TITLE	Reference	Last amendment (CL or IHC)	1st Edition Reference
Digital Tide and Tidal Current Tables.	**XX/XXXX**	**-**	**XX**

1. It is resolved that Hydrographic Offices (HO) may choose to publish their tide and tidal current tables in either paper format or digitally. If published digitally, they can be distributed through the HO's web site, or a distributor agents' network or another third party network.

General Guidelines for Digital Tide and Tidal Current Tables

2. It is resolved that digital tide and tidal current tables should adhere to all the same requirements as existing paper tide and tidal current tables as specified in IHO publication M-3 – *Resolutions of the IHO*.

3. It is recommended that the issuing organization or authority should provide documentation on how to install or read the electronic tables, minimum computer specifications, how to obtain product support and general information on the Digital Tide and Tidal Current Tables. This information should be provided in either hardcopy written form (for example, on a separate sheet of paper or on the cover of the disk or other media) or electronically in a plain ASCII text 'readme.txt' type file. This file should also include user license and/or condition of use information.

4. It is recommended that the responsible issuing office should provide its formal name, mailing address, web URL and point of contact information on the cover of the media. It should also provide information on the production of the tables (including both address and website), information on how to obtain annual updates, and how to obtain interim updates, corrections or errata information.

5. It is resolved that the digital tide and tidal current tables should include a statement confirming the digital tables as meeting the applicable maritime carriage requirement regulations, either SOLAS and/or local country carriage requirements.

Formats for Digital Tide and Tidal Current Tables

6. It is resolved that there shall be two recommended formats for digital tide and tidal current tables:

A. Scanned Images of Tide and Tidal Current Tables: This format consists of scanned images of the paper tide tables. This format should have the attributes detailed below.

B. Electronically generated Tide and Tidal Current Predictions: This format consists of software and a user interface that calculates tide and tidal current predictions from stored harmonic constituents or time and range offsets.

Detailed Specifications for Digital Tide Tables – Scanned Images of Tide Tables:

7. It is resolved that Scanned Images of Tide Tables should follow the following specifications.

a. Should be a faithful reproduction of all the pages of printed tide tables;

b. The images should be formatted in a widely available, common format. Examples formats include, but are not limited to, PDF, tiff, Jpeg, Gif. If PDF files are provided, then information on how to download Adobe© Reader should be provided;

c. If multiple books are published, then each book should be located within its own folder and clearly identified;

d. No modification of the scanned images is permissible by users.

Detailed Specifications for Digital Tide Tables – Electronically Generated Tide Predictions

8. It is resolved that Electronically Generated Tide Predictions should follow the following specifications:

a. Station Selection: It is recommended that station selections can either be map based or list based, and should be organized by water body;

b. Station Information: It is recommended that the following information be included with each station:

Station Name and Number (or ID) as appropriate
Body of Water Descriptor (if appropriate)
Latitude and Longitude (degrees:min:sec and tenths or decimal equivalent? using GIS convention with western and southern hemispheres as being negative latitude and longitude)
Horizontal and Vertical Datum convention
Location Map with nearby prediction stations identified
URL to station or data portal

c. It is recommended that Earth-Moon-Sun Astronomical Calendar Information (Tabular and/or integrated with graphical data output) be included;

d. It is recommended that Sunrise/Sunset Calendar Information (Tabular and/or integrated with graphical data output);

e. It is recommended that the default reference datum is the Chart Datum or nationally recognized equivalent used by the relevant country, furthermore, it is recommended that the user have the ability to reference predictions to other tidal datums supported by the HO (such as LAT, HAT, MHW, MSL) and user identified datums such as a national geodetic or ellipsoidal datum or other coastal engineering or threshold datums that are pertinent;

f. It is recommended that data displays and tables can be toggled to both in Metric or Imperial units, with default set depending upon country of issue;

g. It is recommended that the time displayed is the legal local time as default, with user selected option for UTC/GMT, daylight savings time, etc. Legal time includes daylight savings time if applicable. Furthermore, when time zone information is displayed it should follow the convention that negative time zone offsets are used for east longitude and positive offsets for west longitude;

h. It is recommended that the following tide prediction source metadata information be provided:

Harmonic Constituents or Time and Range Correction to Reference Station;
Dates of Harmonic Analyses time series used to create the set of Harmonic Constituents used in the prediction;

Dates of the observations used to create time and height corrections (for non-harmonic based predictions) to a reference Station;
Links to the list of the Harmonic Constituents used in the Prediction. Furthermore, the display of the Harmonic Constituents should adhere to the IHO National Tidal Constituent Banks Resolution 2/1977, as amended;

i. It is recommended that the HO provide and display tidal sea level amplitude prediction with a minimum of either centimetre (for metric systems) or tenths of foot (for imperial systems) precision;

j. It is recommended that users have the ability to obtain output in common formats such as PDF, TXT, XML, CSV, S-112 single point formats;

k. It is recommended that additional information be provided for special warnings explaining areas of anomalous tidal conditions, special datums, or tidal based hazards to navigations (dual high or low waters, tidal bores, river flow dependencies and river datums, frequent non-tidal conditions, etc..);

l. It is recommended, when applicable, that estimates of uncertainty in the predicted times and heights of high and low waters be provided.

Detailed Specifications for Graphical Display of Electronic Tide Predictions

9. It is resolved that the predictions have the ability to obtain graphical and tabular output for desired time period (either historical and into the future) and should contain the following attributes with the objective not to prescribe a specific graphical view but rather to identify common elements that transcend all types of graphs:

a. It is recommend that the predictions can be displayed as discrete points or a continuous curve using a curve fit routine to times and heights of high and low waters or to the time series values;

b. It is recommended that all axes should be clearly labelled;

c. It is recommended that time series data should have a minimum, 1- hour increments;

d. It is recommended that times and heights of predicted high and low tides should be provided;

e. It is recommended that the default datum should be the same as chart datum or nationally recognized equivalent for the location of the prediction;

f. It is recommended that the tidal height units default should be the same as the HO's printed tables;

g. It is recommended that the display should include station information (as defined above);

h. It is recommended that the display include the name and/or the insignia of the source authority organization;

i. It is recommended that the display should have the option to view the tide prediction numerical values used to create the graphic;

j. It is recommended that the display of the graphical data should be able to be adjusted to suit daytime, twilight, and night time viewing.

Detailed Specifications for Digital Tidal Current Tables

10. It is resolved that Digital Tidal Current Tables can be in the same two formats as Digital Tide Tables and the same requirements that apply to digital tide tables pertain to tidal current tables.

11. It is resolved that electronically generated Tidal Current Predictions do have additional specifications as identified:

a. It is recommended that the depth of prediction be included in the metadata and include a the descriptor that the depth is either from the surface down or from the bottom up;

b. It is recommended, if applicable, flood and ebb current direction (referenced to True North) be presented;

c. It is recommended that for graphical display of tidal currents the default speed units should be knots;

d. It is recommended that for graphical display of tidal currents the default direction units should be degrees (referenced to true north).

Examples of Digital Tide Tables

USA - NOAA Example

Scanned Tide Table

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Albany, New York, 2015

Times and Heights of High and Low Waters

January

	Time	ft	Time	ft	Time	ft	Time	ft
1 Th	0048	5.1	0741	−0.3	1317	5.5	2026	−0.4
	155		−9		168		−12	
2 F	0142	5.1	0833	−0.3	1407	5.5	2120	−0.4
	155		−9		168		−12	
3 Sa	0233	5.1	0922	−0.3	1454	5.6	2210	−0.5
	155		−9		171		−15	
4 Su ○	0321	5.1	1009	−0.2	1538	5.5	2256	−0.4
	155		−6		168		−12	
5 M	0408	5.0	1054	−0.1	1621	5.4	2341	−0.3
	152		−3		165		−9	
6 Tu	0454	4.9	1136	0.1	1702	5.3		
	149		3		162			
7 W	0022	−0.2	0540	4.8	1216	0.2	1742	5.1
	−6		146		6		155	
8 Th	0103	0.0	0625	4.7	1255	0.4	1822	5.0
	0		143		12		152	
9 F	0141	0.1	0710	4.6	1334	0.5	1901	4.9
	3		140		15		149	
10 Sa	0219	0.2	0755	4.6	1416	0.6	1940	4.8
	6		140		18		146	
11 Su	0256	0.3	0839	4.6	1503	0.7	2021	4.6
	9		140		21		140	
12 M	0334	0.4	0922	4.7	1559	0.8	2115	4.4
	12		143		24		134	
13 Tu ◑	0416	0.4	1006	4.7	1701	0.8	2220	4.3
	12		143		24		131	
14 W	0507	0.5	1056	4.8	1806	0.8	2325	4.2
	15		146		24		128	
15 Th	0605	0.5	1148	4.9	1908	0.7		
	15		149		21			
16 F	0026	4.2	0705	0.4	1241	5.0	2006	0.4
	128		12		152		12	
17 Sa	0121	4.3	0803	0.3	1331	5.2	2101	0.2
	131		9		158		6	
18 Su	0211	4.4	0858	0.1	1417	5.4	2153	0.0
	134		3		165		0	
19 M	0257	4.6	0952	−0.1	1503	5.6	2243	−0.2
	140		−3		171		−6	
20 Tu ●	0343	4.8	1044	−0.2	1549	5.7	2331	−0.4
	146		−6		174		−12	
21 W	0430	4.9	1136	−0.4	1639	5.7		
	149		−12		174			
22 Th	0018	−0.5	0520	5.0	1227	−0.4	1733	5.7
	−15		152		−12		174	
23 F	0106	−0.5	0612	5.1	1320	−0.4	1830	5.6
	−15		155		−12		171	
24 Sa	0154	−0.5	0708	5.2	1414	−0.4	1931	5.5
	−15		158		−12		168	
25 Su	0244	−0.4	0806	5.2	1511	−0.3	2032	5.4
	−12		158		−9		165	
26 M ◐	0336	−0.3	0904	5.3	1610	−0.2	2132	5.2
	−9		162		−6		158	
27 Tu	0429	−0.3	1002	5.3	1710	−0.1	2231	5.1
	−9		162		−3		155	
28 W	0524	−0.2	1101	5.3	1810	−0.1	2330	5.0
	−6		162		−3		152	
29 Th	0620	−0.1	1159	5.3	1908	−0.1		
	−3		162		−3			
30 F	0028	5.0	0715	−0.1	1255	5.2	2004	−0.2
	152		−3		162		−6	
31 Sa	0123	5.1	0808	−0.1	1347	5.4	2057	−0.3
	155		−3		165		−9	

February

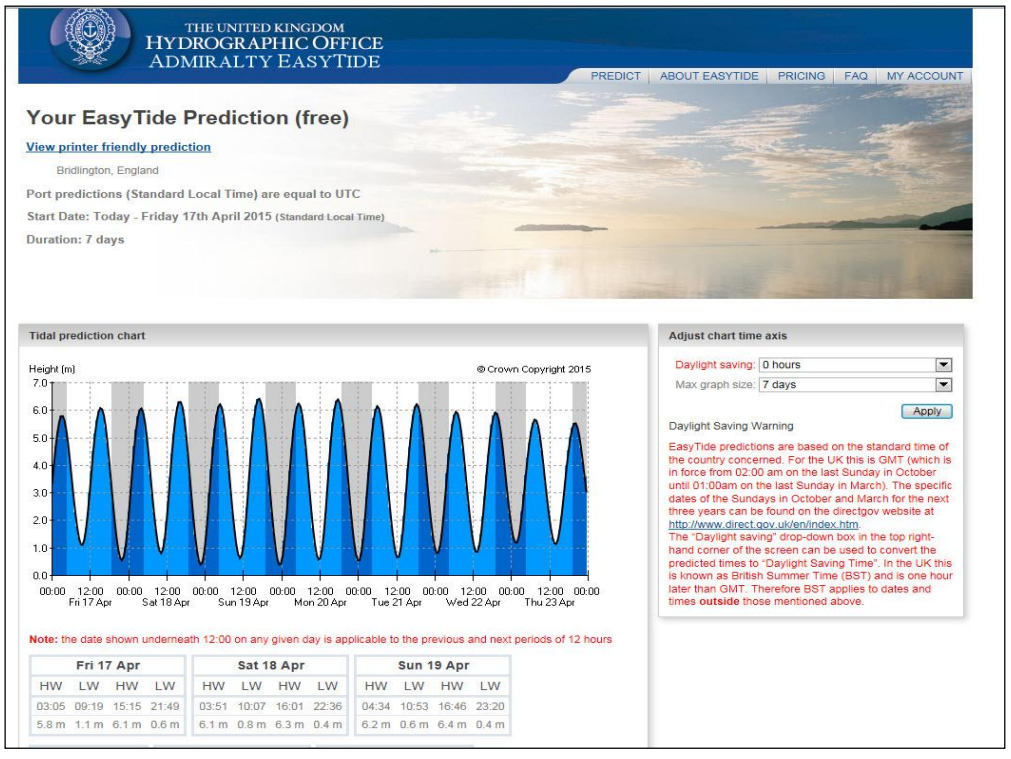
	Time	ft	Time	ft	Time	ft	Time	ft
1 Su	0214	5.2	0859	−0.1	1435	5.4	2145	−0.3
	158		−3		165		−9	
2 M	0302	5.2	0946	−0.1	1519	5.4	2230	−0.3
	158		−3		165		−9	
3 Tu ○	0348	5.2	1030	0.0	1600	5.4	2313	−0.2
	158		0		165		−6	
4 W	0431	5.1	1112	0.1	1640	5.3	2352	−0.1
	155		3		162		−3	
5 Th	0513	5.1	1152	0.2	1718	5.2		
	155		6		158			
6 F	0029	0.0	0553	5.0	1231	0.3	1754	5.1
	0		152		9		155	
7 Sa	0104	0.2	0632	5.0	1310	0.5	1826	5.0
	6		152		15		152	
8 Su	0137	0.3	0706	5.0	1350	0.6	1851	4.9
	9		152		18		149	
9 M	0208	0.4	0730	5.0	1434	0.7	1924	4.8
	12		152		21		146	
10 Tu	0240	0.5	0752	5.1	1526	0.8	2009	4.6
	15		155		24		140	
11 W ◑	0320	0.5	0832	5.2	1627	0.9	2109	4.5
	15		158		27		137	
12 Th	0413	0.7	0923	5.2	1739	0.9	2234	4.4
	21		158		27		134	
13 F	0520	0.7	1028	5.2	1837	0.8	2348	4.4
	21		158		24		134	
14 Sa	0631	0.7	1149	5.2	1938	0.6		
	21		158		18			
15 Su	0050	4.5	0736	0.5	1256	5.4	2034	0.4
	137		15		165		12	
16 M	0144	4.8	0836	0.3	1353	5.6	2127	0.1
	146		9		171		3	
17 Tu	0234	5.0	0933	0.1	1445	5.7	2217	−0.1
	152		3		174		−3	
18 W ●	0322	5.3	1027	−0.2	1535	5.9	2306	−0.2
	162		−6		180		−6	
19 Th	0409	5.4	1119	−0.3	1626	5.9	2353	−0.3
	165		−9		180		−9	
20 F	0458	5.6	1211	−0.4	1719	5.9		
	171		−12		180			
21 Sa	0040	−0.3	0549	5.6	1303	−0.3	1815	5.8
	−9		171		−9		177	
22 Su	0128	−0.2	0642	5.6	1356	−0.2	1913	5.6
	−6		171		−6		171	
23 M	0216	−0.1	0739	5.6	1452	−0.1	2012	5.5
	−3		171		−3		168	
24 Tu	0307	0.1	0837	5.6	1549	0.1	2111	5.4
	3		171		3		165	
25 W ◐	0400	0.2	0935	5.5	1647	0.2	2210	5.3
	6		168		6		162	
26 Th	0455	0.4	1034	5.4	1746	0.3	2309	5.2
	12		165		9		158	
27 F	0552	0.5	1133	5.4	1843	0.3		
	15		165		9			
28 Sa	0007	5.3	0648	0.5	1231	5.4	1938	0.2
	162		15		165		6	

March

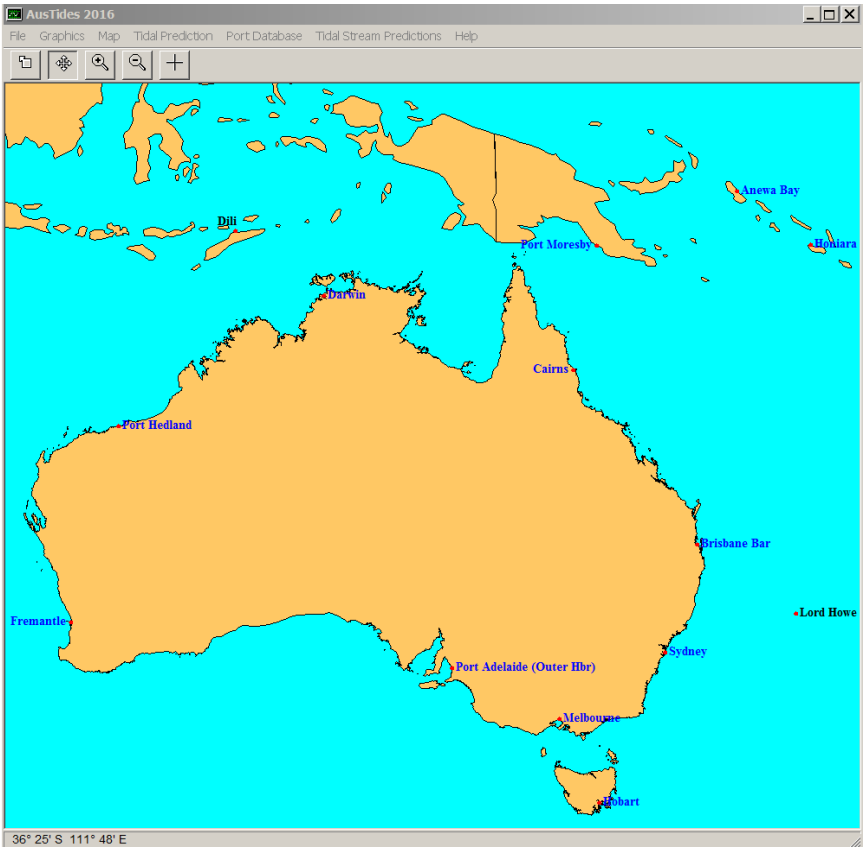
	Time	ft	Time	ft	Time	ft	Time	ft
1 Su	0102	5.4	0743	0.5	1324	5.5	2029	0.1
	165		15		168		3	
2 M	0153	5.5	0834	0.4	1413	5.6	2117	0.1
	168		12		171		3	
3 Tu	0241	5.6	0922	0.4	1457	5.6	2201	0.1
	171		12		171		3	
4 W	0325	5.7	1006	0.4	1538	5.6	2241	0.1
	174		12		171		3	
5 Th	0406	5.7	1049	0.4	1617	5.5	2319	0.3
	174		12		168		9	
6 F	0444	5.6	1130	0.4	1654	5.4	2354	0.4
	171		12		165		12	
7 Sa	0520	5.6	1209	0.5	1728	5.3		
	171		15		162			
8 Su	0027	0.5	0550	5.6	1249	0.6	1757	5.2
	15		171		18		158	
9 M	0058	0.6	0607	5.7	1330	0.7	1821	5.2
	18		174		21		158	
10 Tu	0129	0.7	0627	5.8	1414	0.8	1855	5.1
	21		177		24		155	
11 W	0202	0.8	0704	5.8	1504	1.0	1942	5.0
	24		177		30		152	
12 Th	0245	0.9	0751	5.8	1602	1.1	2041	4.9
	27		177		34		149	
13 F ◑	0341	1.0	0844	5.8	1705	1.1	2201	4.9
	30		177		34		149	
14 Sa	0453	1.1	0947	5.6	1808	1.1	2318	4.9
	34		171		34		149	
15 Su	0607	1.1	1110	5.6	1909	0.9		
	34		171		27			
16 M	0023	5.1	0715	0.9	1230	5.7	2006	0.7
	155		27		174		21	
17 Tu	0120	5.4	0817	0.6	1333	5.9	2059	0.5
	165		18		180		15	
18 W	0212	5.7	0915	0.3	1428	6.0	2150	0.3
	174		9		183		9	
19 Th	0300	6.0	1009	0.1	1519	6.2	2239	0.1
	183		3		189		3	
20 F ●	0347	6.2	1102	−0.1	1610	6.2	2326	0.1
	189		−3		189		3	
21 Sa	0435	6.3	1154	−0.1	1702	6.1		
	192		−3		186			
22 Su	0013	0.2	0523	6.3	1245	0.0	1756	6.0
	6		192		0		183	
23 M	0100	0.3	0615	6.2	1337	0.1	1853	5.8
	9		189		3		177	
24 Tu	0148	0.5	0710	6.1	1431	0.3	1951	5.7
	15		186		9		174	
25 W	0238	0.7	0807	5.9	1526	0.5	2049	5.6
	21		180		15		171	
26 Th	0331	0.9	0906	5.8	1622	0.6	2147	5.5
	27		177		18		168	
27 F ◐	0426	1.0	1005	5.6	1718	0.7	2245	5.5
	30		171		21		168	
28 Sa	0522	1.1	1104	5.6	1814	0.8	2342	5.6
	34		171		24		171	
29 Su	0619	1.2	1202	5.6	1907	0.7		
	37		171		21			
30 M	0037	5.7	0714	1.1	1256	5.6	1957	0.6
	174		34		171		18	
31 Tu	0128	5.9	0806	1.0	1346	5.7	2043	0.6
	180		30		174		18	

Time meridian 75° W. 0000 is midnight. 1200 is noon. Times are not adjusted for Daylight Saving Time.
Heights are referred to mean low water during lowest river stages which is the chart datum of soundings.

UKHO Example



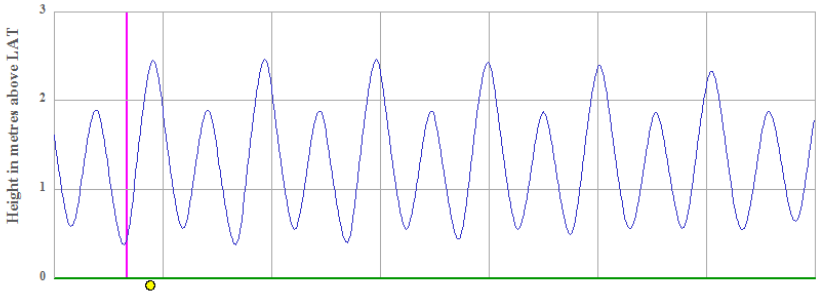
Australian Hydrographic Office Example



BRISBANE BAR

Local Standard Time Zone: -10:00 U.T. | **27° 22' S 153° 10' E** | **Year 2016**

PREDICTION DATUM below MSL: 1.31 (m) | **Port 59980**



16:00 0.4m

Jun 20 Mo		21 Tu		22 We		23 Th		24 Fr		25 Sa		26 Su	
Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m
0343	0.6	0423	0.6	0503	0.5	0543	0.5	0624	0.5	0024	2.4	0109	2.3
0911	1.9	0951	1.9	1032	1.9	1115	1.9	1200	1.9	0707	0.5	0755	0.5
1520	0.4	1557	0.4	1635	0.4	1713	0.4	1755	0.5	1250	1.9	1347	1.9
2150	2.4	2227	2.5	2304	2.5	2343	2.4			1843	0.6	1939	0.6

Moon phases supplied by Sydney Observatory

No account is taken of Daylight Saving Time

These predictions are identical to those published in ANTT and can thus be used as an official navigational publication.
Prediction Datum is LAT, which may not be Chart Datum. Correction to Chart Datum can be found at:
Level / To Chart Datum Corrections and Zero of Predictions Window.

Example from SHOM (France)