pm	
7	9:07 am	9:31 pm	
8	9:40 am	10:25 pm	
9	10:13 am	11:19 pm	
10	10:46 am		
11	11:22 am	12:12 am	☾
12	12:01 pm	1:05 am	
13	12:44 pm	1:58 am	
14	1:31 pm	2:50 am	
15	2:22 pm	3:42 am	
16	3:18 pm	4:31 am	
17	4:18 pm	5:19 am	
18	5:21 pm	6:04 am	☽
19	6:25 pm	6:46 am	
20	7:31 pm	7:27 am	
21	8:36 pm	8:07 am	
22	9:42 pm	8:47 am	
23	10:48 pm	9:27 am	
24	11:54 pm	10:10 am	
25		10:56 am	●
26	12:57 am	11:46 am	
27	1:58 am	12:39 pm	
28	2:55 am	1:35 pm	
29	3:47 am	2:33 pm	
30	4:35 am	3:32 pm	
31	5:18 am	4:31 pm	

SEPTEMBER 2016

DAY	MOON RISE	MOON SET	NOTES
1	5:56 am	5:29 pm	●
2	6:32 am	6:26 pm	
3	7:06 am	7:21 pm	
4	7:39 am	8:16 pm	
5	8:12 am	9:09 pm	
6	8:45 am	10:03 pm	
7	9:20 am	10:56 pm	
8	9:57 am	11:48 pm	
9	10:38 am		
10	11:22 am	12:40 am	●
11	12:11 pm	1:31 am	
12	1:04 pm	2:21 am	
13	2:01 pm	3:09 am	
14	3:02 pm	3:54 am	
15	4:06 pm	4:38 am	
16	5:12 pm	5:20 am	
17	6:19 pm	6:01 am	○
18	7:27 pm	6:41 am	
19	8:35 pm	7:23 am	
20	9:43 pm	8:06 am	
21	10:49 pm	8:52 am	
22	11:52 pm	9:42 am	
23		10:35 am	●
24	12:51 am	11:30 am	
25	1:45 am	12:28 pm	
26	2:33 am	1:26 pm	
27	3:17 am	2:25 pm	
28	3:56 am	3:22 pm	
29	4:33 am	4:18 pm	
30	5:07 am	5:14 pm	

OCTOBER 2016

DAY	MOON RISE	MOON SET	NOTES
1	5:39 am	6:08 pm	●
2	7:12 am	8:02 pm	
3	7:45 am	8:56 pm	
4	8:19 am	9:49 pm	
5	8:55 am	10:41 pm	
6	9:34 am	11:33 pm	
7	10:16 am		
8	11:03 am	12:24 pm	
9	11:53 am	1:13 am	●
10	12:47 pm	2:01 am	
11	1:45 pm	2:46 am	
12	2:46 pm	3:29 am	
13	3:49 pm	4:11 am	
14	4:55 pm	4:51 am	
15	6:03 pm	5:32 am	
16	7:13 pm	6:13 am	○
17	8:23 pm	6:56 am	
18	9:33 pm	7:43 am	
19	10:40 pm	8:32 am	
20	11:43 pm	9:26 am	
21		10:22 am	
22	12:41 am	11:21 am	
23	1:32 am	12:20 pm	●
24	2:17 am	1:19 pm	
25	2:58 am	2:17 pm	
26	3:35 am	3:13 pm	
27	4:09 am	4:09 pm	
28	4:42 am	5:03 pm	
29	5:14 am	5:57 pm	
30	5:46 am	6:50 pm	
31	6:20 am	7:43 pm	●

NOVEMBER 2016

DAY	MOON RISE	MOON SET	NOTES
1	6:55 am	8:36 pm	
2	7:33 am	9:29 pm	
3	8:14 am	10:20 pm	
4	8:58 am	11:10 pm	
5	9:47 am	11:57 pm	
6	10:38 am		
7	11:33 am	12:42 am	
8	12:31 pm	1:25 am	☾
9	1:32 pm	2:06 am	
10	2:34 pm	2:45 am	
11	3:39 pm	3:24 am	
12	4:47 pm	4:03 am	
13	5:56 pm	4:44 am	
14	7:07 pm	5:29 am	
15	8:17 pm	6:17 am	☽
16	9:25 pm	7:09 am	
17	10:28 pm	8:06 am	
18	11:24 pm	9:07 am	
19		10:08 am	
20	12:14 am	11:10 am	
21	12:58 am	12:09 pm	☽
22	1:36 am	1:07 pm	
23	2:12 am	2:03 pm	
24	2:45 am	2:58 pm	
25	3:17 am	3:52 pm	
26	3:49 am	4:45 pm	
27	4:21 am	5:38 pm	
28	4:56 am	6:32 pm	
29	5:33 am	7:24 pm	☾
30	6:12 am	8:17 pm	

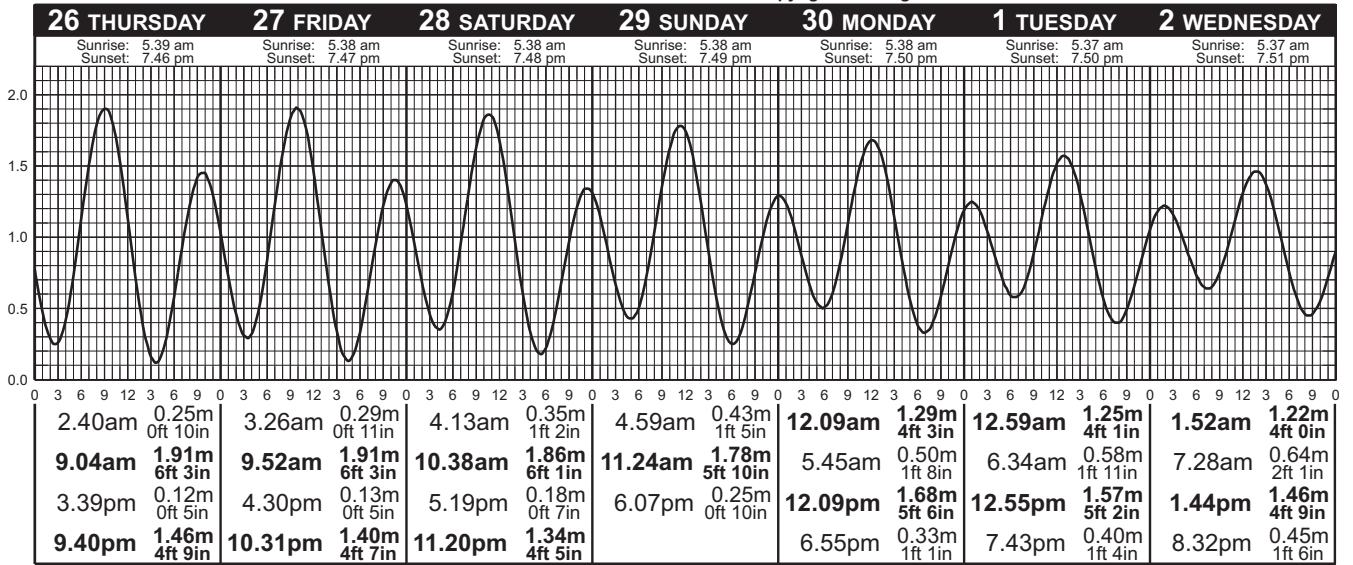
DECEMBER 2016

DAY	MOON RISE	MOON SET	NOTES
1	6:56 am	9:07 pm	
2	7:43 am	9:56 pm	
3	8:34 am	10:42 pm	
4	9:28 am	11:25 pm	
5	10:24 am		
6	11:22 am	12:06 am	
7	12:22 pm	12:44 am	☾
8	1:24 pm	1:22 am	
9	2:28 pm	1:59 am	
10	3:33 pm	2:37 am	
11	4:42 pm	3:18 am	
12	5:51 pm	4:03 am	
13	7:00 pm	4:52 am	
14	8:07 pm	5:46 am	☽
15	9:08 pm	6:45 am	
16	10:03 pm	7:48 am	
17	10:51 pm	8:52 am	
18	11:34 pm	9:55 am	
19		10:56 am	
20	12:11 am	11:54 am	
21	12:46 am	12:50 pm	☽
22	1:19 am	1:45 pm	
23	1:51 am	2:39 pm	
24	2:23 am	3:32 pm	
25	2:57 am	4:25 pm	
26	3:32 am	5:18 pm	
27	4:11 am	6:11 pm	
28	4:53 am	7:03 pm	
29	5:39 am	7:53 pm	☾
30	6:29 am	8:40 pm	
31	7:23 am	9:25 pm	

November 26 – December 2, 2015

Daylight Saving Time
©2015 Crown copyright in the right of NSW

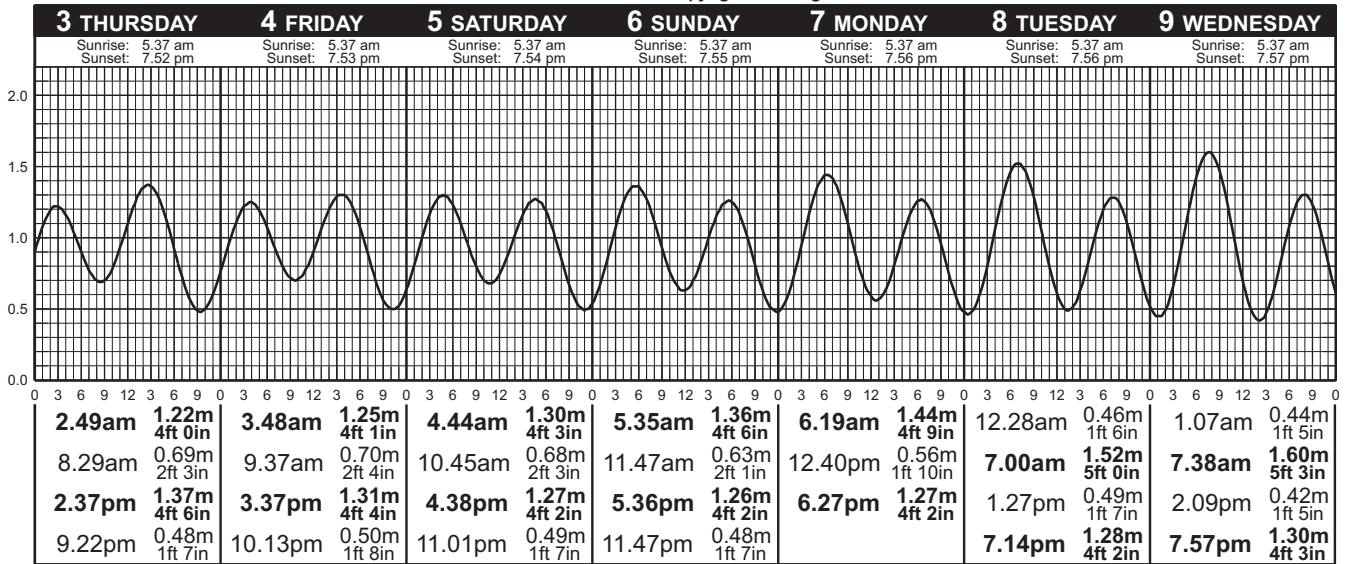
○ Full Moon Nov 26



December 3–9, 2015

Daylight Saving Time
©2015 Crown copyright in the right of NSW

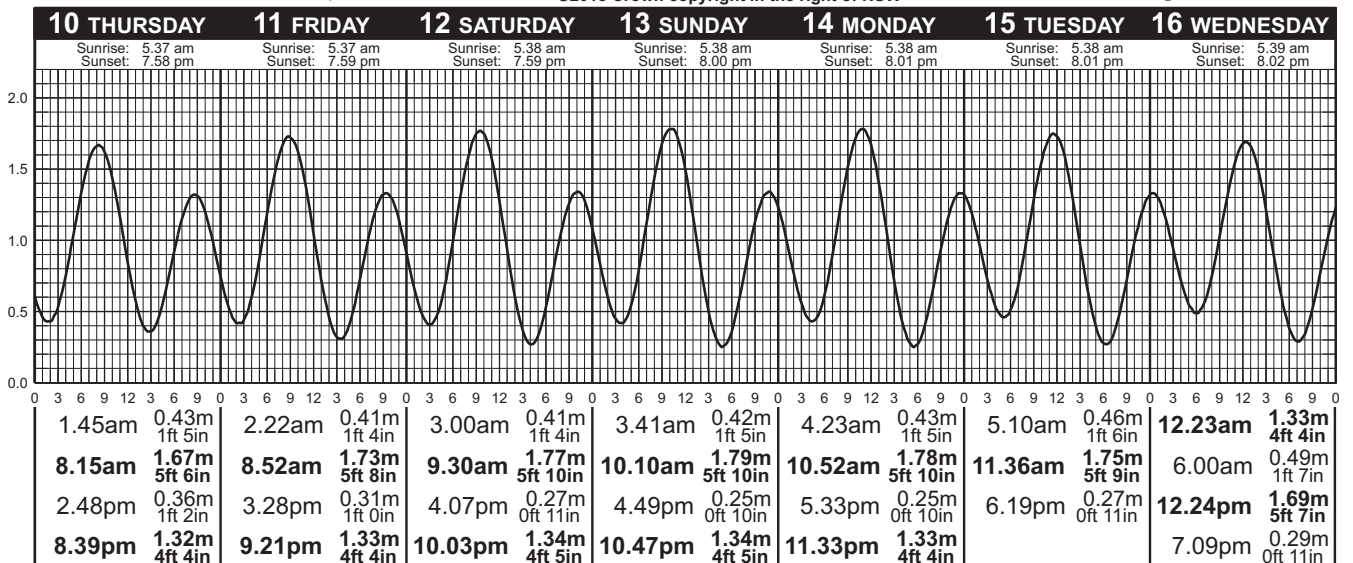
● 3rd Quarter Dec 3



December 10–16, 2015

Daylight Saving Time
©2015 Crown copyright in the right of NSW

● New Moon Dec 11

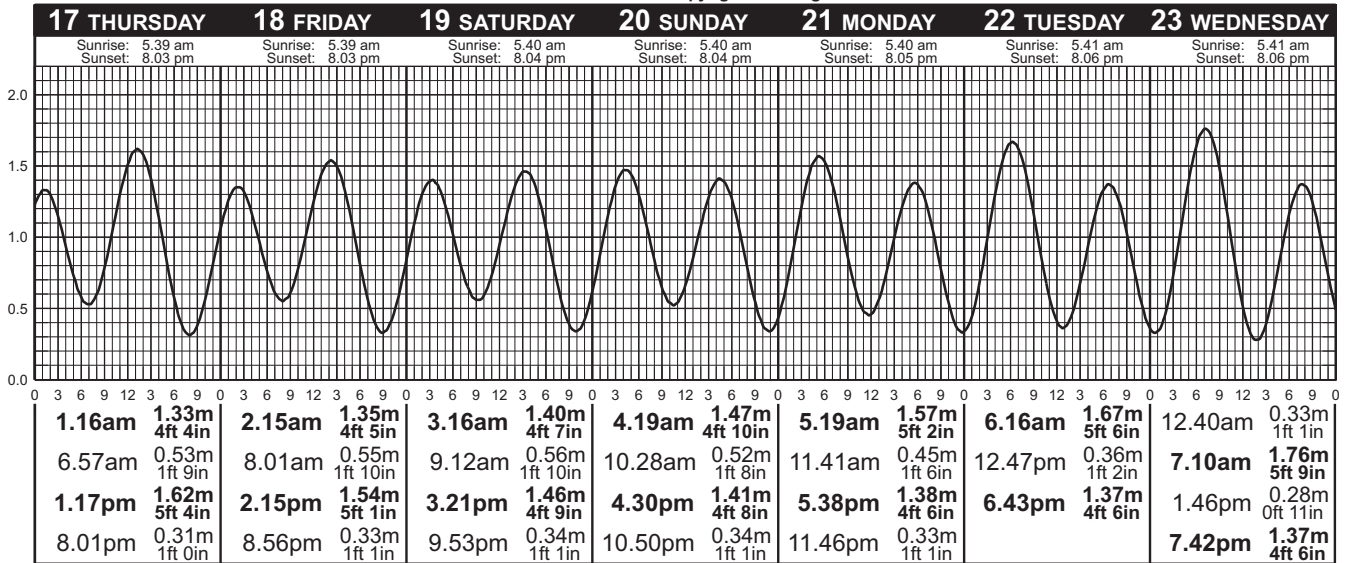


While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

December 17–23, 2015

Daylight Saving Time
©2015 Crown copyright in the right of NSW

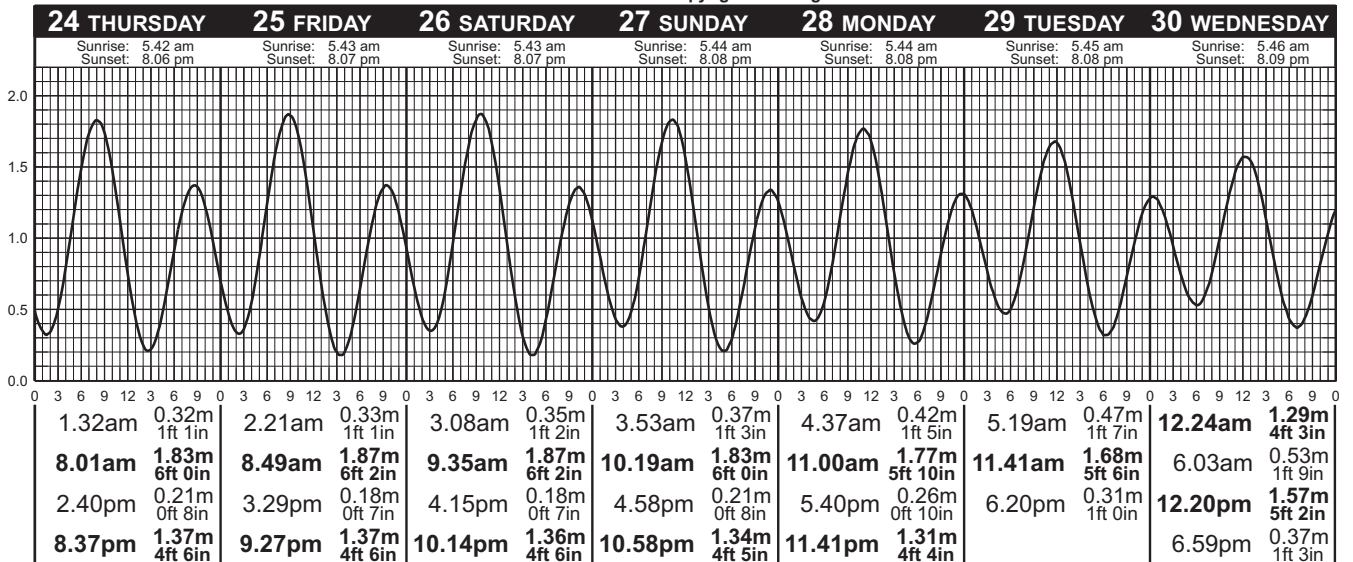
☾ 1st Quarter Dec 19



December 24–30, 2015

Daylight Saving Time
©2015 Crown copyright in the right of NSW

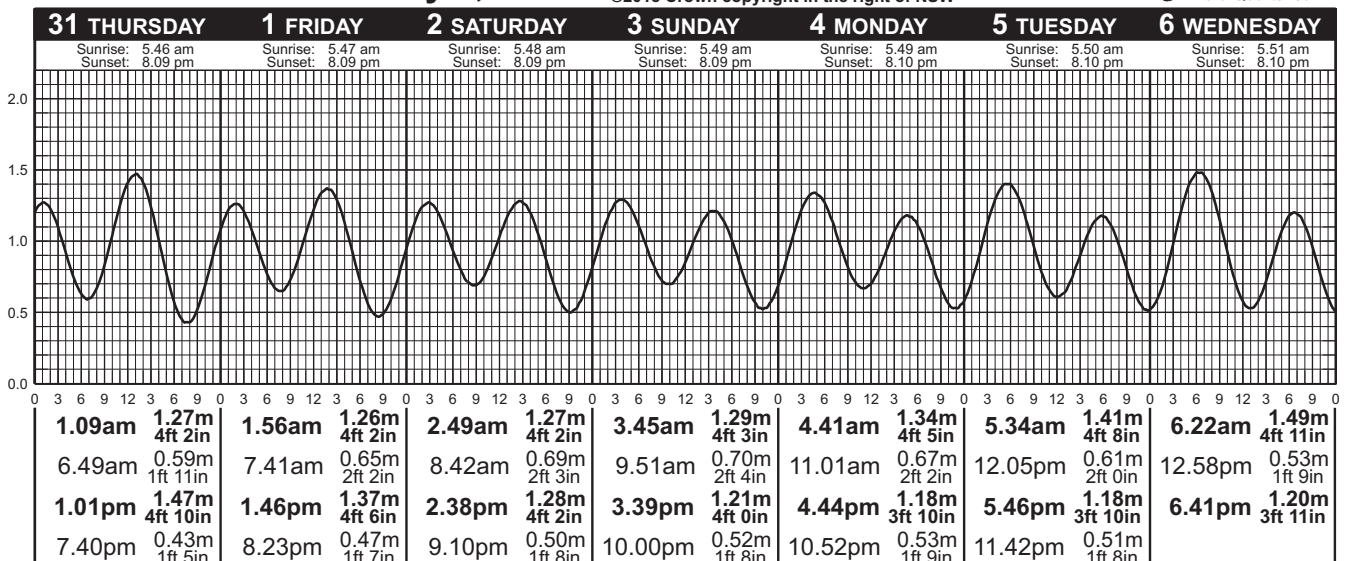
☾ Full Moon Dec 25



December 31 – January 6, 2016

Daylight Saving Time
©2015 Crown copyright in the right of NSW

☾ 3rd Quarter Jan 2

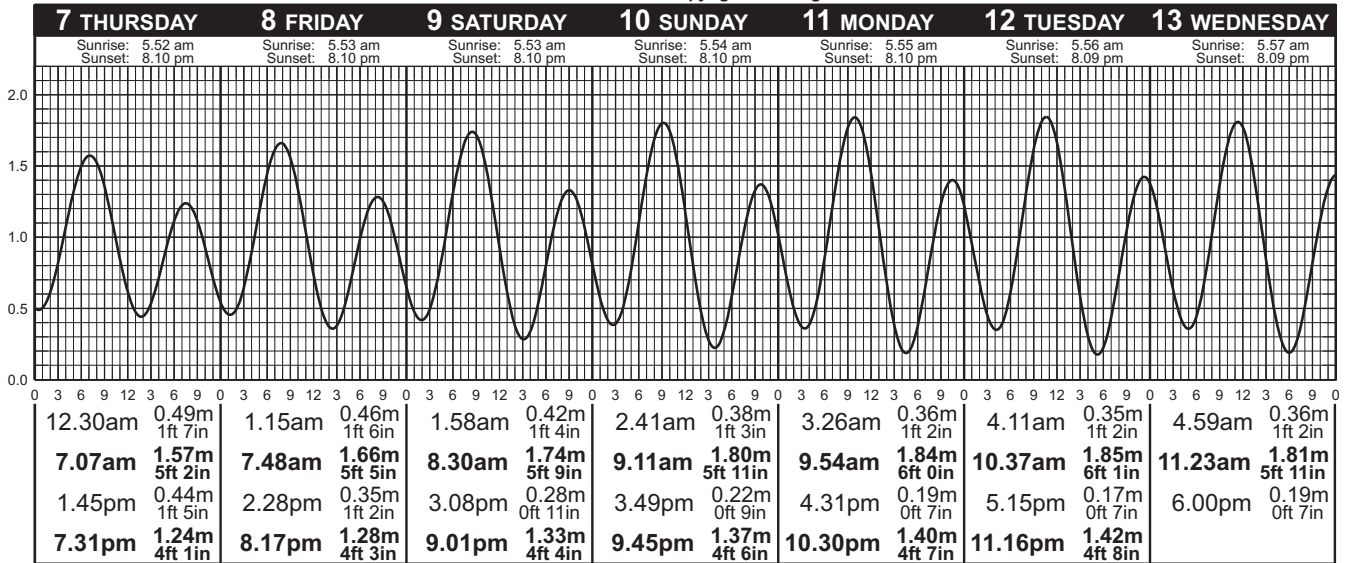


While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

January 7-13, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

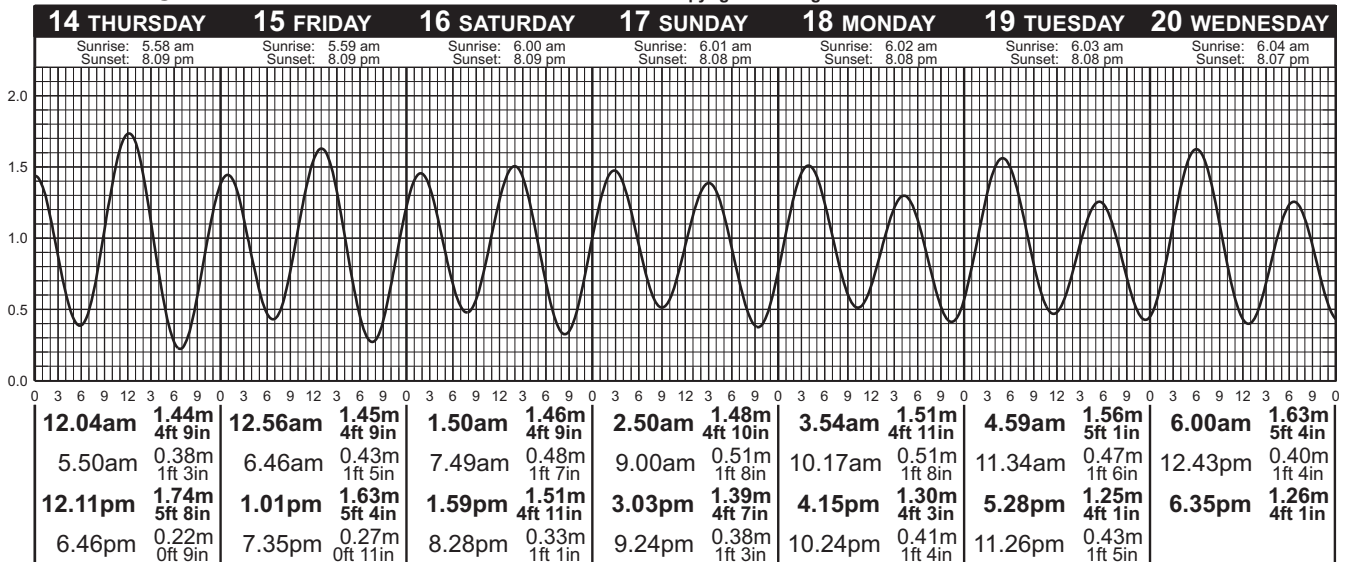
● New Moon Jan 10



January 14-20, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

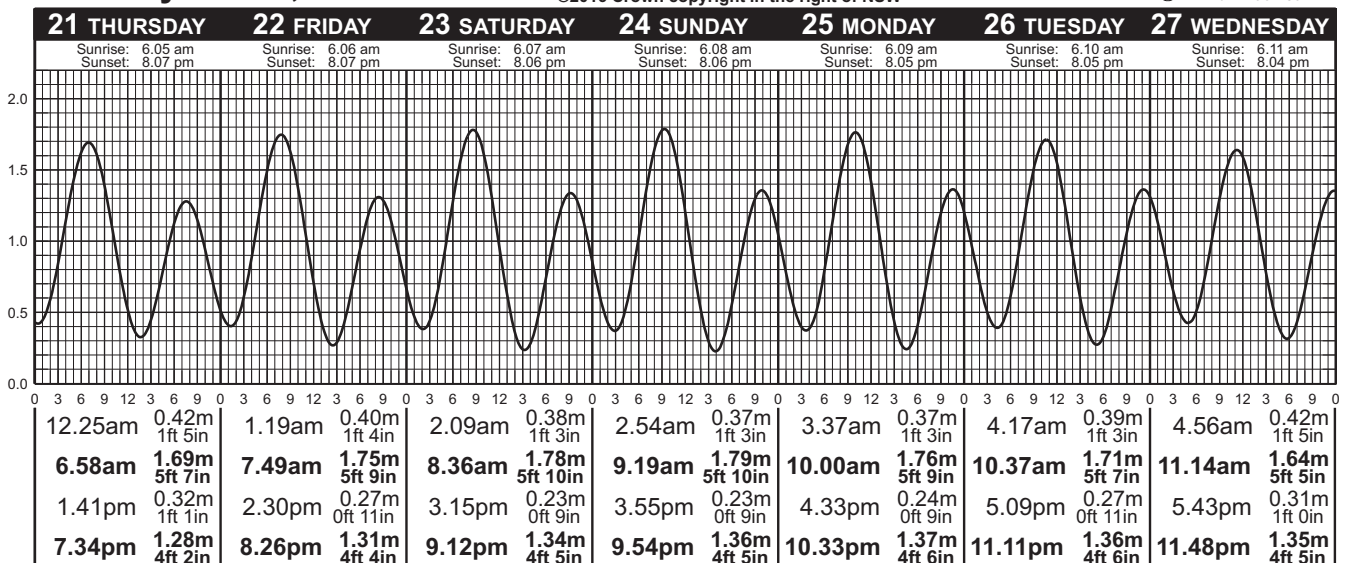
● 1st Quarter Jan 17



January 21-27, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

○ Full Moon Jan 24

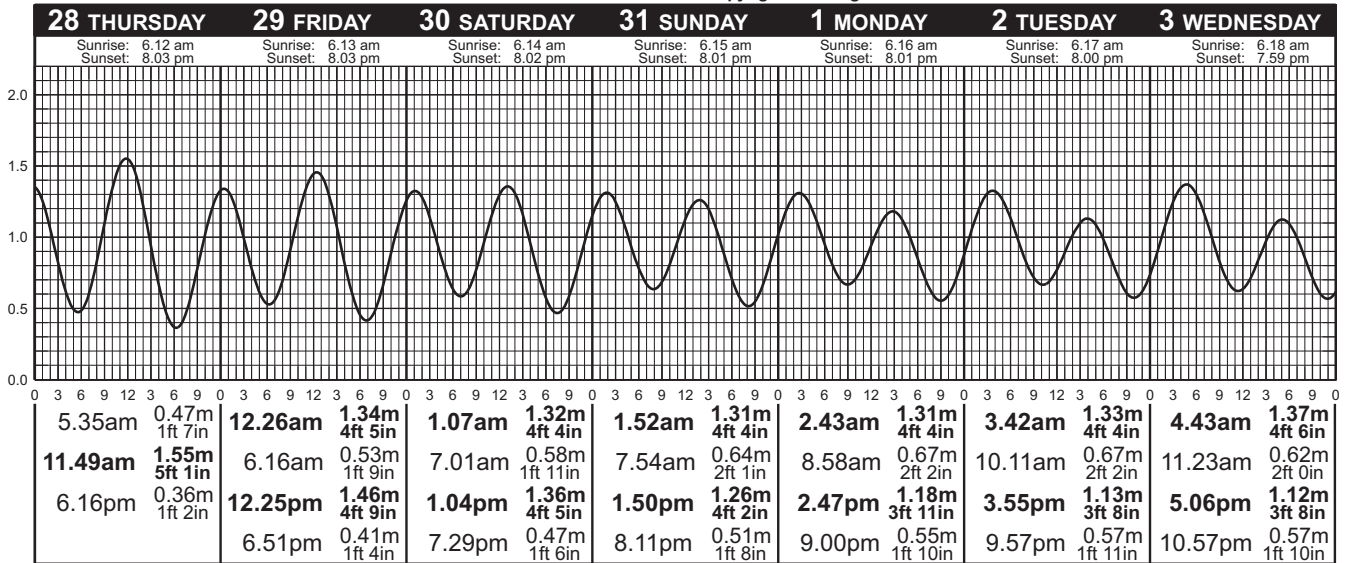


While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

January 28 – February 3, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

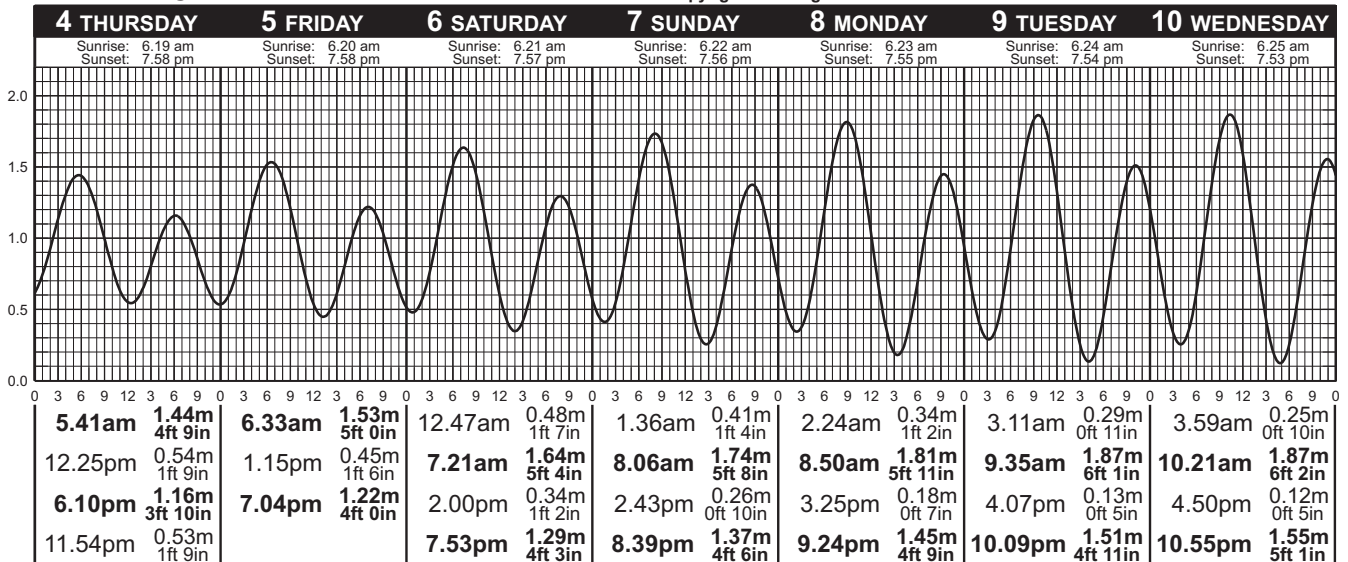
3rd Quarter Feb 1



February 4–10, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

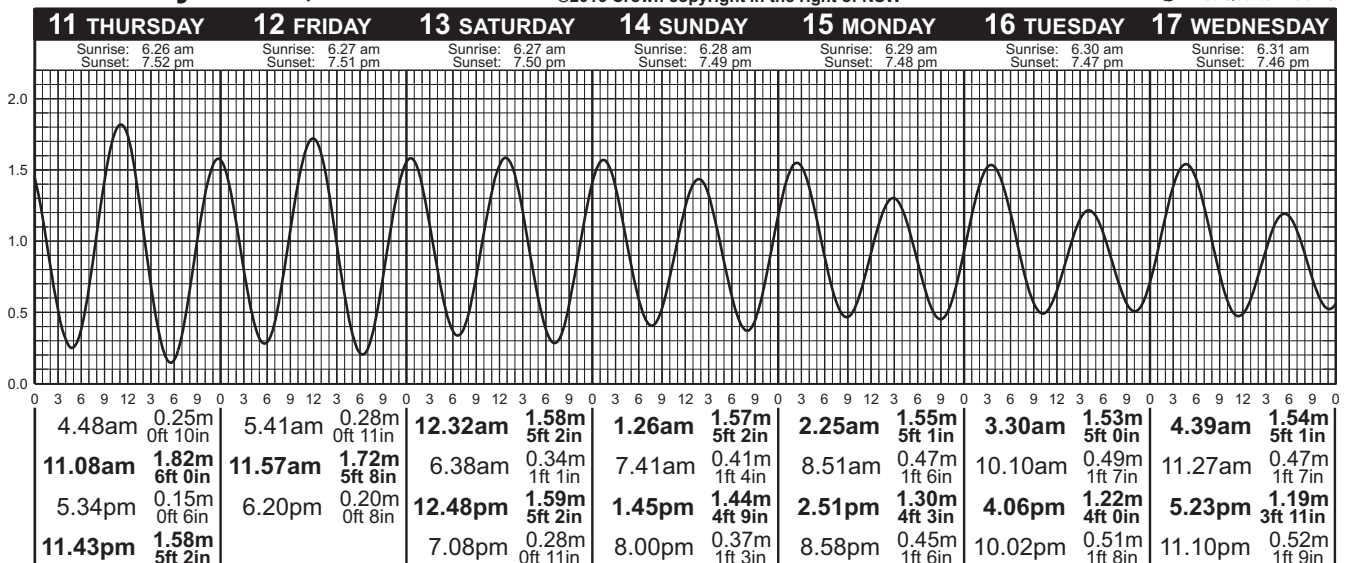
New Moon Feb 9



February 11–17, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

1st Quarter Feb 15

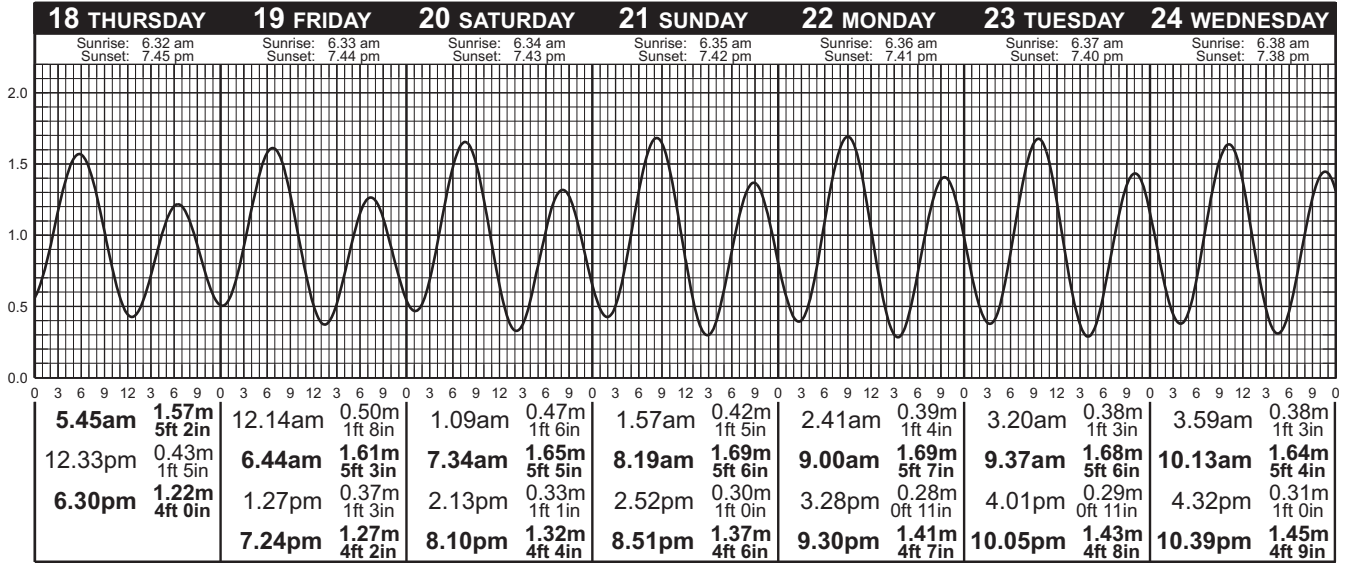


While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

February 18–24, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

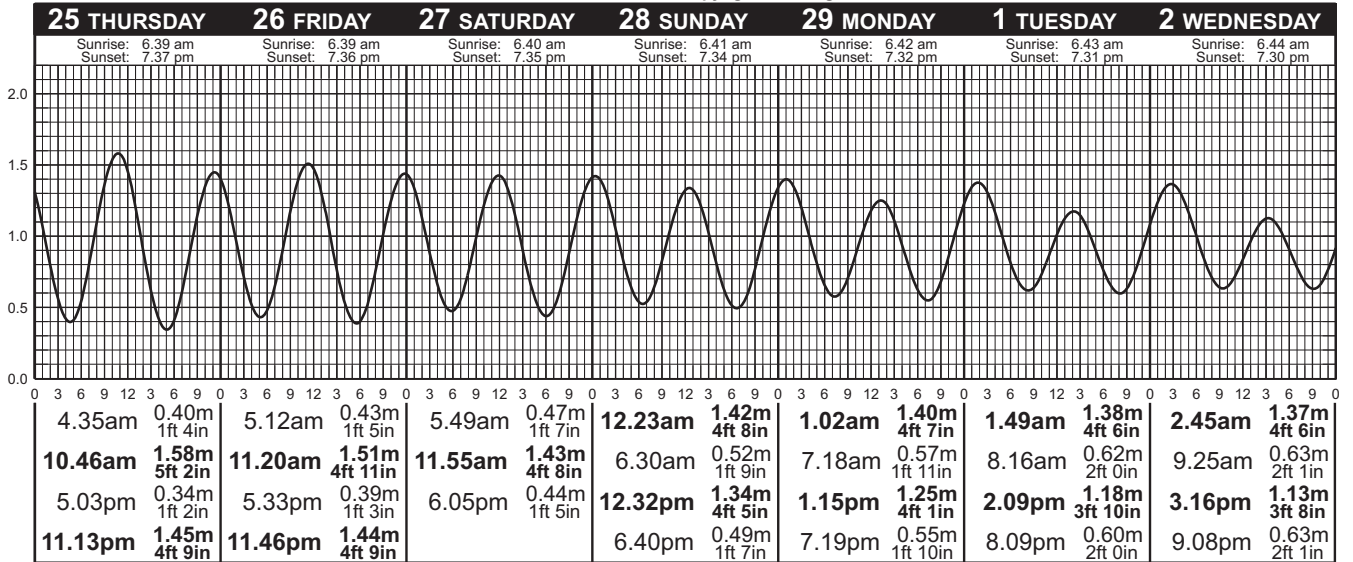
○ Full Moon Feb 23



February 25 – March 2, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

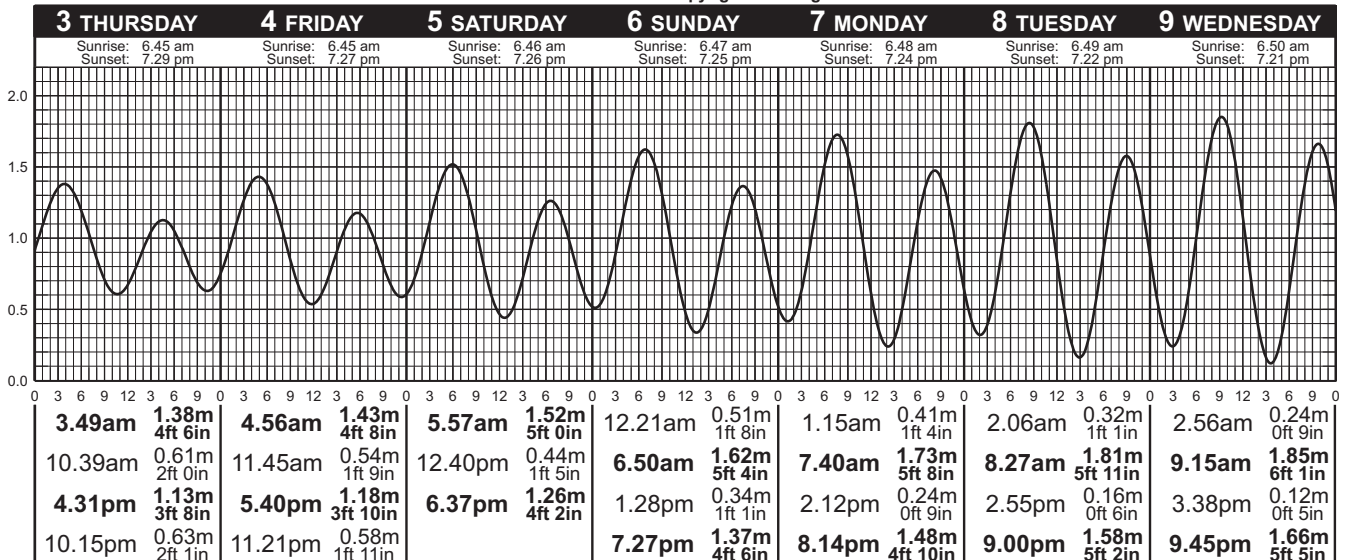
● 3rd Quarter Mar 2



March 3–9, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

● New Moon Mar 9

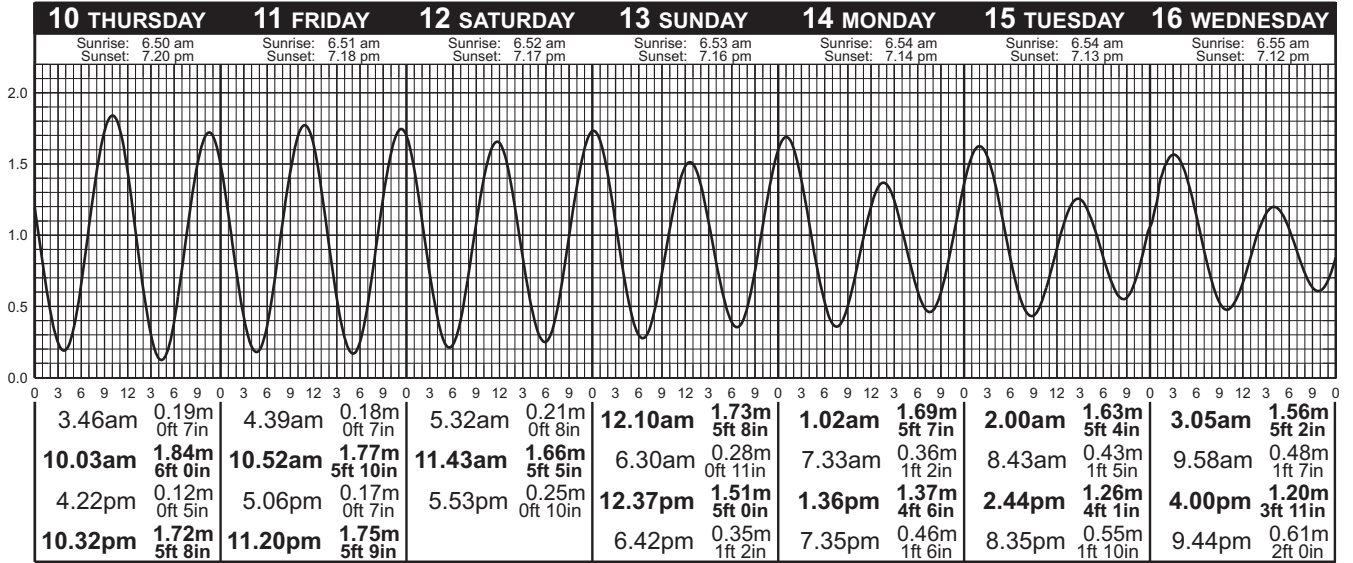


While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

March 10-16, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

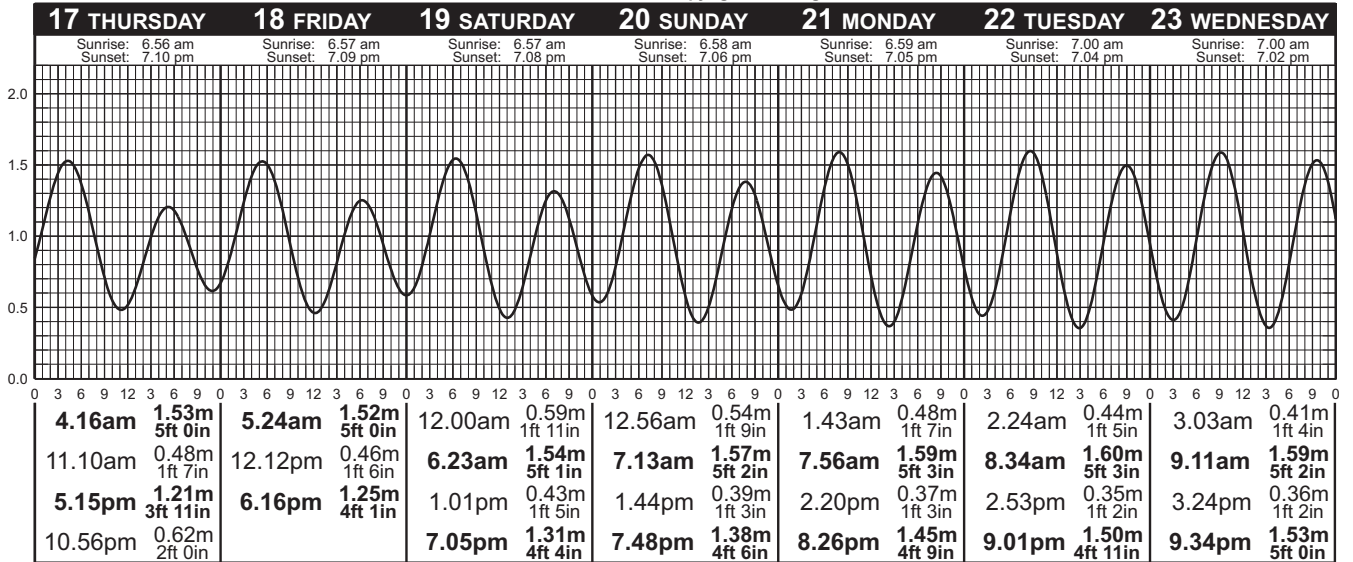
☉ 1st Quarter Mar 16



March 17-23, 2016

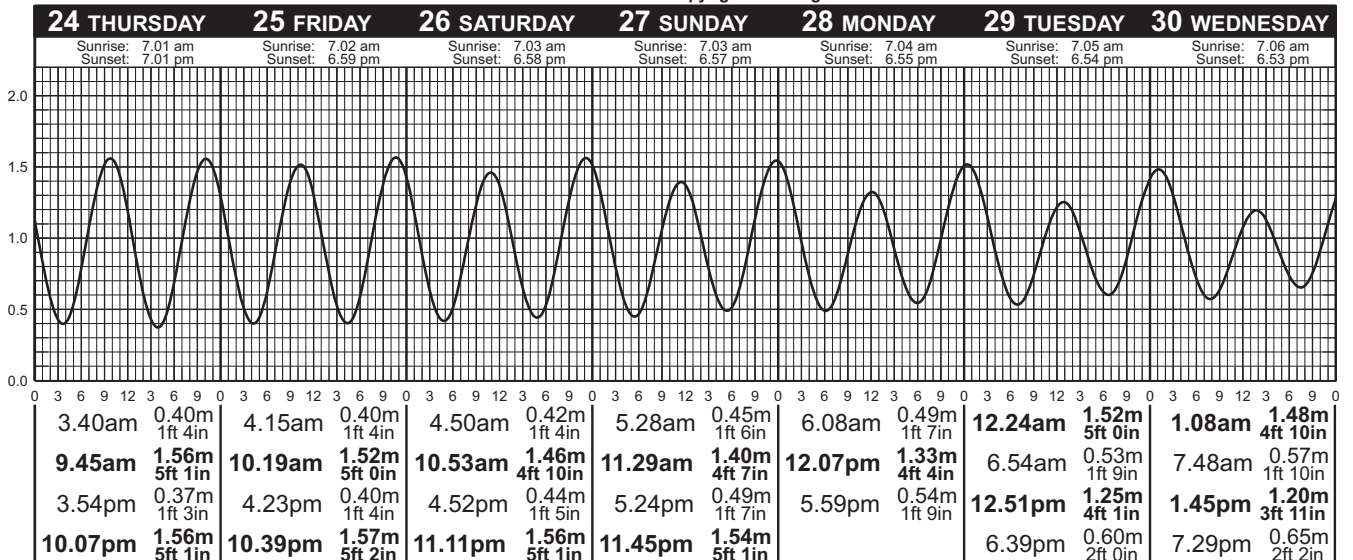
Daylight Saving Time
©2016 Crown copyright in the right of NSW

☾ Full Moon Mar 23



March 24-30, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

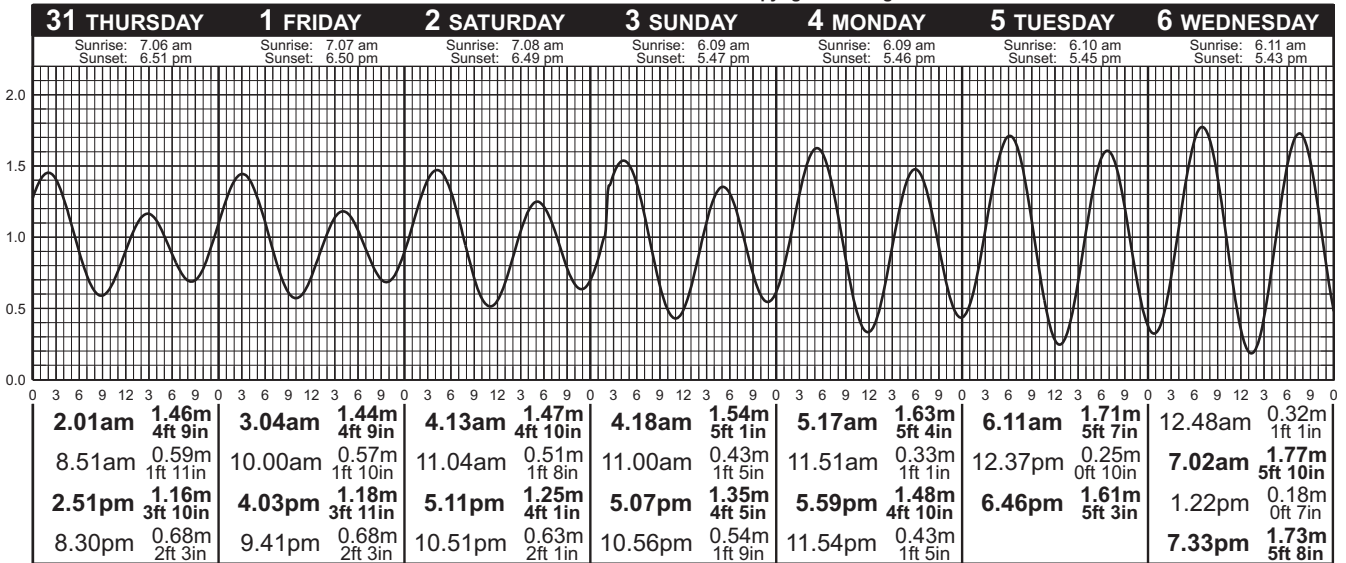


While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

March 31 – April 6, 2016

Daylight Saving Time adjustment ends Sunday April 3
©2016 Crown copyright in the right of NSW

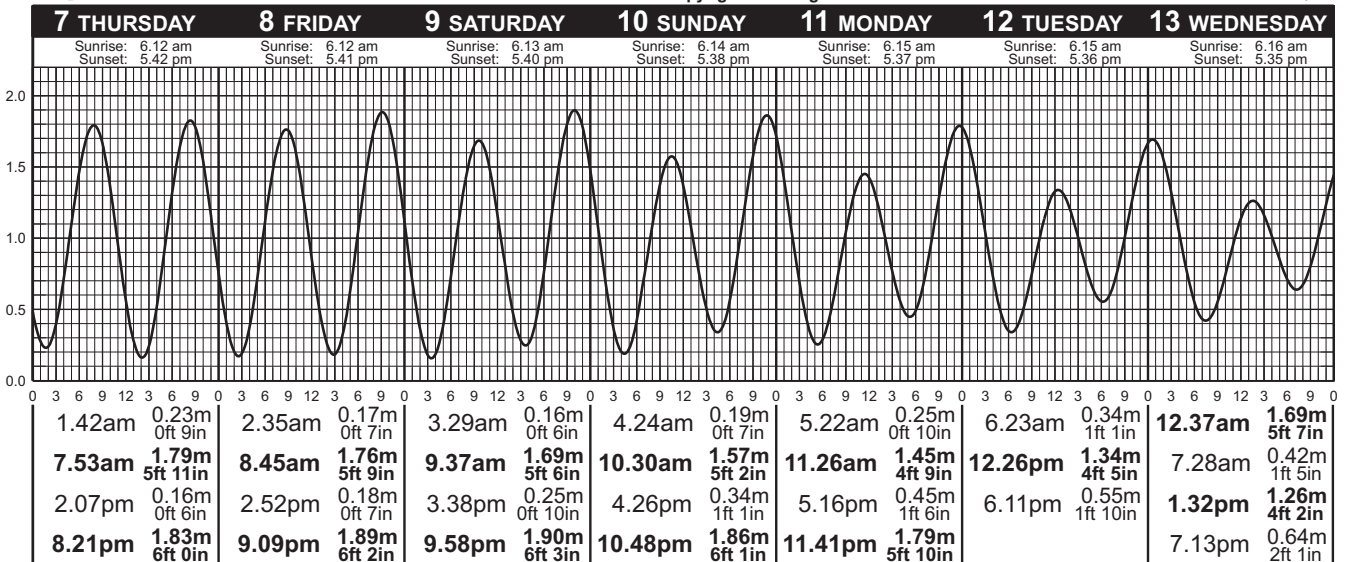
3rd Quarter Apr 1



April 7–13, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

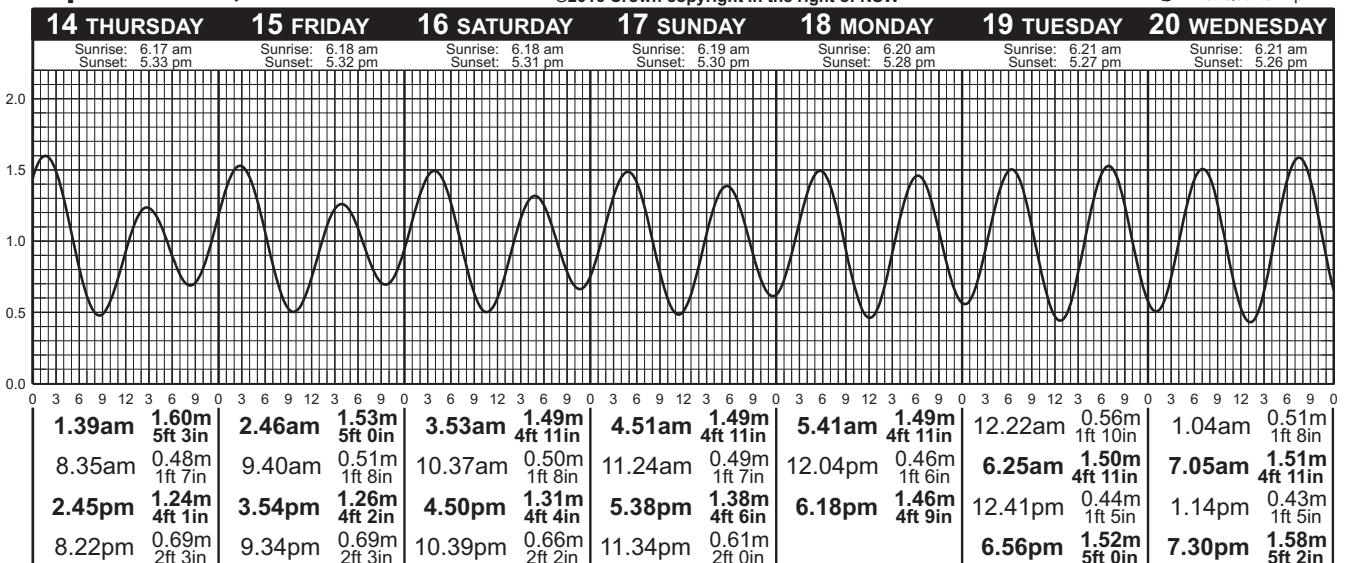
New Moon Apr 7



April 14–20, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

1st Quarter Apr 14

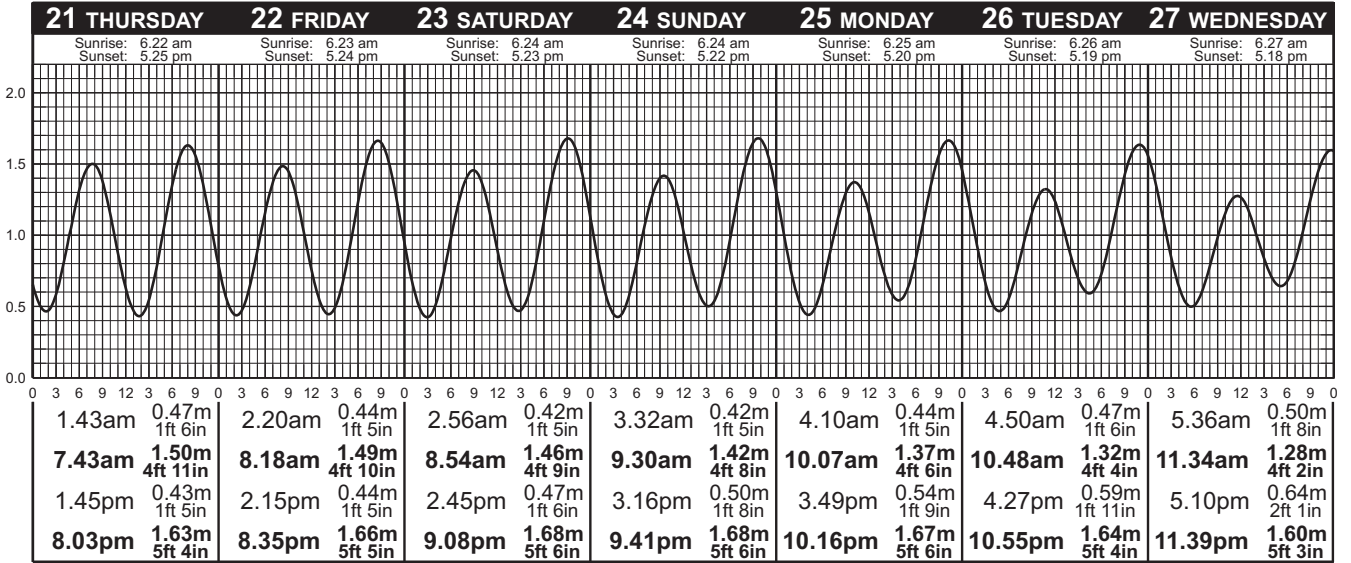


While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

April 21–27, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

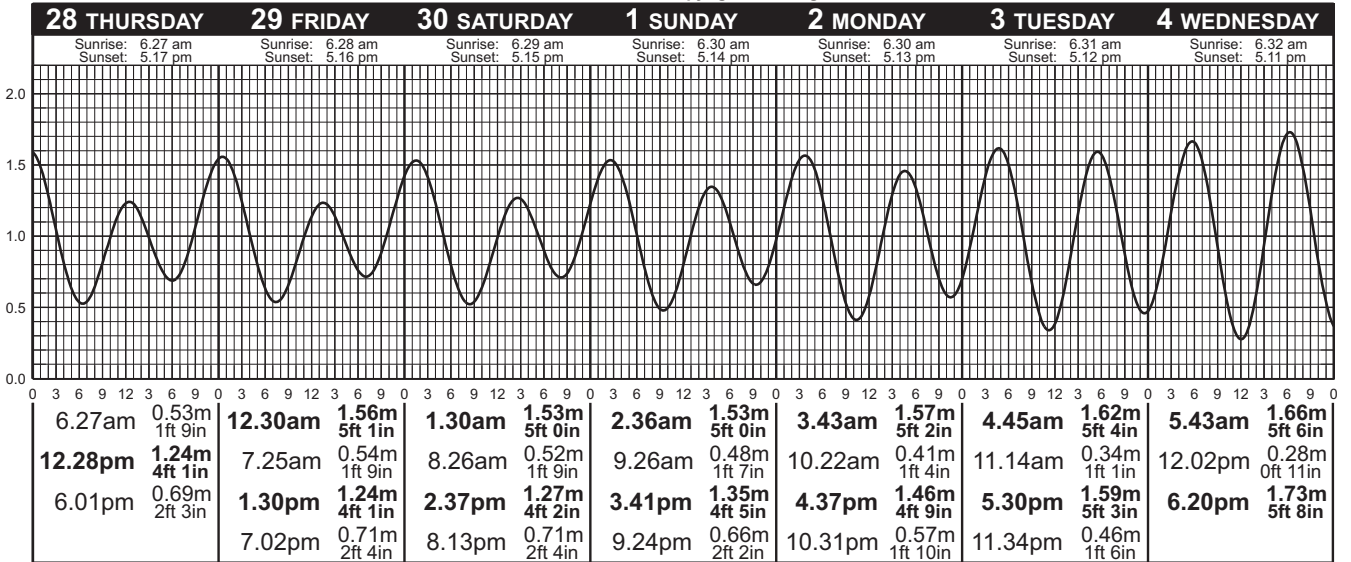
☉ Full Moon Apr 22



April 28 – May 4, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

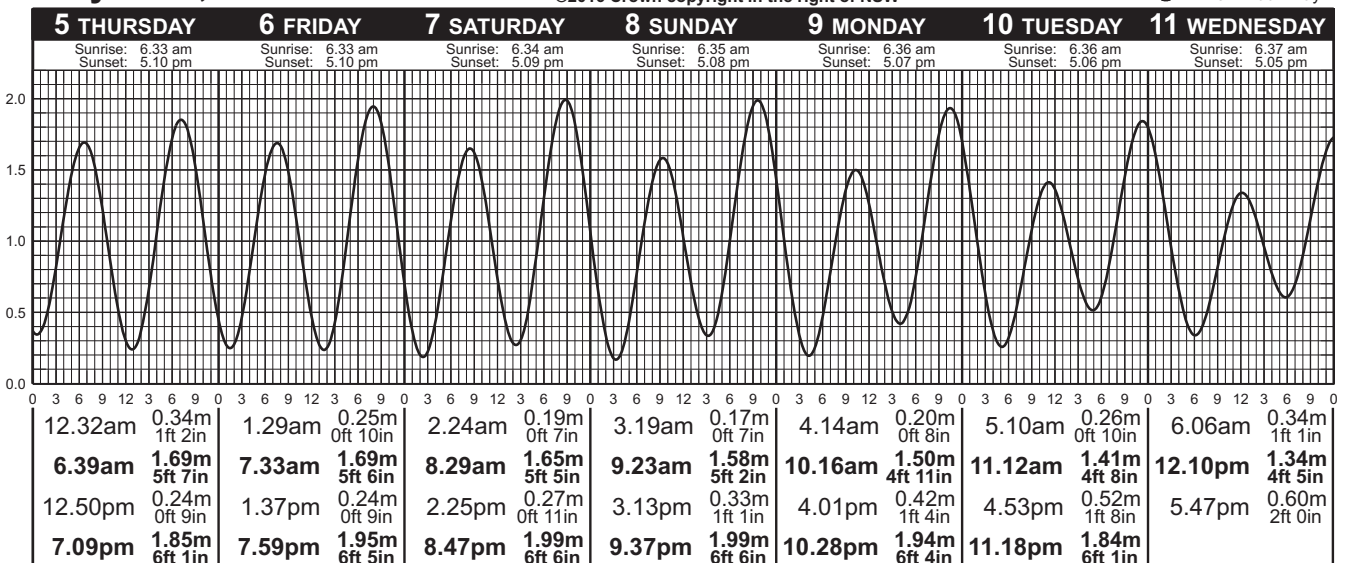
☾ 3rd Quarter Apr 30



May 5–11, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

☾ New Moon May 7

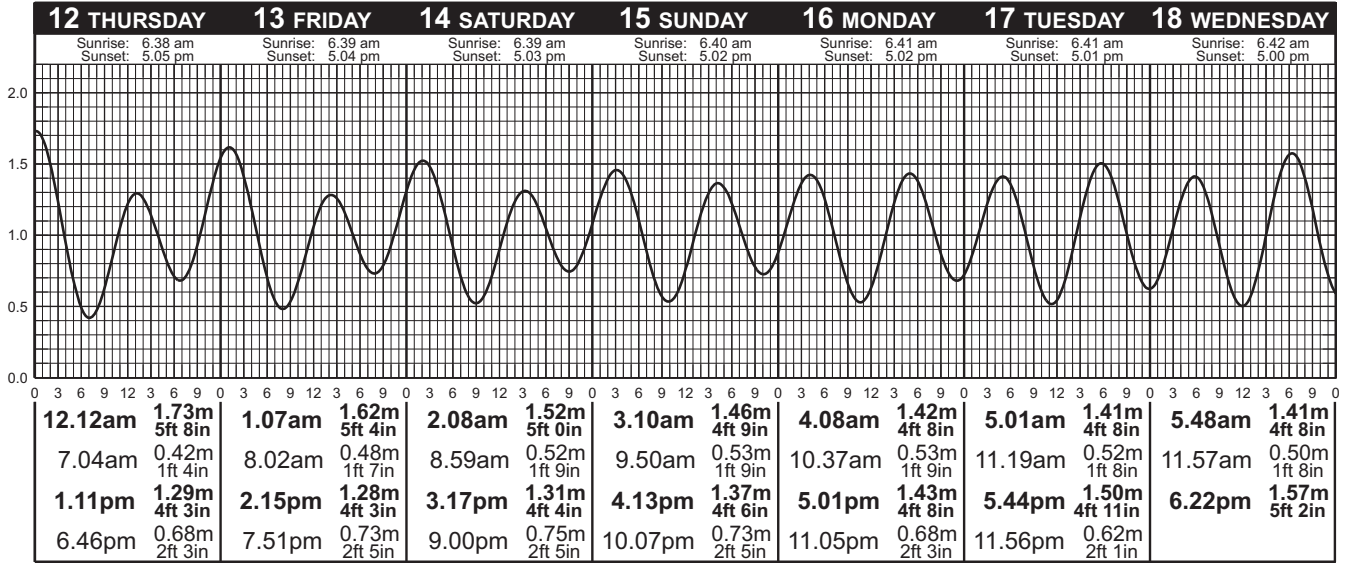


While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

May 12-18, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

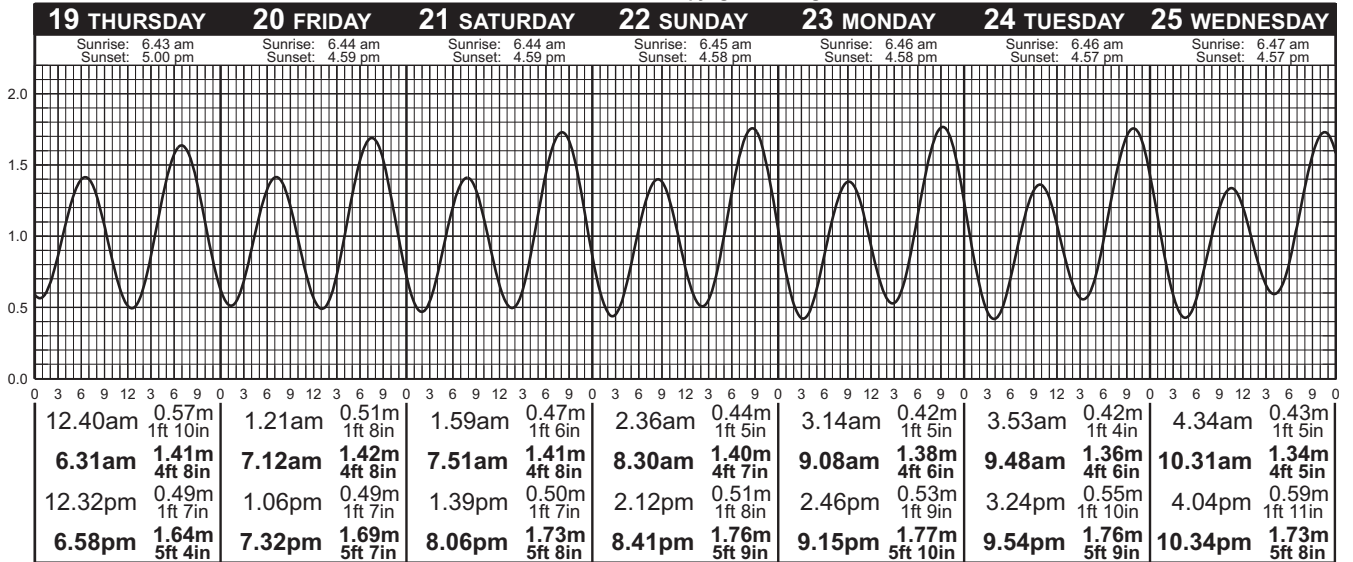
☉ 1st Quarter May 14



May 19-25, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

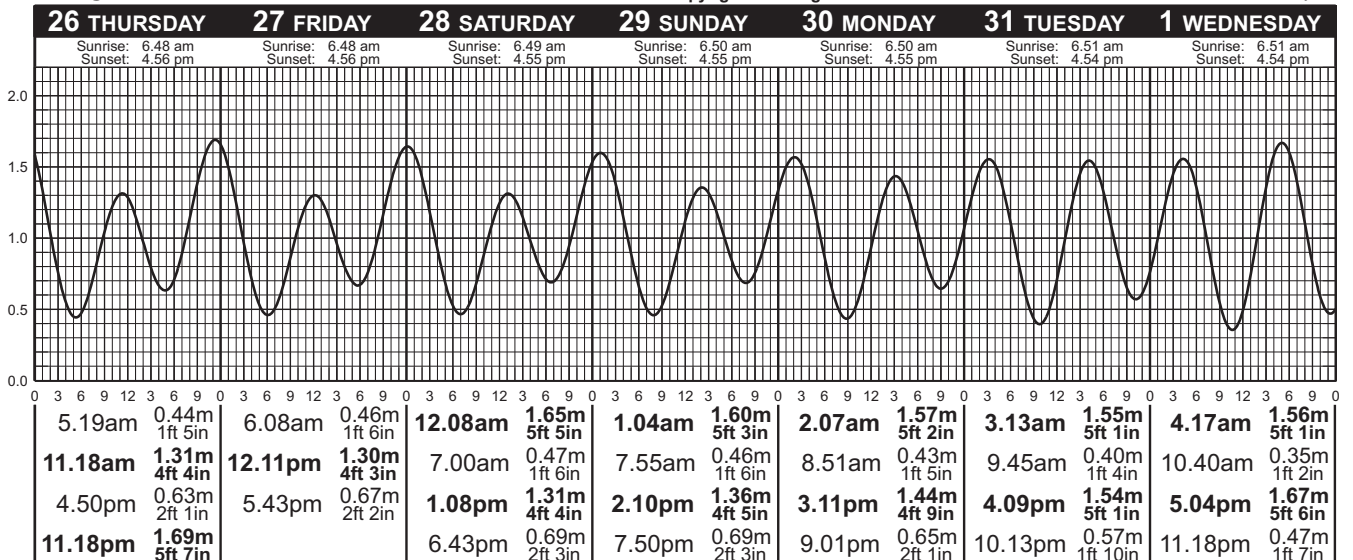
☾ Full Moon May 22



May 26 - June 1, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

☾ 3rd Quarter May 29

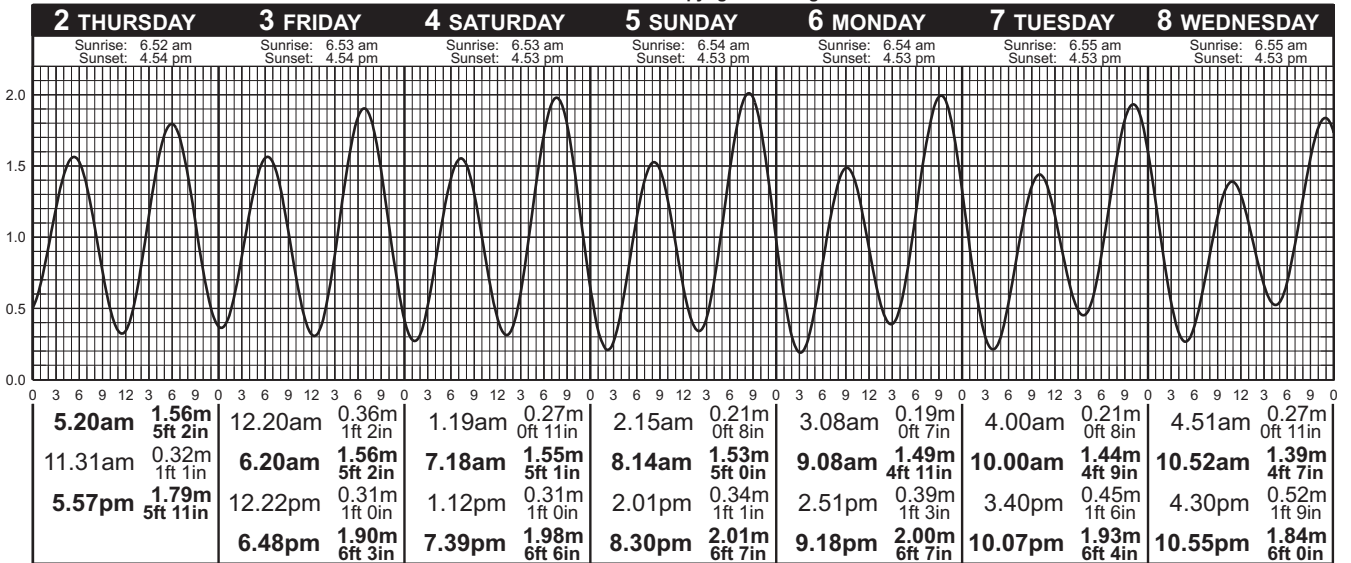


While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

June 2-8, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

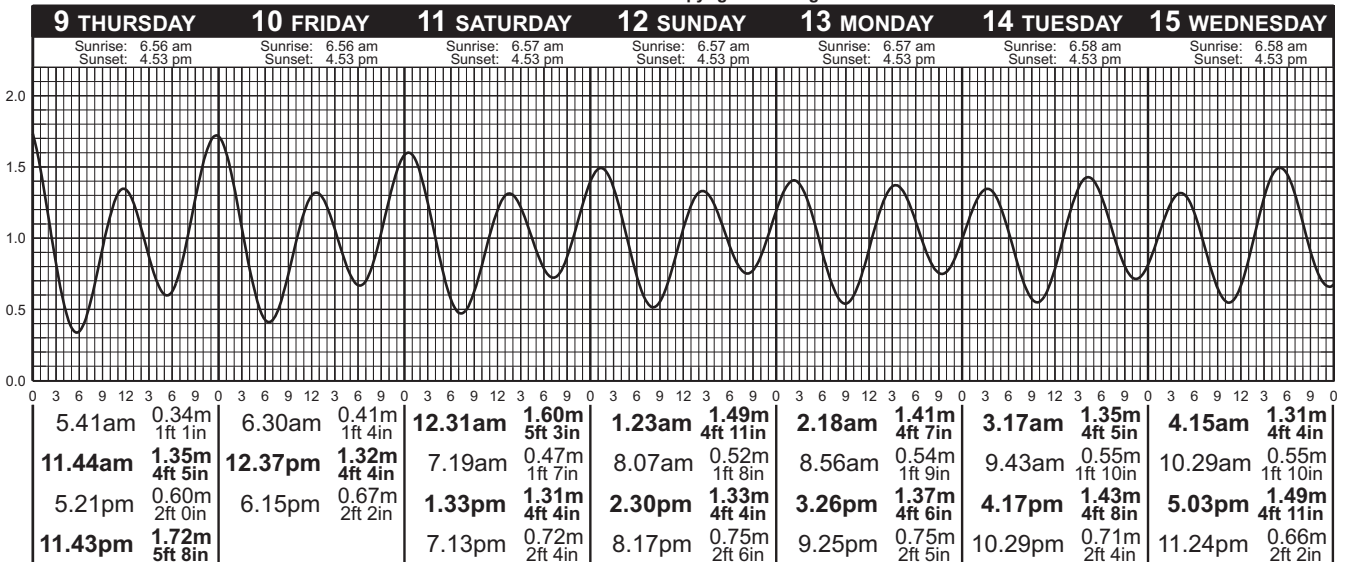
● New Moon Jun 5



June 9-15, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

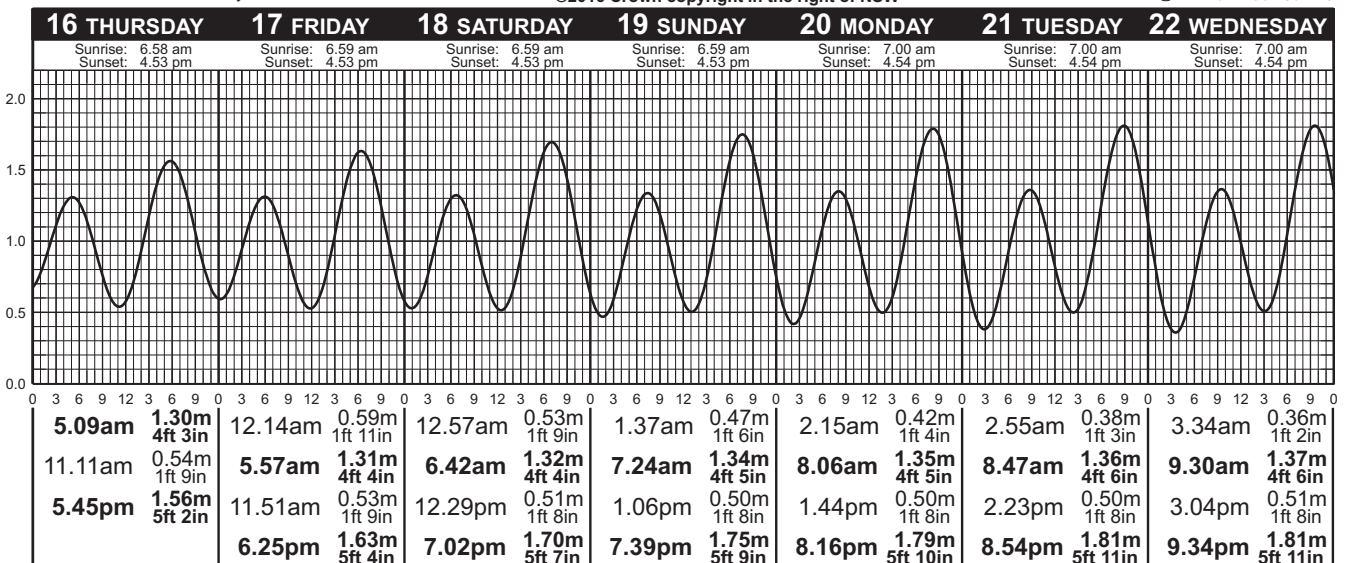
● 1st Quarter Jun 12



June 16-22, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

○ Full Moon Jun 20

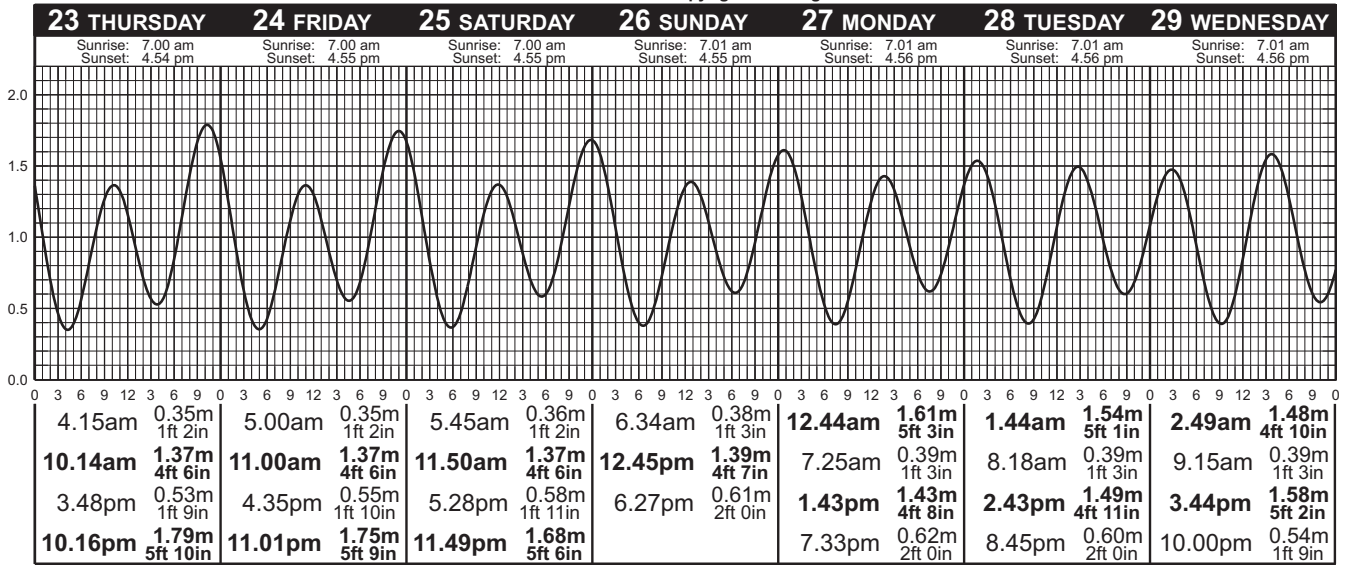


While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

June 23–29, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

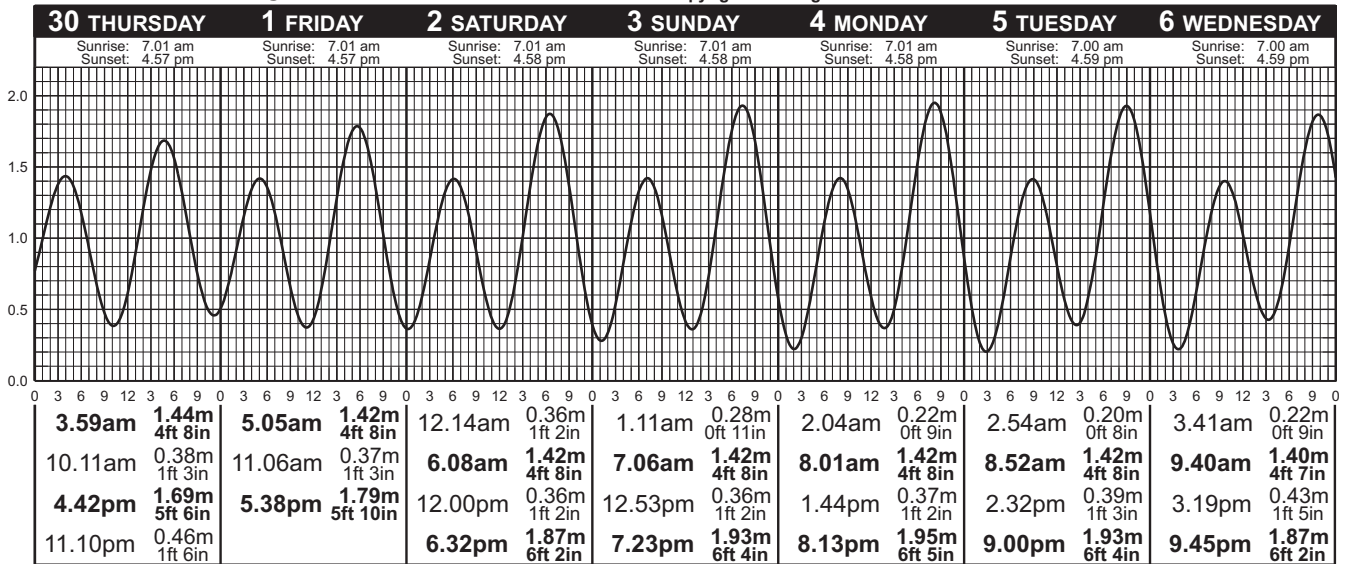
3rd Quarter Jun 28



June 30 – July 6, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

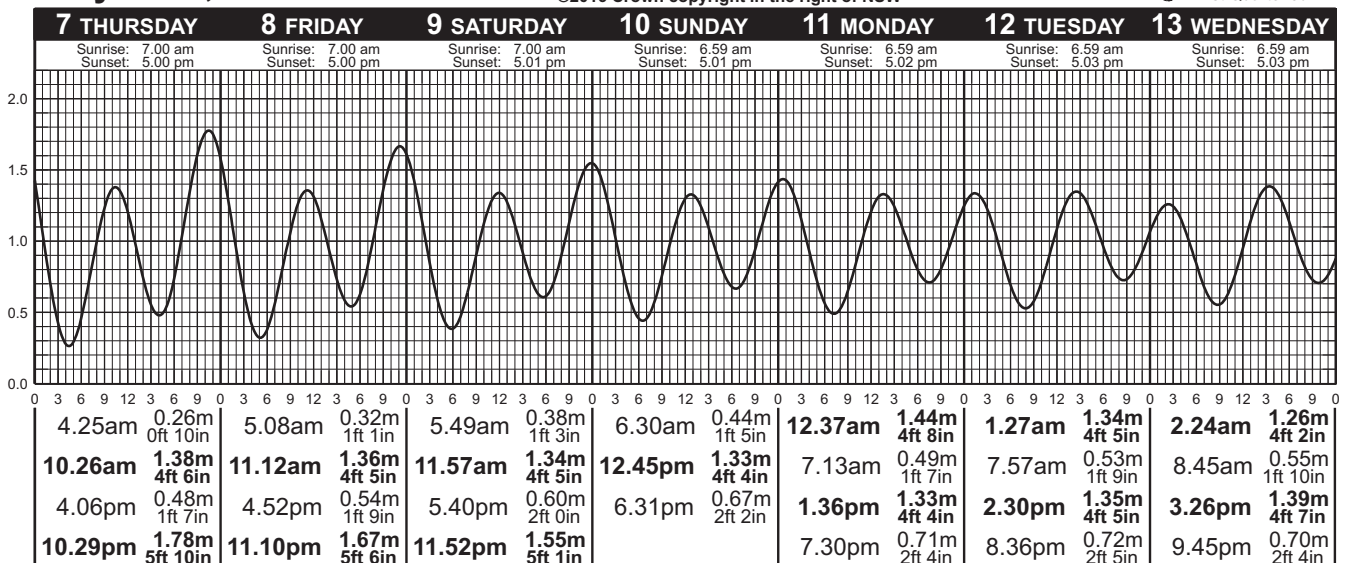
New Moon Jul 4



July 7–13, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

1st Quarter Jul 12

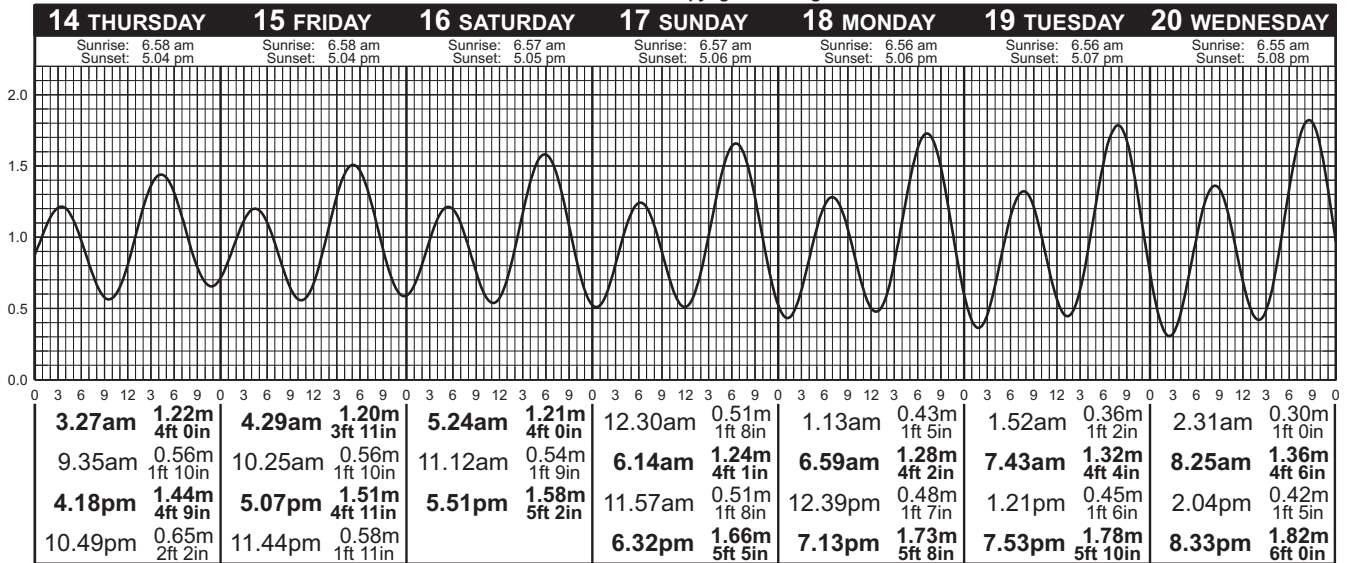


While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

July 14–20, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

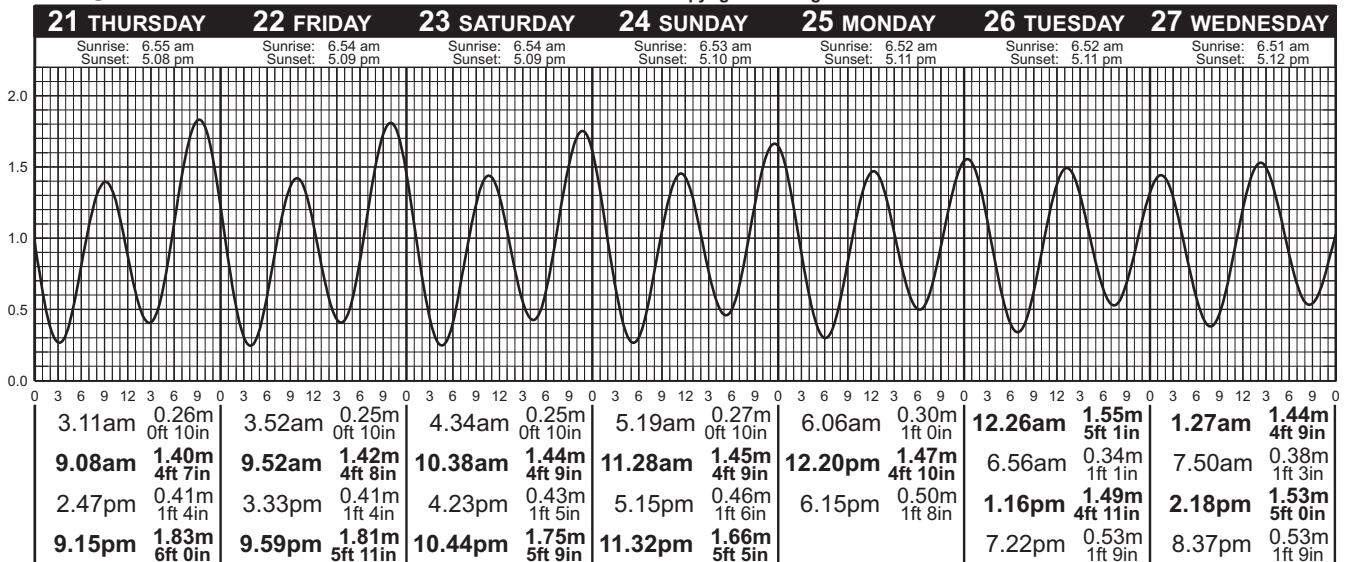
○ Full Moon Jul 20



July 21–27, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

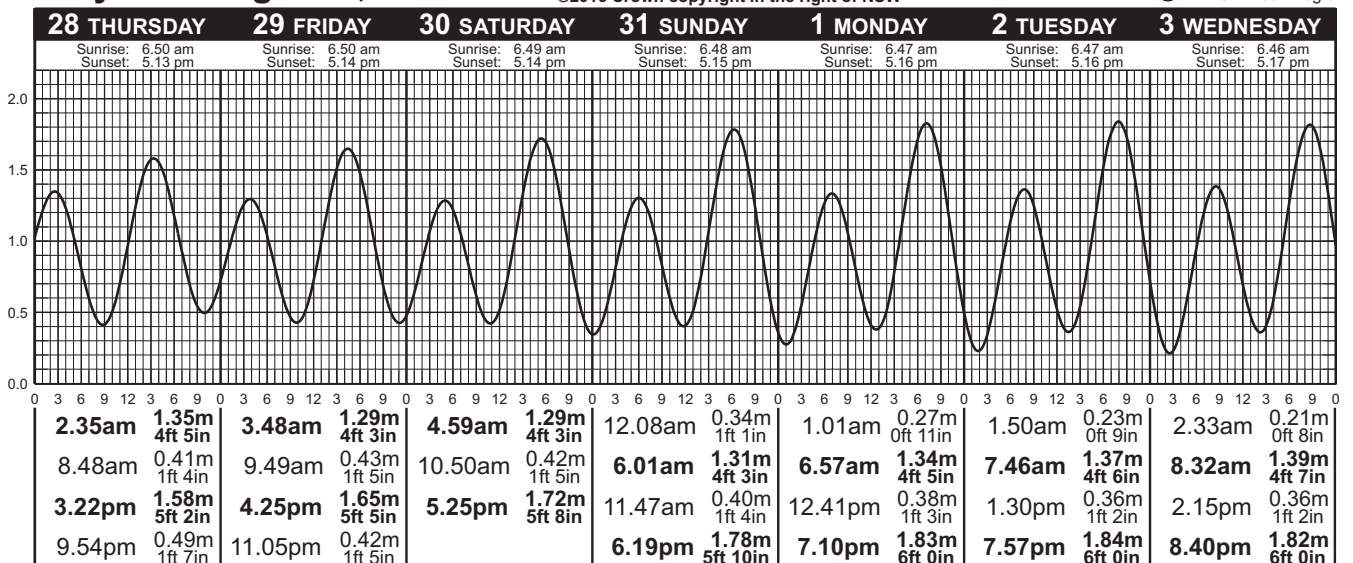
● 3rd Quarter Jul 27



July 28 – August 3, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

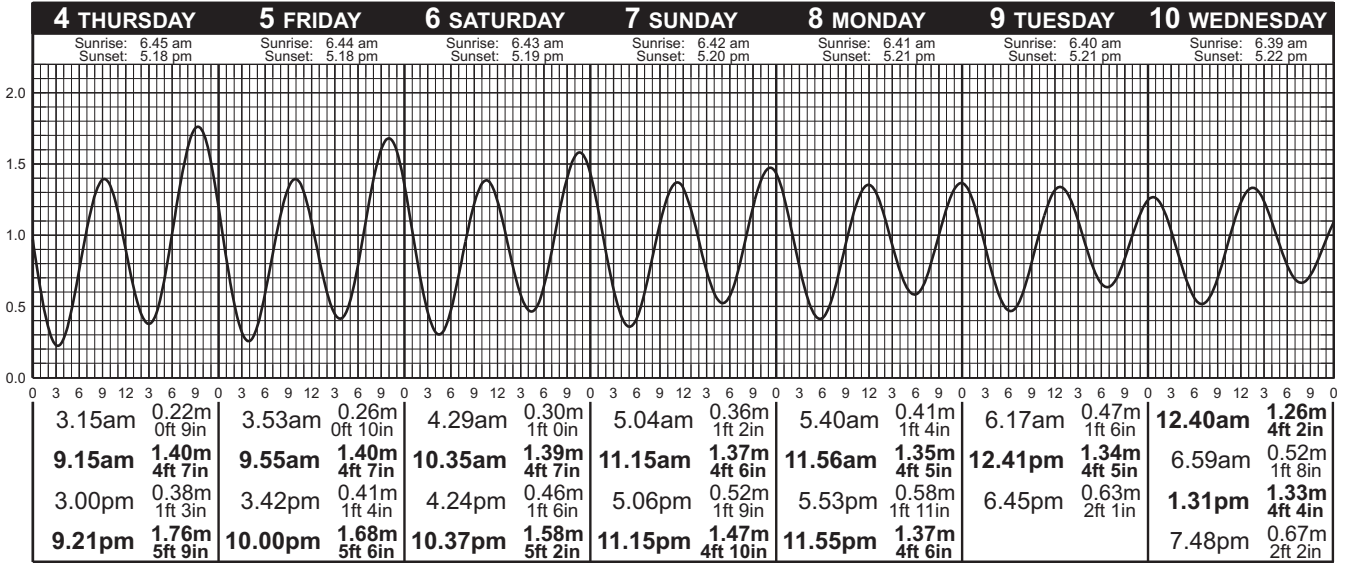
● New Moon Aug 3



While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

August 4–10, 2016

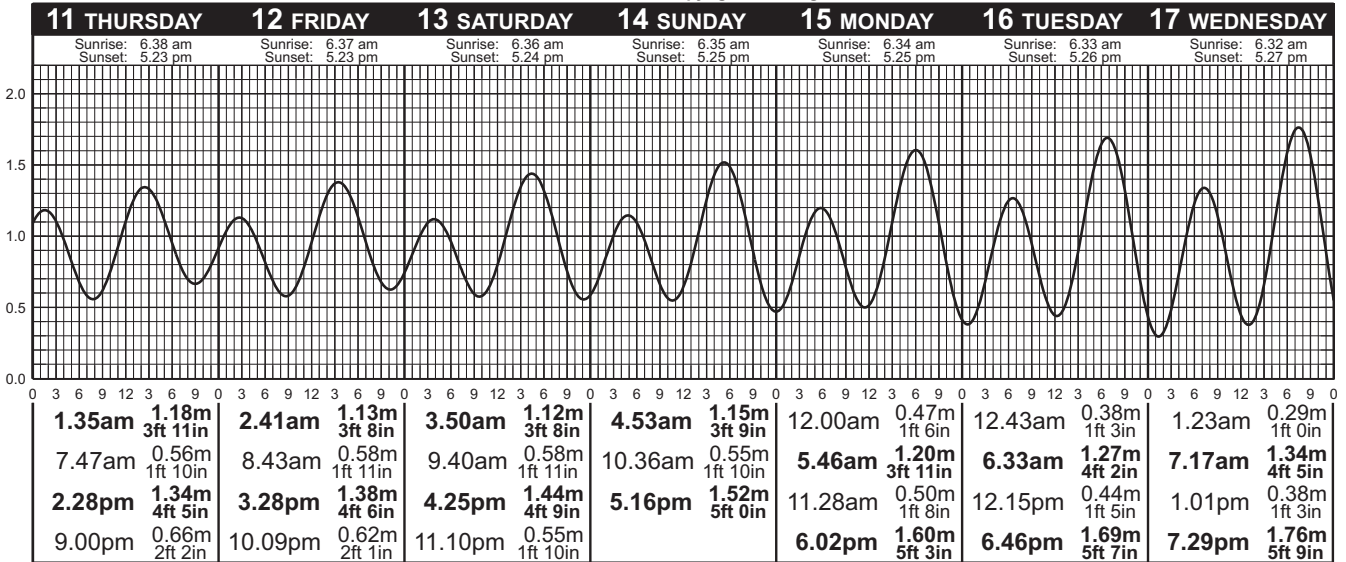
Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW



August 11–17, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

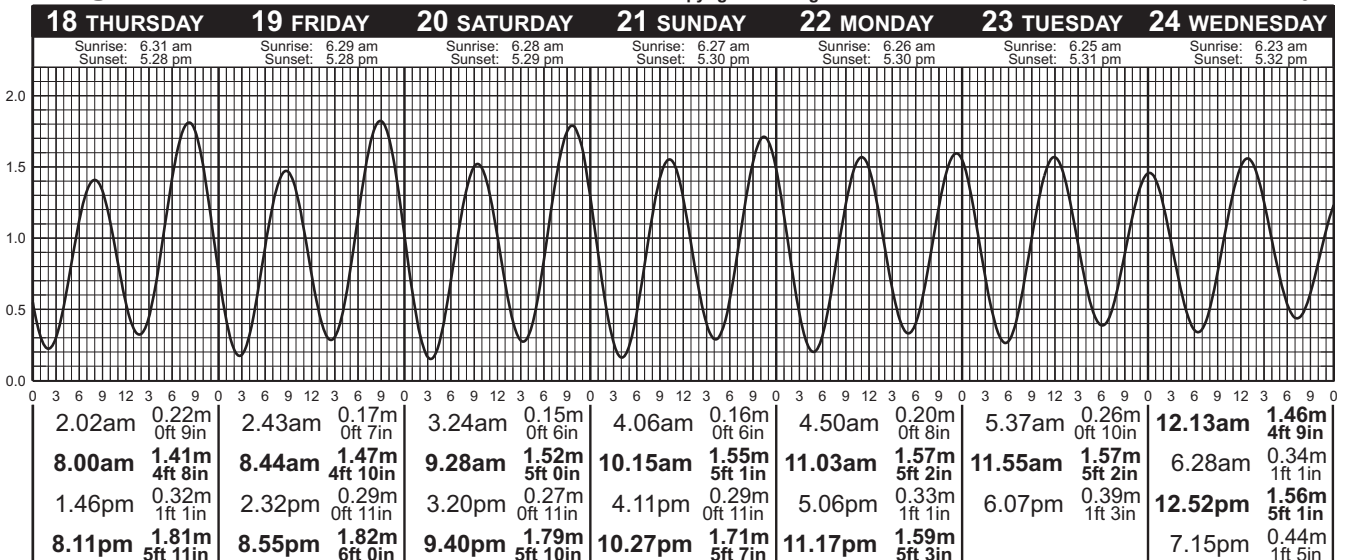
☾ 1st Quarter Aug 11



August 18–24, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

☾ Full Moon Aug 18

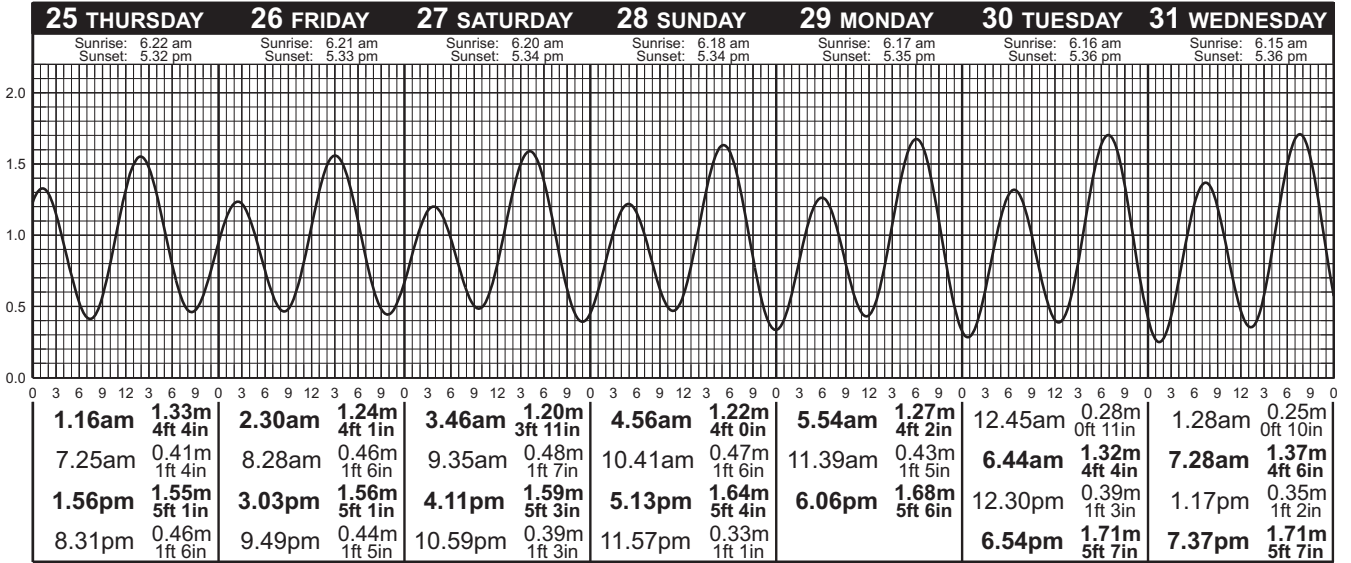


While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

August 25–31, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

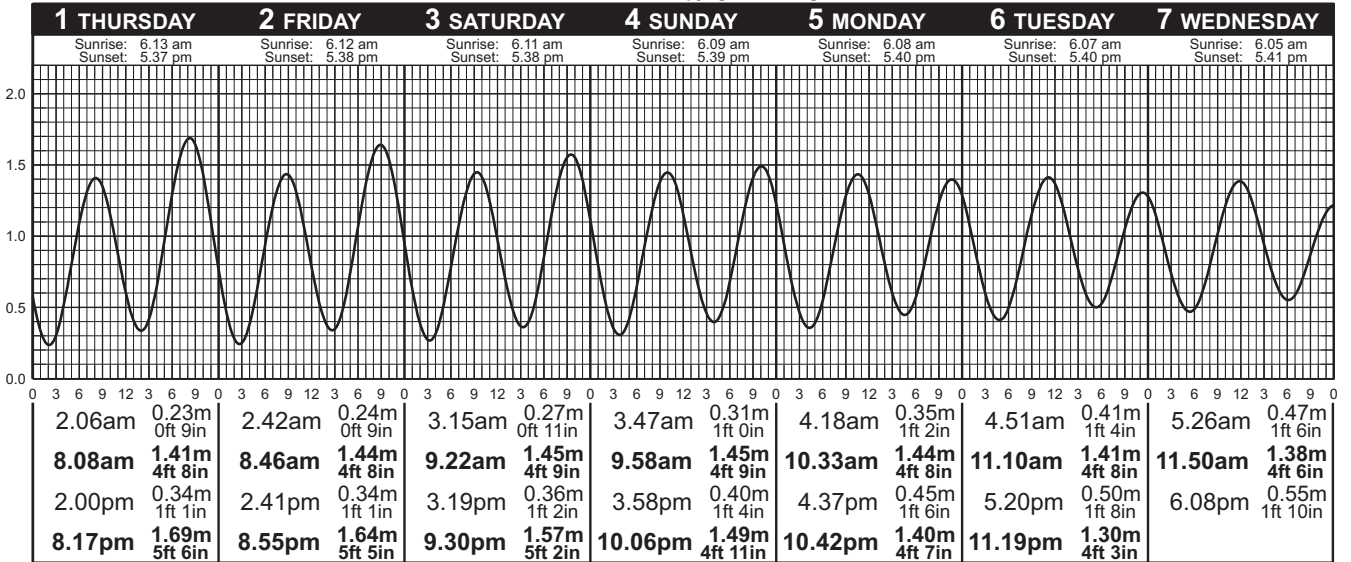
☾ 3rd Quarter Aug 25



September 1–7, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

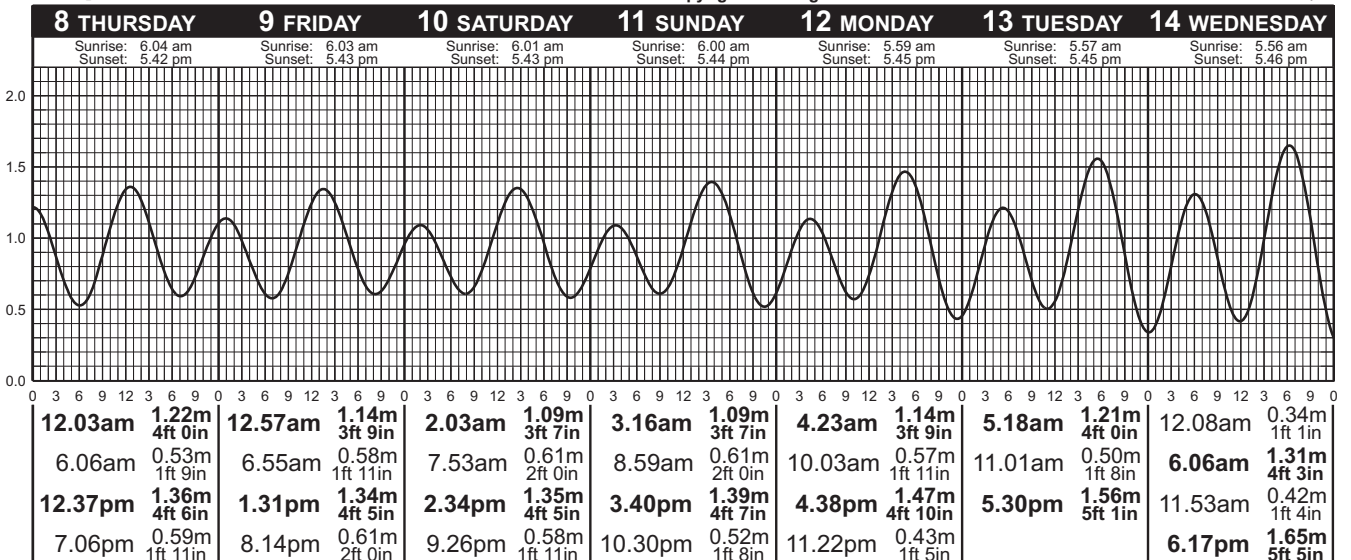
● New Moon Sep 1



September 8–14, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

☽ 1st Quarter Sep 9

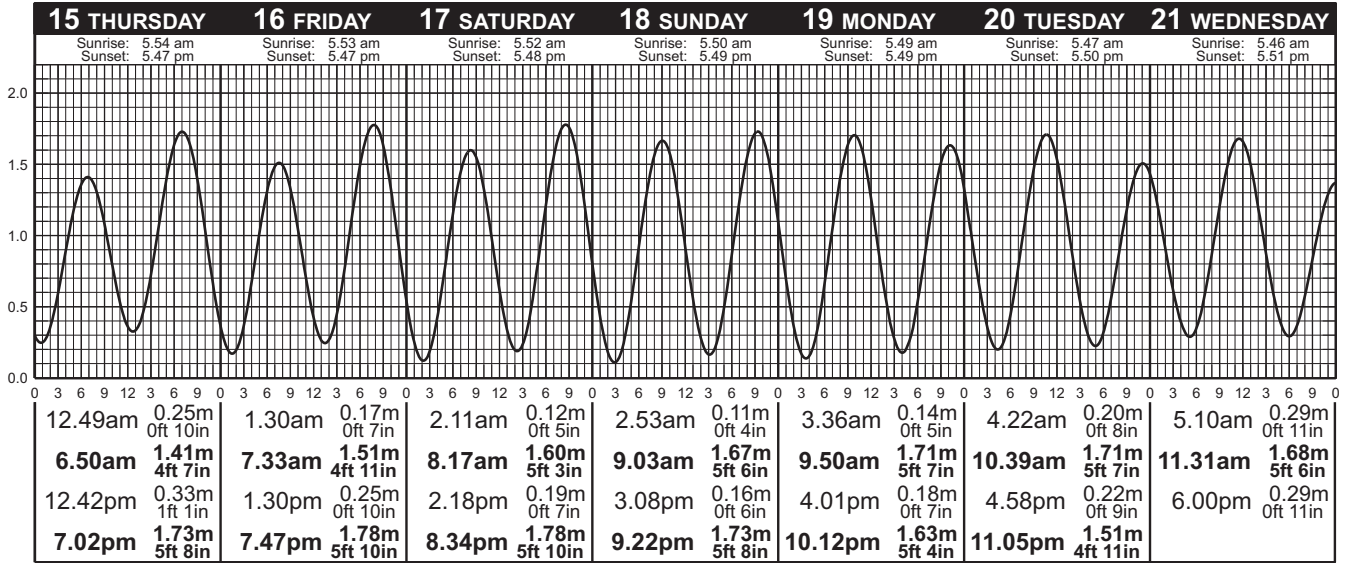


While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

September 15–21, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

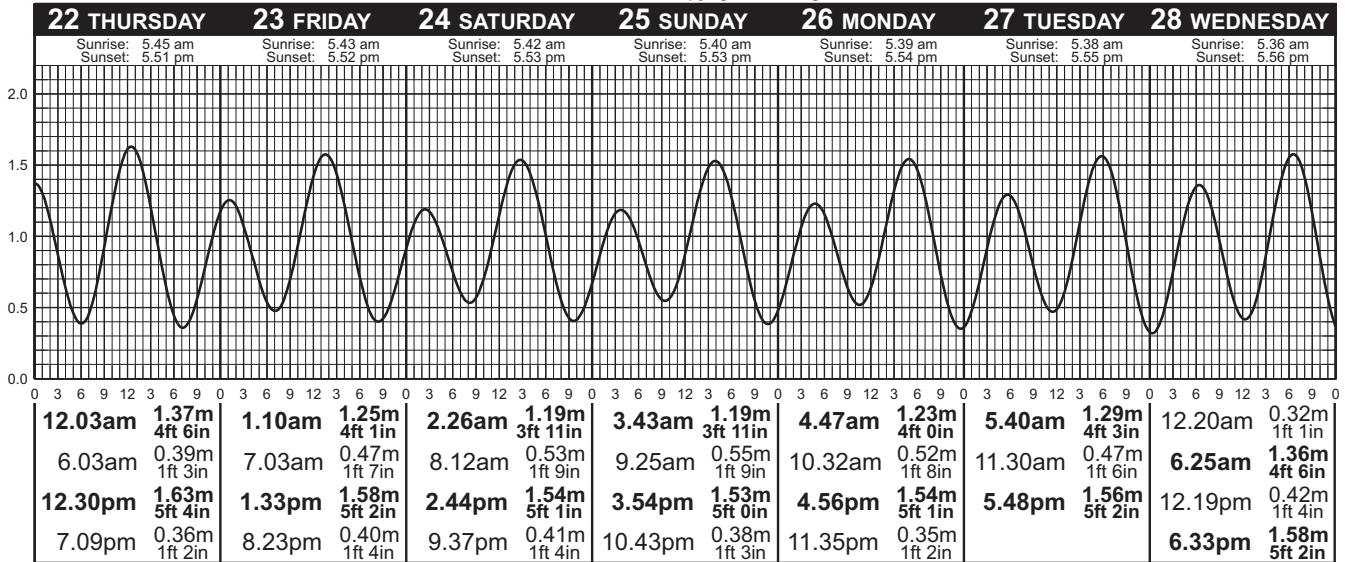
○ Full Moon Sep 17



September 22–28, 2016

Australian Eastern Standard Time
©2016 Crown copyright in the right of NSW

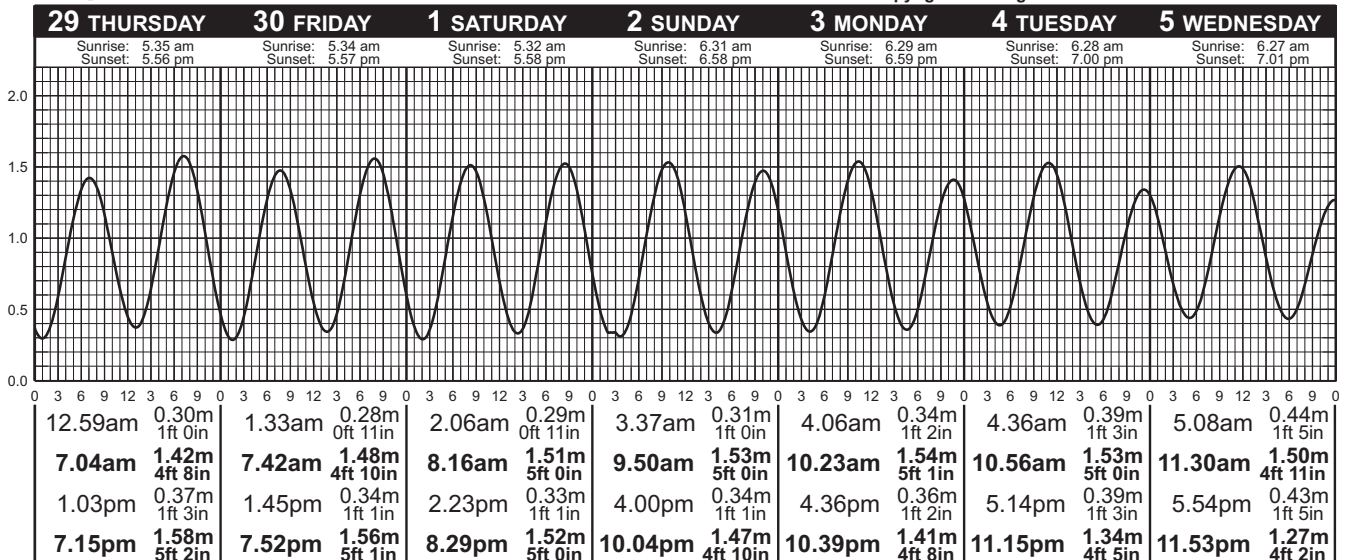
● 3rd Quarter Sep 23



September 29 – October 5, 2016

Daylight Saving Time adjustment starts Sunday October 2
©2016 Crown copyright in the right of NSW

● New Moon Oct 1

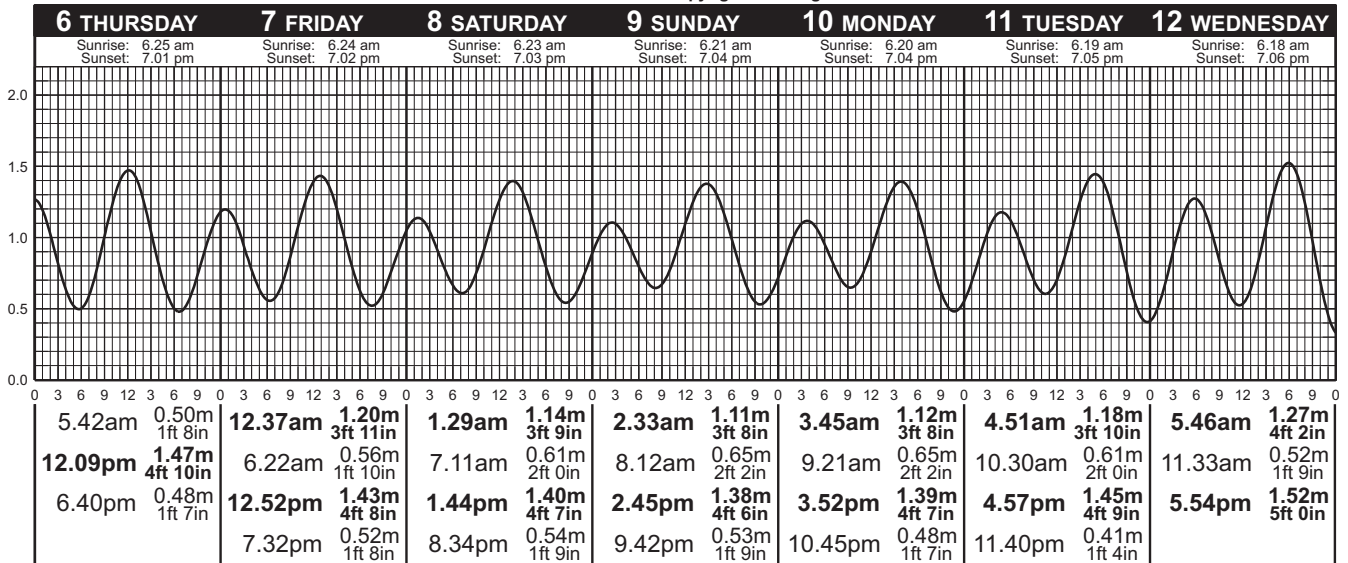


While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

October 6–12, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

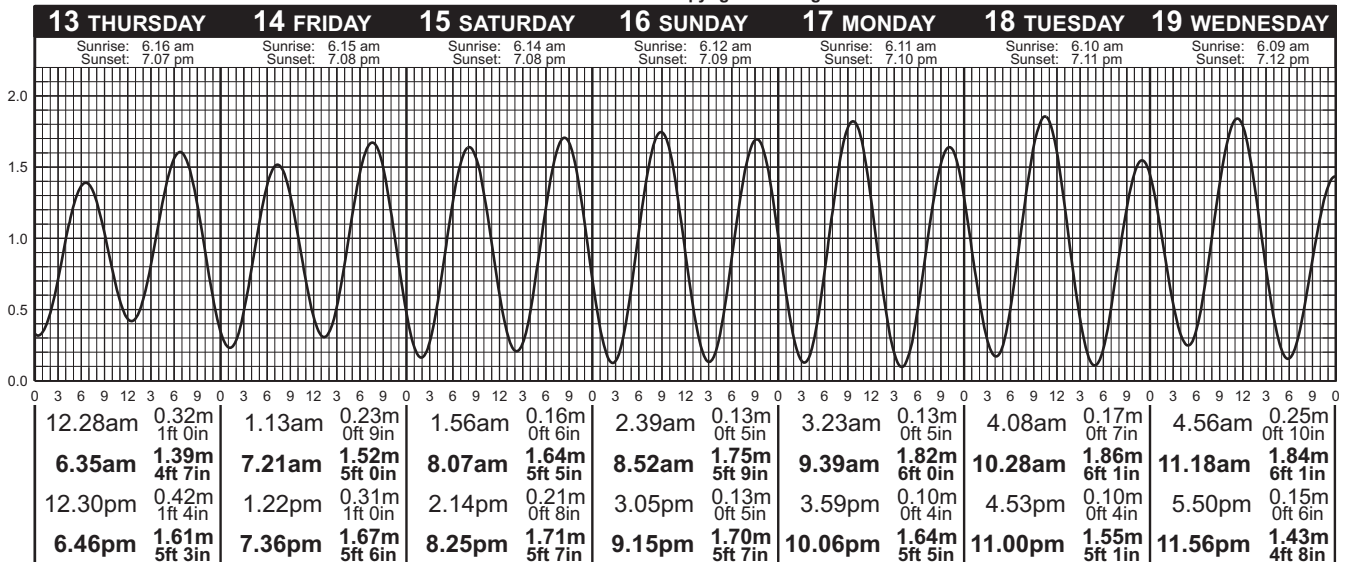
☉ 1st Quarter Oct 9



October 13–19, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

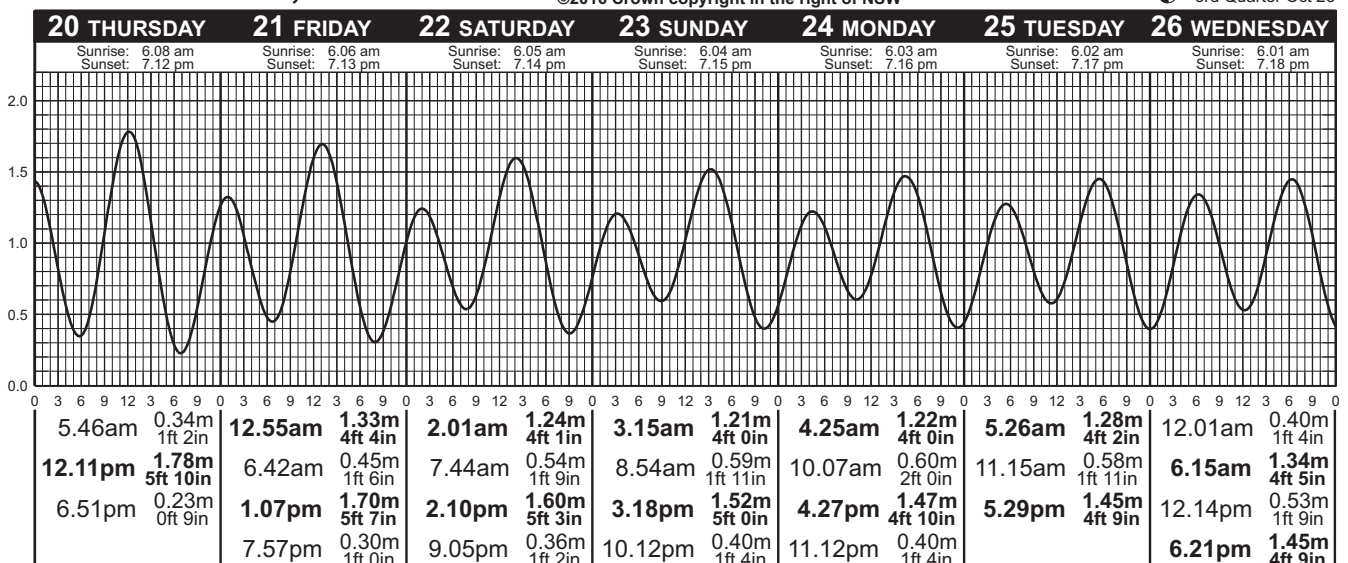
☾ Full Moon Oct 16



October 20–26, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

☾ 3rd Quarter Oct 23

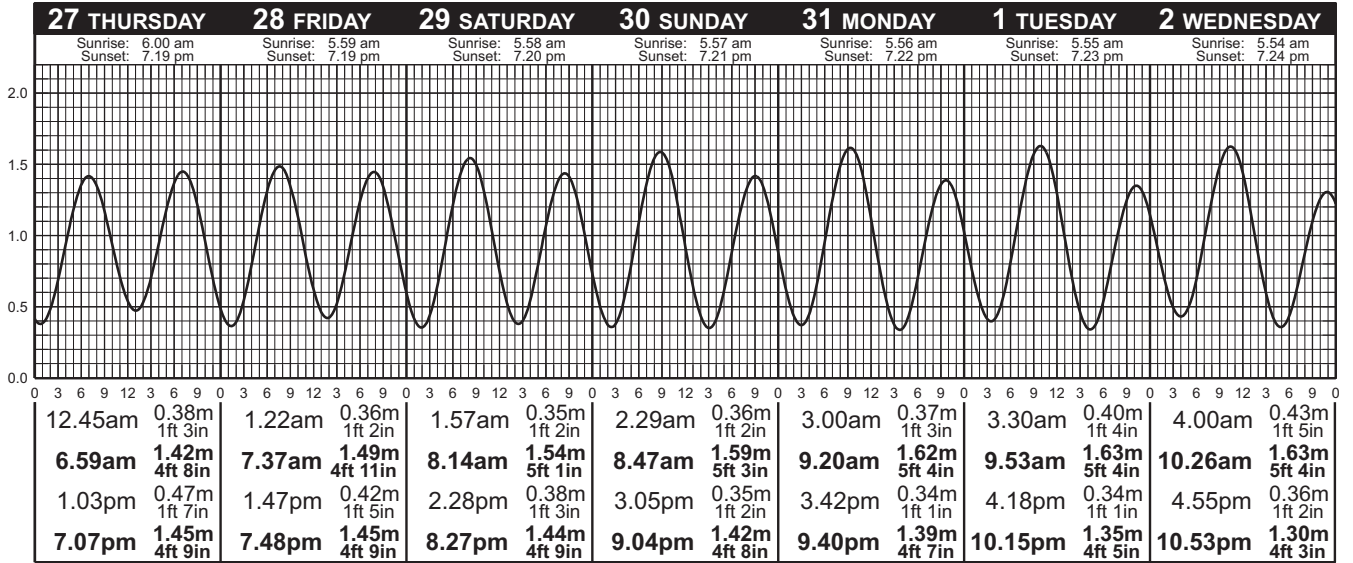


While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

October 27 – November 2, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

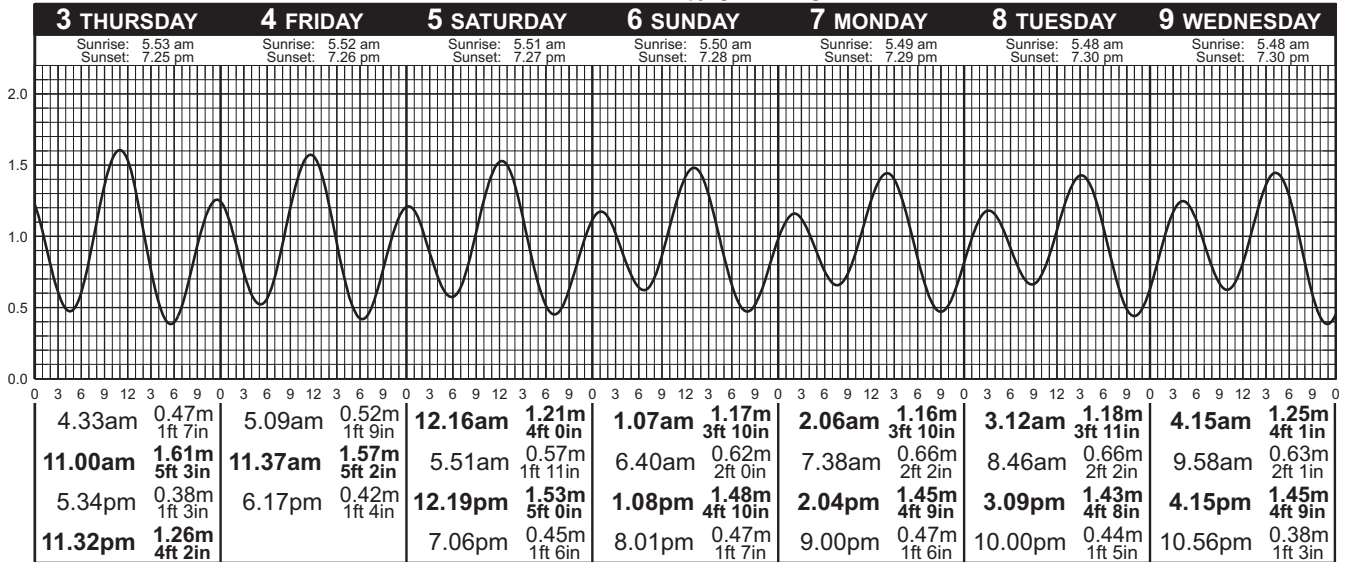
● New Moon Oct 31



November 3–9, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

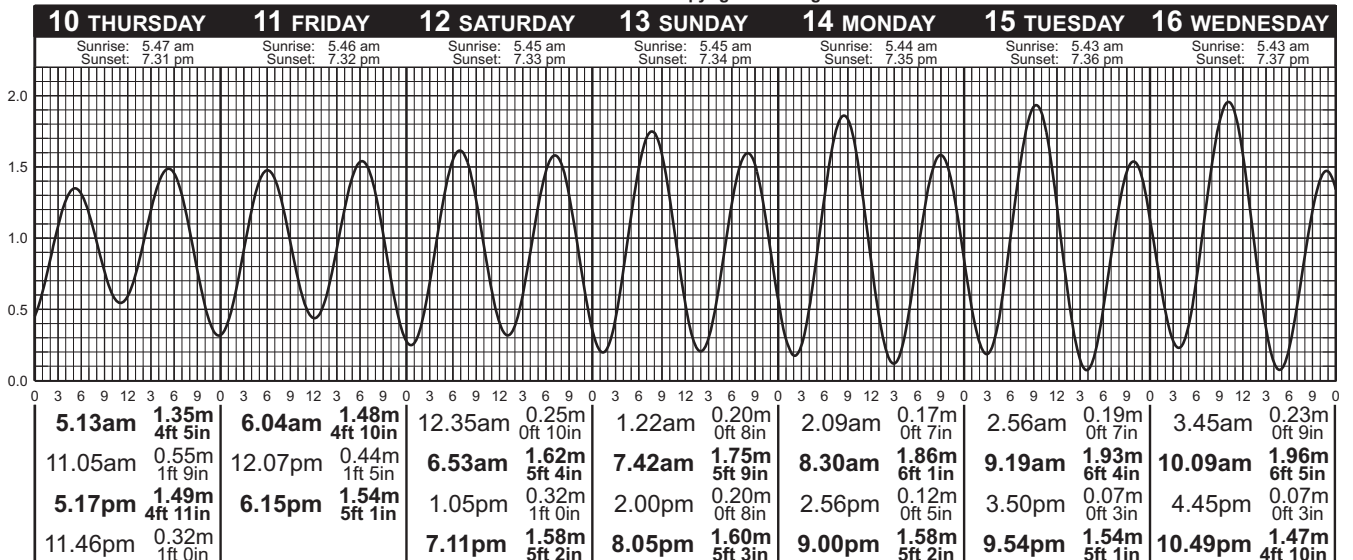
● 1st Quarter Nov 8



November 10–16, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

○ Full Moon Nov 15

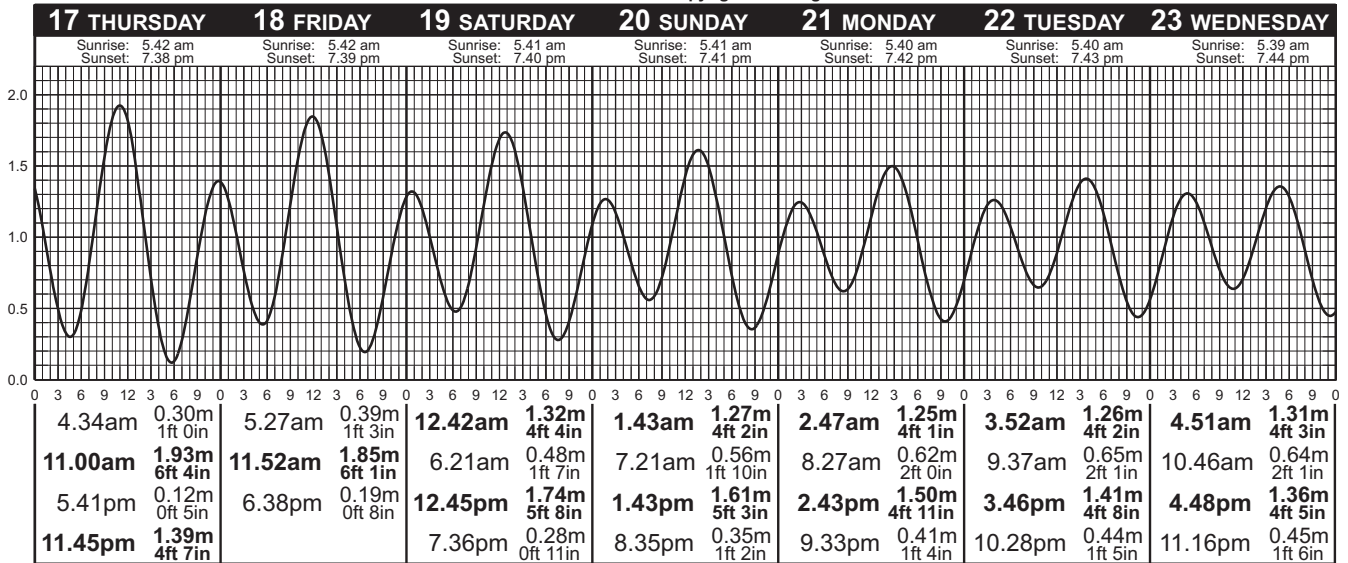


While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

November 17–23, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

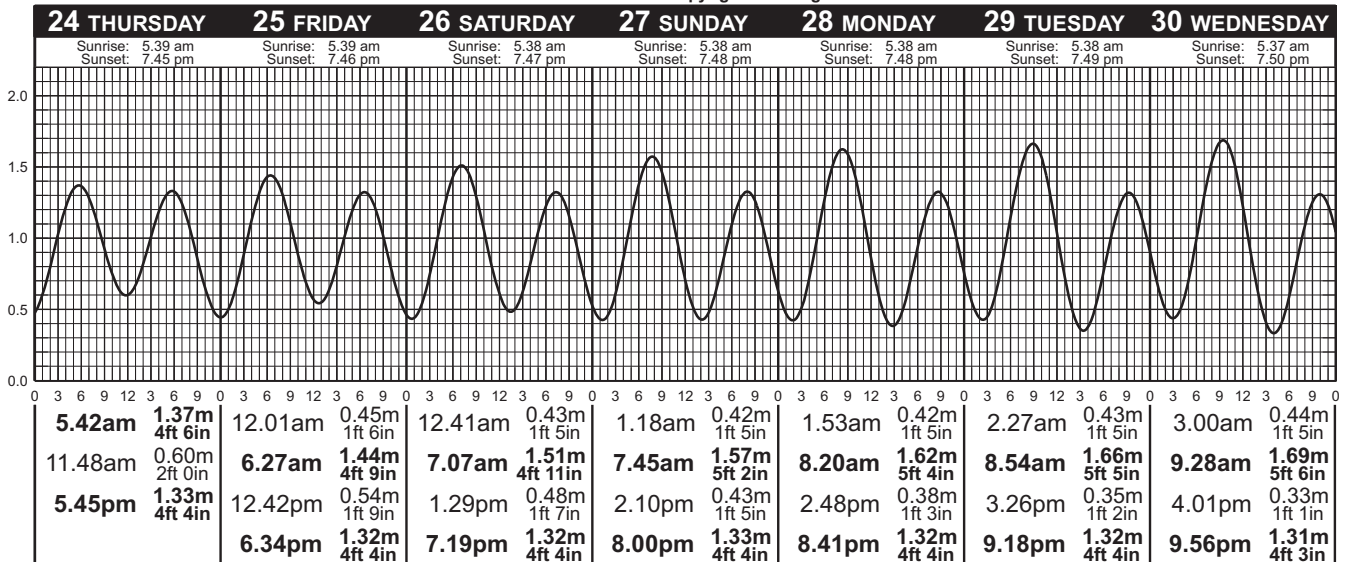
3rd Quarter Nov 21



November 24–30, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

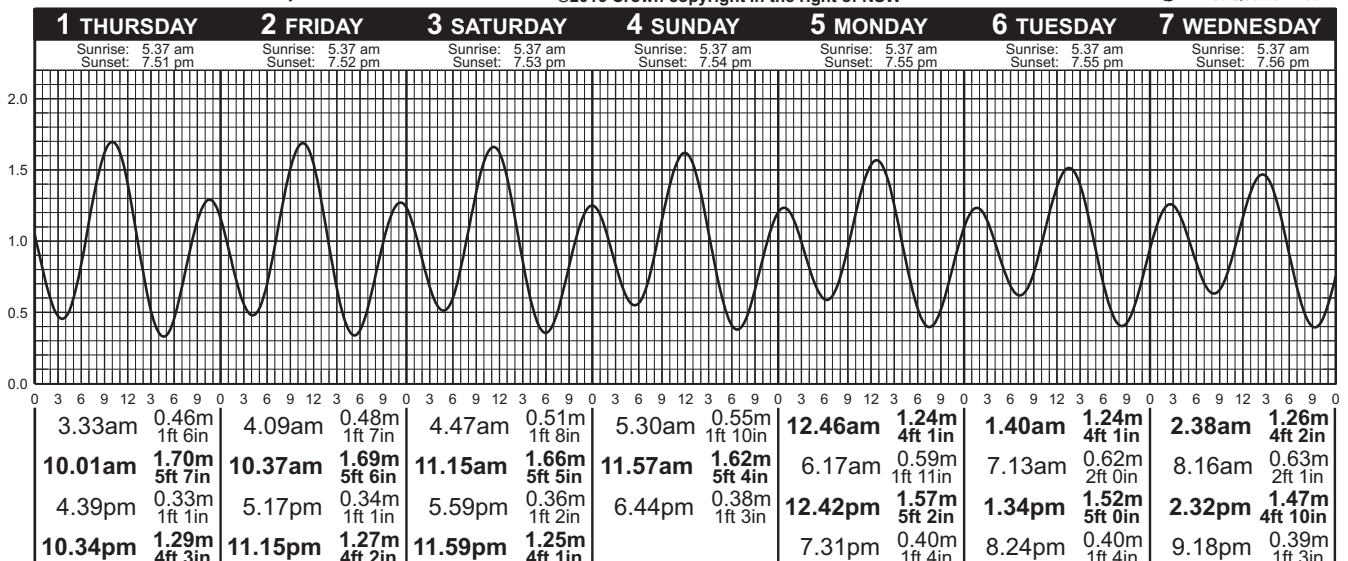
New Moon Nov 29



December 1–7, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

1st Quarter Dec 7

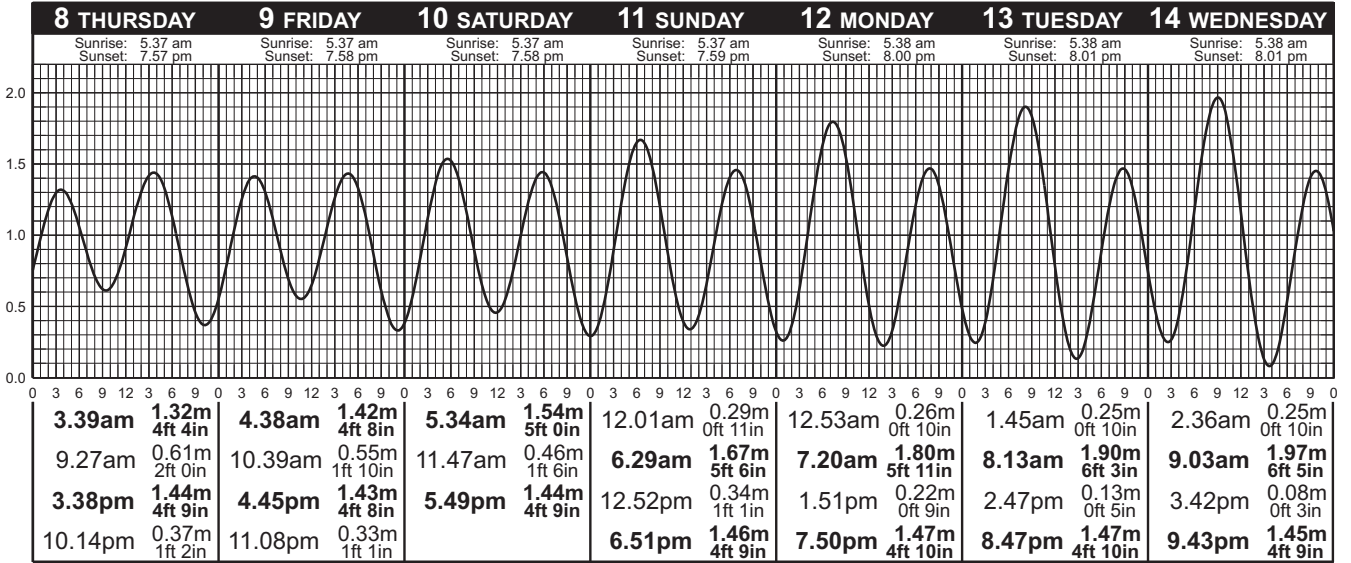


While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

December 8–14, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

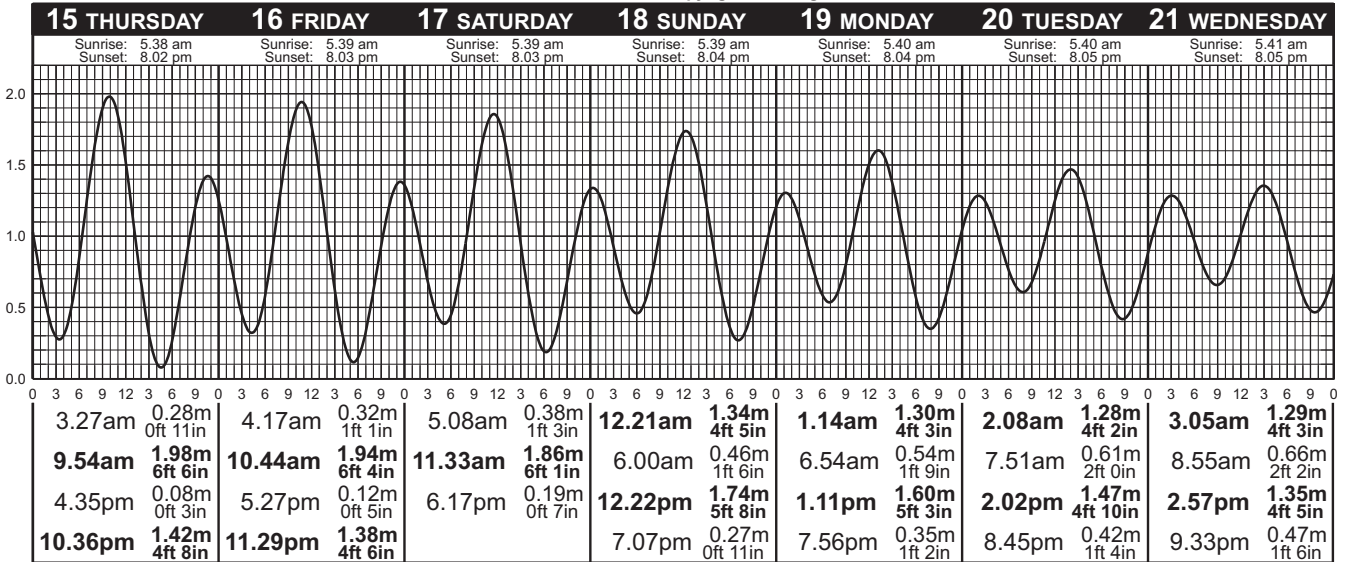
○ Full Moon Dec 14



December 15–21, 2016

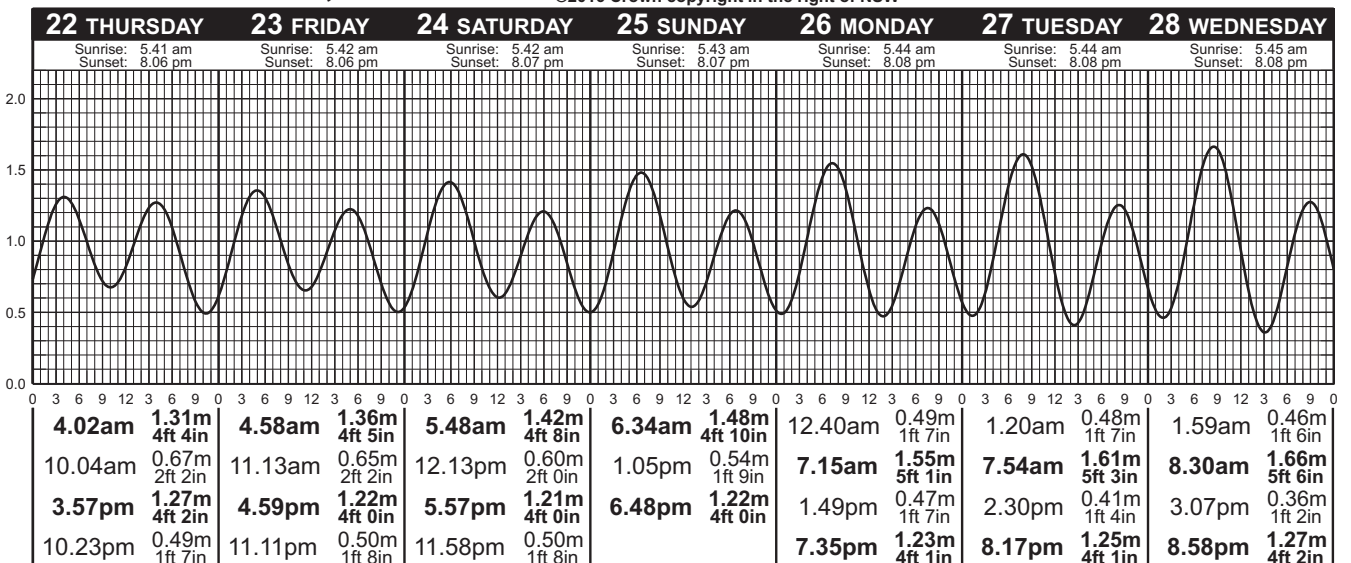
Daylight Saving Time
©2016 Crown copyright in the right of NSW

● 3rd Quarter Dec 21



December 22–28, 2016

Daylight Saving Time
©2016 Crown copyright in the right of NSW

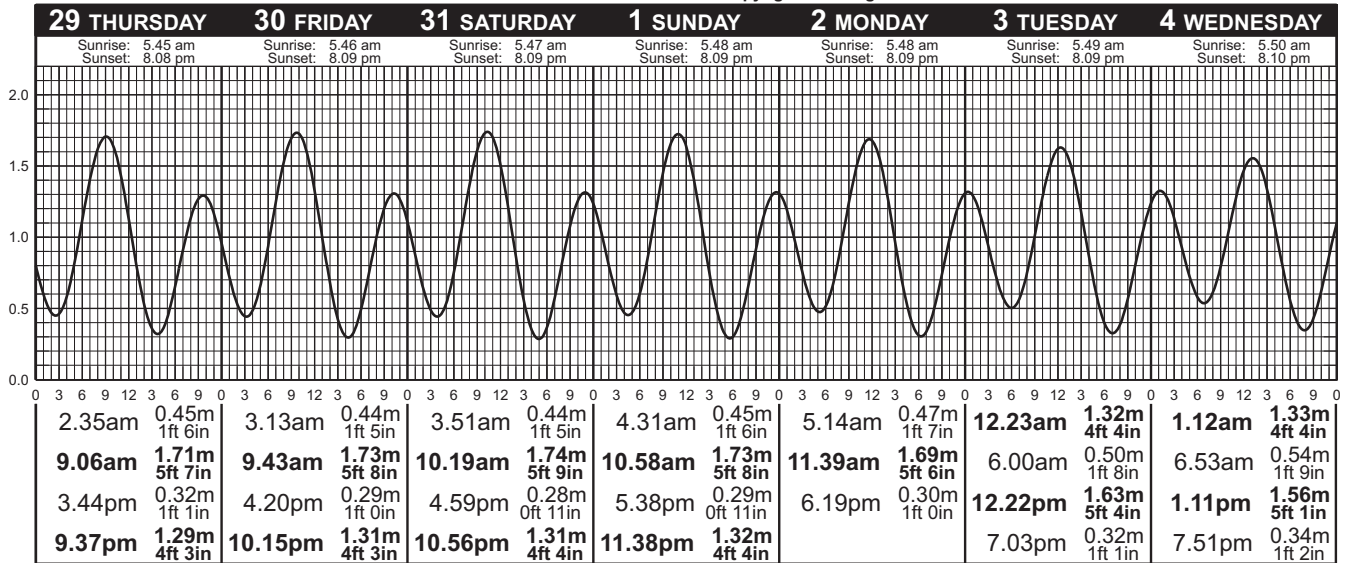


While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

December 29 – January 4, 2017

Daylight Saving Time
©2016 Crown copyright in the right of NSW

● New Moon Dec 29



While this publication has been formulated with all due care, the State of New South Wales does not warrant or represent that this booklet is free from errors or omissions, or that it is exhaustive. The State of NSW disclaims, to the extent permitted by law, all warranties, representations or endorsements, express or implied, with regard to the booklet including but not limited to, all implied warranties of merchantability, fitness for a particular purpose, or non-infringement. The State of NSW further does not warrant or accept any liability in relation to the quality or accuracy of the booklet and no responsibility is accepted by the State of NSW for the accuracy, currency, reliability and correctness of any information in the booklet.

TIME DIFFERENCES FOR SECONDARY LOCATIONS

(* Indicates secondary ocean location).

Secondary Locations have been grouped according to river basins or ocean locations listed from north to south down the New South Wales coastline – from the Tweed River Basin to the Far South Coast Region.

Add or subtract the appropriate hours and/or minutes listed here to adjust for the time difference between when high or low tide occurs at Middle Head, Sydney Harbour, and when the corresponding tide will occur at the secondary location. Lows will be generally later than the highs because the falling water levels will no longer have the tidal force behind them.

LOCATION	HOUR:MIN
Tweed River Basin	
Tweed Heads, River Entrance	+0:04*
Greenbank Island	+0:40
Cave Point	+0:50
Barneys Point	+1:25
Tumbulgum	+2:35
Murwillumbah	+2:40
Caddys Island, Terranora Creek	+1:40
Cobaki Broadwater	+2:10
Birds Bay, Terranora Broadwater	+2:20
Kynnumboon, Rous Creek	+3:15
Kingscliff, Cudgen Creek Mouth	+0:17

Brunswick River Basin	
Brunswick Heads, River Entrance	+0:06*
Billinudgel, Marshalls Creek	+3:55
Mullumbimby	+1:10

Richmond River Basin	
Ballina, River Entrance	+0:07*
Byrnes Point Ferry	+0:30
Woodburn	+2:30
Highway Bridge, Tucombil Creek	+2:30
Floodgate, Evans River	+2:25
Coraki	+4:05
Lismore Airfield, Wilsons River	+5:10
Woodlawn College, Wilsons River	+6:05
Tuncester, Leycester Creek	+6:05

Clarence River Basin	
Yamba, River Entrance	0:00*
Palmers Island, Palmers Channel	+2:40
Macleay	+2:00
Brushgrove	+3:45
Grafton	+4:15
Wooli River Entrance	+0:12
Wooli Caravan Park	+1:40

Coffs Harbour Region	
Harbour Jetty	-0:07*
Highway Bridge, Coffs Creek	+1:50
Newports Creek Junction	+1:50
Boambee, Boambee Creek	+1:50

Bellingen River Basin	
Repton Railway Bridge	+1:30
East Bellingen	+2:10
Urunga Bridge, Kalang River	+1:45
West Newry Island, Kalang River	+2:05

Nambucca River Basin	
Stuarts Island	+1:10
Macksville	+2:00
Utungun	+2:40

Macleay River Basin	
South West Rocks (Kemps Corner)	+0:23
Smithtown	+2:10
Kempsey	+3:25
West Euroka	+4:05

Hastings River Basin	
Port Macquarie, River Entrance	+0:19*
Settlement Point	+0:50
Dennis Bridge	+1:25
Wauchope Railway Bridge	+1:55
Telegraph Point, Wilson River	+3:05
Green Valley, Maria River	+3:45

LOCATION	HOUR:MIN
Camden Haven Basin	
North Haven	+0:18
Laurieton	+0:45
West Haven, Stingray Creek	+1:00

Manning River Basin	
Crowdy Head, Harbour Marina	-0:02
Harrington	+0:11
Croki	+2:05
Taree	+2:25
Wingham	+3:45
Farquhar Inlet, South Channel	+1:50

Wallis Lake	
Forster, Harbour Entrance	+0:01*
Wallamba Island, North Tuncurry	+2:05
Tiona	+3:25

Hunter River Basin	
Tomaree, Port Stephens	+0:05*
Nelson Bay, Port Stephens	+0:30
Stockton Bridge	+0:20
Hexham Bridge	+1:10
Tea Gardens, Port Stephens	+1:30
Raymond Terrace	+1:55
Green Rocks	+2:20
Hinton Bridge, Paterson River	+3:25
Morpeth	+3:30
McKimms Corner	+3:40
Dunmore, Paterson River	+3:55
Maitland, Wallis Creek	+4:10
Paterson, Paterson River	+4:30
Maitland, Belmore Bridge	+4:50
Swansea, Lake Mouth	0:00*

Brisbane Water/Broken Bay	
Ettalong	+0:40
Woy Woy Bridge	+2:15
East Gosford	+2:20
Little Patonga (Juno Point)	+0:09
Patonga	+0:10
Newport Wharf, Pittwater	+0:08
Berowra Waters Ferry	+1:00

Hawkesbury River	
Gentlemans Halt	+1:00
Spencer	+1:10
Gunderman	+1:45
Wisemans Ferry	+2:25
Lower Portland	+3:10
Sackville	+3:55
Ebenezer	+4:50
Windsor	+5:40
Freemans Reach	+7:30

Sydney Harbour	
Roseville Bridge Marina	+0:03
Gladesville Bridge	+0:05
Ryde Railway Bridge	+0:12
Silverwater Bridge	+0:14
Homebush Bay	+0:23

Georges River Basin	
Canterbury Bridge, Cooks River	+0:40
Picnic Point	+1:10
Milperra	+2:15
Lansdowne Bridge, Prospect Creek	+2:25
Lansvale	+2:35
Irelands Bridge, Cabramatta Creek	+2:35
Warwick Farm	+2:45
Cabbage Tree Point, Port Hacking	+0:03*

LOCATION	HOUR:MIN
Lake Illawarra Basin	
Port Kembla	-0:01*
Lake Illawarra Entrance (Windang Caravan Park)	+0:16
Lake Illawarra, Koonawarra Bay	+3:16
Shoalhaven River Basin	
South Shoalhaven Heads	+0:55
Shoalhaven Heads Inlet	+1:05
Nowra Bridge	+2:00
Crookhaven River Entrance	+0:16
Greenwell Point, Crookhaven River	+0:40
Jervis Bay	
Huskisson	+0:08*
Captains Point	+0:01*
St Georges Basin	
Lumeah	+0:18
Sussex Inlet Coastal Patrol Jetty	+0:35
Talofa Caravan Park	+1:15
Island Point	+3:40
Lake Conjola Entrance	+1:35
Narrawallee Inlet	+0:45
Burrill Lake, Highway Bridge	+0:55

LOCATION	HOUR:MIN
Batemans Bay	
Snapper Island	+0:03*
Princes Highway Bridge	+0:20
Nelligen, Clyde River	+0:45
Moruya River	
Tuross River, West Tuross Head	+1:40
Moruya Quarry Wharf	+0:35
Moruya Hospital	+0:55
Wagonga Inlet (Narooma)	
MSB Boatshed/Jetty	+0:15
Narooma Old Municipal Wharf	+0:40
Apex Park Boat Ramp	+0:55
Princes Highway Bridge	+1:15
Barlows Bay	+2:00
Far South Coast Region	
Bermagui, Boat Harbour	+0:08*
Merimbula Wharf	+0:40
Bonnie Doon, Merimbula Lake	+2:40
Wallaga Lake Entrance	+1:40
Wallaga Lake, Regatta Point	+2:50
Tee Tree Point, Pambula Lake	+1:10
Eden, Fishing Co-operative Jetty	+0:08*

LEADERS IN WATER, COASTAL AND ENVIRONMENTAL SOLUTIONS

Manly Hydraulics Laboratory is a team within NSW Water Solutions which provides specialist services in the areas of water, sewer, stormwater, irrigation, coastal and environmental solutions including physical and numerical modelling investigations and delivery of extensive data collection programs. NSW Water Solutions is a business unit within NSW Public Works, a division of the Department of Finance, Services and Innovation.

Environmental Data Capture

weather, tides, waves
water levels, flows, water quality
oceanographic monitoring

Investigations

beach erosion and foreshore protection
ports, harbours and breakwaters
offshore and coastal structures
rivers, floodplains, dams and fishways
bridges and river training works
water supply and wastewater systems
water quality, effluent management and stormwater
pumps, flows in pipes and open channels
NATA and NMI accredited meter testing (AS17025)

Environmental and water quality engineering

Development of specialised instruments and logging systems




Public Works
Manly Hydraulics Laboratory

110B King Street
Manly Vale NSW 2093
T: (02) 9949 0200
F: (02) 9948 6185

www.mhl.nsw.gov.au

quality system certified to AS/NSZ ISO 9001:2008

These tide charts have been prepared by Manly Hydraulics Laboratory based on water level recorders managed by the Environmental Programs Branch of the NSW Office of Environment and Heritage. Further information on the work we undertake can be found at the websites shown below.



Public Works
Manly Hydraulics Laboratory

MHL Home | About MHL | Services | Facilities | Data Request | Public

Today's Conditions

- Ocean Wave
- Sea Temperature
- Ocean Tide
- Water Level
- Rainfall
- Water Quality
- Barometric

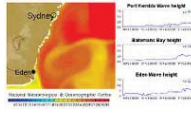
Capabilities / Services

NSW Ocean Wave Data Collection Program

The wave data presented online by MHL has been collected under the NSW Coastal Data Network Program managed by the Office of Environment and Heritage (OEH). For more information on coasts, estuaries and floods visit: environment.nsw.gov.au.

MHL collects offshore wave data at seven continuously recording sites off the NSW coast. The ocean wave monitoring sites are based on the Waverider buoy system developed by the Dutch company, Datawell. Waverider buoys are located off Byron Bay, Coffs Harbour, Crowdy Head, Sydney, Port Kembla, Batemans Bay and Eden. To provide deepwater wave data, the buoys are typically moored in water depths between 70 and 100 metres, between 6 and 12 kilometres from the shoreline.

Ocean Wave Links



Latest offshore wave data >>

Station Data Pages

- >> Byron Bay
- >> Coffs Harbour
- >> Crowdy Head
- >> Sydney
- >> Port Kembla
- >> Batemans Bay
- >> Eden

www.mhl.nsw.gov.au



Office of Environment & Heritage

HOME | ENVIRONMENTAL ISSUES | CLIMATE CHANGE | ACTION MATTERS | NATURE CONSERVATION | CULTURE AND HERITAGE | KNOWLEDGE CENTRE

Environmental Issues

- Water
 - Water quality
 - Waterwatch
 - Stormwater
 - Beachwatch programs
 - Water pollution and treatment
 - Wetlands
- Water for the environment
 - Coastal and floodplain management
 - Coastal zone management
 - Coastal erosion management
 - Coastal management reforms

Estuaries of NSW: Physical characteristics, tidal surveys and hydrographic surveys

A range of physical characteristics for each estuary listed, including their location and size is provided. Many estuaries have also been subject to tidal surveys and/or hydrographic surveys that may cover part or all of an estuary. The link will provide a listing of available tidal survey reports and a map detailing the most comprehensive survey. Hydrographic survey map sheets and data are also provided.

Estuary (north to south)	Physical characteristics	Hydrographic survey	Tidal prism measurements and tidal survey reports
Tweed River	✓	✓	✓
Curlgen Creek	✓	✓	✓
Cudgera Creek	✓	✓	✓

www.environment.nsw.gov.au/water/coastandfloodplain.htm