

This booklet is intended for use in nautical college lessons and in SQA and HND examinations relating to calculation of times and heights of tides and directions and rates of tidal streams within the SQA and HND syllabuses.

It contains references relating to topics outside the two syllabuses.

The following do not apply to these extracts :

- All references to Part III
- All references to Shallow Water Corrections
- All references to Harmonic Constants and Tidal Angles and Factors
- All references to simplified harmonic method of tidal prediction
- All references to Tables I to VIII
- All references to Tidal Levels
- References to ports between Swanage and Selsey including Shoreham
- References to Padstow in the instructions
- Co-tidal Charts
- All references to Tidal Stream Atlases
- Tidal prediction forms and NP 159
- All references to page 344

For details of the above, please see the Admiralty Tide Table Volume 1 for the current year.

The data used in examples contained in the instructions do not refer to the current year of these tables.

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INTRODUCTION

Methods of Prediction

(1) *Standard ports in the British Isles.* Wherever possible predictions are based on continuous observation of the tide over a period of at least one year; in such cases the average changes in mean sea level due to changes in meteorological conditions for the year in question are calculated and are included in the predictions. These changes do not, however, repeat themselves exactly from year to year; it has been found advisable, therefore, to observe and analyse changes in mean sea-level for a period of not less than three years and in the case of modern analyses this practice is followed wherever possible.

As predictions are given for average meteorological conditions it follows that when conditions are not average the actual tides may differ from those predicted. Under extreme conditions these differences can be very large. The effects of varying meteorological conditions are discussed in subsequent paragraphs.

(2) *Standard ports outside the British Isles.* Predictions for most Standard Ports outside the British Isles are obtained from the National Authorities responsible for the predictions. The method of prediction is not always known but it can be assumed that, under average weather conditions, the predictions will be adequate for all normal navigational requirements.

(3) *Secondary Ports.* Predictions for Secondary Ports are made by applying time and height differences to predictions at a selected Standard Port or by using the harmonic constants and the Simplified Harmonic Method of Tidal Prediction. The data on which the differences are based are extremely variable in quality. Modern revisions are almost invariably based on the analysis of one complete month's observations but some of the data are based on less comprehensive observations. When harmonic constants are based on less than one month's data a reference is made.

In order that the average time and height differences given in Part II may be as reliable as possible, it is necessary that the Standard Port chosen should have tidal characteristics which are similar to those of the Secondary Port. In some cases there is no local Standard Port with similar characteristics and it is necessary to choose a Standard Port which may be distant from the Secondary Port. In still other cases it is not possible to refer the tides to any published Standard Port, and in such cases prediction should only be carried out using harmonic constants to be found in Part III.

The term "Secondary Port" does not imply that the place concerned must be of secondary importance. Considerations of space preclude the inclusion, as Standard Ports, of many important ports, particularly outside the British Isles. Many Secondary Ports in these tables are, in fact, Standard Ports in the national tables of the country concerned, and these are marked accordingly.

Tidal Levels

A list of tidal levels for Standard Ports is given in Table V and the levels thus given are defined in the notes attached to that table. As well as average levels at Springs and Neaps, extreme high and low levels are given; these, like the predictions, are valid for average meteorological conditions though higher and lower levels than those given have been recorded at most places. Tidal levels for a large number of Secondary Ports can be calculated from Part II.

Tidal levels are referred to Chart Datum of the largest scale Admiralty chart; the connection between Chart Datum and Ordnance Datum in the United Kingdom is given in Table III. The same information for ports outside the United Kingdom is given, where it is known, in Table IV.

Tidal levels for Standard Ports are subject to re-examination from time to time; due to changes in mean sea level they do not necessarily remain constant; recent analyses have caused a number of levels to be raised by an average of about 0.1 m which is the estimated amount by which sea level has risen around the British Isles during the last 40 years or so.

Meteorological Effects on Tides

Meteorological conditions which differ from the average will cause corresponding differences between the predicted and the actual tide. Variations in tidal heights are mainly caused by strong or prolonged winds and by unusually high or low barometric pressure. Differences between predicted and actual times of high and low water are caused mainly by wind. The two effects are discussed separately in the following paragraphs.

Barometric pressure. Tidal predictions are computed for average barometric pressure. A difference from the average of 34 millibars can cause a difference in height of about 0.3m. A low barometer will tend to raise sea level and a high barometer will tend to depress it. The water level does not, however, adjust itself immediately to a change of pressure and it responds, moreover, to the average change in pressure over a considerable area. The average barometric pressure for certain places is given in Sailing Directions and information is also given in some instances concerning the changes in level which can be expected under different conditions. Changes in level due to barometric pressure seldom exceed 0.3m but, when mean sea level is raised or lowered by strong winds or by storm surges, this effect can be important.

The effect of wind. The effect of wind on sea level - and therefore on tidal heights and times - is considerably variable and depends largely on the topography of the area in question; thus the effects on the south coast of England may be very different from those on the east coast, while the effects on the east coast of Scotland may again be different from those experienced on the Suffolk coast. In general it can be said that wind will raise sea level in the direction towards which it is blowing. A strong wind blowing straight onshore will pile up the water and cause high waters to be higher than predicted, while winds blowing off the land will have the reverse effect. Winds blowing along a coast tend to set up long waves which travel along the coast, raising sea level where the crest of the wave appears and lowering sea level in the trough. These waves, which are known as "storm surges", are discussed in succeeding paragraphs.

Seiches. Abrupt changes in meteorological conditions, such as the passage of an intense depression or line squall, may cause oscillations in sea level. The period between successive waves may be anything between a few minutes and about two hours and the height of the waves may be anything from a few centimetres to a metre or even more.

Small seiches are not uncommon round the coast of the British Isles. The shape and size of certain harbours makes them very susceptible to seiches, especially in the winter months. Fishguard and Wick are examples of harbours where seiches regularly occur.

North Sea. Abnormal high and low waters. Storm surges. Strong winds in the North Sea and in the surrounding waters have three main effects, namely (a) they may cause a general raising or lowering of sea level; (b) they may cause oscillations in sea level in one or more directions; and (c) they may generate storm surges which have a considerable variety of forms.

(a) A general raising of sea level is sometimes caused in the southern part of the North Sea by a steady northerly wind; this sometimes has the effect of lowering sea level in the northern part of the North Sea.

(b) A typical oscillation of sea level can be set up when a strong southerly wind is abruptly replaced by a strong northerly wind; water which has been piled up in the north part of the North Sea is released and travels south as a wave or series of waves, being given added impetus and amplitude by the northerly wind. On reaching the southern shores of the North Sea the waves are reflected and travel north again with diminished amplitude. Changes in the force of the wind may sustain these oscillations for a considerable time. It should be noted that oscillations of sea level are not restricted to movements from north to south and vice versa; similar oscillations may take place from east to west and in other directions, the combination of several different oscillations resulting in a complicated pattern of changes in sea level.

(c) A storm surge may be generated either in the northern part of the North Sea or in the Atlantic. In the latter case, the wave may travel round the north of Scotland and, on entering the North Sea, be deflected by the rotation of the earth towards the south.

The most dangerous surges occur when a deep depression, moving in from the Atlantic, travels slowly across the north of Scotland from west to east, causing strong and sustained northwesterly or northerly winds. A wave is set up which travels down the coast at approximately the same speed as the tidal wave, i.e. if the wave's crest arrives at, say, Aberdeen near the time of high water, the same crest will arrive at the Tyne near high water and will also arrive farther south at or near the time of local high water.

Of equal importance to the time at which the crest of the surge arrives is the range of the tide on the day in question. Surges which occur at or near neaps seldom cause abnormally high levels, but relatively small surges occurring at high water of equinoctial springs can be very dangerous.

The height of surges in the North Sea can reach considerable proportions, the maximum height increasing from north to south. At Aberdeen, for instance, the height of a surge would not normally exceed 0.9m. The same surge, by the time it reaches the Humber, may have a height of 2.4m, and by the time it reaches the Netherlands coast 3.0m or more.

Large surges of this kind are fortunately rare but smaller surges which raise the height of high or low water between 0.6m and 0.9m are not infrequent and they may occur several times during a normal year in the North Sea.

A very severe storm surge occurred on 31st January, 1953, when a northerly gale of exceptional strength and duration, blowing over the whole of the North Sea, raised sea level by 2.7m on the east coast of England and by even more on the Netherlands coast. Predicted high waters were exceeded by nearly 2.4m on the coast between the rivers Humber and Thames and by more than 3.0m on the Netherlands coast, resulting in disastrous flooding with considerable loss of life and property.

Negative Surges

In a manner somewhat similar to the Storm Surges described above, the level of the sea can also be lower than the predicted level. Again the cause is usually meteorological. This effect is of great importance to very large vessels which may be navigating with small under-keel clearances. Negative surges of over 0.6m occur about 15 times a year in the southern North Sea, 3 or 4 of them exceeding 1m. Negative surges are about twice as frequent in the Thames Estuary and, on one occasion in 1982, the level of the sea at Southend was 2.3m below predictions.

In order to provide the mariner with some warning of the onset of Negative Surges in the Southern North Sea a warning service has been established for this area only. It is hoped that experience will improve the efficiency of this service.

Shallow Water Corrections

Shallow water effects can be included in the Simplified Harmonic Method of Tidal Prediction. At ports where the shallow water effect is noticeable and can reasonably be represented by corrections, data for use in the Simplified Harmonic Method of Tidal Prediction is included in Part III of the tables and in Table VI.

Seasonal Changes in Mean Level

The monthly variations in mean sea level do not necessarily repeat themselves exactly from year to year; hence the values given may be found to differ from observed values by as much as 0.1m, even where the values given are based on several years' observations. In consequence, where the maximum variation of mean sea level above and below the mean value is less than about 0.1m, the changes are listed as "negligible". In practice, mean sea level data are largely based on a relatively small number of observations for one year only and the figures for many places have been obtained by interpolation.

Variations in mean sea level over short periods may be considerably greater than the values given; mean sea level may remain as much as 0.3m above or below the average for as long as a month.

Seasonal Variations in Harmonic Constants

Variations have been detected in the harmonic constants of some ports. These can be included in the Simplified Harmonic Method of Tidal Prediction by the use of special values for the period of prediction. For those ports where the data is available and the variations are large enough, monthly values of the constants are given in Part III below the seasonal corrections for Mean Level.

Zone Time and Time Differences

Universal Time (UT) is the mean solar time of the prime meridian obtained from direct astronomical observation and corrected for the effects of small movements of the Earth relative to the axis of rotation. Greenwich Mean Time (GMT) is based on the hour angle of the mean sun and for all tidal predictions may be taken as the same as UT. The term UT(GMT) is used throughout this volume.

There are twenty four Time Zones in the world each of which covers 15° of longitude. The zero time zone, in which the time kept corresponds to Greenwich Mean Time, is centred on the prime meridian and extends from $7\frac{1}{2}^\circ$ W. to $7\frac{1}{2}^\circ$ E. The other zones, in which the time kept differs from GMT by an integral number of hours, are sequentially numbered and have either a negative prefix if east of Greenwich or a positive prefix if west of Greenwich.

To convert Zone Time to GMT, the number of hours as given by the zone number is added to or subtracted from the Zone Time, e.g. in Zone - 0400 the time kept is 4 hours in advance of GMT and so at 2000 local time it is 1600 GMT, i.e. to obtain GMT apply zone number and its sign.

On land, a uniform time is adopted for convenience throughout a given country even though its boundaries may not wholly lie within a time zone. The Standard Time or Legal Time is in most cases that of the zone in which the country mainly lies. Countries having a longitudinal extent greater than a time zone may adopt more than one Standard Time, e.g. Eastern Standard Time, Pacific Standard Time in the United States.

Daylight Saving Time (Summer Time), introduced to prolong the hours of daylight in the evening, may in certain countries be the Legal Time for part of the year. The Standard Time of the zone to the eastward is normally adopted during such periods, e.g. BST (British Summer Time) is Zone - 0100. In certain countries this advanced time has been made Standard Time throughout the year. *In Admiralty Tide Tables no account is taken of Daylight Saving Time unless it has been adopted throughout the year.*

The times of Standard Port predictions are given in the normal Standard Time kept by the port. When using the tables it should be verified that this is the same as the time *which is actually being kept*. Changes in Zone Times are not always reported in sufficient time for inclusion in the tide tables. For the latest information consult Admiralty List of Radio Signals Vol.2 (NP282) corrected by Section VI of the weekly edition of Admiralty Notices to Mariners.

Time Differences for Secondary Ports, when applied to the printed times of high and low water at Standard Ports, will give times of high and low water at the Secondary Ports in the *Zone Time tabulated for the Secondary Port*. Any change in Zone Time at the Standard Port, or any difference between Zone Times at Reference and Secondary Ports has no significance; *the predicted values tabulated for the Standard Port must be used unaltered*. Only changes in Zone Time at the Secondary Port, where different from those tabulated, may be corrected for. It should be verified that the Zone Time tabulated for the Secondary Port is the same as the time being kept.

Tidal Streams and Currents

A distinction is drawn between tidal streams, which are astronomical in origin, and currents, which are not dependent on astronomical conditions and which, in the waters around the British Isles, are mainly of meteorological origin; in practice, of course, the navigator experiences a combination of tidal stream and current.

Tidal streams can be predicted for any period in the future but currents caused by temporary meteorological conditions can only be assessed approximately when these conditions are known. In open waters around the British Isles, therefore, non-tidal currents are not included in the tidal stream prediction tables given on most Admiralty Charts. With strong or prolonged winds these currents may, nevertheless, be considerable and they must be assessed separately. In rivers and estuaries there is often a permanent current caused by the flow of river water; such currents *are* included in the tidal stream tables.

The tidal streams in European waters are, for the most part, of the same type as the tides, i.e. they are semi-diurnal in character. They can therefore be predicted by reference to a suitable Standard Port by tables printed on the published charts and there is no necessity for daily predictions to be published. In some other parts of the world, however, the pattern of the tidal streams is entirely unrelated to the pattern of the tides and in these cases daily predictions *are* necessary; such predictions will be found in Volumes 3 and 4 of Admiralty Tide Tables.

The prevailing south-westerly wind causes a weak residual current from west to east in the English Channel. On the east coast of Britain there is a weak residual current from north to south, possibly due in part to the difference in average barometric pressure between Scotland and southern England causing a slightly higher mean sea level in the north. On the west coasts of Scotland and Ireland there is probably a weak residual current to the northward caused by the prevailing south-westerly wind. Except during and following periods of strong winds, these currents can be neglected for normal navigational purposes.

Temporary wind-induced currents may attain a rate of about 1 knot in a strong gale, though the effect of the gale on the ship's speed may be as much as 2 knots. The current takes some time to develop and it may continue to run for some time after the wind has dropped.

The tidal streams around the British Isles are shown in pictorial form in a series of tidal stream atlases, details of which are given, together with other publications on tides, etc., on page 428. More detailed information may be found in the relevant Admiralty Sailing Directions.

A diagram showing the direction of the main flood stream round the coasts of the British Isles is on page 429.

Tidal Data on Admiralty Charts

Large scale modern charts of the British Isles contain a panel giving tidal information; this normally consists of the mean heights of high and low water at both springs and neaps. This information is intended solely as a guide to the approximate depths which may be found at springs and neaps under *average* conditions. It should be borne in mind that, at extreme springs, the range of the tide will be increased by an amount which varies from 20% to 30% in different places. The tidal heights given refer to the datum of the chart and its connection to Ordnance Datum is given wherever possible on the larger scale charts for the use of surveyors and engineers. If precise information is required concerning either times or heights of the tide, Admiralty Tide Tables should invariably be consulted.

Tidal heights given in the "tidal panel" indicate, apart from the range of the tide, the datum in terms of low water levels. Thus, if the mean spring tidal range is 3.7m and the value of MLWS is given as 0.5m, it can be inferred that soundings have been reduced approximately to lowest predictable low water. Where MLWS is given as 0.0, soundings have in fact been reduced exactly to MLWS. Examination of the value of MLWS will give information regarding the Chart Datum used. Additionally information is included under the titles of Metric Charts, e.g. "reduced to Chart Datum, which is approximately the level of Lowest Astronomical Tide".

Datums of Tidal Predictions

The datum for tidal predictions must be the same as the datum for soundings since the total depth of water is found by the addition of the height of the tide to the charted depth. The levels at which datums have been established at Standard Ports, however, vary widely and the datums do not conform to any uniform tidal level. Modern practice is to establish datum at or near the level of Lowest Astronomical Tide but reference to Table V will show that many datums are established considerably above this level and a few are established below it. For areas where the Hydrographer of the Navy is the surveying authority, datums have been adjusted to approximate to LAT. It should be emphasised that the level of LAT will be reached occasionally in the normal course of events and that lower levels than this may be reached with particular meteorological conditions. At Sheerness, for instance, a low water level of 2.3m below predictions has been recorded.

For those areas where the Hydrographer is the surveying authority details of the Bench Marks used, and the connections between them and Chart Datum, are available on application to the UK Hydrographic Office, Taunton.

TABLE V - Part 1
TIDAL LEVELS IN METRES AT STANDARD PORT

Standard Port	LAT	MLWS	MLWN	MSL	MHWN	MEWS	HAT
Plymouth (Devonport)	0.0	+0.8	+2.2	+3.4	+4.4	+5.5	+5.9
Portland	-0.2	+0.2	+0.7	+1.0	+1.4	+2.1	+2.5
Southampton	-0.1	0.5	+1.8	+2.9	+3.7	+4.5	+5.0
Portsmouth	+0.1	+0.6	+1.8	+2.8	+3.8	+4.7	+5.1
Lowestoft	+0.1	+0.5	+1.0	+1.6	+2.1	+2.4	+3.0
River Tyne	+0.0	+0.7	+1.8	+2.9	+3.9	+5.0	+5.7
Greenock	-0.3	+0.4	+1.0	+2.0	+2.9	+3.4	+3.9
Liverpool	0.0	+0.9	+2.9	+5.3	+7.4	+9.3	+10.4
Milford Haven	0.0	+0.7	+2.5	+3.8	+5.2	+7.0	+7.9
Bristol (Avonmouth)	-0.1	+0.9	+3.5	+7.0	+10.0	+13.2	+14.7
Cobh	-0.1	+0.5	+1.4	+2.2	+3.3	+4.2	+4.5
Antwerp	-0.6	+0.0	+1.0	+2.9	+4.2	+5.8	+6.7
Le Havre	+0.3	+1.2	+3.0	+4.9	+6.6	+7.9	+8.4

Notes

The above levels, in metres, are referred to Chart Datum, which is same as the zero of the tidal predictions in all cases.

TABLE V - Part 1

TIDAL LEVELS

The preceding table gives average tidal levels of all Standard Ports in this volume.

In general the levels are computed from at least a year's predictions. The values of Lowest Astronomical Tide (LAT) and Highest Astronomical Tide (HAT) are noted over a span of years and are defined below.

All levels in this table and all predictions in this volume are referred to Chart Datum of the largest scale Admiralty Chart of the area.

Tidal levels

HAT (Highest Astronomical Tide), LAT (Lowest Astronomical Tide). The highest and lowest levels respectively which can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions; these levels will not be reached every year. HAT and LAT are not the extreme levels which can be reached, as storm surges (see page i) may cause considerably higher and lower levels to occur.

MHWS (Mean High Water Springs), MLWS (Mean Low Water Springs). The height of mean high water springs is the average, throughout a year when the average maximum declination of the moon is $23\frac{1}{2}^{\circ}$, of the heights of two successive high waters during those periods of 24 hrs (approximately once a fortnight) when the range of the tide is greatest. The height of mean low water springs is the average height obtained by the two successive low waters during the same periods.

MHWN (Mean High Water Neaps), MLWN (Mean Low Water Neaps). The height of mean high water neaps is the average, throughout a year as defined above, of the heights of two successive high waters during those periods (approximately once a fortnight) when the range of the tide is least. The height of mean low water neaps is the average height obtained from the two successive low waters during the same periods.

Note: - The average value of MHWS, etc, varies from year to year in a cycle of approximately 18.6 years. The tidal levels given in Table V are average values for the whole cycle, obtained by computing values of a year or more and correcting the results by the value of f of M_2 .

MSL (Mean Sea Level). Mean sea level is the average level of the sea surface over a long period, preferably 18.6 years, or the average level which would exist in the absence of tides.

TABLE V - Part 2

HIGHEST ASTRONOMICAL TIDAL LEVELS (HAT) IN METRES AT SECONDARY PORTS

No.	Place	HAT(m)	No.	Place	HAT(m)
1	St. Mary's	6.3	48	Freshwater Bay	2.6
2	Penzance (Newlyn)	6.2	51	Ventnor	4.2
2a	Porthleven	6.0	53	Sandown	4.5
3	Lizard Point	5.8	54	Bembridge Harbour	3.6
4	Coverack	5.9			
4a	Helford River (Entrance)	5.7	58	Ryde	5.0
5a	Truro.....	3.9	60a	Folly Inn	4.4
			60b	Newport (Isle Of Wight)	4.4
7	Mevagissey	5.8	61	Calshot Castle	5.0
7a	Par	5.5	62a	Redbridge	4.9
8	Fowey.....	5.8	63	Warsash	5.0
8a	Lostwithiel	1.8	63a	Bursledon	5.1
11	Looe	5.9			
12	Whitsand Bay	5.9	64	Lee-On-The-Solent	4.9
14a	Jupiter Point	6.0	68a	Northney	5.3
14b	Cargreen	5.9	68b	Bosham	5.3
14c	Cotehele Quay	5.0	68c	Itchenor	5.2
14d	Lopwell	3.4	68d	Dell Quay	5.3
14e	Jupiter Point	5.9	69	Selsey Bill	5.7
14f	St. Germans	5.5	70	Nab Tower	4.9
15	Turnchapel	5.9			
15a	Bovisand Pier	5.7	134	Woodbridge Haven	4.1
17	River Yealm Entrance ..	5.8	134a	Woodbridge	4.5
20	Salcombe	5.7	135	Bawdsey	3.7
21	Start Point.....	6.1			
			136	Orford Haven Bar.....	3.5
23a	Greenway Quay	5.6	136a	Orford Quay	3.1
23b	Totnes	4.1	136b	Slaughden Quay	3.1
26	Telgnmouth (Approaches) ..	5.4	136c	Iken Cliffs	3.2
26a	Telgnmouth (New Quay) ..	5.5	137	Orford Ness	3.0
26b	Exmouth (Approaches) ..	4.8	139	Aldeburgh	3.5
			139a	Sizewell	3.2
27	Exmouth Dock	4.5	140	Southwold	3.0
27a	Starcross	4.6	142	Gorleston	2.9
27b	Turf Look	4.3	143	Caister.....	3.2
27c	Topsham	4.5	144	Winterton.....	4.3
28	Lyme Regis	4.8	154	Cromer	5.5
29	Bridport (West Bay)	4.5	155	Blakeney Bar	6.3
30	Chesil Beach	4.4	155a	Blakeney	4.1
			157	Wells Bar	6.6
31	Chesil Cove	4.4	157a	Wells	4.2
34	Lulworth Cove	2.6	158	Bumham (Overy Staithe) ..	3.0
34a	Mupe Bay	2.6			
35	Swanage	2.4	161	Hunstanton	8.3
			161a	West Stones	8.3
36	Poole (Entrance).....	2.7	162	King's Lynn	7.7
36a	Town Quay.....	2.4	163	Outer Westmark Knock ...	8.0
36b	Pottery Pier.....	2.5	164	Wisbech Cut	7.9
36c	Wareham (River Frome) ..	2.4	164b	Lawyer's Sluice.....	7.9
36d	Cleavel Point	2.4	165	Tab's Head	8.4
37	Bournemouth	2.4	166	Boston	7.6
			167	Skegness.....	7.7
38	Christchurch (Entrance) ..	2.0	168	Inner Dowsing Light	7.1
38a	Christchurch (Quay)	1.9			
38b	Christchurch (Tuckton) ..	1.9	171	Bull Sand Fort	7.7
39	Hurst Point	2.9	172	Grimsby	7.8
40	Lymington	3.2	174	Kingston upon Hull.....	8.5
42	Bucklers Hard	4.0	174a	Burton Stather	6.2
43	Stansore Point	4.3	174b	Keadby	5.6
			175	Blacktoft.....	6.7
45	Yarmouth	3.2	176	Goole	6.7
46	Totland Bay	2.7	181	Bridlington	6.8

TABLE V - Part 2

182	Filey Bay	6.2	356	Loch Batharna	4.9
183	Scarborough	6.5	357	Gott Bay	4.4
184	Whitby	6.2			
186	Middlesbrough (Dock Entrance)	6.1	359	Carsaig Bay (Mull)	4.5
187	Tees Bridge (Newport)....	6.1	360	Iona	4.4
188	Hartlepool	6.0	361	Bunessan	4.9
189	Seaham	5.7	362	Ulva Sound.....	4.9
			363	Salen	5.0
190	Sunderland	5.7	364	Tobermory	4.9
201	Entrance	5.8	364a	Salen (Sound Of Mull)..	4.7
203	Newcastle-Upon-Tyne	6.1			
204	Blyth	5.6	365	Loch Aline	5.1
205	Coquet Island	5.8	365a	Craignure	4.4
206	Amble	5.7	367	Corran	4.9
207	North Sunderland (Northumberland)	5.5	368	Corpach	4.5
			368a	Loch Eil Head	⊙
			369	Loch Leven Head	⊙
208	Holy Island	5.5	370	Port Appin	4.7
209	Berwick	5.3	370a	Barcaldine Pier	4.6
221	Eyemouth	5.8	370b	Loch Creran Head	4.2
222	Dunbar	5.9	371	Dunstaffnage Bay ...	4.6
223	Fidra	6.0	371a	Connel.....	4.1
224	Cockenzie	5.9			
226	Granton	6.2	371b	Bonawe.....	2.3
			373	Seil Sound	3.0
228	Grangemouth	6.4	374	Scalasaig	4.1
229	Kinordine	6.5	375	Glangarrisdale Bay	4.0
229a	Alloa	6.3	377	Rubha A'Mhail	4.1
229b	Stirling	3.6	378	Ardnave Point	4.0
230	Burntisland	6.4	379	Orsay Island	3.0
231	Kirkcaldy	5.9	380	Bruichladdich	2.6
232	Methil.....	6.2	381	Port Ellen	1.0
233	Anstruther Easter	5.9	382	Port Askaig.....	2.4
			383	Craighouse	2.7
322	St. Kilda	4.0	384	Loch Beag	1.2
323	Flannan Isles	4.5	387	Carsaig Bay	2.2
324	Rookall	3.6	389	Gigha Sound.....	1.6
327	Loch Bervie	5.4	390	Machrihanish	⊙
			391	Southend (Kintyre)	2.5
328	Loch Laxford	5.6	392	Sanda Island	⊙
329	Badcall Bay	5.1	393	Campbeltown	3.2
330	Loch Nedd	5.5	393a	Carradale	3.5
332	Loch Inver	5.6	393b	Loch Ranza	3.4
333	Tanera Mor	5.7	394	East Loch Tarbert	4.2
336	Mellon Charles	5.4	395	Inverary.....	⊙
			396	Rubha Bodach	3.6
337	Gairloch	5.8	396a	Tighnabruaich	3.7
338	Shieldaig	6.3	398	Millport	3.9
338a	Applecross	5.9	399	Rothesay Bay	4.1
339	Plockton	6.4	399a	Wemyss Bay	3.9
341	Broadford Bay	6.1	399b	Couport	4.0
342	Portree	6.1	399c	Lochgollhead	3.8
343	Loch Snizort (Uig Bay)	6.2	401	Arrochar	3.9
344	Loch Dunvegan	5.9	402	Rosneath	3.8
345	Loch Harport	5.8	402a	Shandon.....	3.8
346	Camus Nan Gall	5.4	402b	Garelochhead	3.9
349	Kyle of Lochalsh	5.9	403	Helensburgh	3.9
349a	Dornie Bridge	5.8	405	Port Glasgow	4.2
351	Gleneig Bay.....	5.5			
			406	Bowling	4.6
352	Loch Hourn	5.6	406a	Renfrew.....	5.1
353	Inverie Bay	5.5	407	Glasgow	5.3
353a	Mallaig	5.6	408	Brodick Bay	3.6
354	Bay Of Laig	5.2	409	Lamlash	3.7
355	Loch Moidart	5.4	410	Ardrossan	3.7
			411	Irvine	3.6

TABLE V - Part 2

412	Troon	3.7	476	Trwyn Dinmor	8.5
413	Ayr	3.4	476a	Moelfre	8.5
414	Girvan	3.6	477	Amlwch	8.1
414a	Stranraer	3.7	477a	Cemaes Bay	7.5
415	Portpatrick	4.3	479	Trearddur Bay	5.9
420	Drummore	6.5	479a	Porth Trece Castell	5.7
420a	Port William	7.2	480	Llanddwyn Island	5.5
421	Isle Of Whithorn	7.9	480a	Trevor	5.6
422	Garlieston	7.8	481	Porth Dinllaen	5.3
422a	Kirkcudbright Bay	8.5	481a	Forth Ysgaden	5.2
424	Hestan Islet	9.6	482	Bardsey Island	5.1
425	Southernness Point	9.8	482a	Aberdaron	5.3
426	Annan Waterfoot	8.6	482b	St. Tudwal's Roads	5.6
430	Torduff Point	7.0	483	Pwllheli	5.8
431	Redkirk	5.5	483a	Criccieth	5.8
432	Silloth	10.6	484	Porthmadog	5.9
433	Maryport	9.9	485	Barmouth	5.5
434	Workington	9.2	486	Aberdovey	5.5
435	Whitehaven	9.1	487	Aberystwyth	5.8
436	Tarn Point	9.5	488	New Quay	5.6
437	Duddon Bar	9.7	488a	Aberporth	5.4
440	Barrow	10.4	489	Port Cardigan	5.3
440a	Haws Point	10.3	489a	Cardigan (Town)	5.4
440b	Ulverston	10.6	491	Porthgain	5.0
440c	Arnside	11.2	492	Ramsey Sound	5.7
440d	Morecambe	10.9	492a	Solva	6.1
441	Heysham	11.0	492b	Little Haven	6.6
442	Glasson Dock	8.0	493	Martin's Haven	6.9
442a	Lancaster	5.5	494	Skomer Island	7.3
443	Wyre Lighthouse	10.4	495	Dale Roads	7.9
444	Fleetwood	10.4	497	Neyland	7.9
445	Blackpool	10.1	498	Black Tar	8.0
446	Preston	6.5	499	Haverfordwest	3.1
447	Southport	10.2	501	Stackpole Quay	8.8
448	Formby	10.0	502	Tenby	9.4
450	Rock Channel	10.1	504	Ferryside	7.7
451	Liverpool (Gladstone Dock) ..	10.4	504a	Carmarthen	3.6
453	Bastham	10.9	505	Burry Port	9.5
455	Hale Head	8.1	505a	Llanelli	8.7
456	Widnes	6.4	508	Mumbles	10.4
456a	Fiddler's Ferry	4.8	510	Port Talbot	10.8
461	Hilbre Island	10.2	512	Porthcawl	11.0
462	Chester	5.2	513	Barry	13.0
463	Connah's Quay	5.7	513a	Flat Holm	13.0
464	Mostyn Docks	9.6	513b	Steep Holm	12.7
466	Peel	5.8	514	Cardiff	13.5
467	Ramsey	8.4	515	Newport	13.7
468	Douglas	7.9	516	Chepstow	⊙
468a	Port St. Mary	6.6	517	Sudbrook	14.9
469	Calf Sound	6.9	518	Beachley (Aust)	14.5
469a	Port Erin	5.8	519	Inward Rocks	13.7
470	Colwyn Bay	8.9	520	Narlwood Rocks	12.8
471	Llandudno	8.6	521	White House	11.7
471a	Conwy	8.9	522	Berkeley	10.9
472	Beaumaris	8.6	522a	Sharpness Dock	10.9
473	Menai Bridge	8.2	522b	Wellhouse Rock	10.7
474	Port Dinorwic	6.3	522c	Epney	⊙
475	Caernarvon	5.9	522d	Minsterworth	⊙
475a	Fort Belan	5.3	522e	Llanthony	⊙

TABLE V - Part 2

523a	Shirehampton	14.0	721	Fenit Pier	5.1
523b	Sea Mills	13.3	722	Smerwick Harbour	4.3
524	Cumberland Basin Entrance	11.8	723	Dingle Harbour	4.4
524a	Portishead	14.6	724	Cromane Point	5.0
525	Clevedon	14.2	725	Knights Town	4.2
525a	St. Thomas Head	14.2	726	Ballinskelligs Bay Castle ...	4.0
526	English And Welsh Grounds	14.3	727	West Cove	3.9
527	Weston-Super-Mare	13.4	728	Dunkerron Harbour	4.4
528	Burnham-On-Sea	12.2	731	Ballycrovanie Harbour	3.9
529	Bridgwater	5.9	732	Black Ball Harbour	3.8
530	Hinkley Point	12.8	733	Castletown Bearhaven	3.5
531	Watchet	12.6	734	Bantry	3.8
532	Minehead	11.8	736	Dunbeacon Harbour	3.7
533	Porlock Bay	11.3	737	Dunmanus Harbour	3.8
534	Lynmouth	10.7	741	Crookhaven	3.6
535	Iffracombe	10.4	742	Skull	3.5
536	Appledore	8.7	743	Baltimore, Ireland	3.8
537	Yelland Marsh	8.1	744	Castletownshend	4.0
538	Premington	7.1	745	Clonakilty Bay	4.1
539	Barnstaple	5.4	746	Courtmacsherry	4.3
540	Bideford	7.0	747	Kinsale	4.2
541	Clovelly	9.2	752	Passage West	4.5
542	Lundy	8.9	753	Cork	4.8
543	Bude	8.6	754	Ballycotton	4.4
544	Boscastle	8.1	755	Youghal	4.2
696	Clare Island	5.0	756	Dungarvan Harbour	4.4
697	Inishgort	4.9	761	Dunmore East	4.6
701	Killary Harbour	4.6	761a	Checkpoint	4.9
702	Bofin Harbour	4.6	762	Waterford	5.0
703	Clifden Bay	4.9	763	New Ross	4.7
704	Styne Head	4.9	765	Great Saltee	4.2
705	Roundstone Bay	4.9	766	Carnsore Point	3.9
706	Kilkieran Cove	5.3	1603	Braye	6.9
707	Killeany Bay	5.2	1603a	Maseline Pier	9.9
711	Liscannor	5.2	1606	St. Catherine Bay	12.2
712	Seafeld Point	5.1	1606a	Bouley Bay	11.9
713	Kilbaha Bay	4.7	1607	Les Brehou	12.1
713a	Carrigaholt	5.4	1608	Les Minquiers	12.9
714	Kilrush	5.6			
716	Foynes Island	5.7			
717	Mellon Point	6.5			
718	Limerick Dock	6.7			
719	Coney Island	5.8			

The preceding table gives HAT tidal levels of all Secondary Ports in this volume, and are referred to Chart Datum, which is the same as the zero of the tidal predictions in all cases.

Notes:

© No data

Height Differences

For semi-diurnal ports, heights obtained by applying the height differences are those for the *mean* spring and neap levels.

Seismic Sea Waves

Submarine earthquakes set up long waves which travel across the ocean at very great speeds, often reaching a speed of 400 knots in the Pacific. On entering shallow water these waves increase in height and often reach destructive proportions; it is, however, rare for a seismic sea wave to be recorded in the British Isles.

Supplementary Tables

- Table I. - Conversion Table - metres to feet.
- Table II. - Multiplication table.
- Table III. - Height of Chart Datum relative to Ordnance Datum in the United Kingdom.
- Table IV. - Height of Chart Datum relative to the Land Levelling System in countries outside the United Kingdom.
- Table V. - Standard Ports: Tidal Levels and Authorities for observations, analyses and predictions.
- Table VI. - Fortnightly Shallow Water Corrections.
- Table VII. - Table of Tidal Angles and Factors, which is the astronomical data for each day of the year (at 0000) used in the Simplified Harmonic Method of Tidal Prediction and in the short period analysis of 24-hourly heights or rates.
- Table VIII. - Table of weekly values of Orbital Elements required for use in the derivation of the Astronomical Arguments (E_0 , u and f) for all constituents.

INSTRUCTIONS FOR THE USE OF TABLES

TO FIND THE TIMES AND HEIGHTS OF HIGH AND LOW WATER

Standard Ports

The times and heights of high and low water are tabulated for every day of the year. The zone time used for the predicted times is usually the standard time for the area and is given at the top of each page. Care should be taken to ensure that this is the actual time zone in use on that date, the predicted time being corrected if necessary. Special care is needed for those ports whose time is changed during the year. In the British Isles, Greenwich Mean Time is shown throughout the year and a correction must be applied during the period of "Summer Time".

The heights are shown in metres referred to the chart datum of the port concerned.

Secondary Ports

The times of high and low water are obtained by applying the time differences tabulated in Part II to the daily prediction for the most suitable (not necessarily the closest) Standard Port. The Standard Port to be used is that which appears in **bold type** at the head of the subsection in Part II. Other Standard Ports may occur within a subsection in their correct geographical sequence but full data for these are not shown. The times obtained by applying these corrections are in the zone time shown next above the Secondary Port irrespective of the zone time used for the Standard Port predictions. Special care is needed when considering adjacent ports in different countries which may not be keeping the same time.

The time differences given are approximately the maximum and minimum differences which will be found to occur under normal weather conditions. Although these differences are normally shown to the nearest minute it must not be assumed that the resulting predictions will be to this accuracy.

Predictions which fall between the times given for the Standard Port at the head of each column can be obtained by simple interpolation between the columns. Time differences must not be extrapolated but only interpolated between the given values for times at Standard Ports which give values throughout a 24 hour period. Thus for secondary ports referred to SHOREHAM:

		H.W.		L.W.	
		0500	1000	0000	0600
		and	and	and	and
		1700	2200	1200	1800
81	SHOREHAM (see page 42)				
75	Worthing 50 48 0 22	+0010	0000	-0005	-0010

the HW-time difference for a tide which occurs at SHOREHAM at 1230 must be interpolated between the values tabulated for 1000 and 1700. High waters which occur at SHOREHAM at both 2330 and at 0300 must have their time differences interpolated between those values tabulated for 2200 and 0500. If a number of tides are required stretching over a period a graphical solution is a convenient method of obtaining this interpolation.

The heights of high and low water are obtained by applying the height differences tabulated in Part II to the daily predictions for the same Standard Port as is used for the times. These differences are tabulated for mean spring and mean neap levels at the Standard Port. Unless there is a statement to the contrary in Part II it may be assumed that the variation is linear and differences for heights other than springs and neaps may be obtained by interpolation or extrapolation. It **MUST** be noted that the predictions for the Standard Ports include the seasonal variations for the Standard Port which may be different from those for the Secondary Port. The first step is therefore to **SUBTRACT** algebraically the seasonal variation for the Standard Port from the predicted height obtained from Part I. The next step is to apply the height difference corresponding to this corrected height at the Standard Port, interpolating or extrapolating as necessary. The final step is to **ADD** algebraically the seasonal variation for the Secondary Port. In both cases great care must be taken to ensure that the signs of the seasonal variations are correctly applied. Where no seasonal variations are given they are less than 0.1 m. and can be ignored. Allowance has been made in the preparation of the tables for any difference in the level of chart datum between the Standard and Secondary Port and the resulting heights are referred to *chart datum at the Secondary Port concerned*. See Example I.

Programmable Calculators can be used with advantage for the arithmetic of the Simplified Harmonic Method of Tidal Prediction. A recommended method with a form and worked example for use when programming can be found on page xxvi.

The accuracy of a prediction for a Secondary Port will depend on the amount of work involved. The less work undertaken, the less accurate the prediction is likely to be. All the data necessary for a more accurate prediction are published in this volume where such data exists.

TO FIND THE HEIGHT OF TIDE AT TIMES BETWEEN HIGH AND LOW WATER

Standard Ports

Intermediate times and heights may best be predicted by the use of the Mean Spring and Neap Curves which are given before the daily predictions for each port. See Examples II and III.

Secondary Ports

For Secondary Ports on a stretch of coast where there is little change of shape between adjacent Standard Port curves and where the duration of rise or fall at the Secondary Port is not markedly different from that of the appropriate Standard Port (i.e. where HW and LW time differences in Part II are nearly the same) intermediate times and heights may be obtained by using the Mean Spring and Neap Curves for the appropriate Standard Port. See Examples IV and V.

Between Swanage and Selsey the tide is of considerable complexity and justifies the inclusion of individual curves - shown on pages xxii to xxiv.

In some other cases the use of the Simplified Harmonic Method of Tidal Prediction is recommended where the intermediate heights are important; these ports are indicated in Part II by "c". This method may sometimes be improved by adjusting the curve to fit high and low waters derived from the time and height differences, particularly when a large range of tide is involved.

See page xxvi for instructions on the use of calculators and the Simplified Harmonic Method of Tidal Prediction. The harmonic constants required for this method will be found in Part III of these tables, the Tidal Angles and Factors in Table VII, and Forms A and B at the back of the book. The remainder of this section is therefore devoted to the descriptions of and instructions for the use of the Mean Spring and Neap Curves in Admiralty Tide Tables.

CURVE INTERPOLATION

Mean Spring and Neap Curves for Standard Ports show the factor of the range attained at given time intervals relative to that of HW: thus by definition $HW=1$ and $LW=0$

The spring curve is shown in solid line and the neap curve, where it differs from the spring in pecked. Interpolation can be made by eye using the plotted positions of the predicted heights with reference to the levels of MHWS etc. *No attempt should be made to extrapolate beyond the spring or neap curves:* for ranges greater than springs the spring curve should be used, while for ranges less than neaps the neap curve should be used.

Where there is an appreciable change in duration between spring and neap tides the results obtained may have a slight error. This error will normally be greatest near LW but in the few cases where the times are plotted relative to LW it will be greatest near HW

MEAN LEVELS

The values of LAT, MLWS, MLWN, ML, MHWN, MHWS and HAT are shown for Standard Ports in Table V. The values of MLWS, MLWN, MHWN and MHWS may be found for Secondary Ports by the direct application of the appropriate height difference tabulated in Part II.

The values of HAT and LAT may be found for a Secondary Port by extrapolating beyond the given differences for a tide that reaches the appropriate level at the Standard Port.

OFFSHORE AREAS AND PLACES BETWEEN SECONDARY PORTS

Tidal predictions for offshore areas and stretches of coastline between Secondary Ports should be obtained by the use of Co-Tidal Charts. For details of Co-Tidal Charts available see page 428 and the Catalogue of Admiralty Charts. Full instructions for their use are contained on the body of the charts.

DETAILED INSTRUCTIONS AND EXAMPLES

The Tidal Prediction Form is intended to assist with time and height calculations. The examples have been carried out on these forms and the instructions refer to the boxes. Copies of the form are bound in the back of Admiralty Tide Tables.

- I. To find the time and height of HW and LW at a Secondary Port
- I. Complete heading of the Tidal Prediction Form.
 - II. Transfer data from ATT Part I to boxes (1), (2), (3) and (4).
 - III. Interpolate data from ATT Part II and insert in boxes (7), (8), (9) and (10).
 - IV. Enter Seasonal Changes for Standard and Secondary Ports from ATT Part II in boxes (6) and (11).
 - V. Apply results of Steps III and IV to obtain boxes (12), (13), (14) and (15).

Example:

Find the time (BST) and height of the afternoon HW and LW at ST. MARY'S (Isles of Scilly) on 14th July.
Note: The data used in this example do not refer to the year of these tables.

Extract from ATT Part I.

		JULY	
PLYMOUTH (DEVONPORT) 14		0309	1.0
		0927	5.3
	SA	1532	1.1
		2149	5.0

Extract from ATT Part II.

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES				HEIGHT DIFFERENCES (IN METRES)			
				High Water Zone UT(GMT)		Low water		MHWS	MHWN	MLWN	MLWS
14	PLYMOUTH (DEVONPORT)	(see page 6)		0000 and 1200	0600 and 1800	0000 and 1200	0600 and 1800	5.5	4.4	2.2	0.8
Isles of Scilly											
1	St. Mary's	49 55	6 19	-0050	-0100	-0045	-0045	+0.2	-0.1	-0.2	-0.1

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1
1-60b							Negligible					

TIDAL PREDICTION FORM

STANDARD PORT Devonport TIME/HEIGHT REQUIRED P.m......
 SECONDARY PORT St. Mary's DATE 14 July TIME ZONE BST.....

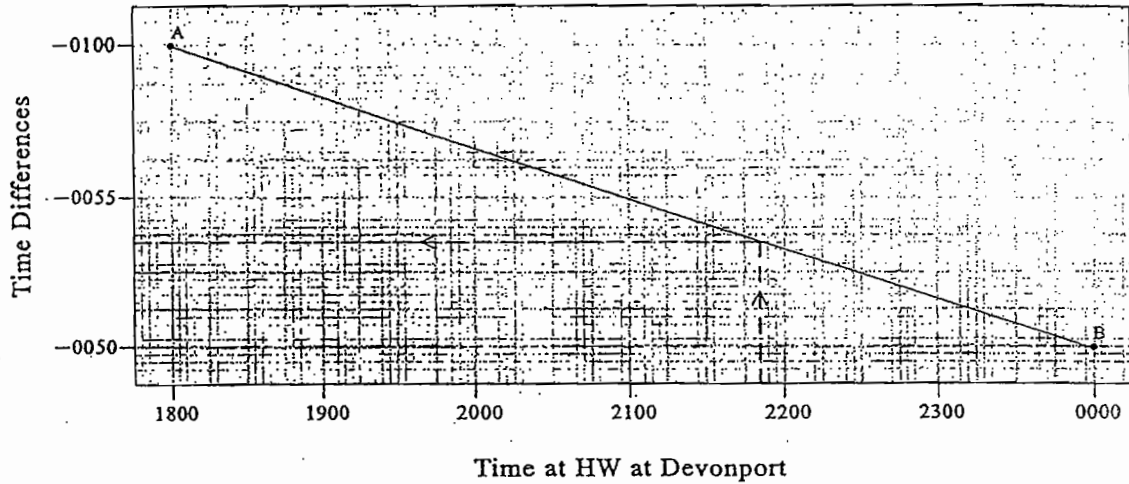
	TIME		HEIGHT		RANGE
	HW	LW	HW	LW	
STANDARD PORT	1 2149	2 1532	3 5.0	4 1.1	5 3.9
Seasonal change	Standard Port		6 0.0	6 0.0	
DIFFERENCES	7* -0054	8* -0045	9* +0.1	10* -0.1	
Seasonal change	Secondary Port		11 0.0	11 0.0	
SECONDARY PORT	12 2055	13 1447	14 5.1	15 1.0	
Duration	16 0608				

LW 1447 GMT = 1547 BST
 HW 2055 GMT = 2155 BST

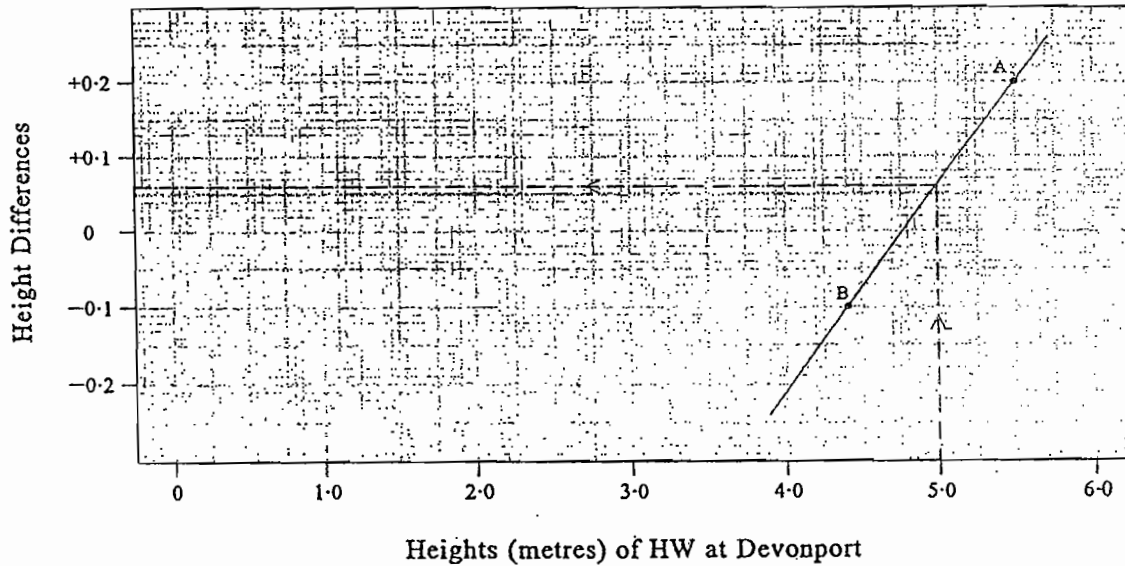
SECONDARY PORT TIME AND HEIGHT DIFFERENCE INTERPOLATION

In most cases interpolation can be carried out by eye. For complex examples or where greater accuracy is required the use of a pocket calculator may be preferred. These interpolations can also be shown graphically at any convenient scale.

Plot the two high water time differences A (-0100 at 1800) and B (-0050 at 0000) and join AB. Read off the Time Difference for St Mary's corresponding to a HW time at Devonport of 2149 = - 0054.



The height difference can be plotted in the same way. Plot A (MHWS of 5.5 and +0.2) and B (MHWN of 4.4 and -0.1). Draw a line through A and B. Read off the height difference for St Mary's corresponding to a height at Devonport of 5.0 = + 0.1m.



Similarly plot the low water time and height differences.

IV and V. Intermediate Times/Heights (Secondary Port)

These are the same as the appropriate calculations for a Standard Port (Examples II and III) except that the Standard Curve diagram for the Standard Port must be entered with HW and LW heights and times for the Secondary Port obtained on the Tidal Prediction Form (Example I). When interpolating between the spring and neap curves (see para. III of Examples II and III) the range at the Standard Port must be used.

Examples:

Find the height of the tide at PADSTOW at 1100 on 28th February. Find the time at which the morning tide at PADSTOW falls to 4.9m on 28th February.

Notes: The data used in these examples do not refer to the year of these tables.

For Instructions on graphical interpolation of differences, see page xv.

Extract from ATT Part I.

		FEBRUARY	
MILFORD HAVEN	28	0315	1.1
		0922	6.6
	TU	1538	1.3
		2145	6.3

Extract from ATT Part II.

496	MILFORD HAVEN	(see page 150)		0100 and 1300	0700 and 1900	0100 and 1300	0700 and 1900	7.0	5.2	2.5	0.7
545	Padstow	50 33	4 56	-0055	-0050	-0040	-0050	+0.3	+0.4	+0.1	+0.1

SEASONAL CHANGES IN MEAN LEVEL

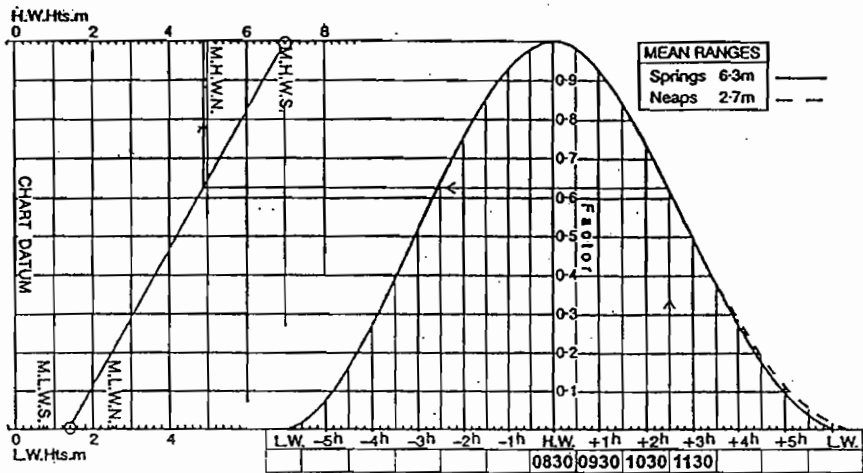
No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1
496	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	+0.1	+0.1
544-548	+0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1

TIDAL PREDICTION FORM

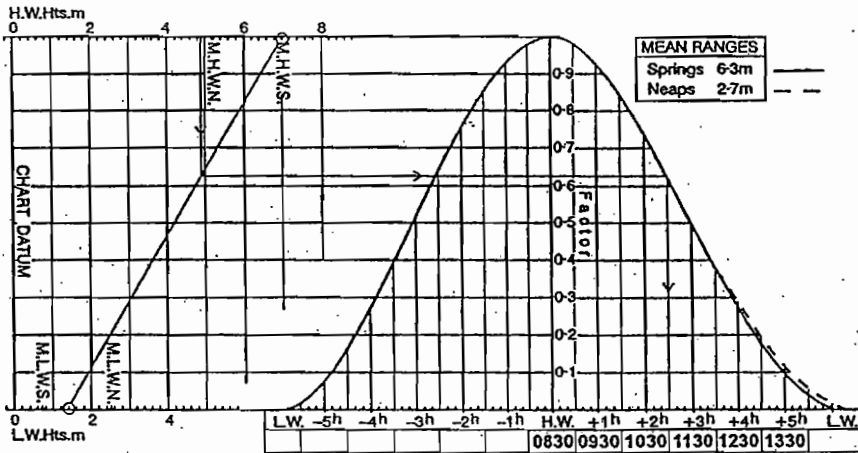
STANDARD PORT Milford Haven TIME/HEIGHT REQUIRED 1100 : 4.9

SECONDARY PORT Padstow DATE 28 Feb TIME ZONE GMT

	TIME		HEIGHT		RANGE
	HW	LW	HW	LW	
STANDARD PORT	1 0922	2 1538	3 6.6	4 1.3	5 5.3
Seasonal change	Standard Port		6 0.0	6 0.0	
DIFFERENCES	7* -0052	8* —	9* +0.3	10* +0.1	
Seasonal change	Secondary Port		11 0.0	11 0.0	
SECONDARY PORT	12 0830	13 —	14 6.9	15 1.4	
Duration	16 —				



Height 4.9m



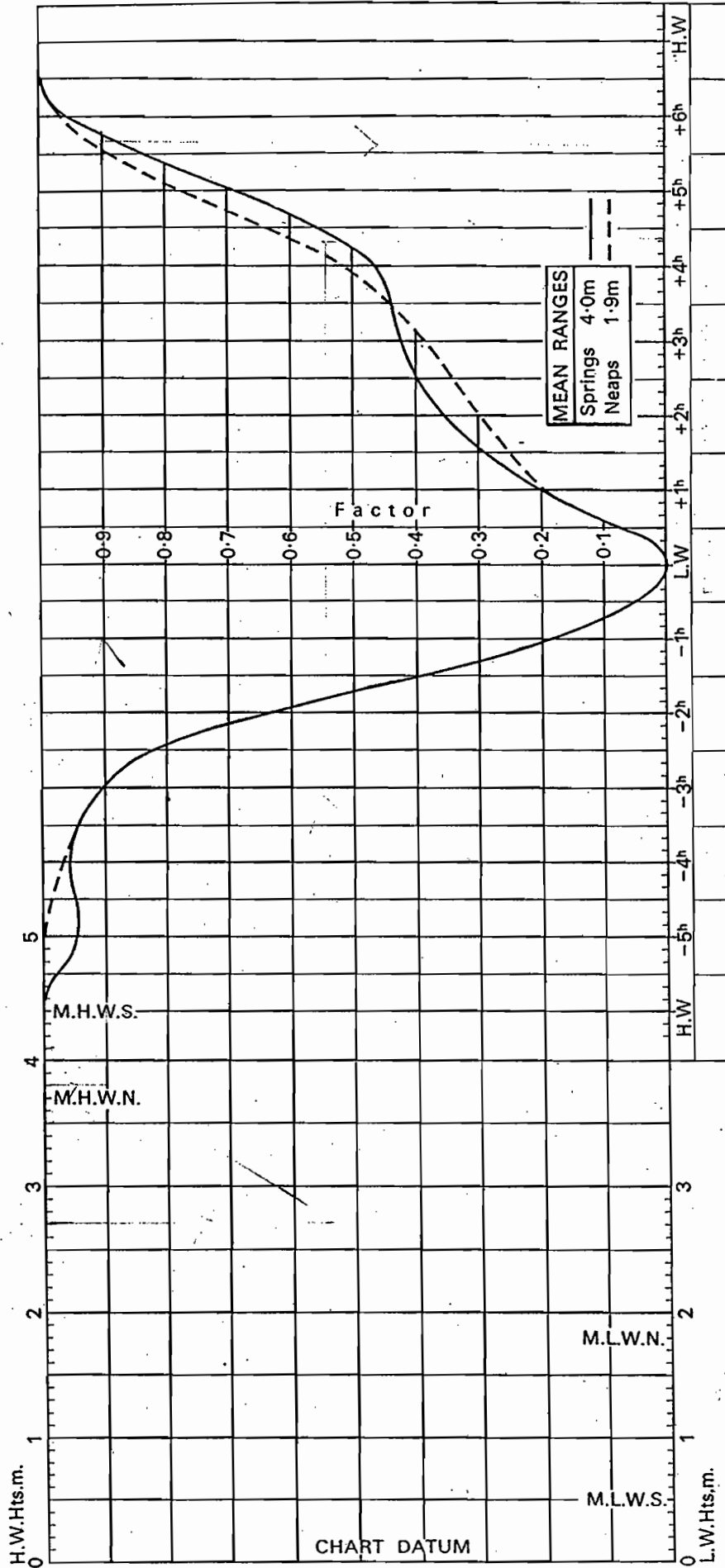
Time 1100

SOUTHAMPTON

MEAN SPRING AND NEAP CURVES

For instructions see page XIV

Springs occur 2 days after New and Full Moon

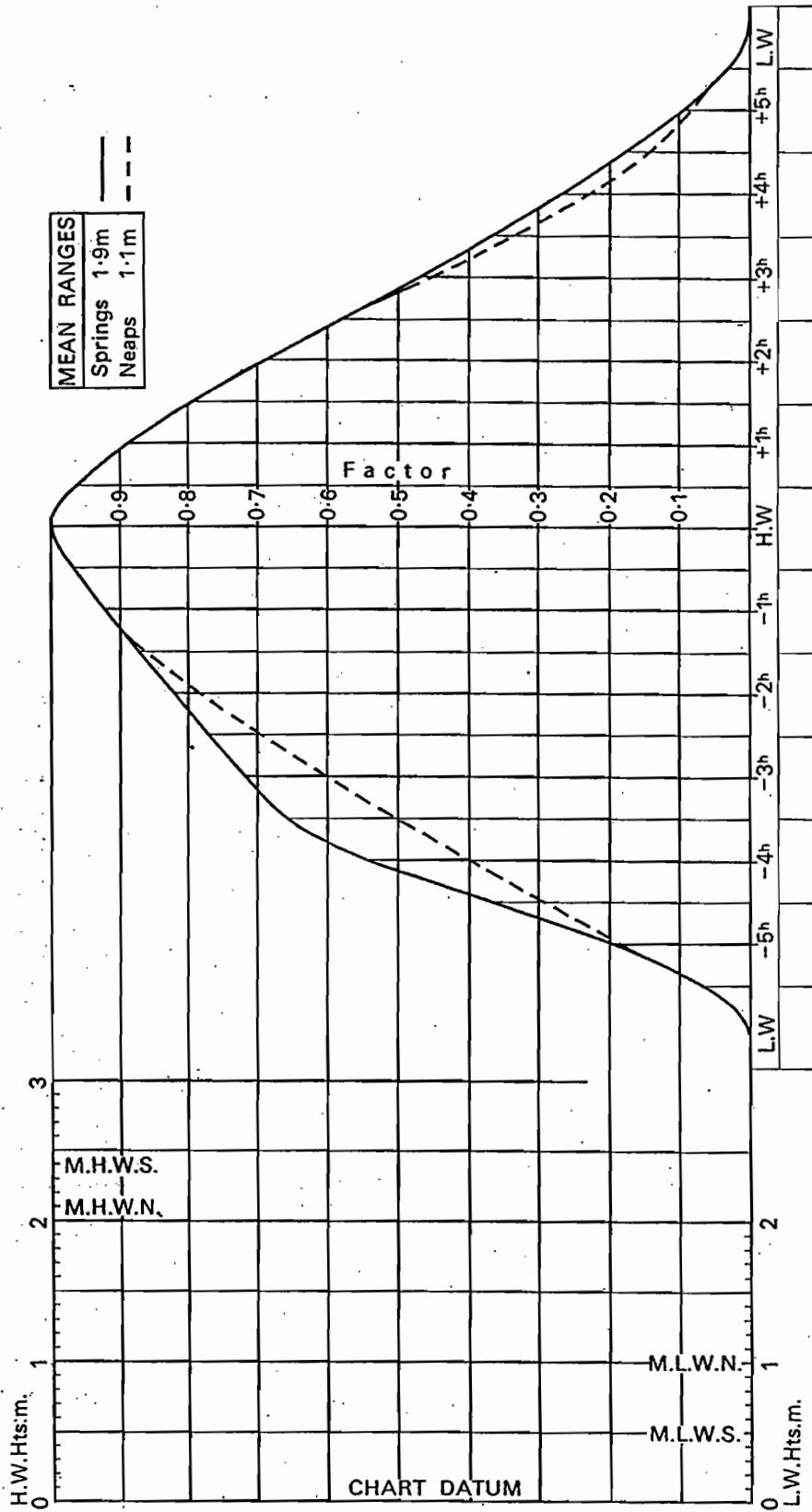


ENGLAND, EAST COAST - LOWESTOFT

LAT 52°28'N LONG 1°45'E

TIME ZONE UT (GMT)				TIMES AND HEIGHTS OF HIGH AND LOW WATERS								YEAR 0000			
JANUARY				FEBRUARY				MARCH				APRIL			
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M
1 0402	0.5	16 0424	0.6	1 0526	0.0	16 0511	0.3	1 0423	0.0	16 0407	0.3	1 0512	0.3	16 0444	0.3
1002	2.5	1040	2.2	1136	2.3	1119	2.2	1033	2.3	1021	2.2	1119	2.2	1052	2.3
TH 1613	0.7	F 1555	0.9	SU 1727	0.7	M 1655	0.6	SU 1624	0.5	M 1559	0.6	W 1711	0.5	TH 1647	0.5
2209	2.6	2217	2.4	2323	2.6	2309	2.5	2221	2.6	2212	2.5	2320	2.5	2302	2.5
2 0454	0.3	17 0459	0.6	2 0608	0.0	17 0544	0.3	2 0502	0.0	17 0442	0.3	2 0546	0.5	17 0518	0.5
1058	2.5	1111	2.2	1219	2.2	1149	2.1	1112	2.3	1049	2.2	1153	2.2	1127	2.3
F 1702	0.8	SA 1631	0.9	M 1805	0.7	TU 1727	0.6	M 1702	0.5	TU 1634	0.5	TH 1743	0.6	F 1726	0.6
2254	2.6	2251	2.4			2344	2.5	2304	2.6	2247	2.5	2358	2.4	2344	2.4
3 0542	0.2	18 0533	0.5	3 0007	2.6	18 0617	0.4	3 0542	0.1	18 0515	0.3	3 0615	0.7	18 0554	0.6
1151	2.4	1142	2.1	0649	0.2	1222	2.1	1150	2.2	1120	2.2	1225	2.1	1204	2.3
SA 1747	0.8	SU 1708	0.8	TU 1304	2.1	W 1801	0.7	TU 1737	0.6	W 1706	0.6	F 1817	0.7	SA 1808	0.6
2340	2.6	2327	2.4	1842	0.8			2344	2.6	2322	2.5				
4 0629	0.2	19 0608	0.5	4 0050	2.5	19 0019	2.4	4 0619	0.3	19 0547	0.4	4 0039	2.2	19 0032	2.3
1245	2.3	1215	2.1	0731	0.4	0650	0.5	1228	2.1	1153	2.2	0642	0.9	0635	0.8
SU 1831	0.9	M 1746	0.8	W 1351	2.0	TH 1259	2.1	W 1811	0.6	TH 1740	0.6	SA 1300	2.1	SU 1246	2.2
				1920	0.9	1836	0.8			2358	2.5	1856	0.8	1903	0.6
5 0027	2.6	20 0004	2.4	5 0137	2.4	20 0056	2.4	5 0024	2.5	20 0619	0.5	5 0130	2.1	20 0133	2.2
0716	0.2	0645	0.5	0813	0.6	0728	0.5	0655	0.6	1228	2.1	0713	1.1	0730	1.0
M 1338	2.2	TU 1253	2.1	TH 1442	2.0	F 1341	2.0	TH 1307	2.1	F 1815	0.7	SU 1344	2.0	M 1337	2.1
1914	1.0	1824	0.9	2002	1.0	1920	0.9	1846	0.7			1944	0.9	2011	0.7
6 0116	2.5	21 0042	2.4	6 0232	2.3	21 0142	2.3	6 0107	2.3	21 0039	2.4	6 0237	1.9	21 0257	2.1
0804	0.4	0721	0.5	0903	0.8	0815	0.7	0730	0.7	0657	0.6	0759	1.3	0842	1.1
TU 1436	2.1	W 1335	2.0	F 1542	1.9	SA 1437	2.0	F 1349	2.0	SA 1309	2.1	M 1440	1.9	TU 1443	2.0
1958	1.1	1904	0.9	2056	1.1	2013	1.0	1924	0.9	1900	0.7	2050	1.0	2132	0.7
7 0208	2.4	22 0121	2.3	7 0336	2.1	22 0249	2.2	7 0158	2.2	22 0131	2.2	7 0406	1.9	22 0431	2.1
0856	0.5	0804	0.6	1009	1.0	0918	0.8	0808	1.0	0745	0.8	0917	1.4	1010	1.2
W 1538	2.0	TH 1426	2.0	SA 1651	1.9	SU 1550	1.9	SA 1440	1.9	SU 1401	2.0	TU 1550	1.9	W 1602	2.0
2049	1.1	1951	1.0	2221	1.2	2129	1.0	2013	1.0	1959	0.8	2308	1.0	2302	0.6
8 0307	2.3	23 0208	2.3	8 0458	2.0	23 0419	2.1	8 0304	2.0	23 0247	2.1	8 0540	1.9	23 0551	2.1
0956	0.7	0854	0.6	1136	1.1	1041	0.9	0900	1.2	0851	1.0	1151	1.3	1133	1.1
TH 1642	2.0	F 1529	2.0	SU 1801	2.0	M 1705	2.0	SU 1545	1.9	M 1510	1.9	W 1701	1.9	TH 1716	2.1
2152	1.2	2047	1.1			2313	1.0	2127	1.2	2125	0.9				
9 0414	2.2	24 0311	2.2	9 0027	1.1	24 0543	2.1	9 0433	1.9	24 0423	2.1	9 0021	0.9	24 0017	0.5
1105	0.8	0957	0.7	0639	2.0	1200	0.9	1057	1.3	1024	1.1	0655	2.0	0659	2.2
F 1746	2.0	SA 1638	2.0	M 1250	1.1	TU 1808	2.0	M 1658	1.9	TU 1630	1.9	TH 1236	1.2	F 1235	1.0
2313	1.2	2203	1.1	1906	2.0					2312	0.8	1807	2.0	1825	2.2
10 0530	2.2	25 0434	2.2	10 0134	1.0	25 0045	0.8	10 0007	1.1	25 0551	2.1	10 0106	0.7	25 0117	0.3
1210	0.9	1109	0.8	0754	2.0	0700	2.2	0624	1.9	1151	1.1	0744	2.1	0751	2.2
SA 1846	2.1	SU 1742	2.0	TU 1341	1.1	W 1309	0.9	TU 1234	1.2	W 1743	2.0	F 1309	1.1	SA 1326	0.9
		2332	1.1	1954	2.1	1907	2.1	1812	1.9			1902	2.1	1924	2.3
11 0034	1.2	26 0550	2.2	11 0220	0.9	26 0158	0.5	11 0110	0.9	26 0039	0.6	11 0144	0.6	26 0206	0.2
0646	2.1	1215	0.8	0843	2.1	0812	2.3	0737	2.0	0712	2.2	0819	2.1	0832	2.2
SU 1306	0.9	M 1836	2.1	W 1419	1.1	TH 1411	0.8	W 1321	1.2	TH 1300	1.0	SA 1342	0.9	SU 1412	0.8
1935	2.2			2030	2.2	2002	2.3	1914	2.0	1848	2.1	1948	2.2	2013	2.4
12 0141	1.1	27 0046	0.9	12 0257	0.7	27 0253	0.3	12 0152	0.8	27 0142	0.4	12 0220	0.4	27 0250	0.2
0754	2.1	0657	2.3	0921	2.1	0907	2.3	0822	2.1	0811	2.2	0850	2.2	0907	2.3
M 1352	1.0	TU 1314	0.8	TH 1447	1.0	F 1501	0.7	TH 1352	1.1	F 1354	0.8	SU 1418	0.8	M 1454	0.7
2018	2.2	1928	2.2	2100	2.2	2053	2.4	1957	2.1	1945	2.3	2027	2.3	2058	2.5
13 0232	1.0	28 0159	0.7	13 0331	0.6	28 0339	0.1	13 0227	0.6	28 0233	0.2	13 0257	0.3	28 0329	0.3
0844	2.1	0804	2.3	0953	2.1	0952	2.4	0857	2.1	0854	2.3	0918	2.2	0942	2.3
TU 1429	1.0	W 1415	0.7	F 1515	0.9	SA 1545	0.6	F 1420	0.9	SA 1439	0.7	M 1456	0.6	TU 1534	0.6
2051	2.3	2019	2.3	2128	2.3	2139	2.5	2029	2.2	2034	2.4	2107	2.4	2141	2.5
14 0312	0.8	29 0303	0.5	14 0403	0.5			14 0300	0.5	29 0317	0.1	14 0334	0.3	29 0406	0.4
0928	2.1	0907	2.4	1023	2.2			0927	2.2	0932	2.3	0948	2.3	1016	2.3
W 1457	1.0	TH 1512	0.7	SA 1546	0.7			SA 1451	0.8	SU 1519	0.6	TU 1532	0.6	W 1612	0.6
2119	2.3	2108	2.4	2200	2.4			2103	2.3	2119	2.5	2145	2.5	2220	2.4
15 0349	0.7	30 0355	0.2	15 0437	0.4			15 0334	0.3	30 0357	0.1	15 0409	0.3	30 0440	0.6
1004	2.2	1002	2.4	1051	2.2			0953	2.2	1009	2.3	1019	2.3	1048	2.3
TH 1524	1.0	F 1603	0.7	SU 1621	0.7			SU 1524	0.6	M 1559	0.5	W 1610	0.5	TH 1648	0.6
O 2148	2.4	2155	2.5	2235	2.5			O 2136	2.4	2202	2.6	2223	2.5	2259	2.3
		31 0441	0.1							31 0435	0.1				
		1049	2.4							1044	2.3				
		SA 1647	0.6							TU 1635	0.5				
		2240	2.6							2241	2.6				

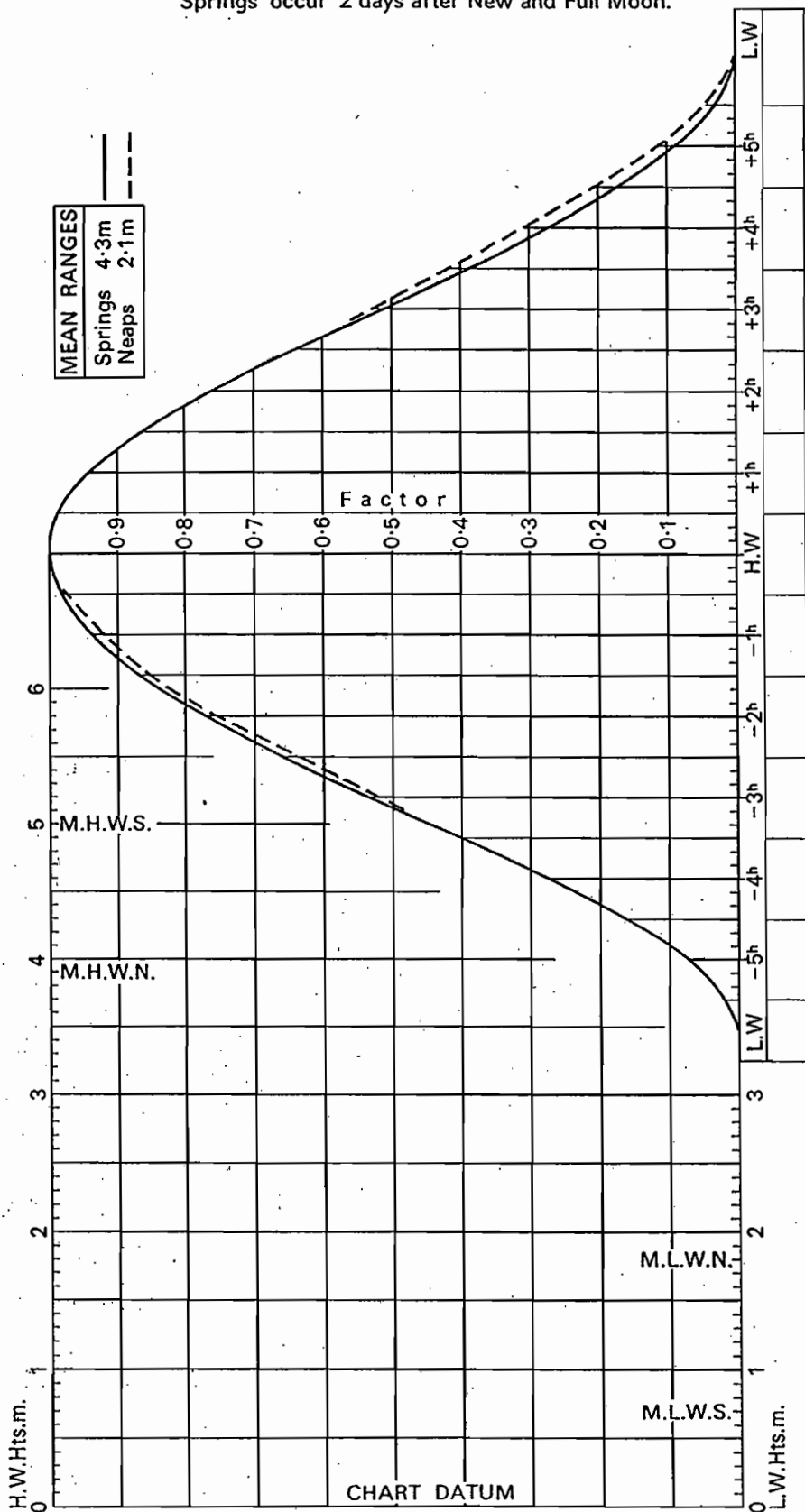
LOWESTOFT
MEAN SPRING AND NEAP CURVES
 Springs occur 2 days after New and Full Moon.



RIVER TYNE (NORTH SHIELDS)

MEAN SPRING AND NEAP CURVES

Springs occur 2 days after New and Full Moon.



ENGLAND, SOUTH COAST - PLYMOUTH (DEVONPORT)

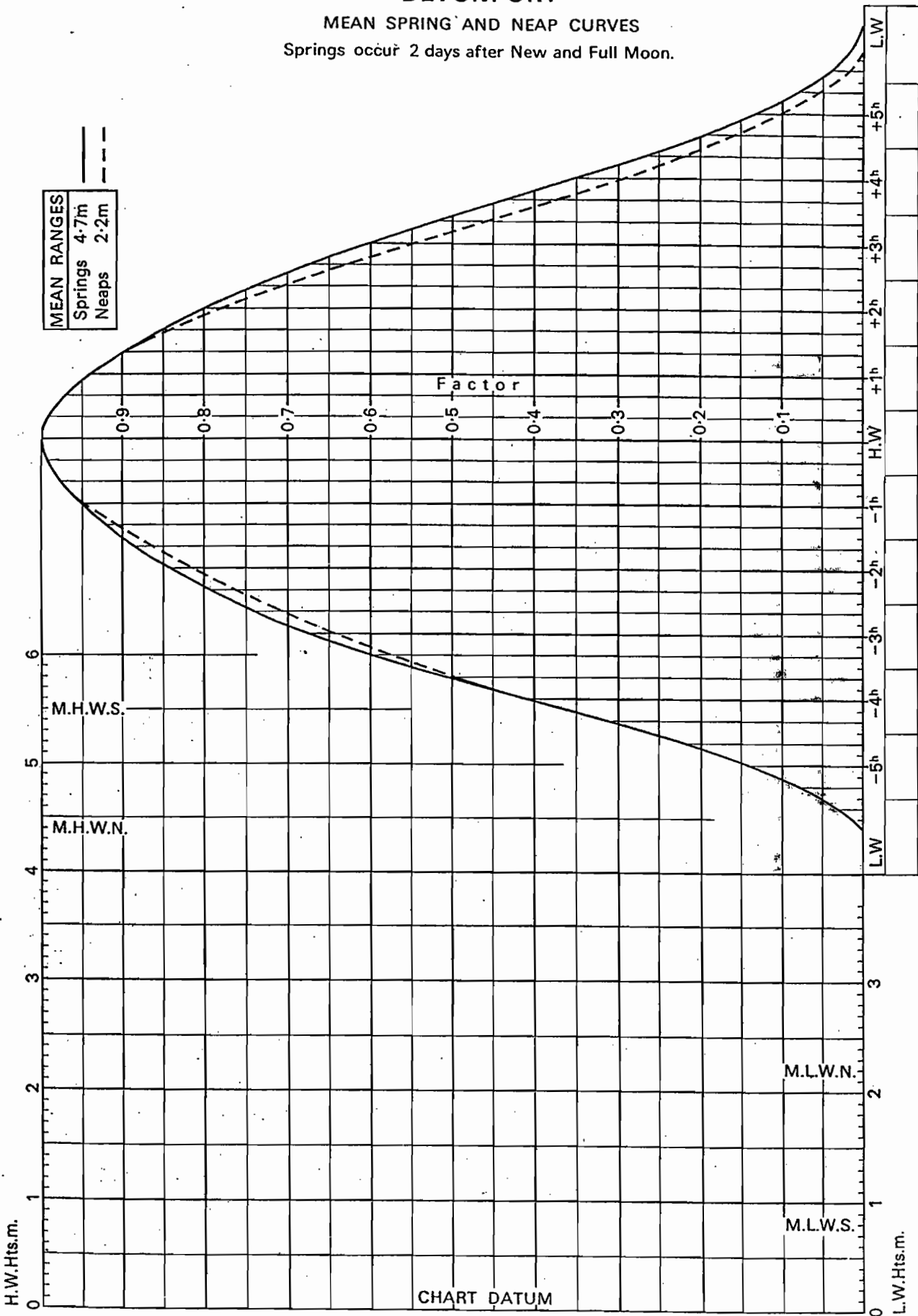
LAT 50°22'N LONG 4°11'W

TIME ZONE UT (GMT)				TIMES AND HEIGHTS OF HIGH AND LOW WATERS								YEAR 0000			
JANUARY				FEBRUARY				MARCH				APRIL			
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M
1 0014 0.9		16 0025 1.3		1 0136 0.6		16 0111 1.0		1 0035 0.5		16 0012 0.9		1 0121 0.7		16 0059 0.7	
0634 5.6		0633 5.3		0803 5.8		0716 5.4		0702 5.8		0620 5.5		0732 5.5		0707 5.5	
TH 1242 0.7	F	1247 1.2		SU 1401 0.6	M	1330 0.9		SU 1259 0.4	M	1232 0.8		W 1337 0.8	TH	1319 0.7	
1908 5.4		1855 5.0		2028 5.4		1936 5.2		1926 5.6		1843 5.4		1944 5.4		1927 5.4	
2 0103 0.9		17 0058 1.3		2 0216 0.7		17 0143 1.0		2 0115 0.5		17 0046 0.8		2 0152 0.9		17 0137 0.8	
0727 5.7		0705 5.3		0840 5.6		0743 5.4		0739 5.8		0654 5.5		0753 5.3		0743 5.3	
F 1331 0.7	SA	1319 1.2		M 1439 0.8	TU	1402 0.9		M 1336 0.5	TU	1306 0.7		TH 1407 1.0	F	1356 0.9	
2000 5.4		1926 5.0		2101 5.3		2001 5.2		1959 5.5		1915 5.4		2004 5.2		1959 5.3	
3 0149 0.9		18 0130 1.3		3 0253 0.9		18 0215 1.1		3 0150 0.6		18 0121 0.8		3 0221 1.1		18 0215 0.9	
0815 5.6		0734 5.3		0909 5.4		0806 5.3		0809 5.6		0724 5.5		0814 5.1		0818 5.1	
SA 1417 0.8	SU	1350 1.2		TU 1515 1.0	W	1435 1.1		TU 1410 0.7	W	1340 0.8		F 1434 1.3	SA	1434 1.2	
2047 5.2		1953 5.0		2128 5.1		2024 5.1		2024 5.4		1944 5.3		2028 5.0		2032 5.1	
4 0234 1.0		19 0201 1.3		4 0328 1.2		19 0249 1.2		4 0223 0.8		19 0155 0.9		4 0250 1.4		19 0256 1.2	
0859 5.5		0759 5.2		0935 5.2		0830 5.2		0831 5.4		0751 5.4		0842 4.8		0859 4.8	
SU 1501 1.0	M	1422 1.3		W 1549 1.4	TH	1509 1.2		W 1440 1.0	TH	1414 0.9		SA 1503 1.6	SU	1516 1.5	
2128 5.1		2018 5.0		2154 4.9		2050 5.0		2044 5.2		2008 5.2		2101 4.8		2115 4.8	
5 0317 1.3		20 0233 1.4		5 0404 1.6		20 0325 1.4		5 0253 1.1		20 0230 1.0		5 0323 1.7		20 0344 1.5	
0939 5.3		0823 5.2		1002 4.9		0902 5.0		0850 5.2		0816 5.2		0921 4.5		0954 4.5	
M 1545 1.3	TU	1455 1.4		TH 1626 1.7	F	1547 1.5		TH 1509 1.3	F	1449 1.1		SU 1536 2.0	M	1607 1.9	
2207 4.9		2044 4.9		2228 4.7		2127 4.8		2105 5.0		2033 5.1		2147 4.5		2217 4.6	

DEVONPORT

MEAN SPRING AND NEAP CURVES

Springs occur 2 days after New and Full Moon.



BELGIUM - ANTWERP (PROSPERPOLDER)

LAT 51°21'N LONG 4°14'E

TIME ZONE - 0100

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

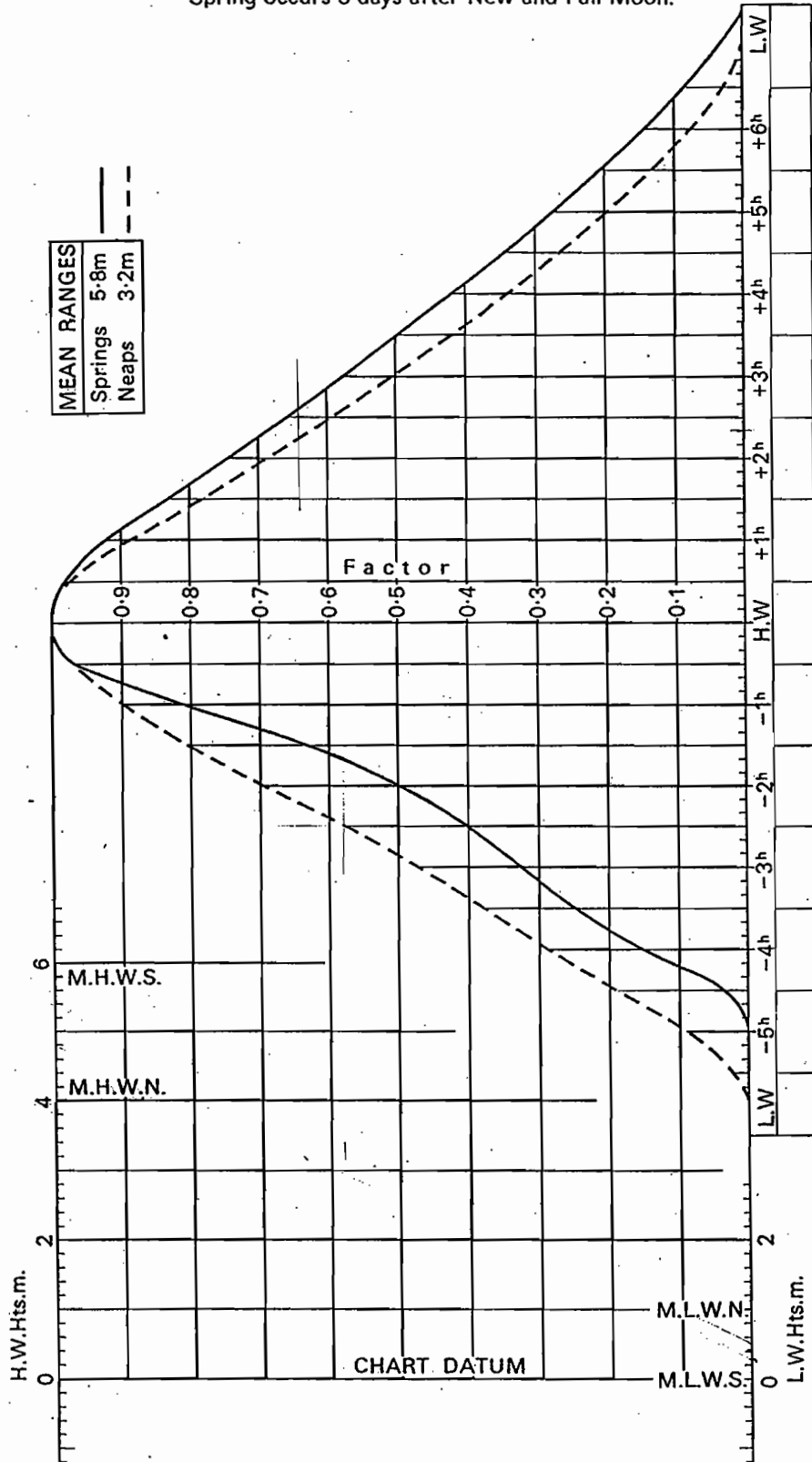
YEAR 0000

JANUARY				FEBRUARY				MARCH				APRIL			
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M
1 0357	5.5	16 0424	5.1	1 0516	5.6	16 0508	5.4	1 0414	5.5	16 0407	5.4	1 0502	5.7	16 0444	5.6
TH 1041	0.1	F 1058	0.4	1 1208	-0.3	16 1147	0.1	1 1106	-0.3	16 1045	0.1	1 1151	0.0	16 1130	0.1
TH 1619	5.8	F 1637	5.2	SU 1739	5.8	M 1720	5.5	SU 1635	5.8	M 1621	5.5	W 1723	5.6	TH 1705	5.7
2301	0.2	2302	0.5			2351	0.4	2316	0.3	2252	0.4			2346	0.2
2 0447	5.5	17 0459	5.1	2 0018	0.4	17 0537	5.4	2 0452	5.6	17 0438	5.5	2 0000	0.3	17 0522	5.6
1133	0.0	1133	0.4	2 0557	5.6	17 1221	0.1	2 1147	-0.3	17 1119	0.1	2 0537	5.6	17 1210	0.1
F 1708	5.8	SA 1711	5.2	M 1250	-0.2	TU 1754	5.5	M 1715	5.8	TU 1654	5.6	TH 1222	0.1	F 1744	5.6
2349	0.3	2334	0.5	1822	5.7			2354	0.3	2329	0.3	1758	5.4		
3 0533	5.5	18 0532	5.1	3 0057	0.5	18 0027	0.4	3 0530	5.7	18 0509	5.6	3 0034	0.3	18 0028	0.2
1222	-0.1	1207	0.3	3 0638	5.5	18 0610	5.4	3 1224	-0.2	18 1156	0.1	3 0614	5.4	18 0603	5.6
SA 1757	5.7	SU 1744	5.3	TU 1330	-0.1	W 1255	0.1	TU 1753	5.7	W 1727	5.6	F 1252	0.3	SA 1250	0.2
				1904	5.4	1829	5.5					1832	5.2	1828	5.3
4 0035	0.5	19 0008	0.6	4 0134	0.6	19 0102	0.4	4 0029	0.4	19 0005	0.3	4 0104	0.3	19 0110	0.2
0619	5.4	0603	5.2	4 0720	5.4	19 0645	5.4	4 0607	5.6	19 0544	5.6	4 0649	5.2	19 0649	5.4
SU 1310	-0.1	M 1241	0.3	W 1406	0.0	TH 1328	0.2	W 1256	-0.1	TH 1232	0.1	SA 1321	0.4	SU 1331	0.3
1846	5.6	1818	5.3	1948	5.2	1907	5.4	1831	5.5	1804	5.6	1906	4.9	1917	5.0
5 0121	0.7	20 0043	0.6	5 0211	0.7	20 0137	0.4	5 0102	0.4	20 0042	0.3	5 0137	0.4	20 0157	0.2
0707	5.3	0635	5.1	5 0802	5.2	20 0726	5.3	5 0645	5.5	20 0621	5.5	5 0726	4.8	20 0742	5.1
M 1357	0.0	TU 1316	0.3	TH 1443	0.2	F 1405	0.3	TH 1327	0.1	F 1307	0.2	SU 1352	0.7	M 1420	0.5
1938	5.4	1855	5.2	2033	4.9	1951	5.2	1907	5.2	1843	5.4	1942	4.5	2016	4.7

ANTWERP (PROSPERPOLDER)

MEAN SPRING AND NEAP CURVES

Spring occurs 3 days after New and Full Moon.



FRANCE, NORTH COAST - LE HAVRE

LAT 49°29'N LONG 0°07'E

TIME ZONE - 0100

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

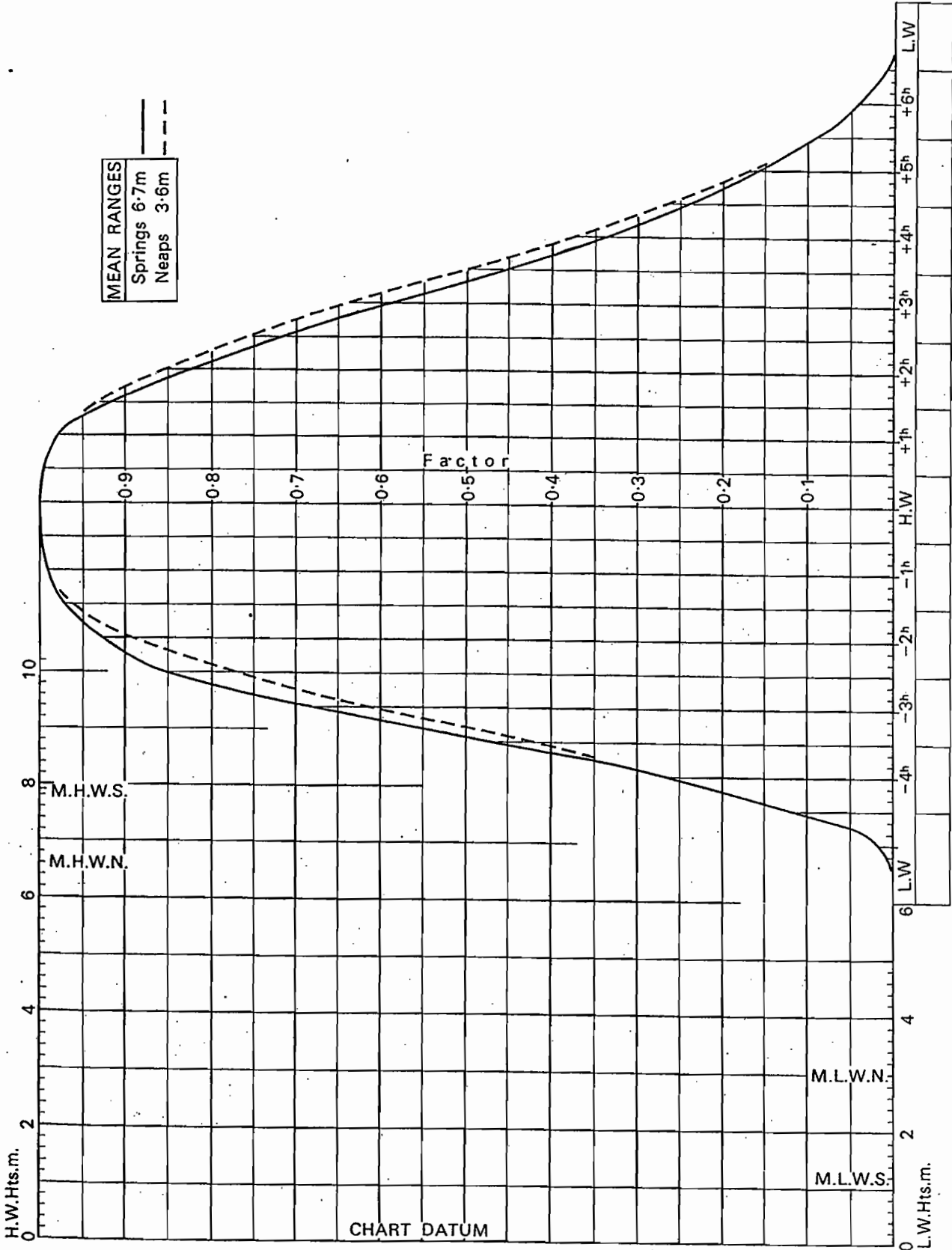
YEAR 0000

JANUARY				FEBRUARY				MARCH				APRIL			
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M
1 0611 1.4 1123 8.0 TH 1841 1.1 2357 7.9		16 0617 2.0 1131 7.5 F 1840 1.7 2358 7.4		1 0033 8.0 0745 1.1 SU 1246 8.1 2007 0.8		16 0011 7.6 0712 1.5 M 1219 7.8 1931 1.3		1 0646 0.9 1143 8.1 SU 1907 0.6		16 0617 1.3 1122 7.8 M 1836 1.1 2345 7.8		1 0015 7.9 0724 1.1 W 1231 7.9 1937 1.3		16 0659 1.1 1209 7.8 TH 1916 1.1	
2 0704 1.4 1213 8.0 F 1933 1.0		17 0652 2.0 1204 7.6 SA 1914 1.7		2 0115 7.9 0823 1.2 M 1327 7.9 2043 1.1		17 0044 7.7 0743 1.5 TU 1253 7.8 2002 1.3		2 0009 8.0 0723 0.9 M 1223 8.1 1942 0.7		17 0649 1.2 1156 7.9 TU 1908 1.0		2 0047 7.7 0751 1.4 TH 1305 7.6 2001 1.6		17 0028 7.8 0736 1.1 F 1249 7.7 1952 1.4	
3 0047 7.9 0754 1.4 SA 1302 7.9 2021 1.1		18 0031 7.4 0726 1.9 SU 1237 7.6 1947 1.7		3 0155 7.7 0857 1.5 TU 1407 7.7 2114 1.5		18 0117 7.6 0815 1.5 W 1231 7.6 2033 1.5		3 0047 7.9 0756 1.0 TU 1300 8.0 2012 1.0		18 0018 7.8 0722 1.2 W 1231 7.9 1939 1.1		3 0118 7.5 0816 1.8 F 1338 7.3 2023 2.1		18 0107 7.7 0812 1.4 SA 1332 7.5 2027 1.8	
4 0136 7.7 0841 1.6 SU 1350 7.7 2105 1.4		19 0105 7.4 0759 2.0 M 1312 7.5 2020 1.8		4 0232 7.4 0929 1.9 W 1445 7.3 2143 2.0		19 0151 7.5 0847 1.8 TH 1402 7.5 2103 1.8		4 0121 7.8 0825 1.4 W 1335 7.7 2037 1.5		19 0052 7.8 0755 1.2 TH 1306 7.7 2011 1.3		4 0147 7.2 0839 2.2 SA 1410 6.8 2047 2.6		19 0148 7.4 0850 1.8 SU 1419 7.1 2107 2.3	
5 0224 7.5 0925 1.9 M 1437 7.4 2147 1.7		20 0140 7.3 0833 2.1 TU 1348 7.4 2052 1.9		5 0309 7.1 1000 2.4 TH 1526 6.9 2214 2.5		20 0225 7.3 0921 2.0 F 1439 7.2 2137 2.2		5 0153 7.5 0850 1.8 TH 1408 7.4 2100 2.0		20 0126 7.6 0828 1.5 F 1343 7.5 2042 1.7		5 0217 6.8 0908 2.7 SU 1448 6.4 2122 3.1		20 0237 7.0 0936 2.2 M 1519 6.7 2202 2.8	
6 0312 7.2 1007 2.2 TU 1526 7.2 2228 2.1		21 0217 7.2 0907 2.2 W 1426 7.2 2126 2.1		6 0351 6.8 1038 2.9 F 1617 6.5 2256 3.1		21 0303 7.1 1001 2.4 SA 1525 6.9 2222 2.6		6 0224 7.2 0914 2.3 F 1442 6.9 2124 2.5		21 0201 7.4 0901 1.9 SA 1423 7.2 2116 2.2		6 0258 6.3 0952 3.2 M 1550 6.0 2218 3.6		21 0345 6.7 1040 2.6 TU 1648 6.5 2324 3.1	
7 0401 7.0 1051 2.6 W 1619 6.9 2312 2.6		22 0256 7.0 0946 2.4 TH 1507 7.1 2206 2.4		7 0449 6.4 1132 3.3 SA 1732 6.2 2359 3.5		22 0357 6.8 1056 2.8 SU 1637 6.5 2330 3.0		7 0256 6.8 0945 2.8 SA 1523 6.4 2200 3.1		22 0243 7.1 0942 2.3 SU 1515 6.8 2204 2.7		7 0413 5.9 1108 3.5 TU 1744 5.8		22 0524 6.5 1214 2.7 W 1823 6.6	
8 0457 6.8 1143 2.9 TH 1721 6.6		23 0340 6.9 1031 2.7 F 1557 6.9 2256 2.7		8 0612 6.2 1258 3.5 SU 1910 6.1		23 0528 6.5 1218 3.0 M 1826 6.4		8 0343 6.3 1033 3.3 SU 1634 6.0 2300 3.6		23 0342 6.7 1040 2.7 M 1637 6.4 2318 3.2		8 0003 3.8 0614 5.8 W 1302 3.4 1912 6.0		23 0108 2.9 0649 6.7 TH 1348 2.4 1942 6.9	
9 0005 2.9 0600 6.6 F 1246 3.1 1833 6.5		24 0437 6.8 1130 2.8 SA 1705 6.7		9 0137 3.5 0752 6.3 M 1430 3.2 2028 6.3		24 0110 3.1 0708 6.6 TU 1404 2.7 1958 6.7		9 0510 5.9 1155 3.6 M 1830 5.8		24 0524 6.4 1210 3.0 TU 1830 6.4		9 0150 3.5 0732 6.1 TH 1422 2.9 2011 6.5		24 0228 2.4 0757 7.0 F 1500 1.9 2036 7.3	
10 0113 3.1 0711 6.6 SA 1359 3.0 1947 6.5		25 0003 2.9 0557 6.7 SU 1247 2.9 1837 6.6		10 0300 3.2 0849 6.5 TU 1536 2.8 2120 6.6		25 0247 2.7 0827 7.0 W 1527 2.2 2111 7.2		10 0048 3.8 0703 5.9 TU 1352 3.5 1959 6.1		25 0109 3.1 0704 6.5 W 1359 2.6 2005 6.8		10 0254 2.8 0825 6.6 F 1519 2.4 2054 6.9		25 0334 1.9 0850 7.3 SA 1601 1.6 2121 7.5	
11 0225 3.0 0820 6.7 SU 1504 2.8 2048 6.7		26 0131 2.8 0720 6.8 M 1419 2.6 2000 6.8		11 0400 2.8 0936 6.9 W 1629 2.3 2159 7.0		26 0403 2.1 0928 7.4 TH 1638 1.6 2204 7.6		11 0235 3.4 0823 6.3 W 1509 2.9 2054 6.5		26 0245 2.6 0819 7.0 TH 1522 2.0 2101 7.2		11 0345 2.3 0906 7.0 SA 1608 1.9 2131 7.3		26 0428 1.5 0935 7.6 SU 1650 1.3 2200 7.7	
12 0325 2.8 0910 6.9 M 1557 2.5 2135 6.9		27 0257 2.5 0831 7.1 TU 1535 2.1 2109 7.2		12 0448 2.4 1007 7.1 TH 1713 2.0 2233 7.2		27 0509 1.5 1017 7.8 F 1738 1.1 2248 7.9		12 0338 2.8 0911 6.7 TH 1604 2.3 2132 6.9		27 0358 1.9 0914 7.4 F 1629 1.4 2147 7.6		12 0429 1.9 0943 7.4 SU 1650 1.6 2206 7.6		27 0512 1.3 1015 7.7 M 1730 1.3 2237 7.8	
13 0415 2.6 0947 7.1 TU 1644 2.3 2215 7.1		28 0405 2.1 0932 7.5 W 1640 1.6 2208 7.6		13 0530 2.0 1041 7.4 F 1753 1.7 O 2305 7.4		28 0602 1.1 1101 8.0 SA 1827 0.7 ● 2330 8.0		13 0426 2.3 0942 7.1 F 1649 1.9 2206 7.3		28 0456 1.4 0959 7.7 SA 1721 1.0 2226 7.8		13 0509 1.5 1018 7.6 M 1729 1.3 2241 7.7		28 0549 1.3 1053 7.8 TU 1804 1.3 ● 2312 7.8	
14 0500 2.4 1023 7.3 W 1726 2.0 2250 7.3		29 0510 1.7 1026 7.8 TH 1743 1.2 ● 2300 7.8		14 0607 1.8 1114 7.6 SA 1828 1.5 2338 7.5				14 0507 1.9 1016 7.4 SA 1728 1.5 2239 7.5		29 0542 1.1 1040 7.9 SU 1803 0.9 ● 2305 7.9		14 0546 1.3 1054 7.8 TU 1805 1.1 O 2316 7.8		29 0622 1.3 1130 7.7 W 1835 1.4 2345 7.7	
15 0540 2.2 1057 7.4 TH 1804 1.8 O 2324 7.3		30 0609 1.3 1116 8.0 F 1839 0.9 2348 8.0		15 0640 1.6 1146 7.7 SU 1900 1.3				15 0543 1.6 1049 7.7 SU 1803 1.3 O 2312 7.7		30 0621 1.0 1118 8.0 M 1839 0.8 2341 7.9		15 0623 1.1 1131 7.9 W 1841 1.1 2351 7.9		30 0653 1.4 1205 7.6 TH 1904 1.6	
		31 0700 1.1 1202 8.1 SA 1926 0.7						31 0654 1.0 1155 8.0 TU 1909 1.0							

LE HAVRE

MEAN SPRING AND NEAP CURVES

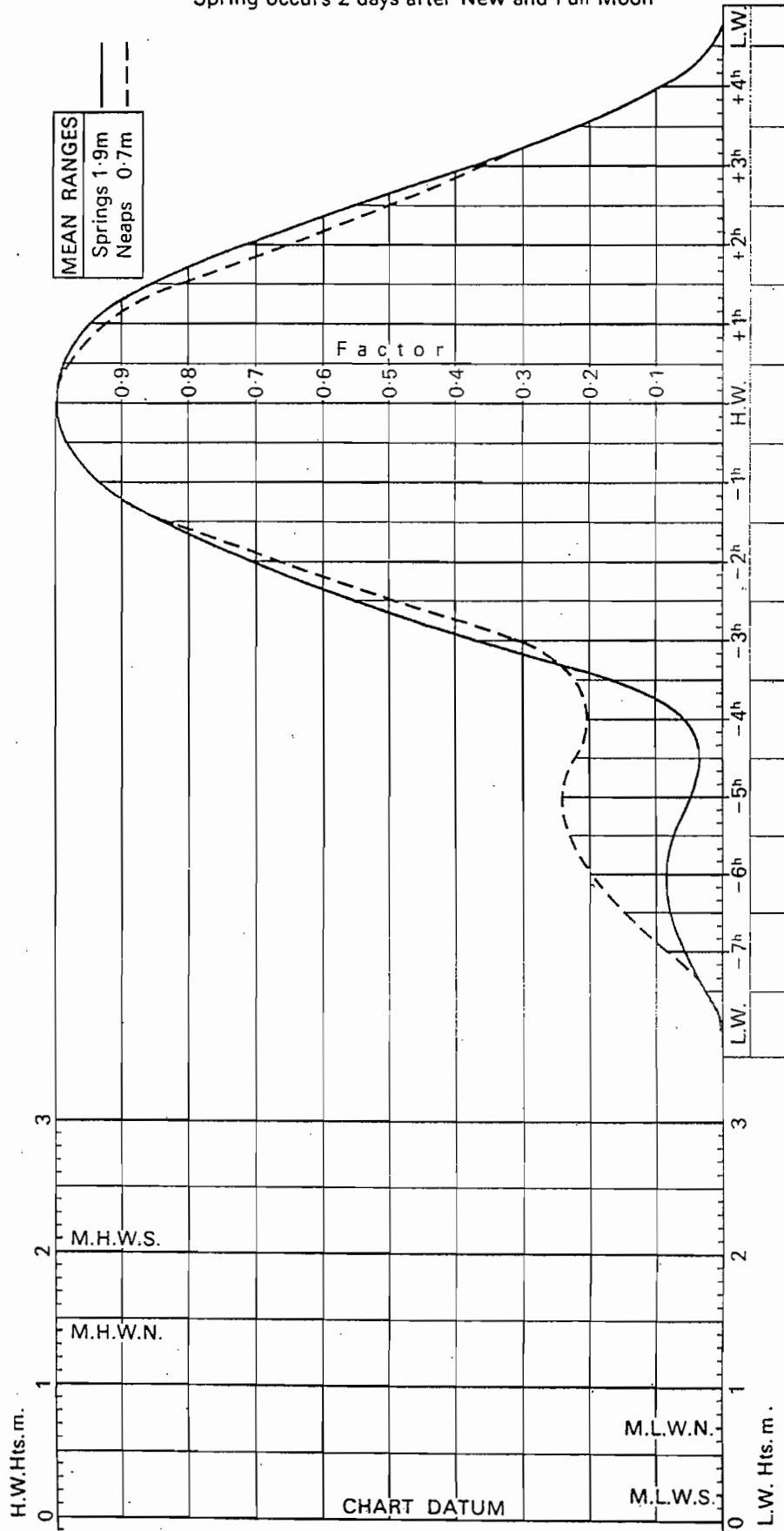
Springs occur 2 days after New and Full Moon.



PORTLAND

MEAN SPRING AND NEAP CURVES

Spring occurs 2 days after New and Full Moon



ENGLAND, SOUTH COAST - PORTLAND

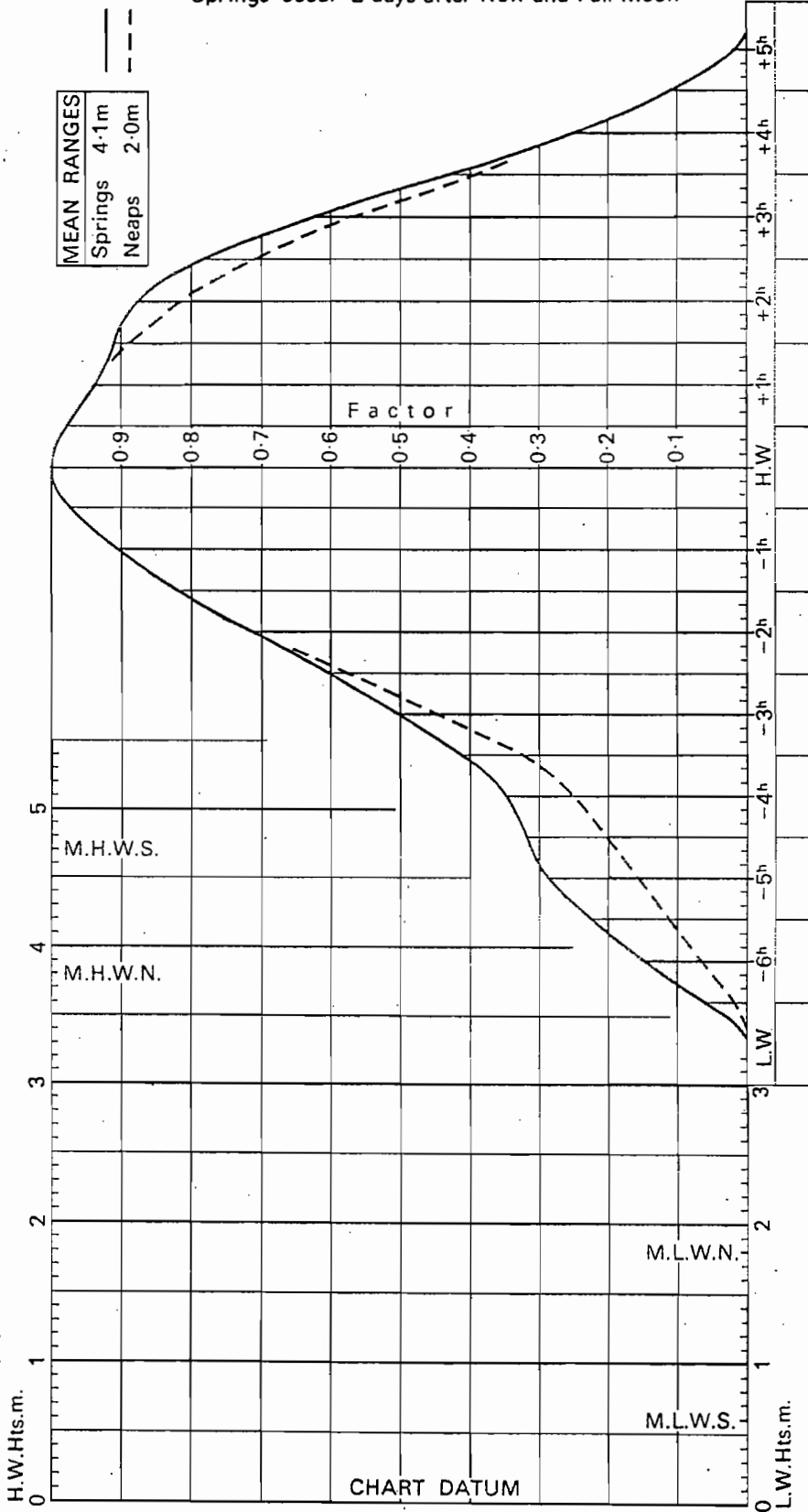
LAT 50°34'N LONG 2°26'W

TIME ZONE GMT		TIMES AND HEIGHTS OF HIGH AND LOW WATERS																YEAR 1987		
JANUARY				FEBRUARY				MARCH				APRIL								
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M			
1	0741 1213 TH 2013	2.4	16 0000 0740 F 1220 2010	0.4	0000 0740 0.4	1	0057 0849 SU 1328 2121	0.3	0039 0819 M 1300 2100	0.2	1	0002 0756 SU 1227 2025	0.2	16 0726 1205 M 2008 2043	2.1	1	0044 0836 W 1308 2043	0.1	16 0025 0817 TH 1244 2043	0.1
2	0030 0825 F 1259 2100	0.4	17 0030 0808 SA 1250 2044	0.4	0030 0808 0.4	2	0134 0923 M 1409 2153	0.3	0107 0848 TU 1334 2128	0.2	2	0036 0830 M 1304 2053	0.1	17 0015 0759 TU 1235 2037	0.2	2	0115 0903 TH 1339 2106	0.1	17 0101 0855 F 1322 2116	0.2
3	0113 0905 SA 1345 2141	0.5	18 0058 0836 SU 1322 2115	0.4	0058 0836 0.4	3	0211 0959 TU 1450 2224	0.3	0138 0920 W 1407 2156	0.2	3	0109 0901 TU 1340 2119	0.2	18 0045 0833 W 1308 2105	0.1	3	0145 0926 F 1404 2127	0.2	18 0139 0931 SA 1400 2150	0.2
4	0156 0943 SU 1432 2222	0.5	19 0127 0903 M 1356 2146	0.4	0127 0903 0.4	4	0248 1033 W 1527 2252	0.4	0211 0952 TH 1439 2221	0.3	4	0143 0931 W 1416 2144	0.2	19 0118 0907 TH 1343 2134	0.1	4	0210 0944 SA 1423 2146	0.4	19 0216 1006 SU 1437 2225	0.3
5	0239 1023 M 1520 2301	0.5	20 0158 0933 TU 1430 2216	0.4	0158 0933 0.4	5	0323 1105 TH 1559 2319	0.5	0242 1022 F 1512 2249	0.4	5	0215 0959 TH 1445 2206	0.3	20 0151 0939 F 1416 2201	0.2	5	0231 0956 SU 1432 2200	0.5	20 0303 1051 M 1523 2315	0.4
6	0321 1105 TU 1607 2343	0.6	21 0231 1006 W 1506 2246	0.5	0231 1006 0.5	6	0356 1136 F 1630 2351	0.6	0319 1059 SA 1551 2330	0.5	6	0243 1022 F 1507 2224	0.4	21 0223 1008 SA 1447 2229	0.3	6	0253 1009 M 1439 2221	0.7	21 0414 1213 TU 1647	0.5
7	0408 1150 W 1657	0.7	22 0308 1044 TH 1546 2324	0.6	0308 1044 0.6	7	0437 1213 SA 1711	0.8	0415 1158 SU 1658	0.7	7	0306 1039 SA 1521 2241	0.5	22 0301 1042 SU 1524 2310	0.5	7	0341 1104 TU 1503 2339	0.8	22 0041 0557 W 1404 1838	1.4
8	0029 0500 TH 1243 1752	1.5	23 0354 1131 F 1637 1752	0.7	0354 1131 0.7	8	0044 0553 SU 1328 1829	1.3	0050 0559 M 1349 1849	1.3	8	0329 1053 SU 1534 2306	0.7	23 0401 1149 M 1637 2306	0.6	8	0644 1519 W 1919	0.8	23 0217 0724 TH 1521 1956	1.5
9	0123 0606 F 1346 1852	1.5	24 0017 0500 SA 1238 1747	1.4	0017 0500 1.4	9	0224 0800 M 1539 2022	1.3	0243 0755 TU 1545 2028	1.4	9	0419 1141 M 1614	0.8	24 0037 0600 TU 1404 1848	1.3	9	0245 0816 TH 1608 2039	1.3	24 0331 0831 F 1623 2057	1.7
10	0226 0723 SA 1459 1958	1.5	25 0133 0630 SU 1409 1913	1.4	0133 0630 1.4	10	0404 0927 TU 1703 2141	1.5	0413 0912 W 1705 2140	1.7	10	0043 0733 TU 1545 2000	1.2	25 0236 0747 W 1543 2019	1.5	10	0354 0904 F 1653 2127	1.5	25 0435 0930 SA 1722 2150	1.9
11	0332 0838 SU 1612 2102	1.6	26 0302 0804 M 1546 2037	1.5	0302 0804 1.5	11	0512 1019 W 1758 2234	1.7	0524 1013 TH 1811 2236	1.9	11	0337 0907 W 1650 2122	1.4	26 0358 0857 TH 1651 2123	1.7	11	0444 0948 SA 1741 2209	1.7	26 0533 1022 SU 1815 2238	2.0
12	0435 0942 M 1716 2200	1.7	27 0425 0920 TU 1708 2148	1.7	0425 0920 1.7	12	0604 1058 TH 1843 2315	1.8	0625 1104 F 1906 2323	2.2	12	0443 0951 TH 1734 2209	1.6	27 0503 0955 F 1753 2217	1.9	12	0531 1029 SU 1826 2246	1.9	27 0625 1105 M 1857 2318	2.0
13	0532 1033 TU 1810 2249	1.8	28 0537 1023 W 1818 2248	2.0	0537 1023 2.0	13	0648 1131 F 1923 2346	2.0	0715 1149 SA 1951	2.4	13	0532 1030 F 1819 2248	1.8	28 0602 1047 SA 1846 2303	2.1	13	0615 1104 M 1906 2320	2.0	28 0707 1140 TU 1928 2352	2.1
14	0624 1115 W 1856 2328	1.9	29 0640 1115 TH 1916 2337	2.2	0640 1115 2.2	14	0722 1201 SA 1958	2.0			14	0614 1105 SA 1900 2320	2.0	29 0652 1130 SU 1928 2341	2.3	14	0657 1136 TU 1940 2351	2.1	29 0742 1210 W 1952	2.1
15	0706 1149 TH 1935 O	2.0	30 0731 1202 F 2005	2.4	0731 1202 2.4	15	0012 0751 SU 1230 2030	0.3			15	0652 1136 SU 1936 O 2349	2.1	30 0733 1206 M 1958	2.3	15	0738 1209 W 2011	2.2	30 0022 0810 TH 1237 2015	0.1
			31 0018 0813 SA 1246 2045	0.3	0018 0813 0.3									31 0014 0807 TU 1238 2021	0.0					

LOW WATERS - IMPORTANT NOTE. DOUBLE LOW WATERS OCCUR AT PORTLAND. THE PREDICTIONS ARE FOR THE FIRST LOW WATER.

PORTSMOUTH

MEAN SPRING AND NEAP CURVES
Springs occur 2 days after New and Full Moon



ENGLAND, SOUTH COAST - PORTSMOUTH

LAT 50°48'N LONG 1°07'W

TIME ZONE GMT

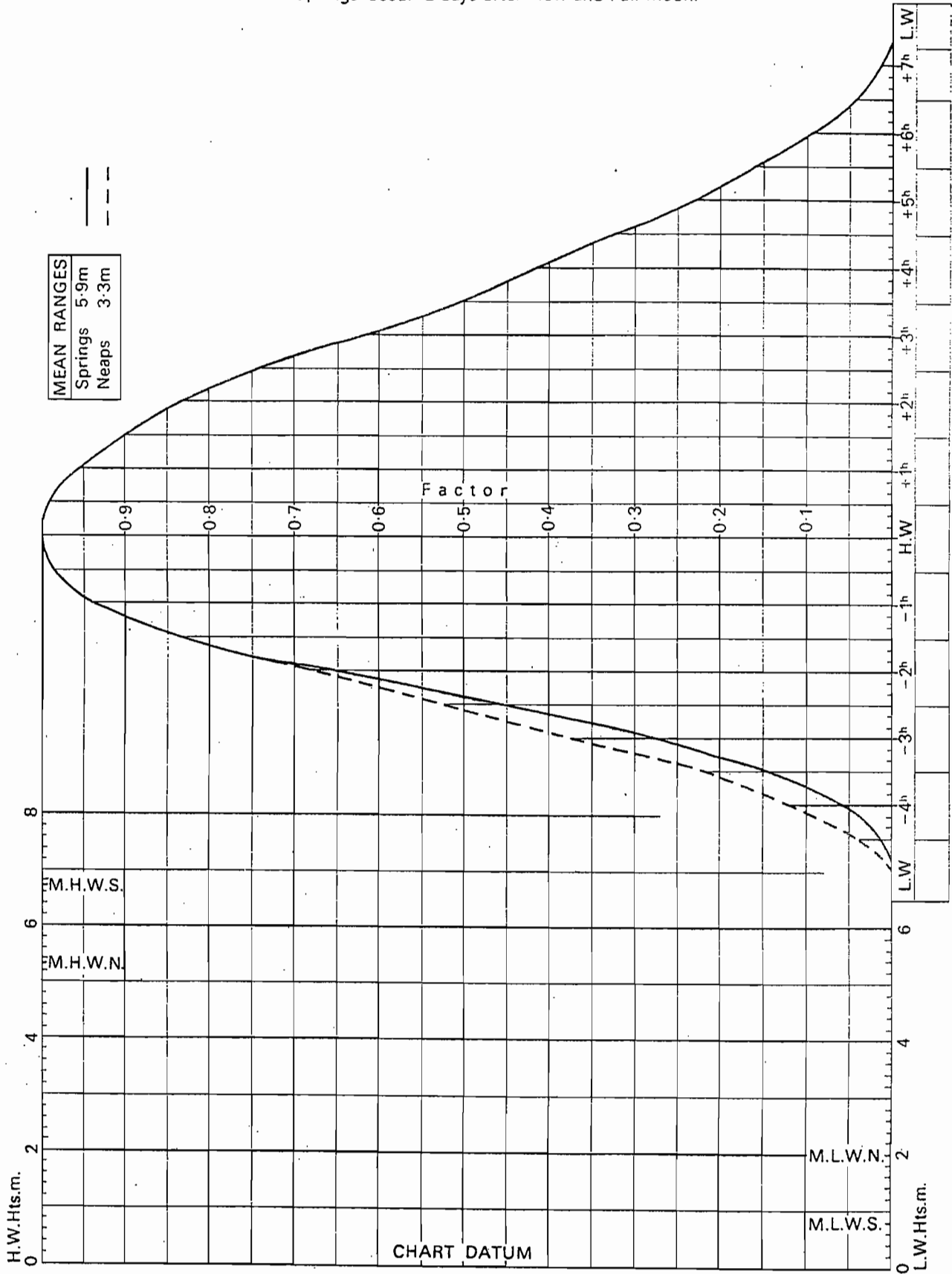
TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 1987

JANUARY				FEBRUARY				MARCH				APRIL			
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M
1 0455	0.9	16 0006	4.3	1 0111	4.8	16 0047	4.4	1 0009	4.8	16 0500	0.8	1 0056	4.7	16 0026	4.7
1201	4.7	0513	1.2	0616	0.8	0600	0.8	0517	0.6	1155	4.5	0604	0.6	0542	0.5
TH 1722	0.7	F 1211	4.3	SU 1318	4.7	M 1256	4.3	SU 1218	4.7	M 1717	0.5	W 1312	4.6	TH 1248	4.6
		1729	1.0	1838	0.5	1815	0.6	1738	0.3			1823	0.7	1804	0.5
2 0037	4.7	17 0039	4.3	2 0154	4.8	17 0123	4.5	2 0049	4.8	17 0019	4.6	2 0130	4.7	17 0106	4.7
0544	0.9	0546	1.1	0657	0.9	0632	0.8	0555	0.6	0533	0.6	0637	0.7	0621	0.5
F 1248	4.7	SA 1244	4.2	M 1400	4.6	TU 1332	4.4	M 1258	4.7	TU 1230	4.5	TH 1349	4.5	F 1331	4.5
1810	0.7	1801	0.9	1919	0.7	1848	0.5	1817	0.4	1752	0.5	1854	0.9	1842	0.7
3 0126	4.7	18 0113	4.3	3 0235	4.8	18 0159	4.5	3 0127	4.8	18 0055	4.6	3 0201	4.5	18 0148	4.5
0631	1.0	0619	1.1	0739	1.0	0704	0.7	0632	0.7	0608	0.5	0710	0.9	0702	0.6
SA 1333	4.6	SU 1318	4.2	TU 1442	4.5	W 1409	4.4	TU 1336	4.7	W 1308	4.5	F 1425	4.3	SA 1419	4.4
1857	0.8	1834	0.9	2001	0.9	1921	0.6	1852	0.6	1826	0.4	1927	1.3	1922	0.9
4 0215	4.7	19 0148	4.3	4 0317	4.6	19 0236	4.5	4 0203	4.7	19 0132	4.6	4 0233	4.3	19 0232	4.3
0719	1.2	0653	1.1	0821	1.2	0737	0.8	0708	0.8	0642	0.5	0746	1.2	0747	0.9
SU 1420	4.5	M 1353	4.2	W 1525	4.3	TH 1447	4.3	W 1415	4.6	TH 1349	4.5	SA 1502	4.1	SU 1510	4.1
1944	0.9	1908	0.8	2045	1.2	1957	0.8	1927	0.9	1901	0.5	2005	1.6	2012	1.3
5 0304	4.6	20 0225	4.3	5 0400	4.4	20 0313	4.4	5 0238	4.6	20 0210	4.5	5 0310	4.0	20 0324	4.1
0808	1.3	0726	1.1	0909	1.4	0814	1.0	0743	1.0	0716	0.6	0829	1.5	0843	1.2
M 1510	4.4	TU 1430	4.2	TH 1615	4.1	F 1528	4.1	TH 1452	4.4	F 1430	4.3	SU 1549	3.8	M 1613	3.9
2034	1.1	1943	0.9	2135	1.5	2038	1.1	2003	1.2	1937	0.8	2057	1.9	2119	1.6

DOVER

MEAN SPRING AND NEAP CURVES
 Springs occur 2 days after New and Full Moon.



ENGLAND, SOUTH COAST - DOVER

LAT 51°07'N LONG 1°19'E

TIME ZONE GMT				TIMES AND HEIGHTS OF HIGH AND LOW WATERS								YEAR 1987											
JANUARY				FEBRUARY				MARCH				APRIL											
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M								
1	0646	1.0	16	0650	1.3	1	0038	6.8	16	0018	6.5	1	0730	0.4	16	0653	0.8	1	0027	6.7	16	0723	0.7
	1139	6.6		1150	6.1		0829	0.5		0748	1.0		1200	6.6		1126	6.4		0806	0.6		1211	6.5
TH	1914	1.0	F	1907	1.2	SU	1302	6.6	M	1227	6.3	SU	1952	0.5	M	1906	0.9	W	1248	6.4	TH	1934	0.8
							2051	0.7		1954	1.0					2347	6.5		2011	0.8			
2	0008	6.7	17	0011	6.4	2	0117	6.8	17	0050	6.5	2	0015	6.8	17	0723	0.8	2	0102	6.6	17	0029	6.5
	0741	0.9		0728	1.2		0910	0.6		0815	1.0		0809	0.4		1200	6.5		0832	0.8		0757	0.7
F	1231	6.6	SA	1218	6.2	M	1342	6.5	TU	1300	6.3	M	1238	6.6	TU	1930	0.9	TH	1323	6.2	F	1252	6.4
	2009	0.9		1942	1.3		2127	0.9		2019	1.1		2026	0.6					2034	1.0		2012	0.9
3	0055	6.7	18	0042	6.4	3	0157	6.7	18	0121	6.5	3	0053	6.8	18	0021	6.6	3	0134	6.3	18	0109	6.3
	0833	0.8		0804	1.2		0946	0.8		0842	1.0		0843	0.5		0748	0.8		0858	1.1		0834	0.9
SA	1319	6.5	SU	1250	6.2	TU	1423	6.3	W	1334	6.2	TU	1314	6.5	W	1234	6.5	F	1357	6.0	SA	1335	6.2
	2101	1.0		2013	1.3		2156	1.2		2047	1.1		2051	0.8		1955	0.9		2105	1.3		2054	1.1
4	0138	6.6	19	0114	6.4	4	0239	6.5	19	0152	6.4	4	0130	6.7	19	0053	6.5	4	0208	6.0	19	0155	6.0
	0924	0.9		0836	1.2		1020	1.1		0912	1.1		0911	0.7		0816	0.8		0928	1.4		0921	1.2
SU	1406	6.3	M	1324	6.1	W	1507	6.0	TH	1409	6.1	W	1352	6.3	TH	1309	6.4	SA	1433	5.7	SU	1427	5.9
	2149	1.2		2042	1.4		2223	1.5		2121	1.3		2112	1.1		2026	0.9		2139	1.6		2143	1.4
5	0222	6.5	20	0149	6.3	5	0324	6.2	20	0227	6.2	5	0206	6.5	20	0126	6.4	5	0243	5.6	20	0256	5.7
	1012	1.0		0907	1.3		1052	1.5		0949	1.3		0936	1.1		0850	0.9		1004	1.8		1016	1.6
M	1453	6.1	TU	1401	6.0	TH	1555	5.7	F	1451	5.9	TH	1430	6.0	F	1345	6.2	SU	1517	5.3	M	1531	5.5
	2233	1.4		2111	1.5		2254	1.9		2200	1.6		2136	1.4		2103	1.1		2221	2.0		2245	1.7

ENGLAND, SOUTH COAST - DOVER

LAT 51°07'N LONG 1°19'E

TIME ZONE GMT		TIMES AND HEIGHTS OF HIGH AND LOW WATERS												YEAR 1987	
MAY		JUNE				JULY				AUGUST					
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M
1 0036	6.4	16 0017	6.4	1 0120	5.8	16 0208	6.2	1 0138	5.9	16 0237	6.3	1 0223	5.9	16 0335	5.9
0757	0.9	0745	0.8	0840	1.4	0934	1.0	0857	1.5	1013	1.0	0934	1.6	1040	1.7
F 1300	6.2	SA 1248	6.4	M 1348	5.9	TU 1426	6.3	W 1405	6.1	TH 1450	6.4	SA 1442	6.1	SU 1552	6.0
2006	1.1	2008	0.9	2101	1.5	2159	0.9	2121	1.4	2235	0.9	2202	1.5	2313	1.7
2 0107	6.2	17 0109	6.3	2 0157	5.6	17 0300	6.1	2 0219	5.7	17 0324	6.1	2 0304	5.7	17 0431	5.5
0827	1.1	0833	0.9	0915	1.6	1028	1.2	0929	1.6	1052	1.3	1010	1.8	1122	2.1
SA 1331	6.0	SU 1341	6.2	TU 1427	5.8	W 1517	6.1	TH 1444	6.0	F 1539	6.2	SU 1524	5.9	M 1654	5.6
2042	1.3	2057	1.0	2141	1.7	2254	1.1	2159	1.5	2319	1.2	2244	1.7		
3 0137	5.9	18 0206	6.0	3 0242	5.4	18 0356	5.9	3 0305	5.6	18 0416	5.9	3 0356	5.5	18 0005	2.2
0901	1.4	0925	1.2	0955	1.8	1123	1.4	1006	1.8	1134	1.6	1055	2.0	0546	5.2
SU 1405	5.8	M 1434	6.0	W 1515	5.6	TH 1612	5.9	F 1531	5.8	SA 1633	6.0	M 1620	5.7	TU 1225	2.4
2118	1.6	2152	1.2	2224	1.8	2353	1.2	2240	1.7			2337	1.9	1819	5.2
4 0212	5.5	19 0307	5.8	4 0342	5.2	19 0459	5.7	4 0400	5.5	19 0008	1.5	4 0459	5.4	19 0126	2.4
0938	1.7	1026	1.5	1041	2.0	1221	1.5	1049	1.9	0516	5.6	1158	2.2	0710	5.2
M 1447	5.5	TU 1531	5.8	TH 1614	5.5	F 1716	5.8	SA 1624	5.7	SU 1224	1.9	TU 1727	5.5	W 1359	2.5
2159	1.9	2257	1.4	2318	1.9			2329	1.8	1737	5.7			1944	5.2
5 0301	5.2	20 0414	5.6	5 0452	5.1	20 0055	1.4	5 0458	5.4	20 0107	1.8	5 0046	2.0	20 0254	2.4
1020	2.1	1136	1.6	1136	2.1	0608	5.6	1143	2.1	0627	5.4	0612	5.3	0820	5.3
TU 1545	5.2	W 1637	5.6	F 1719	5.4	SA 1323	1.7	SU 1720	5.7	M 1328	2.1	W 1319	2.2	TH 1524	2.2
2249	2.1					1824	5.8			1850	5.6	1845	5.4	2051	5.4

ENGLAND, SOUTH COAST - DOVER

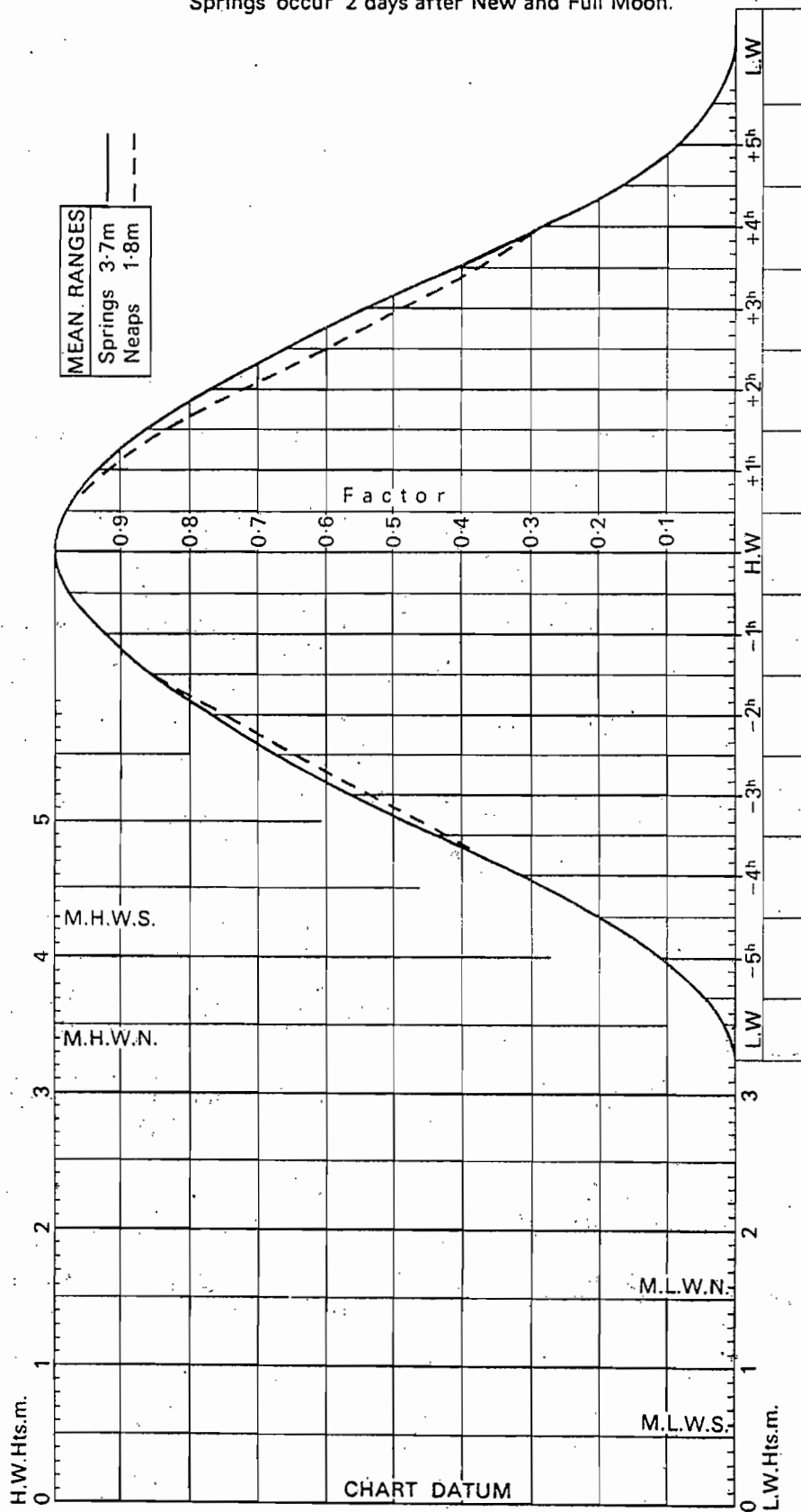
LAT 51°07'N LONG 1°19'E

TIME ZONE GMT		TIMES AND HEIGHTS OF HIGH AND LOW WATERS												YEAR 1987									
SEPTEMBER				OCTOBER				NOVEMBER				DECEMBER											
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M								
1	0310	5.7	16	0458	5.1	1	0403	5.3	16	0537	5.0	1	0148	1.9	16	0126	2.5	1	0230	1.7	16	0120	2.4
TU	1027	2.0	W	1137	2.5	TH	1126	2.2	F	1225	2.6	SU	0716	5.6	M	0656	5.4	TU	0734	5.9	W	0648	5.6
	1535	5.7		1744	4.9		1648	5.2		1839	4.8		2001	5.8		1935	5.3		2015	5.9		1926	5.4
	2305	2.0																					
2	0419	5.4	17	0029	2.7	2	0017	2.2	17	0114	2.7	2	0303	1.5	17	0229	2.2	2	0331	1.5	17	0225	2.2
W	1132	2.2	TH	0636	5.0	F	0544	5.1	SA	0703	5.1	M	0816	6.0	TU	0749	5.7	W	0827	6.1	TH	0742	5.8
	1652	5.3		1314	2.7		1300	2.2		1402	2.4		1535	1.2		1503	1.8		1603	1.2		1503	1.7
				1924	4.9		1900	5.2		1954	5.0		2051	6.2		2019	5.6		2103	6.1		2018	5.7
3	0021	2.2	18	0215	2.6	3	0157	2.1	18	0236	2.4	3	0403	1.2	18	0324	1.9	3	0423	1.5	18	0329	2.0
TH	0546	5.1	F	0755	5.2	SA	0744	5.4	SU	0804	5.4	TU	0903	6.3	W	0834	6.0	TH	0914	6.3	F	0832	6.0
	1300	2.3		1454	2.4		1442	1.8		1508	2.0		1631	0.9		1553	1.5		1651	1.2		1602	1.5
	1835	5.2		2037	5.2		2023	5.7		2042	5.4		2132	6.4		2058	5.9		2146	6.2		2107	5.9
4	0154	2.1	19	0328	2.3	4	0322	1.6	19	0331	2.0	4	0455	1.1	19	0414	1.6	4	0505	1.4	19	0431	1.7
F	0747	5.3	SA	0851	5.5	SU	0846	5.9	M	0846	5.8	W	0943	6.6	TH	0914	6.3	F	0959	6.4	SA	0921	6.1
	1444	2.0		1553	1.9		1555	1.2		1557	1.6		1722	0.8		1641	1.2		1732	1.2		1657	1.3
	2023	5.5		2127	5.5		2115	6.1		2111	5.7		2209	6.5		2136	6.2		2228	6.4		2155	6.2
5	0329	1.7	20	0419	1.9	5	0428	1.2	20	0416	1.6	5	0539	1.0	20	0501	1.4	5	0542	1.4	20	0525	1.4
SA	0901	5.8	SU	0932	5.9	M	0932	6.4	TU	0921	6.1	TH	1021	6.8	F	0952	6.5	SA	1041	6.5	SU	1009	6.3
	1607	1.5		1640	1.6		1655	0.8		1640	1.3		1803	0.8		1725	1.1		1807	1.2		1747	1.2
	2128	6.0		2157	5.8		2157	6.5		2139	6.1		2247	6.6		2214	6.4		2311	6.5		2244	6.4

ABERDEEN

MEAN SPRING AND NEAP CURVES

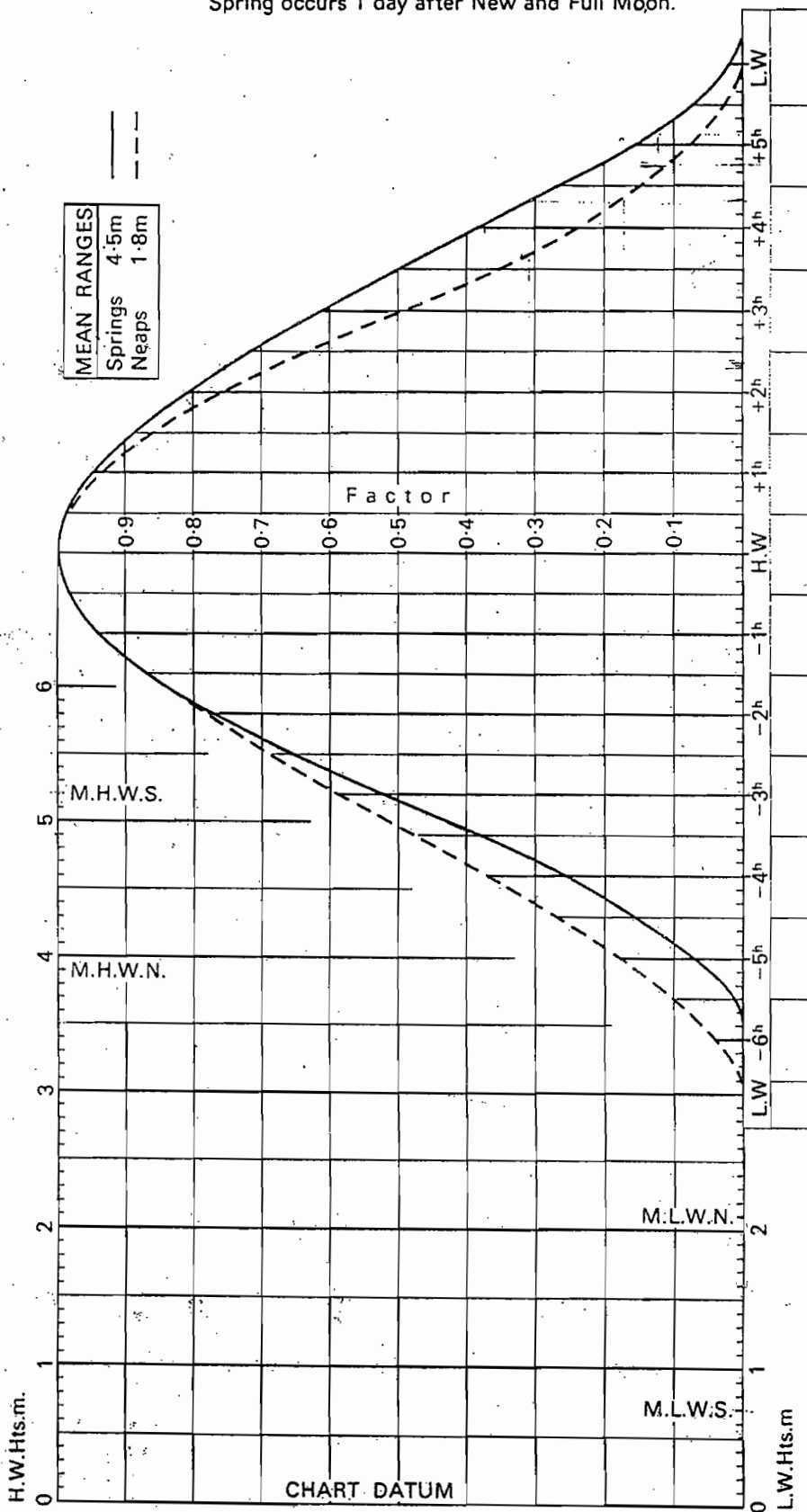
Springs occur 2 days after New and Full Moon.



ULLAPOOL

MEAN SPRING AND NEAP CURVES

Spring occurs 1 day after New and Full Moon.



SCOTLAND, WEST COAST - ULLAPOOL

LAT 57°54'N LONG 5°10'W

TIME ZONE GMT		TIMES AND HEIGHTS OF HIGH AND LOW WATERS												YEAR 1987									
JANUARY				FEBRUARY				MARCH				APRIL											
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M								
1	0132	0.8	16	0140	1.4	1	0248	0.6	16	0227	1.1	1	0149	0.5	16	0131	1.0	1	0234	0.7	16	0213	0.7
	0731	5.3		0741	4.9		0849	5.5		0818	5.2		0745	5.6		0721	5.2		0826	5.2		0801	5.2
	TH 1400	0.6		F 1417	1.3		SU 1517	0.4		M 1458	1.0		SU 1414	0.2		M 1359	0.8		W 1451	0.8		TH 1436	0.7
	2002	5.1		2002	4.7		2118	5.0		2041	5.0		2009	5.3		1942	5.2		2039	4.9		2023	5.1
2	0218	0.8	17	0213	1.4	2	0329	0.8	17	0259	1.1	2	0226	0.5	17	0202	0.9	2	0309	1.0	17	0252	0.8
	0819	5.3		0810	5.0		0932	5.4		0849	5.2		0822	5.6		0750	5.3		0859	4.9		0840	5.0
	F 1448	0.5		SA 1450	1.2		M 1557	0.6		TU 1530	1.0		M 1450	0.3		TU 1429	0.8		TH 1523	1.1		F 1514	0.9
	2053	4.9		2035	4.7		2200	4.8		2114	4.9		2044	5.1		2012	5.2		2108	4.6		2103	4.9
3	0304	0.9	18	0246	1.4	3	0409	1.0	18	0334	1.2	3	0302	0.6	18	0236	0.9	3	0344	1.3	18	0333	1.0
	0908	5.3		0842	5.0		1015	5.1		0923	5.1		0859	5.4		0822	5.3		0934	4.5		0926	4.6
	SA 1535	0.6		SU 1524	1.3		TU 1637	1.0		W 1604	1.2		TU 1525	0.6		W 1501	0.8		F 1554	1.5		SA 1555	1.2
	2145	4.7		2109	4.6		2244	4.5		2151	4.8		2117	4.9		2045	5.1		2139	4.3		2152	4.6
4	0350	1.0	19	0321	1.4	4	0450	1.4	19	0412	1.3	4	0338	0.9	19	0311	0.9	4	0421	1.6	19	0420	1.2
	1000	5.1		0915	4.9		1100	4.7		1001	4.9		0935	5.1		0857	5.1		1015	4.1		1026	4.2
	SU 1623	0.8		M 1558	1.3		W 1717	1.4		TH 1641	1.4		W 1558	1.0		TH 1536	1.0		SA 1628	1.9		SU 1642	1.6
	2241	4.5		2146	4.5		2333	4.2		2235	4.5		2150	4.6		2122	4.9		2219	4.0		2300	4.2
5	0437	1.3	20	0357	1.5	5	0535	1.8	20	0454	1.6	5	0414	1.3	20	0349	1.1	5	0504	2.0	20	0516	1.6
	1055	4.9		0952	4.8		1150	4.3		1045	4.6		1011	4.7		0937	4.8		1115	3.7		1157	3.8
	M 1713	1.1		TU 1634	1.4		TH 1801	1.8		F 1724	1.6		TH 1632	1.4		F 1613	1.3		SU 1708	2.2		M 1744	2.0
	2340	4.3		2228	4.4		2331	4.3		2331	4.3		2225	4.3		2205	4.6		2331	3.7			

SCOTLAND, WEST COAST - ULLAPOOL

LAT 57°54'N LONG 5°10'W

TIME ZONE GMT TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR 1987

MAY		JUNE				JULY				AUGUST					
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M		
1 0245	1.1	16 0239	0.7	1 0348	1.5	16 0414	0.7	1 0409	1.4	16 0445	0.7	1 0450	1.4	16 0536	1.6
0834	4.6	0835	4.8	0944	4.1	1036	4.3	1003	4.2	1105	4.4	1047	4.3	1207	3.9
F 1453	1.3	SA 1500	0.9	M 1545	1.7	TU 1632	1.2	W 1606	1.6	TH 1702	1.2	SA 1659	1.7	SU 1803	1.9
2042	4.6	2056	4.9	2148	4.2	2253	4.6	2206	4.4	2319	4.7	2250	4.4		
2 0322	1.3	17 0326	0.8	2 0431	1.6	17 0510	0.9	2 0448	1.5	17 0534	1.0	2 0531	1.6	17 0031	3.9
0912	4.3	0931	4.5	1035	3.9	1144	4.2	1048	4.1	1204	4.2	1140	4.1	0626	2.0
SA 1526	1.5	SU 1546	1.2	TU 1626	1.9	W 1730	1.5	TH 1648	1.8	F 1754	1.5	SU 1748	1.9	M 1332	3.7
2116	4.3	2154	4.6	2239	4.1	2357	4.5	2250	4.3			2343	4.2	1912	2.2
3 0401	1.6	18 0418	1.0	3 0519	1.8	18 0610	1.1	3 0531	1.7	18 0017	4.4	3 0623	1.8	18 0159	3.7
0957	4.0	1041	4.2	1135	3.7	1252	4.0	1140	4.0	0627	1.4	1250	4.0	0740	2.3
SU 1602	1.8	M 1638	1.5	W 1715	2.1	TH 1835	1.6	F 1736	1.9	SA 1309	4.0	M 1848	2.1	TU 1459	3.7
2200	4.1	2305	4.3	2339	3.9			2340	4.1	1853	1.8			2055	2.3
4 0445	1.8	19 0518	1.3	4 0618	1.9	19 0102	4.3	4 0621	1.8	19 0122	4.1	4 0057	4.0	19 0325	3.6
1058	3.7	1204	3.9	1241	3.7	0717	1.3	1240	3.9	0727	1.7	0733	2.0	0925	2.4
M 1643	2.1	TU 1744	1.8	TH 1818	2.2	F 1358	4.0	SA 1833	2.1	SU 1419	3.9	TU 1414	4.0	W 1608	3.8
2306	3.8					1945	1.7			2003	2.0	2007	2.1	2229	2.2
5 0542	2.1	20 0024	4.2	5 0043	3.9	20 0205	4.2	5 0038	4.1	20 0232	3.9	5 0236	3.9	20 0432	3.8
1219	3.5	0634	1.4	0729	1.9	0825	1.5	0723	1.8	0838	1.9	0902	2.0	1043	2.2
TU 1739	2.3	W 1326	3.9	F 1346	3.8	SA 1501	4.0	SU 1346	4.0	M 1527	3.9	W 1530	4.1	TH 1701	4.1
		1909	1.9	1935	2.2	2053	1.8	1941	2.1	2121	2.1	2137	2.0	2326	1.9

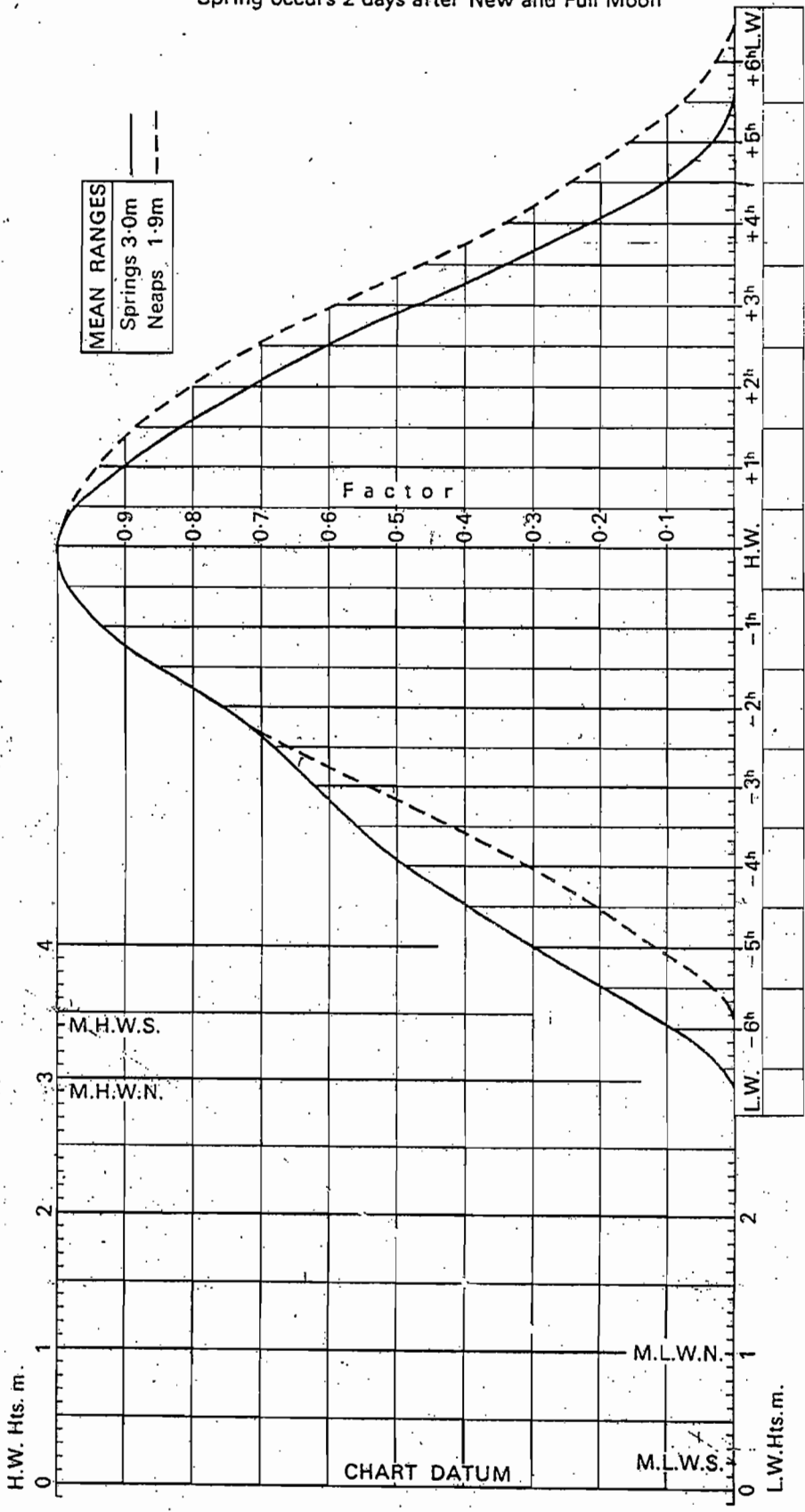
SCOTLAND, WEST COAST - ULLAPOOL

LAT 57°54'N LONG 5°10'W

TIME ZONE GMT				TIMES AND HEIGHTS OF HIGH AND LOW WATERS												YEAR 1987							
SEPTEMBER				OCTOBER				NOVEMBER				DECEMBER											
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M						
1	0542	1.8	16	0127	3.5	1	0048	3.7	16	0224	3.5	1	0334	4.1	16	0330	3.9	1	0358	4.3	16	0321	4.1
	1207	4.0		0640	2.5		0635	2.2		0810	2.6		0940	1.7		0932	2.2		0957	1.6		0920	2.2
TU	1812	2.0	W	1424	3.6	TH	1340	3.9	F	1452	3.7	SU	1539	4.5	M	1535	4.1	TU	1603	4.6	W	1524	4.2
				2036	2.4		1941	2.1		2135	2.1		2212	1.2		2213	1.7		2227	1.2		2202	1.8
2	0032	3.8	17	0302	3.5	2	0239	3.7	17	0332	3.7	2	0426	4.4	17	0414	4.2	2	0445	4.5	17	0411	4.3
	0652	2.1		0903	2.5		0845	2.2		0943	2.4		1031	1.4		1018	2.0		1048	1.4		1015	2.0
W	1350	3.9	TH	1540	3.8	F	1502	4.0	SA	1549	3.9	M	1630	4.7	TU	1618	4.3	W	1652	4.7	TH	1618	4.4
	1941	2.2		2217	2.2		2136	1.8		2226	1.8		2259	0.9		2252	1.5		2312	1.1		2250	1.6
3	0235	3.7	18	0411	3.7	3	0354	4.0	18	0422	4.0	3	0509	4.7	18	0451	4.5	3	0527	4.7	18	0455	4.6
	0845	2.2		1026	2.3		1008	1.8		1029	2.1		1115	1.1		1058	1.8		1134	1.3		1105	1.8
TH	1516	4.0	F	1633	4.0	SA	1604	4.4	SU	1631	4.2	TU	1714	5.0	W	1656	4.6	TH	1736	4.8	F	1707	4.6
	2136	2.0		2306	1.8		2240	1.3		2304	1.6		2340	0.7		2328	1.3		2353	1.1		2334	1.4
4	0401	4.0	19	0459	4.0	4	0448	4.4	19	0459	4.3	4	0546	4.9	19	0525	4.7	4	0604	4.8	19	0537	4.8
	1018	1.9		1109	2.0		1059	1.4		1105	1.8		1156	0.9		1136	1.5		1217	1.2		1152	1.5
F	1621	4.3	SA	1712	4.3	SU	1654	4.8	M	1705	4.5	W	1754	5.2	TH	1732	4.8	F	1817	4.8	SA	1753	4.8
	2253	1.5		2342	1.5		2327	0.8		2336	1.3												
5	0501	4.3	20	0534	4.3	5	0531	4.8	20	0530	4.5	5	0018	0.6	20	0003	1.1	5	0032	1.1	20	0018	1.2
	1117	1.4		1142	1.7		1142	1.0		1138	1.6		0621	5.1		0558	5.0		0638	4.9		0617	5.0
SA	1713	4.7	SU	1743	4.6	M	1737	5.1	TU	1735	4.7	TH	1235	0.8	F	1214	1.3	SA	1259	1.2	SU	1239	1.2
	2346	1.0											1831	5.2		1808	5.0		1855	4.8		1837	4.9

GREENOCK

MEAN SPRING AND NEAP CURVES
Spring occurs 2 days after New and Full Moon



SCOTLAND, WEST COAST - GREENOCK

LAT 55°57'N LONG 4°46'W

TIME ZONE GMT

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 1987

JANUARY				FEBRUARY				MARCH				APRIL			
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M
1	0037 3.5	16	0122 3.1	1	0219 3.4	16	0210 3.0	1	0117 3.3	16	0110 3.0	1	0201 3.4	16	0137 3.3
TH	0608 0.7	F	0640 0.7	SU	0732 0.6	M	0718 0.5	SU	0630 0.5	M	0619 0.4	W	0717 0.5	TH	0655 0.3
	1258 3.7		1301 3.5		1427 3.9		1352 3.5		1330 3.8		1255 3.5		1422 3.7		1342 3.6
	1835 0.4		1850 0.5		1956 0.3		1928 0.3		1850 0.2		1828 0.2		1940 0.4		1910 0.4
2	0133 3.5	17	0158 3.0	2	0302 3.4	17	0239 3.0	2	0159 3.3	17	0140 3.0	2	0231 3.5	17	0210 3.4
	0658 0.7		0712 0.6		0816 0.7		0749 0.5		0708 0.5		0648 0.4		0750 0.5		0734 0.4
F	1348 3.8	SA	1334 3.5	M	1509 3.9	TU	1426 3.6	M	1411 3.8	TU	1330 3.6	TH	1455 3.6	F	1423 3.6
	1925 0.4		1920 0.5		2041 0.4		2001 0.4		1931 0.3		1859 0.2		2017 0.6		1954 0.5
3	0226 3.4	18	0231 3.0	3	0340 3.4	18	0308 3.2	3	0235 3.4	18	0209 3.2	3	0259 3.5	18	0247 3.5
	0748 0.8		0743 0.7		0857 0.7		0824 0.6		0747 0.5		0720 0.4		0823 0.6		0820 0.5
SA	1436 3.9	SU	1408 3.5	TU	1550 3.8	W	1501 3.7	TU	1448 3.8	W	1404 3.6	F	1528 3.4	SA	1508 3.5
	2016 0.5		1952 0.5		2126 0.6		2038 0.5		2010 0.4		1934 0.3		2056 0.8		2043 0.7
4	0316 3.4	19	0303 3.0	4	0415 3.4	19	0339 3.3	4	0308 3.5	19	0239 3.3	4	0331 3.5	19	0327 3.5
	0839 0.8		0818 0.7		0940 0.8		0902 0.7		0822 0.6		0755 0.5		0900 0.8		0914 0.6
SU	1522 3.8	M	1444 3.6	W	1630 3.6	TH	1541 3.7	W	1523 3.7	TH	1440 3.7	SA	1606 3.2	SU	1557 3.4
	2109 0.5		2029 0.5		2215 0.7		2121 0.6		2050 0.6		2012 0.4		2142 1.0		2143 0.9
5	0403 3.3	20	0334 3.0	5	0451 3.3	20	0414 3.3	5	0338 3.5	20	0312 3.4	5	0407 3.4	20	0411 3.4
	0931 0.9		0854 0.8		1024 1.0		0946 0.8		0858 0.7		0836 0.6		0944 1.0		1022 0.8
M	1609 3.7	TU	1521 3.6	TH	1713 3.4	F	1626 3.6	TH	1559 3.6	F	1522 3.7	SU	1651 2.9	M	1651 3.2
	2204 0.6		2109 0.6		2308 0.9		2211 0.8		2131 0.8		2057 0.6		2245 1.2		2255 1.1
6	0447 3.2	21	0407 3.1	6	0531 3.1	21	0453 3.3	6	0410 3.4	21	0348 3.4	6	0449 3.2	21	0501 3.2
	1023 1.0		0935 0.9		1120 1.2		1040 1.0		0935 0.9		0924 0.7		1056 1.2		1146 0.8
TU	1656 3.5	W	1603 3.6	F	1805 3.1	SA	1717 3.5	F	1638 3.3	SA	1608 3.6	M	1745 2.7	TU	1754 2.9
	2301 0.7		2154 0.7		2309 1.0		2309 1.0		2219 1.0		2149 0.8				
7	0533 3.1	22	0444 3.2	7	0015 1.1	22	0541 3.2	7	0445 3.3	22	0429 3.4	7	0016 1.3	22	0023 1.1
	1119 1.1		1021 1.0		0619 3.0		1154 1.2		1022 1.1		1024 0.9		0541 3.0		0607 2.9
W	1750 3.3	TH	1649 3.6	SA	1253 1.3	SU	1816 3.3	SA	1725 3.0	SU	1700 3.4	TU	1302 1.2	W	1316 0.7
			2244 0.8		1913 2.9				2326 1.2		2255 1.0		1859 2.6		1935 2.7

SCOTLAND, WEST COAST - GREENOCK

LAT 55°57'N LONG 4°46'W

TIME ZONE GMT

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 1987

MAY				JUNE				JULY				AUGUST			
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M
1	0155 3.5	16	0147 3.5	1	0231. 3.4	16	0305 3.6	1	0249 3.3	16	0345 3.7	1	0340 3.4	16	0448 3.3
	0726 0.5		0721 0.4		0822 0.6		0901 0.4		0839 0.5		0932 0.3		0922 0.5		1034 0.7
	F 1428 3.3	SA	1410 3.4	M	1525 2.8	TU	1550 3.2	W	1546 2.7	TH	1624 3.1	SA	1623 2.9	SU	1708 3.1
	1952 0.6		1944 0.6		2057 0.8		2128 0.8		2109 0.8		2153 0.7		2149 0.8		2251 0.9
2	0225 3.5	17	0228 3.6	2	0308 3.3	17	0354 3.5	2	0326 3.3	17	0430 3.5	2	0422 3.4	17	0537 3.1
	0800 0.6		0812 0.4		0905 0.7		1002 0.4		0919 0.6		1025 0.4		1007 0.6		1136 0.9
	SA 1503 3.2	SU	1500 3.4	TU	1606 2.8	W	1642 3.0	TH	1621 2.8	F	1706 3.0	SU	1701 3.0	M	1751 2.9
	2033 0.8		2039 0.8		2143 1.0		2228 0.8		2150 0.9		2245 0.8		2236 1.0		
3	0257 3.5	18	0312 3.6	3	0350 3.2	18	0445 3.4	3	0406 3.3	18	0518 3.3	3	0510 3.3	18	0611 1.1
	0837 0.7		0911 0.5		0953 0.7		1104 0.4		1003 0.6		1121 0.6		1058 0.8		0637 2.8
	SU 1542 3.0	M	1553 3.2	W	1649 2.7	TH	1736 2.9	F	1658 2.8	SA	1751 2.9	M	1745 3.0	TU	1256 1.0
	2118 0.9		2140 0.9		2235 1.1		2331 0.9		2235 1.0		2344 0.9		2338 1.1		1847 2.8
4	0334 3.4	19	0400 3.5	4	0434 3.1	19	0544 3.2	4	0451 3.2	19	0613 3.0	4	0605 3.2	19	0152 1.1
	0923 0.8		1019 0.6		1048 0.8		1208 0.5		1051 0.7		1222 0.7		1201 1.0		0800 2.5
	M 1626 2.8	TU	1648 3.1	TH	1736 2.6	F	1837 2.8	SA	1741 2.8	SU	1843 2.8	TU	1843 2.9	W	1414 1.0
	2214 1.1		2250 1.0		2332 1.1				2327 1.1						2007 2.7
5	0417 3.2	20	0454 3.3	5	0525 3.0	20	0638 0.9	5	0541 3.2	20	0100 1.0	5	0102 1.1	20	0302 1.0
	1023 1.0		1134 0.6		1146 0.8		0656 3.0		1145 0.8		0722 2.8		0711 3.1		0935 2.5
	TU 1715 2.7	W	1750 2.8	F	1832 2.6	SA	1310 0.5	SU	1832 2.8	M	1330 0.8	W	1321 1.0	TH	1517 1.0
	2324 1.2				1951 2.7				1950 2.7		1950 2.7		2004 2.9		2138 2.8
6	0506 3.0	21	0606 1.0	6	0633 1.2	21	0148 0.9	6	0628 1.2	21	0218 1.0	6	0228 1.0	21	0355 0.8
	1141 1.0		0600 3.0		0624 3.0		0814 2.9		0641 3.1		0839 2.8		0833 3.0		1045 2.7
	W 1815 2.6	TH	1248 0.5	SA	1245 0.8	SU	1410 0.5	M	1243 0.8	TU	1436 0.8	TH	1447 1.0	F	1610 0.8
			1921 2.7		1950 2.7		2056 2.8		1939 2.8		2103 2.8		2133 3.0		2238 2.9
7	0042 1.3	22	0124 0.9	7	0136 1.2	22	0250 0.9	7	0140 1.2	22	0320 0.9	7	0334 0.7	22	0439 0.6
	0603 2.9		0742 2.9		0733 3.0		0918 2.9		0749 3.1		0948 2.8		0955 3.0		1136 2.8
	TH 1259 1.0	F	1353 0.4	SU	1342 0.8	M	1503 0.6	TU	1350 0.9	W	1533 0.8	F	1551 0.8	SA	1653 0.7
	2006 2.5		2053 2.7		2058 2.8		2148 2.9		2053 2.9		2204 2.9		2239 3.1		2322 3.1

SCOTLAND, WEST COAST - GREENOCK

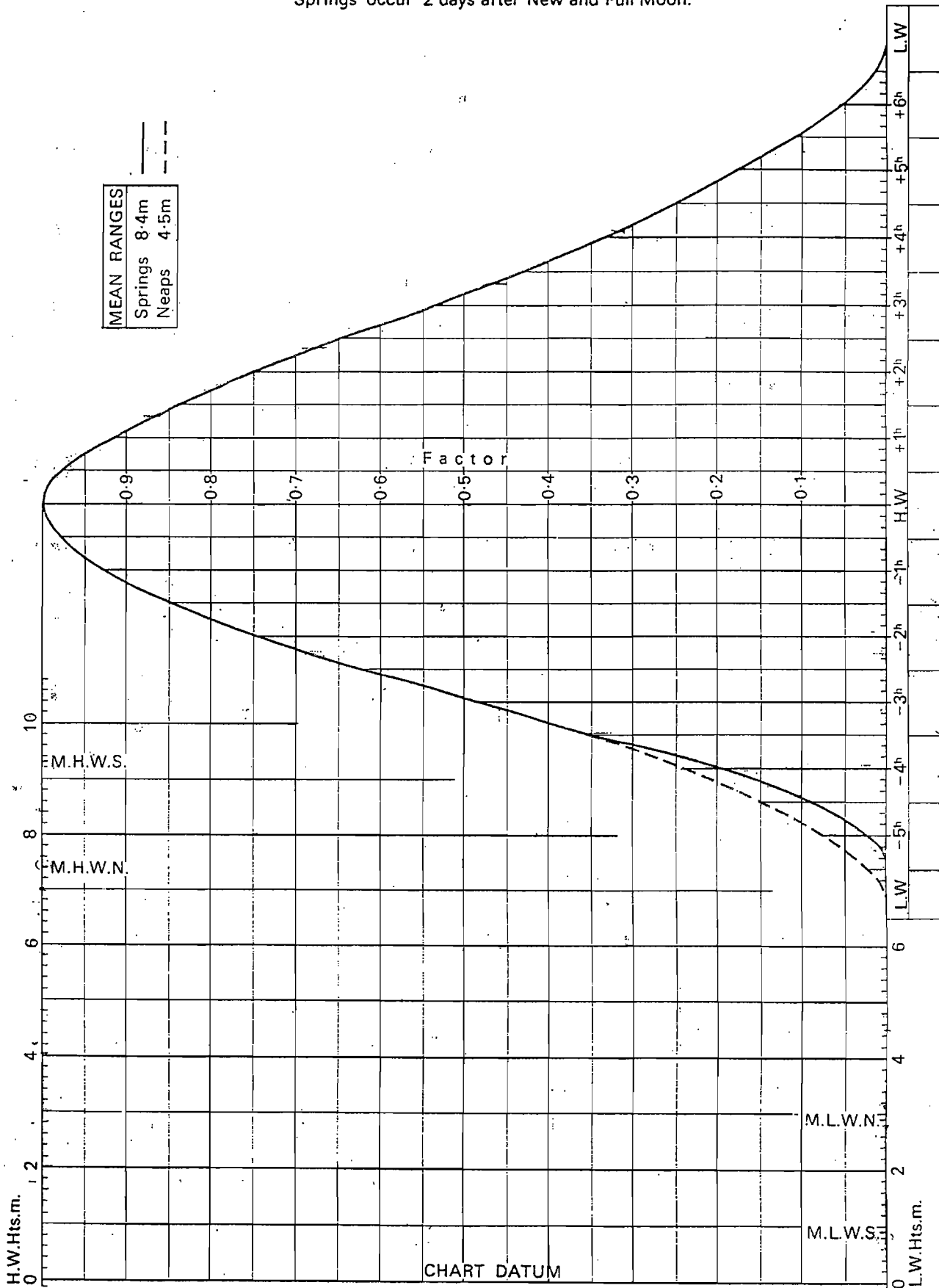
LAT 55°57'N LONG 4°46'W

TIME ZONE GMT				TIMES AND HEIGHTS OF HIGH AND LOW WATERS												YEAR, 1987	
SEPTEMBER				OCTOBER				NOVEMBER				DECEMBER					
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M		
1 0447	3.3	16 0601	2.7	1 0529	3.1	16 0043	1.1	1 0149	0.6	16 0145	1.0	1 0216	0.5	16 0117	1.1		
1027	0.9	1227	1.2	1137	1.2	0649	2.6	0846	2.8	0907	2.8	0911	3.0	0836	2.9		
TU 1714	3.1	W 1803	2.9	TH 1750	3.0	F 1318	1.3	SU 1421	1.0	M 1426	1.3	TU 1449	1.0	W 1409	1.4		
2311	1.0					1832	2.8	2104	3.1	2024	3.0	2129	3.2	2022	3.2		
2 0542	3.2	17 0125	1.1	2 0044	0.9	17 0200	1.0	2 0248	0.4	17 0233	0.9	2 0308	0.5	17 0214	1.0		
1139	1.1	0724	2.6	0641	2.9	0903	2.6	0948	3.0	0950	2.9	0958	3.1	0928	3.0		
W 1809	3.0	TH 1352	1.2	F 1317	1.2	SA 1427	1.2	M 1516	0.8	TU 1510	1.2	W 1537	0.9	TH 1503	1.3		
		1914	2.7	1919	2.9	2006	2.8	2202	3.3	2124	3.1	2220	3.3	2121	3.3		
3 0047	1.1	18 0239	1.0	3 0210	0.7	18 0255	0.9	3 0336	0.3	18 0314	0.8	3 0353	0.5	18 0309	1.0		
0649	3.0	0929	2.6	0848	2.8	1004	2.8	1031	3.1	1024	3.0	1038	3.2	1011	3.2		
TH 1316	1.2	F 1458	1.1	SA 1439	1.0	SU 1518	1.1	TU 1600	0.7	W 1547	1.1	TH 1618	0.8	F 1549	1.1		
1931	2.9	2103	2.8	2124	3.0	2131	2.9	2249	3.4	2209	3.3	2307	3.4	2214	3.4		
4 0221	0.9	19 0333	0.8	4 0312	0.4	19 0335	0.7	4 0417	0.2	19 0351	0.7	4 0435	0.5	19 0359	0.8		
0828	2.8	1035	2.7	1008	2.9	1042	2.9	1109	3.2	1055	3.1	1118	3.3	1055	3.3		
F 1445	1.0	SA 1550	0.9	SU 1536	0.8	M 1557	1.0	W 1638	0.7	TH 1620	0.9	F 1658	0.8	SA 1633	0.9		
2127	2.9	2214	2.9	2226	3.2	2218	3.1	2333	3.5	2251	3.4	2354	3.4	2306	3.4		
5 0325	0.6	20 0415	0.6	5 0359	0.2	20 0407	0.6	5 0456	0.3	20 0428	0.6	5 0518	0.6	20 0447	0.7		
1004	2.9	1118	2.8	1056	3.0	1112	3.0	1147	3.3	1130	3.2	1157	3.4	1139	3.4		
SA 1546	0.8	SU 1631	0.8	M 1619	0.6	TU 1628	0.9	TH 1715	0.6	F 1655	0.8	SA 1738	0.7	SU 1717	0.6		
2235	3.2	2258	3.1	2313	3.4	2254	3.2	O		2334	3.5	O		2358	3.5		
31 0033	0.8	31 0239	0.8	31 0643	2.8	31 0919	3.0	31 1305	1.2	31 1516	1.0	31 1915	3.1	31 2051	3.1		
SA 1305	1.2	TH 1516	1.0	1914	3.0	2153	3.1										

LIVERPOOL

MEAN SPRING AND NEAP CURVES

Springs occur 2 days after New and Full Moon.



ENGLAND, WEST COAST - LIVERPOOL

LAT 53°25'N LONG 3°00'W

TIME ZONE GMT		TIMES AND HEIGHTS OF HIGH AND LOW WATERS												YEAR 1987									
JANUARY				FEBRUARY				MARCH				APRIL											
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M								
1	0614	1.0	16	0614	1.9	1	0055	9.5	16	0035	9.0	1	0638	0.5	16	0611	1.1	1	0039	9.3	16	0014	9.5
	1150	9.7		1204	8.9		0737	0.7		0707	1.2		1210	10.0		1151	9.3		0721	0.8		0657	0.8
TH	1845	0.8	F	1848	1.7	SU	1312	9.9	M	1249	9.2	SU	1906	0.1	M	1841	0.8	W	1256	9.4	TH	1231	9.5
							2008	0.4		1938	1.1								1940	1.0		1921	0.9
2	0018	9.5	17	0022	8.7	2	0137	9.3	17	0107	9.0	2	0034	9.6	17	0008	9.3	2	0112	9.0	17	0050	9.4
	0703	1.0		0648	1.8		0818	0.9		0740	1.2		0716	0.5		0645	0.9		0754	1.2		0734	1.0
F	1239	9.7	SA	1236	8.9	M	1354	9.7	TU	1320	9.2	M	1249	9.9	TU	1222	9.5	TH	1330	9.0	F	1310	9.3
	1935	0.7		1921	1.6		2047	0.7		2009	1.2		1941	0.3		1913	0.8		2008	1.5		1957	1.2
3	0109	9.3	18	0056	8.7	3	0216	9.0	18	0140	8.9	3	0110	9.4	18	0041	9.3	3	0142	8.7	18	0131	9.1
	0749	1.1		0721	1.7		0856	1.3		0813	1.4		0751	0.7		0719	0.9		0823	1.7		0813	1.3
SA	1328	9.6	SU	1310	8.9	TU	1433	9.3	W	1352	9.1	TU	1326	9.7	W	1255	9.5	F	1404	8.5	SA	1352	8.9
	2025	0.8		1957	1.6		2124	1.2		2040	1.4		2015	0.7		1945	0.9		2034	2.0		2034	1.7
4	0157	9.1	19	0130	8.6	4	0256	8.5	19	0213	8.8	4	0144	9.1	19	0113	9.3	4	0215	8.3	19	0215	8.8
	0836	1.4		0758	1.8		0934	1.8		0846	1.6		0825	1.1		0752	1.1		0854	2.3		0857	1.7
SU	1416	9.4	M	1342	8.8	W	1514	8.8	TH	1427	8.9	W	1401	9.3	TH	1328	9.3	SA	1440	8.0	SU	1443	8.4
	2112	1.0		2032	1.7		2202	1.9		2112	1.7		2046	1.3		2016	1.2		2103	2.6		2119	2.3
5	0246	8.7	20	0204	8.5	5	0336	8.0	20	0251	8.5	5	0218	8.7	20	0148	9.0	5	0253	7.7	20	0310	8.2
	0924	1.7		0833	1.9		1014	2.4		0922	2.0		0856	1.7		0826	1.4		0931	2.8		0953	2.2
M	1504	9.1	TU	1418	8.7	TH	1557	8.2	F	1507	8.6	TH	1436	8.7	F	1405	9.0	SU	1524	7.3	M	1546	7.8
	2159	1.4		2107	1.8		2242	2.5		2150	2.2		2115	1.9		2049	1.6		2141	3.2		2221	2.8
31	0011	9.5	31	0011	9.5							31	0007	9.4									
	0655	0.7		0655	0.7								0649	0.6									
	1229	9.9		1229	9.9								1222	9.7									
	1926	0.3		1926	0.3								1910	0.6									

ENGLAND, WEST COAST - LIVERPOOL

LAT 53°25'N LONG 3°00'W

TIME ZONE GMT

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

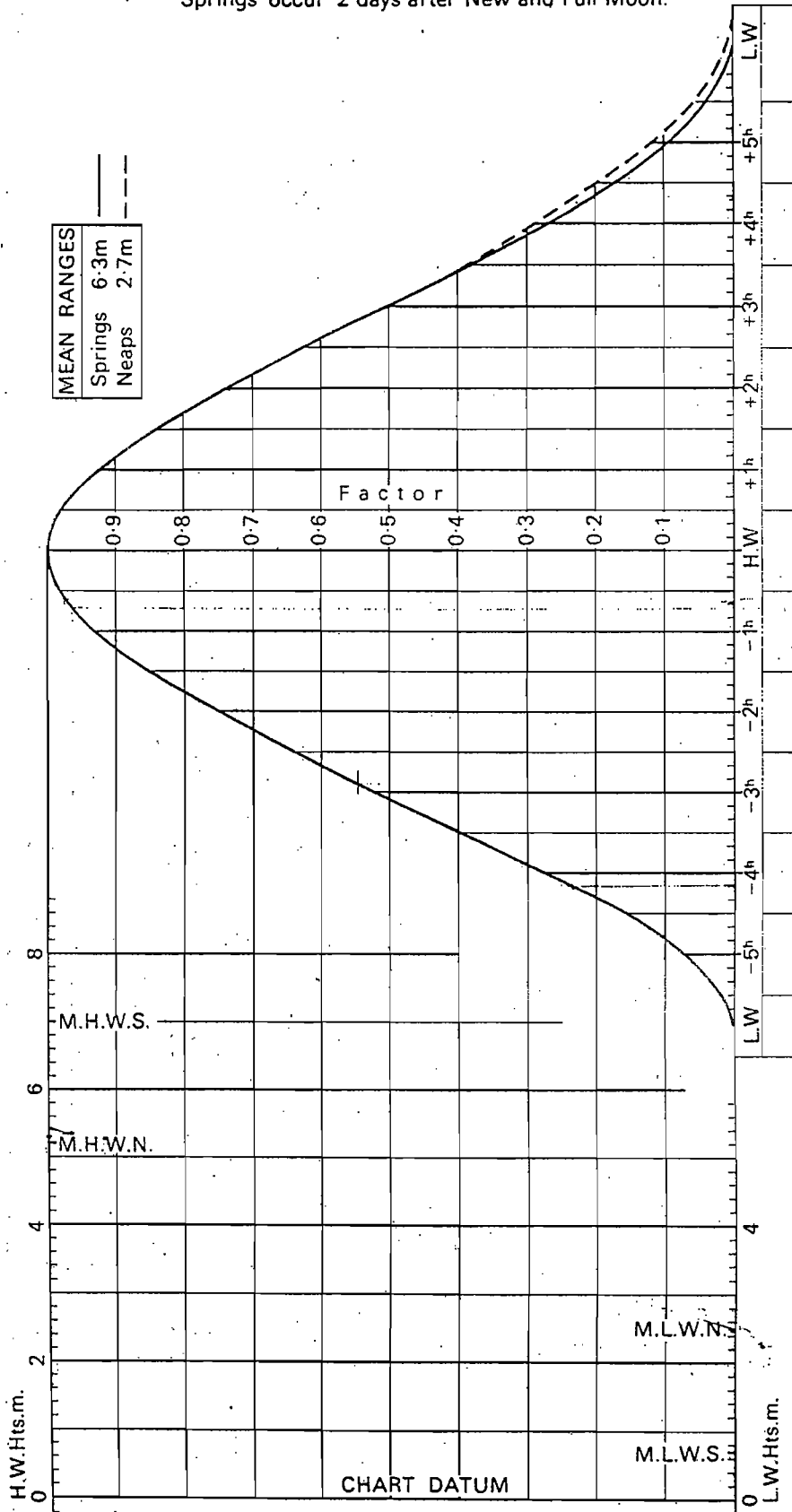
YEAR 1987

SEPTEMBER				OCTOBER				NOVEMBER				DECEMBER			
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M
1 0328	8.1	16 0455	6.9	1 0426	7.4	16 0001	3.7	1 0128	2.3	16 0131	3.0	1 0202	1.9	16 0121	2.8
1013	2.8	1126	3.8	1111	3.4	0556	6.6	0724	7.8	0724	7.3	0752	8.1	0707	7.5
TU 1603	7.7	W 1736	6.8	TH 1713	7.4	F 1227	4.1	SU 1401	2.6	M 1348	3.3	TU 1429	2.2	W 1341	3.1
2242	3.0					1834	6.9	1944	8.4	1940	7.7	2009	8.6	1927	7.8
2 0433	7.6	17 0046	3.7	2 0007	3.1	17 0133	3.4	2 0239	1.8	17 0226	2.6	2 0301	1.7	17 0222	2.5
1125	3.2	0641	6.6	0611	7.2	0728	6.9	0826	8.4	0813	7.8	0846	8.4	0804	7.9
W 1723	7.4	TH 1319	3.9	F 1259	3.3	SA 1355	3.7	M 1503	2.0	TU 1442	2.8	W 1525	2.0	TH 1442	2.7
		1926	7.0	1850	7.6	1949	7.4	2042	8.9	2027	8.1	2103	8.8	2023	8.1
3 0011	3.1	18 0220	3.3	3 0147	2.6	18 0236	2.9	3 0335	1.3	18 0314	2.1	3 0352	1.6	18 0317	2.2
0611	7.3	0812	7.1	0744	7.7	0826	7.5	0917	8.8	0856	8.2	0934	8.7	0854	8.3
TH 1307	3.2	F 1442	3.5	SA 1425	2.7	SU 1451	3.1	TU 1555	1.6	W 1527	2.3	TH 1614	1.8	F 1536	2.2
1902	7.5	2034	7.5	2009	8.3	2040	7.9	2131	9.3	2110	8.5	2150	8.9	2114	8.5
4 0151	2.8	19 0322	2.8	4 0303	1.9	19 0324	2.3	4 0423	1.0	19 0357	1.8	4 0437	1.6	19 0407	1.8
0748	7.6	0905	7.6	0851	8.4	0907	8.1	0959	9.1	0934	8.7	1016	8.9	0942	8.8
F 1436	2.7	SA 1534	2.9	SU 1529	2.0	M 1534	2.5	W 1640	1.3	TH 1610	1.9	F 1659	1.6	SA 1627	1.8
2022	8.1	2121	8.1	2108	9.8	2119	8.4	2214	9.5	2148	8.9	2234	9.0	2203	8.9
5 0314	2.1	20 0407	2.2	5 0403	1.2	20 0403	1.9	5 0505	0.9	20 0438	1.5	5 0516	1.6	20 0454	1.6
0903	8.2	0946	8.2	0942	9.0	0942	8.5	1038	9.3	1012	9.0	1055	9.0	1028	9.1
SA 1545	2.1	SU 1614	2.4	M 1621	1.4	TU 1612	2.1	TH 1720	1.1	F 1652	1.6	SA 1740	1.6	SU 1716	1.5
2125	8.8	2159	8.6	2156	9.5	2155	8.8	2254	9.6	2227	9.2	2315	9.0	2251	9.1
6 0419	1.4	21 0444	1.8	6 0452	0.7	21 0440	1.5	6 0543	1.0	21 0519	1.3	6 0551	1.7	21 0540	1.4
0959	8.9	1020	8.6	1026	9.4	1014	8.9	1116	9.4	1049	9.3	1133	9.0	1115	9.4
SU 1641	1.4	M 1648	2.0	TU 1706	1.0	W 1647	1.7	F 1800	1.1	SA 1734	1.4	SU 1819	1.7	M 1805	1.2
2216	9.4	2233	8.9	2240	9.9	2227	9.1	2333	9.5	2308	9.3	2353	8.8	2340	9.3

MILFORD HAVEN

MEAN SPRING AND NEAP CURVES

Springs occur 2 days after New and Full Moon.



WALES - MILFORD HAVEN

LAT 51°42'N LONG 5°01'W

TIME ZONE GMT

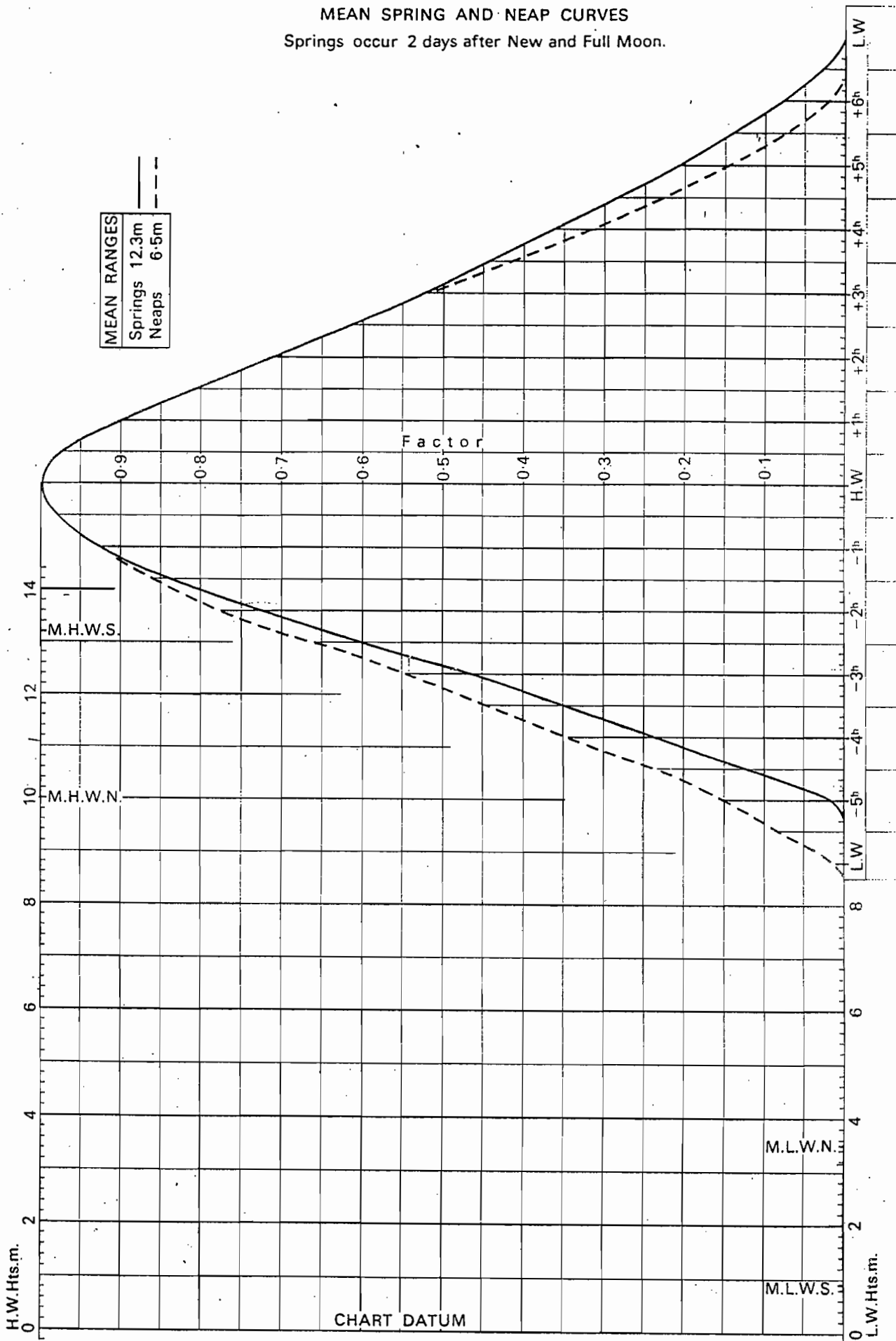
TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 1987

JANUARY				FEBRUARY				MARCH				APRIL																		
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M															
1	0045	0.9	16	0059	1.5	1	0208	0.5	16	0142	0.9	1	0107	0.4	16	0045	0.8	1	0151	0.6	16	0124	0.6							
TH	0650	7.3	F	0704	6.6	SU	0813	7.5	M	0747	6.9	SU	0710	7.5	M	0646	7.0	W	0754	7.1	TH	0727	7.2							
	1313	0.7		1323	1.4		1434	0.4		1404	0.9		1330	0.2		1306	0.7		1406	0.8		1344	0.6							
	1919	7.1		1924	6.4		2033	7.0		2005	6.7		1930	7.3		1904	7.0		2006	6.9		1945	7.1							
2	0134	0.8	17	0131	1.4	2	0247	0.7	17	0215	0.9	2	0145	0.4	17	0116	0.7	2	0222	0.9	17	0201	0.7							
F	0741	7.3	SA	0737	6.6	M	0854	7.3	TU	0819	6.9	M	0748	7.5	TU	0719	7.1	TH	0826	6.7	F	0805	7.0							
	1404	0.6		1354	1.3		1512	0.7		1436	0.9		1406	0.3		1337	0.6		1437	1.1		1420	0.9							
	2006	7.0		1957	6.4		2112	6.8		2036	6.7		2006	7.1		1937	7.0		2037	6.5		2025	6.9							
3	0222	0.9	18	0204	1.3	3	0325	0.9	18	0247	1.0	3	0220	0.5	18	0148	0.6	3	0253	1.3	18	0240	0.9							
SA	0829	7.3	SU	0809	6.6	TU	0932	6.9	W	0851	6.8	TU	0825	7.3	W	0751	7.1	F	0857	6.3	SA	0846	6.6							
	1451	0.7		1426	1.3		1549	1.1		1507	1.1		1440	0.6		1409	0.7		1505	1.5		1500	1.2							
	2054	6.8		2029	6.4		2149	6.4		2110	6.5		2040	6.9		2009	7.0		2108	6.2		2107	6.5							
4	0308	1.0	19	0236	1.4	4	0403	1.3	19	0319	1.2	4	0253	0.8	19	0222	0.7	4	0322	1.7	19	0324	1.3							
SU	0915	7.1	M	0843	6.6	W	1012	6.5	TH	0925	6.6	W	0858	6.9	TH	0825	7.0	SA	0929	5.8	SU	0932	6.2							
	1539	1.0		1500	1.4		1626	1.5		1541	1.3		1512	1.0		1442	0.9		1534	2.0		1545	1.7							
	2139	6.5		2103	6.3		2227	6.0		2145	6.3		2112	6.5		2043	6.8		2142	5.7		2157	6.1							
	5	0353	1.3	20	0311	1.5		5	0441	1.8	20	0356	1.5		5	0325	1.2	20	0256	1.0		5	0356	2.2	20	0419	1.8			
	M	1003	6.7		0917	6.4		M	1051	6.0		M	1003	6.3		M	0932	6.5		M	0901	6.7		M	1006	5.3		M	1030	5.6
		1626	1.3		1535	1.5		TH	1705	2.0		F	1619	1.7		TH	1542	1.5		F	1515	1.2		SU	1609	2.4		M	1642	2.2
		2226	6.2		2138	6.1			2309	5.6			2226	5.9			2145	6.1			2119	6.5			2224	5.3			2304	5.6

AVONMOUTH

MEAN SPRING AND NEAP CURVES
 Springs occur 2 days after New and Full Moon.



ENGLAND, WEST COAST - PORT OF BRISTOL (AVONMOUTH)

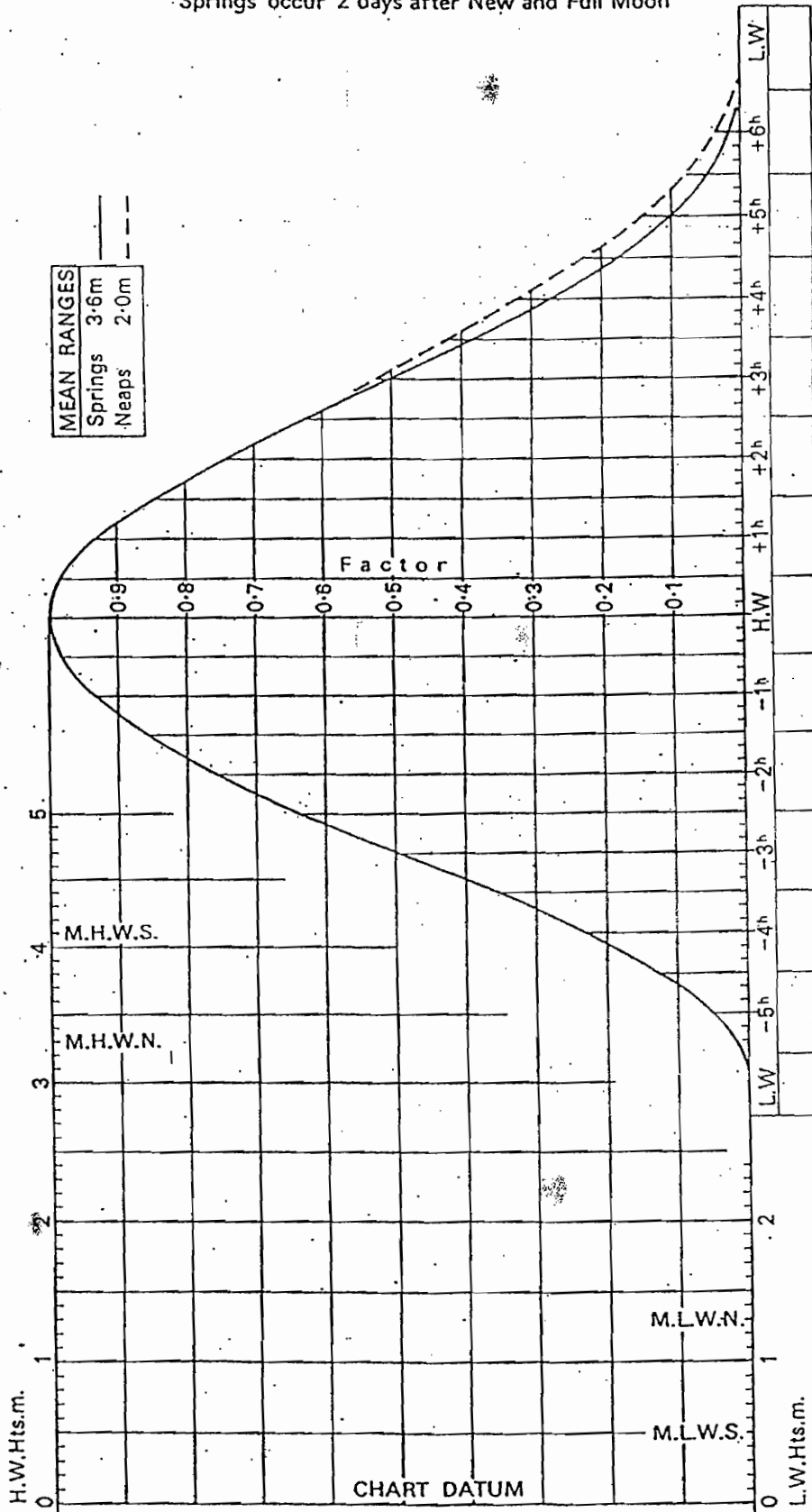
LAT 51°30'N LONG 2°43'W

TIME ZONE GMT				TIMES AND HEIGHTS OF HIGH AND LOW WATERS								YEAR 1987												
SEPTEMBER				OCTOBER				NOVEMBER				DECEMBER												
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M									
1	0534	3.0	16	0005	9.6	1	0605	3.8	16	0034	8.5	1	0244	10.3	16	0246	9.2	1	0328	11.2	16	0240	9.9	
	1120	10.4		0615	3.8		1234	9.5		0634	4.6		0924	3.2		0844	4.3		0956	2.6		0842	4.0	
TU	1756	3.4	W	1224	9.3	TH	1846	4.1	F	1319	8.5	SU	1527	11.1	M	1511	9.9	TU	1602	11.8	W	1507	10.5	
	2353	10.2		1843	4.4					1924	4.9		2202	2.4		2141	3.9		2227	2.2		2128	3.6	
2	0619	3.6	17	0126	8.8	2	0126	9.4	17	0239	8.5	2	0406	11.3	17	0346	10.0	2	0433	11.8	17	0345	10.6	
	1227	9.7		0717	4.6		0730	4.4		0823	4.9		1038	2.3		1010	3.6		1105	2.3		1010	3.5	
W	1852	4.1	TH	1416	8.8	F	1416	9.6	SA	1517	9.1	M	1635	12.1	TU	1606	10.8	W	1659	12.2	TH	1607	11.2	
				2049	4.8		2104	3.9		2156	4.3		2315	1.7		2241	3.1		2334	2.0		2244	3.0	
3	0127	9.6	18	0329	9.0	3	0301	9.9	18	0356	9.4	3	0506	12.2	18	0437	11.0	3	0525	12.2	18	0441	11.3	
	0730	4.3		0943	4.5		0946	3.7		1020	4.0		1151	1.6		1108	2.9		1210	2.0		1119	2.8	
TH	1427	9.6	F	1607	9.5	SA	1548	10.6	SU	1617	10.1	TU	1730	12.8	W	1654	11.6	TH	1749	12.5	F	1704	11.8	
	2110	4.2		2237	3.9		2230	2.8		2254	3.3					2336	2.5					2349	2.5	
4	0310	9.9	19	0442	9.9	4	0431	11.0	19	0447	10.4	4	0019	1.2	19	0522	11.8	4	0034	1.8	19	0536	12.0	
	0956	3.9		1059	3.5		1111	2.5		1113	3.0		0556	12.9		1204	2.2		0611	12.6		1222	2.2	
F	1559	10.4	SA	1705	10.5	SU	1702	11.9	M	1702	11.1	W	1248	1.2	TH	1739	12.3	F	1300	1.9	SA	1758	12.3	
	2245	3.2		2334	2.9		2350	1.7		2343	2.6		1817	13.3					F	1834	12.6			
5	0441	10.8	20	0530	10.8	5	0534	12.2	20	0527	11.3	5	0110	1.0	20	0031	2.0	5	0119	1.7	20	0050	2.0	
	1125	2.9		1154	2.6		1224	1.5		1203	2.3		0638	13.2		0607	12.4		0652	12.7		0628	12.6	
SA	1716	11.7	SU	1747	11.4	M	1757	13.0	TU	1742	11.9	TH	1334	1.1	F	1256	1.8	SA	1342	1.8	SU	1320	1.7	
												O	1857	13.4		1824	12.7	O	1914	12.7	●	1852	12.7	

COBH

MEAN SPRING AND NEAP CURVES

Springs occur 2 days after New and Full Moon



IRELAND, SOUTH COAST - COBH (RINGASKIDDY)

LAT 51°50'N LONG 8°19'W

TIME ZONE GMT

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 1987

JANUARY				FEBRUARY				MARCH				APRIL			
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M
1 0011	0.7	16 0024	0.9	1 0138	0.3	16 0109	0.6	1 0035	0.2	16 0011	0.5	1 0123	0.4	16 0048	0.5
0603	4.4	0622	4.0	0731	4.4	0703	4.1	0631	4.4	0604	4.2	0712	4.2	0635	4.3
TH 1238	0.6	F 1246	0.9	SU 1404	0.4	M 1327	0.7	SU 1259	0.3	M 1228	0.5	W 1338	0.6	TH 1306	0.6
1827	4.3	1835	4.0	1951	4.2	1914	4.1	1848	4.3	1818	4.1	1924	4.1	1852	4.3
2 0103	0.6	17 0057	0.8	2 0223	0.4	17 0138	0.6	2 0117	0.2	17 0041	0.5	2 0155	0.6	17 0124	0.5
0653	4.4	0656	4.0	0815	4.3	0731	4.1	0709	4.4	0632	4.2	0741	4.0	0710	4.2
F 1330	0.6	SA 1319	0.9	M 1447	0.5	TU 1357	0.7	M 1338	0.3	TU 1257	0.5	TH 1408	0.7	F 1344	0.7
1917	4.2	1907	3.9	2032	4.1	1944	4.0	1924	4.2	1846	4.2	1955	3.9	1930	4.2
3 0154	0.6	18 0130	0.8	3 0307	0.5	18 0208	0.6	3 0155	0.3	18 0110	0.5	3 0226	0.8	18 0205	0.7
0744	4.4	0727	4.0	0856	4.1	0802	4.1	0745	4.3	0700	4.2	0812	3.8	0751	4.1
SA 1420	0.6	SU 1351	0.9	TU 1531	0.7	W 1426	0.7	TU 1415	0.5	W 1328	0.6	F 1437	0.9	SA 1427	0.8
2006	4.1	1940	3.9	2112	3.9	2016	4.0	1959	4.1	1916	4.2	2027	3.7	2015	4.0
4 0244	0.6	19 0204	0.8	4 0350	0.7	19 0242	0.7	4 0232	0.5	19 0142	0.5	4 0300	1.0	19 0254	0.8
0833	4.2	0759	4.0	0939	3.9	0836	4.0	0820	4.1	0731	4.2	0847	3.6	0839	3.8
SU 1511	0.7	M 1425	0.9	W 1613	0.9	TH 1501	0.8	W 1450	0.7	TH 1359	0.7	SA 1514	1.1	SU 1521	1.0
2056	4.0	2013	3.9	2156	3.7	2054	3.9	2033	3.9	1949	4.1	2107	3.5	2110	3.8
5 0335	0.7	20 0237	0.8	5 0435	0.9	20 0319	0.8	5 0308	0.7	20 0218	0.6	5 0343	1.2	20 0353	1.0
0924	4.1	0833	3.9	1024	3.6	0917	3.9	0854	3.8	0808	4.1	0931	3.4	0938	3.5
M 1603	0.8	TU 1458	0.9	TH 1658	1.1	F 1543	1.0	TH 1524	0.9	F 1437	0.8	SU 1602	1.3	M 1626	1.2
2146	3.8	2049	3.8	2245	3.5	2141	3.8	2110	3.7	2027	4.0	2159	3.3	2217	3.5

SECTION TWO

TIDAL PREDICTIONS FOR SECONDARY PORTS (EUROPEAN)

(B L A N K)

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES				HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.
				High Water (Zone U.T.)	Low Water (G.M.T.)	MHWS	MHWN	MLWN	MLWS			
14	PLYMOUTH (DEVONPORT)	(see pag. 22)		0000 and 1200	0600 and 1800	0000 and 1200	0600 and 1800	5.5	4.4	2.2	0.8	
England												
<i>Isles of Scilly</i>												
1	St. Mary's	49 55	6 19	-0030	-0110	-0100	-0020	+0.2	-0.1	-0.2	-0.1	3.13
2	Penzance (Newlyn)	50 06	5 33	-0040	-0105	-0045	-0020	+0.1	0.0	-0.2	0.0	3.08
2a	Porthleven	50 05	5 19	-0045	-0105	-0035	-0025	0.0	-0.1	-0.2	0.0	3.08
3	Lizard Point	49 57	5 12	-0045	-0055	-0040	-0030	-0.2	-0.2	-0.3	-0.2	2.99
4	Coverack	50 01	5 05	-0030	-0040	-0020	-0010	-0.2	-0.2	-0.3	-0.2	2.99
4a	Helford River (Entrance)	50 05	5 05	-0030	-0035	-0015	-0010	-0.2	-0.2	-0.3	-0.2	⊙
<i>River Fal</i>												
5	Falmouth	50 09	5 03	-0030	-0030	-0010	-0010	-0.2	-0.2	-0.3	-0.2	3.00
5a	Truro	50 16	5 03	-0020	-0025	§	§	-2.0	-2.0	§	§	⊙
7	Mevagissey	50 16	4 47	-0010	-0015	-0005	+0005	-0.1	-0.1	-0.2	-0.1	3.14
7a	Par	50 21	4 42	-0005	-0015	0000	-0010	-0.4	-0.4	-0.4	-0.2	3.12
<i>River Fowey</i>												
8	Fowey	50 20	4 38	-0010	-0015	-0010	-0005	-0.1	-0.1	-0.2	-0.2	3.14
8a	Lostwithiel	50 24	4 40	+0005	-0010	§	§	-4.1	-4.1	§	§	⊙
11	Looe	50 21	4 27	-0010	-0010	-0005	-0005	-0.1	-0.2	-0.2	-0.2	⊙
12	Whitsand Bay	50 20	4 15	0000	0000	0000	0000	0.0	+0.1	-0.1	+0.2	⊙
<i>River Tamar</i>												
14	PLYMOUTH (DEVONPORT)	50 22	4 11		STANDARD PORT				See Table V			3.35
14a	Jupiter Point	50 23	4 14	+0010	+0005	0000	-0005	0.0	0.0	+0.1	0.0	3.35
14b	Saltash	50 24	4 12	0000	+0010	0000	-0005	+0.1	+0.1	+0.1	+0.1	3.36 c
14c	Cargreen	50 26	4 12	0000	+0010	+0020	+0020	0.0	0.0	-0.1	0.0	3.39 c
14d	Cotehele Quay	50 29	4 13	0000	+0020	+0045	+0045	-0.9	-0.9	-0.8	-0.4	2.40 c
<i>River Tavy</i>												
14e	Lopwell	50 28	4 09	⊙	⊙	§	§	-2.6	-2.7	§	§	⊙
<i>River Lynher</i>												
14f	St. Germans	50 23	4 18	0000	0000	+0020	+0020	-0.3	-0.1	0.0	+0.2	3.34
15	Turnchapel	50 22	4 07	0000	0000	+0010	-0015	0.0	+0.1	+0.2	+0.1	3.32
15a	Bovisand Pier	50 20	4 08	0000	-0020	0000	-0010	-0.2	-0.1	0.0	+0.1	3.30
<i>River Yealm</i>												
17	Entrance	50 18	4 04	+0006	+0006	+0002	+0002	-0.1	-0.1	-0.1	-0.1	3.18
14	PLYMOUTH (DEVONPORT)	(see pag. 22)		0100 and 1300	0600 and 1800	0100 and 1300	0600 and 1800	5.5	4.4	2.2	0.8	
<i>Salcombe River</i>												
20	Salcombe	50 13	3 47	0000	+0010	+0005	-0005	-0.2	-0.3	-0.1	-0.1	3.10 c
21	Start Point	50 13	3 39	+0005	+0030	-0005	+0005	-0.2	-0.4	-0.1	-0.1	3.20 *c
<i>River Dart</i>												
23	Dartmouth	50 21	3 34	+0025	+0040	+0015	0000	-0.8	-0.6	-0.1	-0.2	2.80 *c
23a	Greenway Quay	50 23	3 35	+0030	+0045	+0025	+0005	-0.6	-0.6	-0.2	-0.2	2.84 c
23b	Totnes	50 26	3 41	+0025	+0040	+0115	+0030	-2.0	-2.1	§	§	1.36 c
25	Torquay	50 28	3 31	+0025	+0045	+0010	0000	-0.6	-0.7	-0.2	-0.1	2.89 *c
26	Teignmouth (Approaches)	50 33	3 30	+0025	+0040	0000	0000	-0.7	-0.8	-0.3	-0.2	2.74 *c
26a	Exmouth (Approaches)	50 36	3 23	+0030	+0050	+0015	+0005	-0.9	-1.0	-0.5	-0.3	⊙ *
<i>River Exe</i>												
27	Exmouth Dock	50 37	3 25	+0040	+0100	+0050	+0020	-1.5	-1.6	-0.9	-0.6	⊙
27a	Starcross	50 38	3 27	+0040	+0110	⊙	⊙	-1.4	-1.5	⊙	⊙	⊙
27b	Topsham	50 54	3 28	+0045	+0105	⊙	⊙	-1.5	-1.6	⊙	⊙	⊙
28	Lyme Regis	50 43	2 56	+0040	+0100	+0005	-0005	-1.2	-1.3	-0.5	-0.2	2.44 *c
29	Bridport (West Bay)	50 42	2 45	+0025	+0040	0000	0000	-1.4	-1.4	-0.6	-0.2	2.43 *c
30	Chesil Beach	50 37	2 33	+0040	+0055	-0005	+0010	-1.6	-1.5	-0.5	0.0	2.28 *c
31	Chesil Cove	50 34	2 28	+0035	+0050	-0010	+0005	-1.5	-1.6	-0.5	-0.2	2.27 *c

⊙ No data.

§ Dries out except for river water.

* See notes on page 344.

c For intermediate heights, use harmonic constants (see Part III) and N.P.159.

j For intermediate heights, see pages xxii to xxiv.

x M.L. inferred.

ENGLAND, SOUTH COAST

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES				HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.
				High Water (Zone G.M.T.)	Low Water	MHWS	MHWN	MLWN	MLWS			
33	PORTLAND	(see page 28)		0100 and 1300	0700 and 1900	0100 and 1300	0700 and 1900	2.1	1.4	0.7	0.2	1.00
34	Lulworth Cove	50 37	2 15	-0015	-0005	-0005	+0005	+0.2	+0.1	+0.2	+0.1	⊙ *
65	PORTSMOUTH	(see page 14)		0000 and 1200	0600 and 1800	0500 and 1700	1100 and 2300	4.7	3.8	1.8	0.6	
35	Swanage	50 37	1 57	-0250	+0105	-0105	-0105	-2.7	-2.2	-0.7	-0.3	1.49 *j
<i>Poole Harbour</i>												
36	Entrance	50 40	1 56	-0240	+0105	-0100	-0030	-2.7	-2.2	-0.7	-0.3	1.49 *j
36a	Town Quay	50 43	1 59	-0210	+0140	-0015	-0005	-2.6	-2.2	-0.7	-0.2	1.49 *j
36b	Pottery Pier	50 42	1 59	-0150	+0200	-0010	0000	-2.7	-2.1	-0.6	0.0	1.49 *j
36c	Wareham (River Frome)	50 41	2 06	-0140	+0205	+0110	+0035	-2.5	-2.1	-0.7	+0.1	⊙ §*
36d	Cleavel Point	50 40	2 00	-0220	+0130	-0025	-0015	-2.6	-2.3	-0.7	-0.3	⊙ *
37	Bournemouth	50 43	1 52	-0240	+0055	-0050	-0030	-2.7	-2.2	-0.8	-0.3	1.49 *j
38	Christchurch (Entrance)	50 43	1 45	-0230	+0030	-0035	-0035	-2.9	-2.4	-1.2	-0.2	1.17 *j
38a	Christchurch (Tuckton)	50 44	1 47	-0205	+0110	+0110	+0105	-3.0	-2.5	-1.0	+0.1	1.14 §*
39	Hurst Point	50 42	1 33	-0115	-0005	-0030	-0025	-2.0	-1.5	-0.5	-0.1	1.97 *j
40	Lymington	50 46	1 32	-0110	+0005	-0020	-0020	-1.7	-1.2	-0.5	-0.1	2.04 *j
42	Bucklers Hard	50 48	1 25	-0040	-0010	+0010	-0010	-1.0	-0.8	-0.2	-0.3	2.40 *j
43	Stansore Point	50 47	1 21	-0050	-0010	-0005	-0010	-0.9	-0.6	-0.2	0.0	2.39 *j
<i>Isle of Wight</i>												
45	Yarmouth	50 42	1 30	-0105	+0005	-0025	-0030	-1.6	-1.3	-0.4	0.0	2.03 *j
46	Totland Bay	50 41	1 33	-0130	-0045	-0040	-0040	-2.0	-1.5	-0.5	-0.1	1.88 *j
48	Freshwater	50 40	1 31	-0210	+0025	-0040	-0020	-2.1	-1.5	-0.4	0.0	1.62 *j
51	Ventnor	50 36	1 12	-0025	-0030	-0025	-0030	-0.8	-0.6	-0.2	+0.2	2.33 *j
53	Sandown	50 39	1 09	0000	+0005	+0010	+0025	-0.6	-0.5	-0.2	0.0	2.41 *j
54	Bembridge Harbour	50 42	1 06	-0010	+0005	+0020	0000	-1.6	-1.5	-1.4	-0.6	⊙ *j
58	Ryde	50 44	1 07	-0010	+0010	-0005	-0010	-0.2	-0.1	0.0	+0.1	2.76 *j
<i>Medina River</i>												
60	Cowes	50 46	1 18	-0015	+0015	0000	-0020	-0.5	-0.3	-0.1	0.0	2.67 *j
60a	Folly Inn	50 44	1 17	-0015	+0015	0000	-0020	-0.6	-0.4	-0.1	+0.2	⊙ *j
60b	Newport	50 42	1 17	⊙	⊙	⊙	⊙	-0.6	-0.4	+0.1	+1.3	⊙ *j
62	SOUTHAMPTON	(see page 16)		0400 and 1600	1100 and 2300	0000 and 1200	0600 and 1800	4.5	3.7	1.8	0.5	
61	Calshot Castle	50 49	1 18	+0015	+0030	+0015	+0005	0.0	0.0	+0.2	+0.3	2.96 *j
62	SOUTHAMPTON	50 54	1 24	STANDARD PORT				See Table V				2.87
62a	Redbridge	50 55	1 28	-0020	+0005	0000	-0005	-0.1	-0.1	-0.1	-0.1	2.82 *
<i>River Hamble</i>												
63	Warsash	50 51	1 18	+0020	+0010	+0010	0000	0.0	+0.1	+0.1	+0.3	2.95 *
63a	Bursledon	50 53	1 18	+0020	+0020	+0010	+0010	+0.1	+0.1	+0.2	+0.2	3.05 *
65	PORTSMOUTH	(see page 30)		0500 and 1700	1000 and 2200	0000 and 1200	0600 and 1800	4.7	3.8	1.8	0.6	
64	Lee-on-the-Solent	50 48	1 12	-0005	+0005	-0015	-0010	-0.2	-0.1	+0.1	+0.2	⊙ *j
65	PORTSMOUTH	50 48	1 07	STANDARD PORT				See Table V				2.84
<i>Chichester Harbour</i>												
68	Entrance	50 47	0 56	-0010	+0005	+0015	+0020	+0.2	+0.2	0.0	+0.1	2.83 j
68a	Northney	50 50	0 58	+0010	+0015	+0015	+0025	+0.2	0.0	-0.2	-0.3	2.73 j
68b	Bosham	50 50	0 52	0000	+0010	⊙	⊙	+0.2	+0.1	⊙	⊙	⊙ j
68c	Itchenor	50 48	0 52	-0005	+0005	+0005	+0025	+0.1	0.0	-0.2	-0.2	2.90 j
68d	Dell Quay	50 49	0 49	+0005	+0015	⊙	⊙	+0.2	+0.1	⊙	⊙	⊙ j
69	Selsey Bill	50 43	0 47	-0005	-0005	+0035	+0035	+0.6	+0.6	0.0	0.0	2.94 j
70	Nab Tower	50 40	0 57	+0015	0000	+0015	+0015	-0.2	0.0	+0.2	0.0	2.58 j

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
1-60b							Negligible						
61-63a	+0.1	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1
64-70							Negligible						

ENGLAND, SOUTH AND EAST COASTS

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES				HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.
				High Water (Zone G.M.T.)	Low Water	MHWS	MHWN	MLWN	MLWS			
81	SHOREHAM	(see pag.		0500 and 1700	1000 and 2200	0000 and 1200	0600 and 1800	6.2	5.0	1.9	0.7	
72	Pagham	50 46	0 43	+0015	0000	-0015	-0025	-0.7	-0.5	-0.1	-0.1	⊙
73	Bognor Regis	50 47	0 40	+0010	-0005	-0005	-0020	-0.6	-0.5	-0.2	-0.1	3.14
<i>River Arun</i>												
74	Littlehampton (Entrance)	50 48	0 32	+0010	0000	-0005	-0010	-0.4	-0.4	-0.2	-0.2	⊙
74a	Littlehampton (Norfolk Wharf)	50 48	0 33	+0015	+0005	0000	+0045	-0.7	-0.7	-0.3	+0.2	2.83 *c
74b	Arundel	50 51	0 33	⊙	+0120	⊙	⊙	-3.1	-2.8	⊙	⊙	
75	Worthing	50 48	0 22	+0010	0000	-0005	-0010	-0.1	-0.2	0.0	0.0	⊙
81	SHOREHAM	50 50	0 15	STANDARD PORT				See Table V				3.36
82	Brighton	50 49	0 08	-0010	-0005	-0005	-0005	+0.3	+0.1	0.0	-0.1	3.49
N. E.												
83	Newhaven	50 47	0 04	-0015	-0010	0000	0000	+0.4	+0.2	0.0	-0.2	3.61
84	Eastbourne	50 46	0 17	-0010	-0005	+0015	+0020	+1.1	+0.6	+0.2	+0.1	3.77
89	DOVER	(see page 32.		0000 and 1200	0600 and 1800	0100 and 1300	0700 and 1900	6.7	5.3	2.0	0.8	
85	Hastings	50 51	0 35	0000	-0010	-0030	-0030	+0.8	+0.5	+0.1	-0.1	3.85
86	Rye (Approaches)	50 55	0 47	+0005	-0010	⊙	⊙	+1.0	+0.7	⊙	⊙	⊙
86a	Rye (Harbour)	50 56	0 46	+0005	-0010	⊙	⊙	-1.4	-1.7	§	§	1.97
87	Dungeness	50 54	0 58	-0010	-0015	-0020	-0010	+1.0	+0.6	+0.4	+0.1	4.13
88	Folkestone	51 05	1 12	-0020	-0005	-0010	-0010	+0.4	+0.4	0.0	-0.1	3.74
89	DOVER	51 07	1 19	STANDARD PORT				See Table V				3.70
98	Deal	51 13	1 25	+0010	+0020	+0010	+0005	-0.6	-0.3	0.0	0.0	3.54
99	Richborough	51 18	1 21	+0015	+0015	+0030	+0030	-3.4	-2.6	-1.7	-0.7	1.42
102	Ramsgate	51 20	1 25	+0020	+0020	-0007	-0007	-1.8	-1.5	-0.8	-0.4	2.56
103	MARGATE	(see pag.		0100 and 1300	0700 and 1900	0100 and 1300	0700 and 1900	4.8	3.9	1.4	0.5	
102a	Broadstairs	51 21	1 27	-0020	-0008	+0007	+0010	-0.2	-0.2	-0.1	-0.1	⊙
103	MARGATE	51 24	1 23	STANDARD PORT				See Table V				2.67
104	Herne Bay	51 23	1 07	+0034	+0022	+0015	+0032	+0.4	+0.4	0.0	0.0	2.73
105	Whitstable Approaches	51 22	1 02	+0042	+0029	+0025	+0050	+0.6	+0.6	+0.1	0.0	⊙
108	SHEERNESS	(see page		0200 and 1400	0800 and 2000	0200 and 1400	0700 and 1900	5.7	4.8	1.5	0.6	
<i>River Swale</i>												
106	Grovehurst Jetty	51 22	0 46	-0007	0000	0000	+0016	0.0	0.0	0.0	-0.1	⊙
<i>River Medway</i>												
108	SHEERNESS	51 27	0 45	STANDARD PORT				See Table V				3.06
108a	Bee Ness	51 25	0 39	+0002	+0002	0000	+0005	+0.2	+0.1	0.0	0.0	⊙
108b	Bartlett Creek	51 23	0 38	+0016	+0008	⊙	⊙	+0.1	-0.0	⊙	⊙	⊙
108c	Darnett Ness	51 24	0 36	+0004	+0004	0000	+0010	+0.2	+0.1	0.0	-0.1	⊙
109	Chatham (Lock Approaches)	51 24	0 33	+0010	+0012	+0012	+0018	+0.3	+0.1	-0.1	-0.2	2.95
109a	Upnor	51 25	0 32	+0015	+0015	+0015	+0025	+0.2	+0.2	-0.1	-0.1	⊙
109b	Rochester (Strood Pier)	51 24	0 30	+0018	+0018	+0018	+0028	+0.2	+0.2	-0.2	-0.3	2.91
109c	Wouldham	51 21	0 27	+0030	+0025	+0035	+0120	-0.2	-0.3	-1.0	-0.3	2.69
109d	New Hythe	51 19	0 28	+0035	+0035	+0220	+0240	-1.6	-1.7	-1.2	-0.3	2.03
109e	Allington Lock	51 17	0 30	+0050	+0035	⊙	⊙	-2.1	-2.2	-1.3	-0.4	0.96
<i>River Thames</i>												
110	Southend	51 31	0 43	-0005	-0005	-0005	-0005	0.0	0.0	-0.1	-0.1	3.02 *
110a	Thames Haven	51 30	0 31	+0010	+0010	0000	+0010	+0.5	+0.4	-0.1	-0.1	3.15 *

⊙ No data.

* See Notes on page 344.

§ Dries out except for river water.

c For intermediate heights, use harmonic constants (see Part III) and N.P.159.

x M.L. inferred.

ENGLAND, EAST COAST

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No.	PLACE	Lat. N.	Long. E.	TIME DIFFERENCES (Zone G.M.T.)				HEIGHT DIFFERENCES (IN METRES)				M.L. Z _m m.
				High	Water	Low	Water	MHWS	MHWN	MLWN	MLWS	
113	LONDON BRIDGE	(see pag		0300 and 1500	0900 and 2100	0400 and 1600	1100 and 2300	7.1	5.8	1.6	0.5	
111	Tilbury	51 28	0 22	-0055	-0040	-0045	-0110	-0.7	-0.5	0.0	0.0	3.33 *
112	Woolwich (Gallion's Point)	51 30	0 05	-0020	-0020	-0025	-0040	-0.1	-0.1	+0.1	0.0	3.67 *
113	LONDON BRIDGE	N. 51 30	W. 0 05	STANDARD PORT				See Table V				3.70 *
114	Chelsea Bridge	51 29	0 09	+0020	+0015	+0055	+0100	-0.8	-0.7	-0.6	-0.3	⊙ *
115	Barnes Bridge	51 28	0 15	+0045	+0040	+0220	+0210	-1.6	-1.7	-1.1	-0.5	⊙ *
116	Richmond Lock	51 28	0 19	+0100	+0055	+0325	+0305	-2.1	-2.2	-1.4	-0.3	⊙ *
108	SHEERNESS	(see pag		0200 and 1400	0700 and 1900	0100 and 1300	0700 and 1900	5.7	4.8	1.5	0.6	
116a	Thames Estuary Shivering Sand Tower	N. 51 30	E. 1 05	-0025	-0019	-0008	-0026	-0.6	-0.6	-0.1	-0.1	2.75
103	MARGATE	(see pag		0100 and 1300	0700 and 1900	0100 and 1300	0700 and 1900	4.8	3.9	1.4	0.5	
117	S.E. Longsand	51 32	1 21	-0006	-0003	-0004	-0004	0.0	+0.1	0.0	-0.1	2.5 *
129	WALTON-ON-THE-NAZE	(see pag		0000 and 1200	0600 and 1800	0500 and 1700	1100 and 2300	4.2	3.4	1.1	0.4	
121	Whitaker Beacon	51 40	1 06	+0022	+0024	+0033	+0027	+0.6	+0.5	+0.2	+0.1	2.5 **
121a	Holliwell Point	51 38	0 56	+0034	+0037	+0100	+0037	+1.1	+0.9	+0.3	+0.1	⊙
121b	River Roach Rochford	51 35	0 43	+0050	+0040	§	§	-0.8	-1.1	§	§	⊙
122	River Crouch Burnham-on-Crouch	51 37	0 48	+0050	+0035	+0115	+0050	+1.0	+0.8	-0.1	-0.2	2.50 c
122a	North Fambridge	51 38	0 41	+0115	+0050	+0130	+0100	+1.1	+0.8	0.0	-0.1	2.55 c
122b	Hullbridge	51 38	0 38	+0115	+0050	+0135	+0105	+1.1	+0.8	0.0	-0.1	2.55 c
122c	Battlesbridge	51 37	0 34	+0120	+0110	§	§	-1.8	-2.0	§	§	⊙
123	River Blackwater Bradwell-on-Sea	51 45	0 53	+0035	+0023	+0047	+0004	+1.1	+0.8	+0.2	+0.1	2.85 c
123a	Osea Island	51 43	0 46	+0057	+0045	+0050	+0007	+1.1	+0.9	+0.1	0.0	2.68
123b	Maldon	51 44	0 42	+0107	+0055	⊙	⊙	-1.3	-1.1	⊙	⊙	⊙
124	West Mersea	51 47	0 54	+0035	+0015	+0055	+0010	+0.9	+0.4	+0.1	+0.1	2.7 cx
126	River Colne Brightlingsea	51 48	1 00	+0025	+0021	+0046	+0004	+0.8	+0.4	+0.1	0.0	2.84
127	Colchester	51 53	0 56	+0035	+0025	§	§	0.0	-0.3	§	§	⊙
128	Clacton	51 47	1 09	+0012	+0010	+0025	+0008	+0.3	+0.1	0.0	0.0	2.38
129	WALTON-ON-THE-NAZE	51 51	1 16	STANDARD PORT				See Table V				2.23
129a	Bramble Creek	51 53	1 14	+0010	-0007	-0005	+0010	+0.3	+0.3	+0.3	+0.3	2.38
130	Sunk Head Tower	51 46	1 30	0000	+0002	-0002	+0002	-0.3	-0.3	-0.1	-0.1	2.08
131	HARWICH	(see pag		0000 and 1200	0600 and 1800	0000 and 1200	0600 and 1800	4.0	3.4	1.1	0.4	2.10
132	River Stour Mistley	51 57	1 05	+0025	+0025	0000	+0020	+0.2	0.0	-0.1	-0.1	⊙
133	River Orwell Ipswich	52 03	1 10	+0015	+0025	0000	+0010	+0.2	0.0	-0.1	-0.1	2.44 c

SEASONAL CHANGES IN MEAN LEVEL

No. Jan. 1 Feb. 1 Mar. 1 Apr. 1 May 1 June 1 July 1 Aug. 1 Sep. 1 Oct. 1 Nov. 1 Dec. 1 Jan. 1

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Negligible

ENGLAND, EAST COAST

No.	PLACE	Lat. N.	Long. E.	TIME DIFFERENCES				HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.
				High Water (Zone G.M.T.)	Low Water	MHWS	MHWN	MLWN	MLWS			
129	WALTON-ON-THE-NAZE	(see page		0100 and 1300	0700 and 1900	0100 and 1300	0700 and 1900	4.2	3.4	1.1	0.4	
133a	Felixstowe Pier	51 57	1 21	-0005	-0007	-0018	-0020	-0.5	-0.4	0.0	0.0	2.09
	<i>River Deben</i>											
134	Woodbridge Haven	51 59	1 24	0000	-0005	-0020	-0025	-0.5	-0.5	-0.1	+0.1	⊙
134a	Woodbridge	52 05	1 19	+0045	+0025	+0025	-0020	-0.2	-0.3	-0.2	0.0	⊙
135	Bawdsey	52 00	1 26	-0010	-0012	-0028	-0032	-0.8	-0.7	-0.2	-0.2	1.86
	<i>Orford Haven</i>											
136	Bar	52 03	1 29	-0015	-0017	-0038	-0042	-1.0	-0.8	-0.2	-0.1	1.79
136a	Orford Quay	52 05	1 32	+0040	+0040	+0055	+0055	-1.6	-1.3	+0.2	0.0	1.6 ax
136b	Slaughden	52 08	1 36	+0100	+0100	+0115	+0115	-1.3	-1.0	+0.2	0.0	1.6 ax
136c	Iken Cliff	52 09	1 31	+0130	+0130	+0155	+0155	-1.3	-1.0	+0.2	0.0	1.6 ax
136d	Snape	52 10	1 30	+0200	+0200	⊙	⊙	-1.3	-1.0	-0.3	+0.4	1.6 ax
141	LOWESTOFT	(see page 18)		0300 and 1500	0900 and 2100	0200 and 1400	0800 and 2000	2.4	2.1	1.0	0.5	
137	Orfordness	52 05	1 35	+0135	+0135	+0135	+0125	+0.4	+0.6	-0.1	0.0	⊙
139	Aldeburgh	52 09	1 36	+0120	+0120	+0120	+0110	+0.4	+0.6	0.0	0.0	1.52
139a	Sizewell	52 13	1 37	+0047	+0047	+0032	+0032	0.0	-0.1	-0.2	-0.2	1.4
140	Southwold	52 19	1 41	+0035	+0035	+0040	+0030	+0.1	+0.1	-0.1	-0.1	1.32
141	LOWESTOFT	52 28	1 45	STANDARD PORT				See Table V				1.56
	<i>Great Yarmouth</i>											
142	Gorleston	52 34	1 44	-0035	-0035	-0030	-0030	0.0	-0.1	0.0	0.0	1.46 *
143	Caister	52 39	1 44	-0130	-0130	-0100	-0100	0.0	-0.1	0.0	0.0	1.64 *
144	Winterton	52 43	1 42	-0225	-0215	-0135	-0135	+0.8	+0.5	+0.2	+0.1	1.81 *
173	IMMINGHAM	(see page 5)		0100 and 1300	0700 and 1900	0100 and 1300	0700 and 1900	7.3	5.8	2.6	0.9	
154	Cromer	52 56	1 18	+0056	+0056	+0104	+0104	-2.0	-1.6	-0.7	-0.3	2.97
155	Blakeney Bar	52 59	0 59	+0031	+0031	+0031	+0031	-1.6	-1.3	⊙	⊙	⊙
155a	Blakeney	52 57	1 01	+0050	+0050	+0130	+0130	-4.2	-3.7	⊙	⊙	⊙
157	Wells Bar	52 59	0 49	+0022	+0022	+0022	+0022	-1.3	-1.0	⊙	⊙	⊙
157a	Wells	52 57	0 51	+0102	+0102	+0130	+0130	-3.7	-3.5	†	†	⊙
	<i>The Wash</i>											
161	Hunstanton	52 56	0 29	+0020	+0020	+0105	+0025	0.0	-0.1	-0.1	0.0	3.80
161a	West Stones	52 50	0 21	+0025	+0025	+0115	+0040	-0.3	-0.4	-0.3	+0.2	3.8 x
162	King's Lynn	52 45	0 24	+0030	+0030	+0305	+0140	-0.5	-0.8	-0.8	+0.1†	3.56 c
164	Wisbech Cut	52 48	0 13	+0020	+0025	+0200	+0030	-0.3	-0.7	-0.4	⊙	⊙
164a	Lawyers Sluice	52 53	0 05	+0010	+0020	⊙	⊙	-0.3	-0.6	⊙	⊙	⊙
165	Tab's Head	52 56	0 05	0000	+0005	+0125	+0020	+0.2	-0.2	-0.2	-0.2	3.82
166	Boston	N. 52 58 W. 0 01	0 01	0000	+0010	+0140	+0050	-0.5	-1.0	-0.9	-0.5	3.31 c
167	Skegness	N. 53 09 E. 0 21	0 21	+0010	+0015	+0030	+0020	-0.4	-0.5	-0.1	0.0	4.11
168	Inner Dowsing Light Tower	53 20	0 34	0000	0000	+0010	+0010	-0.9	-0.7	-0.1	+0.3	3.8 x
	<i>River Humber</i>											
171	Bull Sand Fort	53 34	0 04	-0020	-0030	-0035	-0015	-0.4	-0.3	+0.1	+0.2	4.03
172	Grimsby	N. 53 35 W. 0 04	0 04	-0003	-0011	-0015	-0002	-0.3	-0.2	0.0	+0.1	⊙
173	IMMINGHAM	53 38	0 11	STANDARD PORT				See Table V				4.17
174	Kingston upon Hull	53 44	0 21	+0005	+0015	+0010	+0020	+0.2	0.0	-0.2	-0.2	4.16
	<i>River Trent</i>											
174a	Burton Stather	53 39	0 42	+0105	+0045	+0335	+0305	-2.1	-2.3	-2.3	§	1.97 *c
174b	Keadby	53 36	0 44	+0135	+0125	+0415	+0355	-2.7	-3.1	§	§	⊙ x
	<i>River Ouse</i>											
175	Blacktoft	53 42	0 43	+0055	+0050	+0310	+0255	-1.6	-1.9	-2.0	-0.9	2.27 x
176	Goole	53 42	0 52	+0130	+0115	+0355	+0350	-1.6	-2.1	-1.9	-0.6	2.41 x

⊙ No data.

† The tide does not normally fall below this level.

‡ The tide does not normally fall below Chart Datum.

* See notes on page 344.

§ Dries out except for river water.

a Data approximate.

c For intermediate heights, use harmonic constants (see Part III) and N.P.159.

x M.L. inferred.

ENGLAND, EAST COAST; AND SCOTLAND, EAST COAST

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES High Water Low Water (Zone G.M.T.)				HEIGHT DIFFERENCES (IN METRES) MHWS MHWN MLWN MLWS				M.L. Z ₀ m.
				0000 and 1200	0600 and 1800	0000 and 1200	0600 and 1800					
185	RIVER TEES ENTRANCE	(see page)						5.5	4.3	2.0	0.9	
181	Bridlington	54 05	0 11	+0100	+0050	+0055	+0050	+0.6	+0.4	+0.3	+0.2	3.56
182	Filey Bay	54 13	0 16	+0042	+0042	+0047	+0034	+0.3	+0.6	+0.4	+0.1	⊙
183	Scarborough	54 17	0 23	+0040	+0040	+0030	+0030	+0.2	+0.3	+0.3	0.0	3.47
184	Whitby	54 29	0 37	+0014	+0014	+0011	+0011	-0.1	0.0	0.0	-0.1	3.13
185	RIVER TEES ENTRANCE	54 38	1 09	STANDARD PORT				See Table V				3.17
<i>River Tees</i>												
186	Middlesbrough (Dock Entrance)	54 35	1 13	0000	+0002	0000	-0003	+0.1	+0.2	+0.1	-0.1	⊙
187	Tees Bridge (Newport)	54 34	1 16	-0002	+0004	+0005	-0003	+0.1	+0.2	0.0	-0.1	⊙
188	Hartlepool	54 41	1 11	-0010	-0010	-0007	-0007	-0.4	-0.3	-0.2	-0.1	2.98
189	Seaham	54 50	1 19	-0015	-0015	-0015	-0015	-0.3	-0.2	0.0	-0.2	⊙
190	Sunderland	54 55	1 21	-0017	-0017	-0016	-0016	-0.3	-0.1	0.0	-0.1	2.94
202	RIVER TYNE (NORTH SHIELDS)	(see page 20)		0200 and 1400	0800 and 2000	0100 and 1300	0800 and 2000	5.0	3.9	1.8	0.7	
<i>River Tyne</i>												
201	Entrance	55 00	1 24	+0005	+0005	-0005	-0005	+0.1	0.0	0.0	+0.1	2.85
202	NORTH SHIELDS	55 00	1 26	STANDARD PORT				See Table V				2.91
203	Newcastle-upon-Tyne	54 58	1 36	+0003	+0003	+0008	+0008	+0.3	+0.2	+0.1	+0.1	⊙
204	Blyth	55 07	1 29	+0005	-0007	-0001	+0009	0.0	0.0	-0.1	+0.1	2.80
205	Coquet Road	55 20	1 32	-0010	-0010	-0020	-0020	+0.1	+0.1	0.0	+0.1	⊙
206	Amble	55 20	1 34	-0023	-0015	-0023	-0014	0.0	+0.2	+0.2	+0.1	3.10
207	North Sunderland (Northumberland)	55 34	1 38	-0048	-0044	-0058	-0102	-0.2	-0.2	-0.2	0.0	⊙
208	Holy Island	55 40	1 47	-0043	-0039	-0105	-0110	-0.2	-0.2	-0.3	-0.1	⊙
209	Berwick	55 47	2 00	-0053	-0053	-0109	-0109	-0.3	-0.1	-0.5	-0.1	2.53
225	LEITH	(see page)		0300 and 1500	0900 and 2100	0300 and 1500	0900 and 2100	5.6	4.5	2.1	0.8	
Scotland												
221	Eyemouth	55 52	2 05	-0015	-0025	-0014	-0004	-0.9	-0.8	⊙	⊙	⊙
222	Dunbar	56 00	2 31	-0005	-0010	+0010	+0017	-0.4	-0.3	-0.1	-0.1	3.00
223	Fidra	56 04	2 47	-0005	-0005	-0010	-0010	-0.4	-0.1	0.0	-0.2	3.01
224	Cockenzie	55 58	2 57	-0007	-0015	-0013	-0005	-0.2	0.0	⊙	⊙	⊙
225	LEITH	55 59	3 10	STANDARD PORT				See Table V				3.02
226	Granton	55 59	3 13	0000	0000	0000	0000	0.0	0.0	0.0	0.0	⊙
227	ROSYTH	(see page)		0300 and 1500	1000 and 2200	0300 and 1500	0900 and 2100	5.8	4.7	2.2	0.8	3.30
<i>River Forth</i>												
228	Grangemouth	56 02	3 41	+0025	+0010	-0052	-0015	-0.1	-0.2	-0.3	-0.3	2.91
229	Kincardine	56 04	3 43	+0015	+0030	-0030	-0030	0.0	-0.2	-0.5	-0.3	3.10
229a	Alloa	56 07	3 47	+0040	+0040	+0025	+0025	-0.2	-0.5	⊙	-0.7	2.8
229b	Stirling	56 07	3 50	+0101	+0111	+0438	+0438	-2.9	-3.1	-2.3	-0.7	1.06
225	LEITH	(see page)		0300 and 1500	0900 and 2100	0300 and 1500	0900 and 2100	5.6	4.5	2.1	0.8	
<i>Firth of Forth</i>												
230	Burntisland	56 03	3 14	+0002	-0002	-0002	-0004	0.0	0.0	0.0	0.0	2.94
232	Methil	56 11	3 00	-0006	-0012	-0007	-0001	-0.1	-0.1	-0.1	-0.1	3.0
233	Anstruther Easter	56 13	2 42	-0010	-0035	-0020	-0020	-0.1	-0.1	-0.1	-0.1	3.05

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
129-137	Negligible												
139-144	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	0.0	0.0
154-174	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	+0.1	+0.1	0.0	0.0
174a-176	+0.1	+0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1
181-233	+0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1

SCOTLAND, EAST COAST; ORKNEY ISLANDS

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES				HEIGHT DIFFERENCES (IN METRES)				M.L. Z _m .
				High Water (Zone G.M.T.)	Low Water	MHWS	MHWN	MLWN	MLWS			
244	ABERDEEN	(see page 36)		0000 and 1200	0600 and 1800	0100 and 1300	0700 and 1900	4.3	3.4	1.6	0.6	
	<i>River Tay</i>											
235	Bar	56 27	2 38	+0100	+0057	+0100	+0110	+0.9	+0.8	+0.3	+0.1	⊙
236	Dundee	56 27	2 58	+0132	+0129	+0125	+0150	+1.0	+0.9	+0.3	+0.1	3.09
236a	Newburgh	56 21	3 14	+0212	+0203	+0249	+0337	-0.2	-0.4	-1.1	-0.5	⊙
236b	Perth	56 24	3 27	+0217	+0225	+0512	+0528	-0.9	-1.4	-1.2	-0.3	⊙
241	Arbroath	56 33	2 35	+0056	+0037	+0034	+0055	+0.7	+0.7	+0.2	+0.1	2.94
242	Montrose	56 42	2 27	+0100	+0100	+0030	+0040	+0.5	+0.5	+0.3	+0.1	2.8
243	Stonehaven	56 58	2 12	+0013	+0008	+0013	+0009	+0.2	+0.2	+0.1	0.0	2.64
244	ABERDEEN	57 09	2 05	STANDARD PORT				See Table V				2.51
245	Peterhead	57 30	1 46	-0035	-0045	-0035	-0040	-0.5	-0.3	-0.1	-0.1	⊙
246	Fraserburgh	57 41	2 00	-0045	-0115	-0110	-0045	-0.4	-0.3	-0.1	0.0	⊙
244	ABERDEEN	(see page 36)		0200 and 1400	0900 and 2100	0400 and 1600	0900 and 2100	4.3	3.4	1.6	0.6	
247	Banff	57 40	2 31	-0100	-0150	-0150	-0050	-0.8	-0.6	-0.5	-0.2	⊙
247a	Whitehills	57 41	2 35	-0122	-0137	-0117	-0127	-0.4	-0.3	+0.1	+0.1	2.36
248	Buckie	57 40	2 58	-0130	-0145	-0125	-0140	-0.2	-0.2	0.0	+0.1	2.42
249	Lossiemouth	57 43	3 18	-0125	-0200	-0130	-0130	-0.2	-0.2	0.0	0.0	⊙
250	Burghhead	57 42	3 29	-0120	-0150	-0135	-0120	-0.2	-0.2	0.0	0.0	2.19
253	Nairn	57 36	3 52	-0120	-0150	-0135	-0130	0.0	-0.1	0.0	+0.1	2.23
254	McDermott Base	57 36	3 59	-0110	-0140	-0120	-0115	-0.1	-0.1	+0.1	+0.3	2.48
244	ABERDEEN	(see page 36)		0300 and 1500	1000 and 2200	0000 and 1200	0700 and 1900	4.3	3.4	1.6	0.6	
	<i>Inverness Firth</i>											
255	Fortrose	57 35	4 08	-0125	-0125	-0125	-0125	0.0	0.0	⊙	⊙	⊙
256	Inverness	57 30	4 15	-0050	-0150	-0200	-0105	+0.5	+0.3	+0.2	+0.1	2.66
	<i>Cromarty Firth</i>											
258	Cromarty	57 41	4 02	-0120	-0155	-0155	-0120	0.0	0.0	+0.1	+0.2	2.46
259	Invergordon	57 41	4 10	-0105	-0200	-0200	-0110	+0.1	+0.1	+0.1	+0.1	2.41
260	Dingwall	57 36	4 25	-0045	-0145	⊙	⊙	+0.1	+0.2	⊙	⊙	⊙
244	ABERDEEN	(see page 36)		0300 and 1500	0800 and 2000	0200 and 1400	0800 and 2000	4.3	3.4	1.6	0.6	
	<i>Dornoch Firth</i>											
261	Portmahomack	57 50	3 50	-0120	-0210	-0140	-0110	-0.2	-0.1	+0.1	+0.1	⊙
262	Meikle Ferry	57 51	4 08	-0100	-0140	-0120	-0055	+0.1	0.0	-0.1	0.0	⊙
264	Golspie	57 58	3 59	-0130	-0215	-0155	-0130	-0.3	-0.3	-0.1	0.0	⊙
267	Wick	58 26	3 05	-0155	-0220	-0210	-0220	-0.9	-0.7	-0.2	-0.1	1.97
268	Duncansby Head	58 39	3 03	-0320	-0320	-0320	-0320	-1.2	-1.0	⊙	⊙	⊙
244	ABERDEEN	(see page 36)		0300 and 1500	1100 and 2300	0200 and 1400	0900 and 2100	4.3	3.4	1.6	0.6	
	<i>Orkney Islands</i>											
270	Muckle Skerry	58 41	2 55	-0230	-0230	-0230	-0230	-1.7	-1.4	-0.6	-0.2	⊙
271	Burravness	58 51	2 52	-0200	-0200	-0155	-0155	-1.0	-0.9	-0.3	0.0	⊙
272	Deer Sound	58 58	2 50	-0245	-0245	-0245	-0245	-1.1	-0.9	-0.3	0.0	⊙
273	Kirkwall	58 59	2 58	-0305	-0245	-0305	-0250	-1.4	-1.2	-0.5	-0.2	1.71
275	Kettletoft Pier	59 14	2 36	-0230	-0230	-0225	-0225	-1.1	-0.9	-0.3	0.0	1.9
277	Pierowall	59 19	2 58	-0355	-0355	-0355	-0355	-0.6	-0.6	-0.2	0.0	⊙
279	Eynhallow Sound	59 08	3 05	-0400	-0400	-0355	-0355	-0.6	-0.6	-0.2	-0.1	⊙
280	Stromness	58 58	3 18	-0430	-0355	-0415	-0420	-0.7	-0.8	-0.1	-0.1	2.05
282	Widewall Bay	58 49	3 01	-0400	-0400	-0400	-0400	-0.7	-0.7	-0.3	-0.2	⊙

⊙ No data.
 * See notes on page 344.
 c For intermediate heights, use harmonic constants (see Part III) and N.P.159.
 x M.L. inferred.

SHETLAND ISLANDS; SCOTLAND, NORTH COAST; OUTER HEBRIDES

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES				HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.
				High	Water	Low	Water	MHWS	MHWN	MLWN	MLWS	
				0000 and 1200	0600 and 1800	0100 and 1300	0800 and 2000					
287	LERWICK	(see page 36)						2.2	1.6	0.9	0.5	
285	Fair Isle	59 33	1 38	-0020	-0025	-0020	-0035	0.0	+0.1	0.0	-0.1	1.40
<i>Shetland Islands</i>												
285a	Sumburgh	59 53	1 16	+0002	+0002	+0005	+0005	-0.5	-0.3	-0.2	-0.2	1.0 x
287	LERWICK	60 09	1 08	STANDARD PORT				See Table V				1.29
288	Dury Voe	60 21	1 10	-0015	-0015	-0010	-0010	+0.1	+0.2	0.0	0.0	1.24
289	Out Skerries	60 25	0 45	-0025	-0025	-0010	-0010	+0.1	+0.1	0.0	0.0	1.28
289a	Toft Pier	60 28	1 12	-0105	-0100	-0125	-0115	+0.1	+0.1	-0.2	-0.2	1.23
290	Burra Voe (Yell Sound)	60 30	1 03	-0025	-0025	-0025	-0025	+0.2	+0.2	0.0	0.0	1.31
290a	Mid Yell	60 36	1 03	-0030	-0020	-0035	-0025	+0.2	+0.2	+0.1	0.0	1.52
290b	Balta Sound	60 45	0 50	-0055	-0055	-0045	-0045	+0.1	+0.2	0.0	-0.1	1.32
291	Burra Firth	60 48	0 52	-0110	-0110	-0115	-0115	+0.3	+0.3	0.0	0.0	⊙
292	Bluemull Sound	60 42	1 00	-0135	-0135	-0155	-0155	+0.4	+0.3	+0.1	0.0	⊙
293	Sullom Voe	60 27	1 18	-0135	-0125	-0135	-0120	+0.1	+0.3	0.0	-0.2	1.32
294	Hillswick	60 20	1 20	-0220	-0220	-0200	-0200	0.0	0.0	-0.1	0.0	⊙
295	Scalloway	60 08	1 16	-0150	-0150	-0150	-0150	-0.6	-0.3	-0.3	0.0	⊙
296	Quendale Bay	59 54	1 20	-0025	-0025	-0030	-0030	-0.4	-0.1	-0.2	0.0	1.14
296a	Foula	60 07	2 03	-0140	-0130	-0140	-0120	-0.2	-0.1	-0.1	-0.1	1.23
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244	ABERDEEN	(see page 36)		0300 and 1500	1000 and 2200	0100 and 1300	0800 and 2000	4.3	3.4	1.6	0.6	
297	Stroma	58 40	3 08	-0320	-0320	-0320	-0320	-1.2	-1.1	-0.3	-0.1	⊙
298	Scrabster	58 37	3 33	-0455	-0510	-0500	-0445	+0.7	+0.3	+0.5	+0.2	2.94
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334	ULLAPOOL	(see page 38)		0100 and 1300	0700 and 1900	0300 and 1500	0900 and 2100	5.2	3.9	2.1	0.7	
299	Sule Skerry	59 05	4 24	+0100	+0120	+0110	+0100	-1.2	-0.9	-0.4	-0.1	2.3 x
<i>Loch Eriboll</i>												
300	Portnancoon	58 30	4 42	+0055	+0105	+0055	+0100	0.0	+0.1	+0.1	+0.2	3.02
301	Kyle of Durness	58 36	4 47	+0030	+0030	+0050	+0050	-0.6	-0.4	-0.3	-0.1	⊙
304	Rona	59 08	5 49	+0010	+0030	+0010	+0030	-1.8	-1.4	-0.8	-0.3	1.73
<i>Hebrides</i>												
308	Stornoway	58 12	6 23	-0010	-0010	-0010	-0010	-0.4	-0.2	-0.1	0.0	2.86
309	Loch Shell	58 00	6 25	-0023	-0010	-0010	-0027	-0.4	-0.3	-0.2	0.0	2.75
310	E. Loch Tarbert	57 54	6 48	-0035	-0020	-0020	-0030	-0.2	-0.2	0.0	+0.1	2.93
311	Loch Maddy	57 36	7 06	-0054	-0024	-0026	-0040	-0.4	-0.3	-0.2	0.0	⊙
311a	Loch Carnan	57 22	7 16	-0100	-0020	-0030	-0050	-0.7	-0.7	-0.2	-0.1	2.5 x
312	Loch Skipport	57 20	7 16	-0110	-0035	-0034	-0034	-0.6	-0.6	-0.4	-0.2	⊙
313	Loch Boisdale	57 09	7 16	-0105	-0030	-0035	-0045	-0.9	-0.9	-0.5	-0.2	⊙
314	Barra (North Bay)	57 00	7 24	-0113	-0041	-0044	-0058	-1.0	-0.7	-0.3	-0.1	⊙
314a	Castle Bay	56 57	7 20	-0125	-0050	-0055	-0110	-0.9	-0.8	-0.4	-0.1	2.35
316	Barra Head	56 47	7 38	-0125	-0050	-0055	-0105	-1.2	-0.9	-0.3	+0.1	⊙
317	Shillay	57 31	7 41	-0113	-0053	-0057	-0117	-1.0	-0.9	-0.8	-0.3	⊙
318	Balivanich	57 29	7 23	-0113	-0027	-0041	-0055	-1.1	-0.8	-0.6	-0.2	⊙
318a	Scolpaig	57 39	7 29	-0046	-0046	-0049	-0049	-1.3	-0.9	-0.5	0.0	2.3 x
319	Leverburgh	57 46	7 01	-0051	-0030	-0025	-0035	-0.6	-0.4	-0.2	-0.1	2.59
320	W. Loch Tarbert	57 55	6 55	-0103	-0043	-0024	-0044	-1.0	-0.7	-0.8	-0.3	2.13
321	Little Bernera	58 16	6 52	-0031	-0021	-0027	-0037	-0.9	-0.8	-0.5	-0.2	⊙
321a	Carloway	58 17	6 47	-0050	+0010	-0045	-0025	-1.0	-0.7	-0.5	-0.1	2.33

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
235-246	+0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1
247-260	+0.1	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1
261-298	+0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	+0.1	+0.1	+0.1
299-334	+0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1

OUTLYING ISLANDS; SCOTLAND, WEST COAST

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES				HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.
				High Water (Zone U.T. (G.M.T.))	Low Water	MHWS	MHWN	MLWN	MLWS			
334	ULLAPOOL	(see page 33)		0000 and 1200	0600 and 1800	0300 and 1500	0900 and 2100	5.2	3.9	2.1	0.7	
322	<i>St. Kilda</i> Village Bay	57 48	8 34	-0110	-0040	-0100	-0100	-1.9	-1.4	-0.9	-0.3	1.91
323	Flannan Isles	58 16	7 36	-0036	-0026	-0026	-0036	-1.3	-0.9	-0.7	-0.2	⊙
324	Rockall	57 36	13 41	-0241	-0231	-0231	-0241	-3.2	-2.4	⊙	⊙	1.6 x
327	Loch Bervie	58 27	5 03	+0030	+0010	+0010	+0020	-0.3	-0.3	-0.2	0.0	2.70
328	Loch Laxford	58 24	5 05	+0015	+0015	+0005	+0005	-0.3	-0.4	-0.2	0.0	2.7 x
	<i>Eddrachillis Bay</i>											
329	Badcall Bay	58 19	5 08	+0005	+0005	+0005	+0005	-0.7	-0.5	-0.5	+0.2	⊙
330	Loch Nedd	58 14	5 10	0000	0000	0000	0000	-0.3	-0.2	-0.2	0.0	⊙
332	Loch Inver	58 09	5 18	-0005	-0005	-0005	-0005	-0.2	0.0	0.0	+0.1	3.05
	<i>Summer Isles</i>											
333	Tanera Mor	58 01	5 24	-0005	-0005	-0010	-0010	-0.1	+0.1	0.0	+0.1	⊙
	<i>Loch Broom</i>											
334	ULLAPOOL	57 54	5 10	STANDARD PORT				Sec Table V				3.02
	<i>Loch Eive</i>											
336	Mellon Charles	57 51	5 38	-0010	-0010	-0010	-0010	-0.1	-0.1	-0.1	0.0	2.94
	<i>Loch Gairloch</i>											
337	Gairloch	57 43	5 41	-0020	-0020	-0010	-0010	0.0	+0.1	-0.3	-0.1	⊙
	<i>Loch Torridon</i>											
338	Sheildag	57 31	5 39	-0020	-0020	-0015	-0015	+0.4	+0.3	+0.1	0.0	⊙
	<i>Inner Sound</i>											
338a	Applecross	57 26	5 48	-0020	-0015	-0005	-0025	+0.1	+0.1	+0.1	0.0	3.06
	<i>Loch Carron</i>											
339	Plockton	57 20	5 39	-0020	-0020	-0010	-0010	+0.3	+0.2	+0.1	+0.1	⊙
	<i>Skye</i>											
341	Broadford Bay	57 15	5 54	-0035	-0020	-0025	-0030	+0.3	+0.2	+0.1	-0.1	3.20
342	Portree	57 24	6 11	-0025	-0025	-0025	-0025	+0.1	-0.2	-0.2	0.0	⊙
343	Loch Snizort (Uig Bay)	57 35	6 22	-0045	-0020	-0005	-0025	+0.1	-0.4	-0.2	0.0	3.03
344	Loch Dunvegan	57 27	6 38	-0105	-0030	-0020	-0040	0.0	-0.1	0.0	0.0	⊙
345	Loch Harport	57 20	6 25	-0115	-0035	-0020	-0100	-0.1	-0.1	0.0	+0.1	⊙
	<i>Soay</i>											
346	Camus nan Gall	57 09	6 13	-0055	-0025	-0025	-0045	-0.4	-0.2	⊙	⊙	⊙
	<i>Loch Alsh</i>											
349	Kyle of Lochalsh	57 17	5 43	-0040	-0020	-0005	-0025	+0.1	0.0	+0.1	+0.1	3.06 c
349a	Dornie Bridge	57 17	5 31	-0040	-0010	-0005	-0020	+0.1	-0.1	0.0	0.0	2.98 c
	<i>Kyle Rhea</i>											
351	Glenelg Bay	57 13	5 38	-0105	-0034	-0034	-0054	-0.4	-0.4	-0.9	-0.1	⊙
352	Loch Hourn	57 06	5 34	-0125	-0050	-0040	-0110	-0.2	-0.1	-0.1	+0.1	2.93
	<i>OBAN</i>											
372	OBAN			0000 and 1200	0600 and 1800	0100 and 1300	0700 and 1900	4.0	2.9	1.8	0.7	
	<i>Loch Nevis</i>											
353	Inverie Bay	57 02	5 41	+0030	+0020	+0035	+0020	+1.0	+0.9	+0.2	0.0	⊙
353a	Mallaig	57 00	5 50	+0040	+0020	+0035	+0030	+1.0	+0.9	+0.3	0.0	⊙
	<i>Eigg</i>											
354	Bay of Laig	56 55	6 10	+0015	+0030	+0040	+0005	+0.7	+0.6	-0.2	-0.2	⊙
355	Loch Moidart	56 47	5 53	+0015	+0015	+0040	+0020	+0.8	+0.6	-0.2	-0.2	⊙
	<i>Coll</i>											
356	Loch Eatharna	56 37	6 31	+0025	+0010	+0015	+0025	+0.4	+0.3	⊙	⊙	⊙
	<i>Tiree</i>											
357	Gott Bay	56 31	6 48	+0015	0000	0000	+0015	+0.1	+0.1	-0.1	-0.1	2.42

⊙ No data.

* See notes on page 344.

c For intermediate heights, use harmonic constants (see Part III) and N.P.159.

x M.L. inferred.

SCOTLAND, WEST COAST

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES				HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.	
				High Water	Low Water	MHWS	MHWN	MLWN	MLWS				
				0100 and 1300	0700 and 1900	0100 and 1300	0800 and 2000	4.0	2.9	1.8	0.7		
372	OBAN												
<i>Mull</i>													
359	Carsaig Bay	56 19	5 59	-0015	-0005	-0030	+0020	+0.1	+0.2	0.0	-0.1	⊙	
360	Iona	56 19	6 23	-0010	-0005	-0020	+0015	0.0	+0.1	-0.3	-0.2	2.36	
361	Bunessan	56 19	6 14	-0015	-0015	-0010	-0015	+0.3	+0.1	0.0	-0.1	⊙	
362	Ulva Sound	56 29	6 08	-0010	-0015	0000	-0005	+0.4	+0.3	0.0	-0.1	⊙	
363	<i>Loch Sunart</i> Salen	56 42	5 47	-0015	+0015	+0010	+0005	+0.6	+0.5	-0.1	-0.1	2.53	c
<i>Sound of Mull</i>													
364	Tobermory	56 37	6 04	+0025	+0010	+0015	+0025	+0.4	+0.4	0.0	0.0	2.55	
364a	Salen	56 32	5 56	+0045	+0015	+0020	+0030	+0.2	+0.2	-0.1	0.0	2.43	
365	Loch Aline	56 32	5 46	⊙	+0012	+0012	⊙	+0.5	+0.3	⊙	⊙	⊙	
365a	Craignure	56 28	5 42	+0030	+0005	+0010	+0015	0.0	+0.1	-0.1	-0.1	2.38	
<i>Loch Linnhe</i>													
367	Corran	56 43	5 14	+0007	+0007	+0004	+0004	+0.4	+0.4	-0.1	0.0	⊙	
368	Corpach	56 50	5 07	+0022	+0022	+0020	+0020	+0.1	+0.2	+0.1	+0.2	2.5	x
368a	Loch Eil Head	56 51	5 20	+0046	+0046	+0045	+0045	⊙	⊙	⊙	⊙	⊙	
369	Loch Leven Head	56 43	5 00	+0045	+0045	+0045	+0045	⊙	⊙	⊙	⊙	⊙	
<i>Loch Linnhe</i>													
370	Port Appin	56 33	5 25	-0005	-0005	-0030	0000	+0.2	+0.2	+0.1	+0.1	2.35	
<i>Loch Creran</i>													
370a	Barcaldine Pier	56 32	5 19	+0010	+0020	+0040	+0015	+0.1	+0.1	0.0	+0.1	⊙	
370b	Loch Creran Head	56 33	5 16	+0015	+0025	+0120	+0020	-0.3	-0.3	-0.4	-0.3	⊙	
<i>Loch Etive</i>													
371	Dunstaffnage Bay	56 27	5 26	+0005	0000	0000	+0005	+0.1	+0.1	+0.1	+0.1	⊙	
371a	Connel	56 27	5 24	+0020	+0005	+0010	+0015	-0.3	-0.2	-0.1	+0.1	⊙	
371b	Bonawe	57 27	5 13	+0150	+0205	+0240	+0210	-2.0	-1.7	-1.3	-0.5	1.2	x
372	OBAN	56 25	5 29	STANDARD PORT				See Table V				2.40	
373	Seil Sound	56 18	5 35	-0035	-0015	-0040	-0015	-1.3	-0.9	-0.7	-0.3	1.39	
<i>Colonsay</i>													
374	Scalasaig	56 04	6 10	-0020	-0005	-0015	+0005	-0.1	-0.2	-0.2	-0.2	⊙	
<i>Jura</i>													
375	Glengarrisdale Bay	56 06	5 47	-0020	0000	-0010	0000	-0.4	-0.2	0.0	-0.2	2.13	
372	OBAN			0100 and 1300	0700 and 1900	0000 and 1200	0700 and 1900	4.0	2.9	1.8	0.7		
<i>Islay</i>													
377	Rubha A'Mhail	55 56	6 07	-0020	0000	+0005	-0015	-0.3	-0.1	-0.3	-0.1	2.11	
378	Ardnave Point	55 52	6 20	-0035	+0010	0000	-0025	-0.4	-0.2	-0.3	-0.1	2.02	
379	Orsay Island	55 41	6 31	-0110	-0110	-0040	-0040	-1.4	-0.6	-0.5	-0.2	1.37	c
380	Bruichladdich	55 48	6 22	-0100	-0005	-0110	-0040	-1.7	-1.4	-0.4	+0.1	1.53	c
381	Port Ellen	55 38	6 11	-0530	-0050	-0045	-0530	-3.1	-2.1	-1.3	-0.4	0.57	*
382	Port Askaig	55 51	6 06	-0110	-0030	-0020	-0020	-1.9	-1.4	-0.8	-0.3	1.16	*
<i>Sound of Jura</i>													
383	Craighouse	55 50	5 57	-0430	-0130	-0050	-0500	-2.8	-2.0	-1.4	-0.4	0.42	*
384	Loch Beag	56 09	5 36	-0110	-0045	-0035	-0045	-1.6	-1.2	-0.8	-0.4	1.20	
387	Carsaig Bay	56 02	5 38	-0105	-0040	-0050	-0050	-2.1	-1.6	-1.0	-0.4	0.91	*
389	Gigha Sound	55 41	5 44	-0450	-0210	-0130	-0410	-2.5	-1.6	-1.0	-0.1	0.93	*
390	Machrihanish	55 25	5 45	-0520	-0350	-0340	-0540	Mean range 0.5 metres				1.02	*

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
322-390	+0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1

SCOTLAND, WEST COAST

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES				HEIGHT DIFFERENCES (IN METRES)				M.L. Z _m m.
				High Water (Zone G.M.T.)	Low Water	MHWS	MHWN	MLWN	MLWS			
404	GREENOCK	(see page 42)		0000 and 1200	0600 and 1800	0000 and 1200	0600 and 1800	3.4	2.9	1.0	0.4	
<i>Firth of Clyde</i>												
391	Southend, Kintyre	55 19	5 38	-0020	-0040	-0040	+0035	-1.3	-1.2	-0.5	-0.2	1.77
392	Sanda Island	55 17	5 35	-0040	-0040	⊙	⊙	-1.0	-0.9	⊙	⊙	⊙
393	Campbeltown	55 25	5 36	+0010	+0005	+0005	+0020	-0.5	-0.3	+0.1	+0.2	1.80
393a	Loch Ranza	55 43	5 18	-0015	-0005	-0005	-0010	-0.4	-0.3	-0.1	0.0	1.77
<i>Loch Fyne</i>												
394	East Loch Tarbert	55 52	5 24	+0005	+0005	-0020	+0015	0.0	0.0	+0.1	-0.1	1.77
395	Inverary	56 14	5 04	+0011	+0011	+0034	+0034	-0.1	+0.1	-0.5	-0.2	⊙
<i>Kyles of Bute</i>												
396	Rubha Bodach	55 55	5 09	-0020	-0010	-0007	-0007	-0.2	-0.1	+0.2	+0.2	1.78
396a	Tighnabruich	55 55	5 13	+0007	-0010	-0002	-0015	0.0	+0.2	+0.4	+0.5	2.08
<i>Firth of Clyde (cont.)</i>												
398	Millport	55 45	4 56	-0005	-0025	-0025	-0005	0.0	-0.1	0.0	+0.1	1.94
399	Rothesay Bay	55 51	5 03	-0020	-0015	-0010	-0002	+0.2	+0.2	+0.2	+0.2	1.90
399a	Wemyss Bay	55 53	4 53	-0005	-0005	-0005	-0005	0.0	0.0	+0.1	+0.1	⊙
<i>Loch Long</i>												
399b	Coulport	56 03	4 53	-0005	-0005	-0005	-0005	0.0	0.0	-0.1	-0.1	1.82
399c	Lochgoilhead	56 10	4 54	+0015	0000	-0005	-0005	-0.2	-0.3	-0.3	-0.3	1.71
401	Arrochar	56 12	4 45	-0005	-0005	-0005	-0005	0.0	0.0	-0.1	-0.1	⊙
<i>Gare Loch</i>												
402	Rosneath (Rhu Pier)	56 01	4 46	-0005	-0005	-0005	-0005	0.0	-0.1	0.0	0.0	2.02
402a	Shandon	56 03	4 49	-0005	-0005	-0005	-0005	0.0	0.0	0.0	-0.1	⊙
402b	Garelochhead	56 05	4 50	0000	0000	0000	0000	0.0	0.0	0.0	-0.1	⊙
<i>River Clyde</i>												
403	Helensburgh	56 00	4 44	0000	0000	0000	0000	0.0	0.0	0.0	0.0	⊙
404	GREENOCK	55 57	4 46	STANDARD PORT				See Table V				2.00
405	Port Glasgow	55 56	4 41	+0010	+0005	+0010	+0020	+0.2	+0.1	0.0	0.0	⊙
406	Bowling	55 56	4 29	+0020	+0010	+0030	+0055	+0.6	+0.5	+0.3	+0.1	⊙
406a	Renfrew	55 53	4 23	+0025	+0015	+0035	+0100	+0.9	+0.8	+0.5	+0.2	⊙
407	Glasgow	55 51	4 17	+0025	+0015	+0035	+0105	+1.3	+1.2	+0.6	+0.4	2.77
<i>Firth of Clyde (cont.)</i>												
408	Brodick Bay	55 35	5 08	0000	0000	+0005	+0005	-0.2	-0.2	0.0	0.0	1.86
409	Lamlash	55 32	5 07	-0016	-0036	-0024	-0004	-0.2	-0.2	⊙	⊙	⊙
410	Ardrossan	55 38	4 49	-0020	-0010	-0010	-0010	-0.2	-0.2	+0.1	+0.1	1.86
411	Irvine	55 36	4 41	-0020	-0020	-0030	-0010	-0.3	-0.3	-0.1	0.0	⊙
412	Troon	55 33	4 41	-0025	-0025	-0020	-0020	-0.2	-0.2	0.0	0.0	1.91
413	Ayr	55 28	4 39	-0025	-0025	-0030	-0015	-0.4	-0.3	+0.1	+0.1	⊙
414	Girvan	55 15	4 52	-0025	-0040	-0035	-0010	-0.3	-0.3	-0.1	0.0	1.82
<i>Loch Ryan</i>												
414a	Stranraer	54 55	5 03	-0020	-0020	-0017	-0017	-0.4	-0.4	-0.4	-0.2	⊙
452	LIVERPOOL	(see page 46)		0000 and 1200	0600 and 1800	0200 and 1400	0800 and 2000	9.3	7.4	2.9	0.9	
415	Portpatrick	54 50	5 07	+0018	+0026	0000	-0035	-5.5	-4.4	-2.0	-0.6	2.08
<i>Wigtown Bay</i>												
420	Drummore	54 41	4 53	+0030	+0040	+0015	+0020	-3.4	-2.5	-0.9	-0.3	3.32
420a	Port William	54 43	4 40	+0030	+0030	+0025	0000	-2.9	-2.2	-0.8	⊙	⊙
421	Isle of Whithorn	54 42	4 22	+0020	+0025	+0025	+0005	-2.4	-2.0	-0.8	-0.2	3.74
422	Garliestown	54 47	4 21	+0025	+0035	+0030	+0005	-2.3	-1.7	-0.5	⊙	⊙
<i>Solway Firth</i>												
422a	Kirkcudbright Bay	54 48	4 04	+0015	+0015	+0010	0000	-1.8	-1.5	-0.5	-0.1	⊙
424	Hestan Islet	54 50	3 48	+0025	+0025	+0020	+0025	-1.0	-1.1	-0.5	0.0	4.21
425	Southernness Point	54 52	3 36	+0030	+0030	+0030	+0010	-0.7	-0.7	⊙	⊙	⊙
426	Annan Waterfoot	54 58	3 16	+0050	+0105	+0220	+0310	-2.2	-2.6	-2.7	↑	⊙ *
430	Torduff Point	54 58	3 09	+0105	+0140	+0520	+0410	-4.1	-4.9	↑	↑	⊙ *
431	Redkirk	54 59	3 06	+0110	+0215	+0715	+0445	-5.5	-6.2	↑	↑	⊙ *

⊙ No data.

§ Dries out except for river water.

↑ The tide does not normally fall below Chart Datum.

* See notes on page 344.

c For intermediate heights, use harmonic constants (see Part III) and N.P. 159.

x M.L. inferred.

ENGLAND, WEST COAST; ISLE OF MAN; WALES

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES				HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.	
				High Water	Low Water	MHWS	MHWN	MLWN	MLWS				
				0000 and 1200	0600 and 1800	0200 and 1400	0700 and 1900	9.3	7.4	2.9	0.9		
452	LIVERPOOL	(see pag. 56)		0000 and 1200	0600 and 1800	0200 and 1400	0700 and 1900	9.3	7.4	2.9	0.9		
England													
<i>Solway Firth</i>													
432	Silloth	54 52	3 24	+0030	+0040	+0045	+0055	-0.1	-0.3	-0.6	-0.1	⊙	
433	Maryport	54 43	3 30	+0017	+0032	+0020	+0005	-0.7	-0.8	-0.4	0.0	⊙	
434	Workington	54 39	3 34	+0020	+0020	+0020	+0010	-1.1	-1.0	-0.1	+0.3	4.42	
435	Whitehaven	54 33	3 30	+0005	+0015	+0010	+0005	-1.3	-1.1	-0.5	+0.1	4.53	
436	Tarn Point	54 17	3 25	+0005	+0005	+0010	0000	-1.0	-1.0	-0.4	0.0	⊙	
437	Duddon Bar	54 09	3 20	+0003	+0003	+0008	+0002	-0.8	-0.8	-0.3	0.0	⊙	
<i>Morecambe Bay</i>													
440	Barrow (Ramsden Dock)	54 06	3 12	+0015	+0015	+0020	+0020	-0.2	-0.3	-0.1	+0.1	4.97	
440a	Haws Point	54 03	3 10	+0010	+0010	+0010	+0010	-0.1	-0.3	-0.1	+0.1	4.89	
440b	Ulverston	54 11	3 04	+0020	+0040	⊙	⊙	0.0	-0.1	⊙	⊙	⊙	
440c	Arnside	54 12	2 51	+0100	+0135	⊙	⊙	+0.5	+0.2	⊙	⊙	⊙	
440d	Morecambe	54 04	2 52	+0005	+0010	+0030	+0015	+0.2	0.0	0.0	+0.2	⊙	
441	Heysham	54 02	2 55	+0005	+0005	+0015	0000	+0.1	0.0	0.0	+0.2	5.10	
<i>River Lune</i>													
442	Glasson Dock	54 00	2 51	+0020	+0030	+0220	+0240	-2.7	-3.0	⊙	⊙	⊙	
442a	Lancaster	54 03	2 49	+0110	+0030	⊙	⊙	-5.0	-4.9	⊙	⊙	⊙	
<i>River Wyre</i>													
443	Wyre Lighthouse	53 57	3 02	-0010	-0010	+0005	0000	-0.1	-0.1	⊙	⊙	⊙	
444	Fleetwood	53 56	3 00	0000	0000	+0005	0000	-0.1	-0.1	+0.1	+0.3	4.98	
445	Blackpool	53 49	3 04	-0015	-0005	-0005	-0015	-0.4	-0.4	-0.1	+0.1	⊙	
<i>River Ribble</i>													
446	Preston	53 46	2 45	+0010	+0010	+0335	+0310	-4.0	-4.1	-2.8	-0.8	⊙	*
<i>Liverpool Bay</i>													
447	Southport	53 39	3 01	-0020	-0010	⊙	⊙	-0.3	-0.3	⊙	⊙	⊙	
448	Formby	53 32	3 07	-0015	-0010	-0020	-0020	-0.3	-0.1	0.0	+0.1	5.15	
450	Rock Channel	53 27	3 07	-0030	-0030	-0030	-0030	-0.4	-0.2	-0.2	0.0	⊙	
<i>River Mersey</i>													
452	LIVERPOOL	53 25	3 00	STANDARD PORT				See Table V				5.14	
453	Eastham	53 19	2 57	+0003	+0006	+0015	+0030	+0.4	+0.3	-0.1	-0.1	5.3	x
455	Hale Head	53 19	2 48	+0030	+0025	⊙	⊙	-2.4	-2.5	⊙	⊙	⊙	
456	Widnes	53 21	2 44	+0040	+0045	+0400	+0345	-4.2	-4.4	-2.5	-0.3	⊙	
456a	Fiddler's Ferry	53 22	2 39	+0100	+0115	+0540	+0450	-5.9	-6.3	-2.4	-0.4	⊙	
<i>River Dee</i>													
461	Hilbre Island	53 23	3 13	-0015	-0012	-0010	-0015	-0.3	-0.2	+0.2	+0.4	5.14	
462	Mostyn Quay	53 19	3 16	-0020	-0015	-0020	-0020	-0.8	-0.7	⊙	⊙	⊙	
463	Connah's Quay	53 13	3 03	0000	+0015	+0355	+0340	-4.6	-4.4	⊙	⊙	⊙	*
464	Chester	53 12	2 54	+0105	+0105	+0500	+0500	-5.3	-5.4	⊙	⊙	⊙	*
<i>Isle of Man</i>													
466	Peel	54 14	4 42	-0015	+0010	0000	-0010	-4.0	-3.2	-1.4	-0.4	2.90	
467	Ramsey	54 19	4 22	-0003	+0012	0000	-0015	-2.1	-1.7	-0.3	+0.1	4.05	
468	Douglas	54 09	4 28	-0004	-0004	-0022	-0032	-2.4	-2.0	-0.5	-0.1	3.78	
468a	Port St. Mary	54 04	4 44	+0005	+0015	-0010	-0030	-3.4	-2.7	-1.2	-0.3	3.21	
469	Calf Sound	54 04	4 48	+0005	+0005	-0015	-0025	-3.2	-2.6	-0.9	-0.3	⊙	
469a	Port Erin	54 05	4 46	-0005	+0015	-0010	-0050	-4.1	-3.2	-1.3	-0.5	2.73	
Wales													
470	Colwyn Bay	53 18	3 43	-0035	-0025	⊙	⊙	-1.5	-1.3	⊙	⊙	⊙	
471	Llandudno	53 20	3 50	-0035	-0025	-0025	-0035	-1.9	-1.5	-0.5	-0.2	4.03	
478	HOLYHEAD	(see page)		0000 and 1200	0600 and 1800	0500 and 1700	1100 and 2300	5.7	4.5	2.0	0.7		
471a	Conwy	53 17	3 50	+0020	+0020	⊙	+0050	+2.1	+1.6	+0.3	⊙	⊙	
<i>Menai Strait</i>													
472	Beaumaris	53 16	4 05	+0025	+0010	+0055	+0035	+2.0	+1.6	+0.5	+0.1	4.22	
473	Menai Bridge	53 13	4 09	+0030	+0010	+0100	+0035	+1.7	+1.4	+0.3	0.0	4.05	
474	Port Dinorwic	53 11	4 13	-0015	-0025	+0030	0000	0.0	0.0	0.0	+0.1	3.38	

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
391-398	+0.1	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1
399-407	+0.2	+0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.2	+0.2
408-414a	+0.1	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1
415-444	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	0.0
445-464	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	0.0
466-478	+0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES (Zone U.T. (G.M.T.))				HEIGHT DIFFERENCES (IN METRES)				M.L. Z _n m.
				High Water 0000 and 1200	Low Water 0600 and 1800	Low Water 0500 and 1700	High Water 1100 and 2300	MHWS	MHWN	MLWN	MLWS	
478	HOLYHEAD							5.7	4.5	2.0	0.7	
475	Caernarvon	53 09	4 16	-0030	-0030	+0015	-0005	-0.4	-0.4	-0.1	-0.1	3.04
475a	Fort Belan	53 07	4 20	-0040	-0015	-0025	-0005	-1.0	-0.9	-0.2	-0.1	2.83
476	Trwyn Dinmor	53 19	4 03	+0025	+0015	+0050	+0035	+1.9	+1.5	+0.5	+0.2	4.23
476a	Moelfre	53 20	4 14	+0025	+0020	+0050	+0035	+1.9	+1.4	+0.5	+0.2	4.17
477	Amlwch	53 25	4 20	+0020	+0010	+0035	+0025	+1.6	+1.3	+0.5	+0.2	4.08
477a	Cemaes Bay	53 25	4 27	+0020	+0025	+0040	+0035	+1.0	+0.7	+0.3	+0.1	3.67
478	HOLYHEAD	53 19	4 37	STANDARD PORT				See Table V				3.21
479	Trearddur Bay	53 16	4 37	-0045	-0025	-0015	-0015	-0.4	-0.4	0.0	+0.1	3.08
479a	Porth Treacastell	53 12	4 30	-0045	-0025	-0005	-0015	-0.6	-0.6	0.0	0.0	2.97
480	Llanddwyn Island	53 08	4 25	-0115	-0055	-0030	-0020	-0.7	-0.5	-0.1	0.0	2.95
480a	Trevor	53 00	4 25	-0115	-0100	-0030	-0020	-0.8	-0.9	-0.2	-0.1	2.55
481	Porth Dinllaen	52 57	4 34	-0120	-0105	-0035	-0025	-1.0	-1.0	-0.2	-0.2	2.51
481a	Porth Ysgaden	52 54	4 39	-0125	-0110	-0040	-0035	-1.1	-1.0	-0.1	-0.1	2.45
482	Bardsey Island	52 46	4 47	-0220	-0240	-0145	-0140	-1.2	-1.2	-0.5	-0.1	⊙
496	MILFORD HAVEN	(see page 50)		0100 and 1300	0800 and 2000	0100 and 1300	0700 and 1900	7.0	5.2	2.5	0.7	
	<i>Cardigan Bay</i>											
482a	Aberdaron	52 48	4 43	+0210	+0200	+0240	+0310	-2.4	-1.9	-0.6	-0.2	2.55 cx
482b	St. Tudwal's Roads	52 49	4 29	+0155	+0145	+0240	+0310	-2.2	-1.9	-0.7	-0.2	2.52 c
483	Pwllheli	52 53	4 24	+0210	+0150	+0245	+0320	-2.0	-1.8	-0.6	-0.2	2.59 c
483a	Criccieth	52 55	4 14	+0210	+0155	+0255	+0320	-2.0	-1.8	-0.7	-0.3	2.56 c
484	Porthmadog	52 55	4 08	+0235	+0210	⊙	⊙	-1.9	-1.8	⊙	⊙	⊙
485	Barmouth	52 43	4 03	+0215	+0205	+0310	+0320	-2.0	-1.7	-0.7	0.0	2.64 c
486	Aberdovey	52 32	4 03	+0215	+0200	+0230	+0305	-2.0	-1.7	-0.5	0.0	2.61 c
487	Aberystwyth	52 24	4 05	+0145	+0130	+0210	+0245	-2.0	-1.7	-0.7	0.0	2.70 c
488	New Quay	52 13	4 21	+0150	+0125	+0155	+0230	-2.1	-1.8	-0.6	-0.1	⊙
488a	Aberporth	52 08	4 33	+0135	+0120	+0150	+0220	-2.1	-1.8	-0.6	-0.1	2.6 cx
489	Port Cardigan	52 07	4 42	+0140	+0120	+0220	+0130	-2.3	-1.8	-0.5	0.0	2.39
489a	Cardigan (Town)	52 05	4 40	+0220	+0150	⊙	⊙	-2.2	-1.6	⊙	⊙	⊙
490	Fishguard	52 00	4 58	+0115	+0100	+0110	+0135	-2.2	-1.8	-0.5	+0.1	2.52
491	Porthgain	51 57	5 11	+0055	+0045	+0045	+0100	-2.5	-1.8	-0.6	0.0	2.65
492	Ramsey Sound	51 53	5 19	+0030	+0030	+0030	+0030	-1.9	-1.3	-0.3	0.0	2.89
492a	Solva	51 52	5 12	+0015	+0010	+0035	+0015	-1.5	-1.0	-0.2	0.0	3.18
492b	Little Haven	51 46	5 06	+0010	+0010	+0025	+0015	-1.1	-0.8	-0.2	0.0	3.32
493	Martin's Haven	51 44	5 15	+0010	+0010	+0015	+0015	-0.8	-0.5	+0.1	+0.1	3.54
494	Skomer Island	51 44	5 17	-0005	-0005	+0005	+0005	-0.4	-0.1	0.0	0.0	⊙
495	Dale Roads	51 42	5 09	-0005	-0005	-0008	-0008	0.0	0.0	0.0	-0.1	⊙
496	MILFORD HAVEN	51 42	5 01	STANDARD PORT				See Table V				3.83
	<i>Cleddau River</i>											
497	Neyland	51 42	4 57	+0002	+0010	0000	0000	0.0	0.0	0.0	0.0	⊙
498	Black Tar	51 45	4 54	+0010	+0020	+0005	0000	+0.1	+0.1	0.0	-0.1	⊙
499	Haverfordwest	51 48	4 58	+0010	+0025	⊙	⊙	-4.8	-4.9	§	§	⊙
501	Stackpole Quay	51 37	4 54	-0005	+0025	-0010	-0010	+0.9	+0.7	+0.2	+0.3	4.28
502	Tenby	51 40	4 42	-0015	-0010	-0015	-0020	+1.4	+1.1	+0.5	+0.2	4.49
	<i>Towy River</i>											
504	Ferryside	51 46	4 22	0000	-0010	+0220	0000	-0.3	-0.7	-1.7	-0.6	⊙
504a	Carmarthen	51 51	4 18	+0010	0000	⊙	⊙	-4.4	-4.8	§	§	⊙
	<i>Burry Inlet</i>											
505	Burry Port	51 41	4 15	+0003	+0003	+0007	+0007	+1.6	+1.4	+0.5	+0.4	4.75
505a	Llanelli	51 40	4 10	-0003	-0003	+0150	+0020	+0.8	+0.6	⊙	⊙	⊙
508	Mumbles	51 34	3 58	+0005	+0010	-0020	-0015	+2.3	+1.7	+0.6	+0.2	5.1 x
509	SWANSEA	51 37	3 55	STANDARD PORT				See Table V				5.24
510	Port Talbot	51 35	3 49	-0005	+0005	-0015	-0030	+2.6	+2.1	+0.8	+0.3	5.33
512	Porthcawl	51 28	3 42	0000	0000	0000	-0015	+2.9	+2.3	+0.8	+0.3	5.31

⊙ No data.

* See notes on page 344.

§ Dries out except for river water.

a Data approximate.

c For intermediate heights, use harmonic constants (see Part III) and N.P.159.

x M.L. inferred.

WALES; ENGLAND, WEST COAST

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES				HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.
				High Water	Low Water	MHWS	MHWN	MLWN	MLWS			
				(Zone U.T. (G.M.T.))								
523	PORT OF BRISTOL (AVONMOUTH)	(see page 52)		0600 and 1800	1100 and 2300	0300 and 1500	0800 and 2000	13.2	10.0	3.5	0.9	
513	Barry	51 23	3 16	-0030	-0015	-0125	-0030	-1.8	-1.3	+0.2	0.0	6.11
513a	Flatholm	51 23	3 07	-0015	-0015	-0045	-0045	-1.4	-1.2	+0.2	+0.1	6.2
513b	Steeptom	51 20	3 06	-0020	-0020	-0050	-0050	-1.6	-1.4	+0.1	-0.1	6.1
514	Cardiff	51 27	3 09	-0015	-0015	-0100	-0030	-1.0	-0.6	+0.1	0.0	6.45
515	Newport	51 33	2 59	-0020	-0010	0000	-0020	-1.1	-1.0	-0.6	-0.7	6.04
516	River Wye Chepstow	51 39	2 40	+0020	+0020	0	0	0	0	0	0	0
523	PORT OF BRISTOL (AVONMOUTH)	(see page 52)		0000 and 1200	0600 and 1800	0000 and 1200	0700 and 1900	13.2	10.0	3.5	0.9	
England												
River Severn												
517	Sudbrook	51 35	2 43	+0010	+0010	+0025	+0015	+0.2	+0.1	-0.1	+0.1	0
518	Beachley (Aust.)	51 36	2 38	+0010	+0015	+0040	+0025	-0.2	-0.2	-0.5	-0.3	6.43
519	Inward Rocks	51 39	2 37	+0020	+0020	+0105	+0045	-1.0	-1.1	-1.4	-0.6	5.66
520	Narlwood Rocks	51 39	2 36	+0025	+0025	+0120	+0100	-1.9	-2.0	-2.3	-0.8	0
521	White House	51 40	2 33	+0025	+0025	+0145	+0120	-3.0	-3.1	-3.6	-1.0	3.93
522	Berkeley	51 42	2 30	+0030	+0045	+0245	+0220	-3.8	-3.9	-3.4	-0.5	3.43
522a	Sharpness Dock	51 43	2 29	+0035	+0050	+0305	+0245	-3.9	-4.2	-3.3	-0.4	0
522b	Wellhouse Rock	51 44	2 29	+0040	+0055	+0320	+0305	-4.1	-4.4	-3.1	-0.2	3.26
522c	Epney	51 42	2 24	+0130	0	0	0	-9.4	0	0	0	0
522d	Minsterworth	51 50	2 23	+0140	0	0	0	-10.1	0	0	0	0
522e	Llanthony	51 51	2 21	+0215	0	0	0	-10.7	0	0	0	0
523	PORT OF BRISTOL (AVONMOUTH)	(see page 52)		0200 and 1400	0800 and 2000	0300 and 1500	0800 and 2000	13.2	10.0	3.5	0.9	6.92
River Avon												
523a	Shirehampton	51 29	2 41	0000	0000	+0035	+0010	-0.7	-0.7	-0.8	0.0	0
523b	Sea Mills	51 29	2 39	+0005	+0005	+0105	+0030	-1.4	-1.5	-1.7	-0.1	0
524	Bristol (Cumberland Basin)	51 27	2 37	+0010	+0010	§	§	-2.9	-3.0	§	§	0
524a	Portishead	51 30	2 45	-0002	0000	0	0	-0.1	-0.1	0	0	0
525	Clevedon	51 27	2 52	-0010	-0020	-0025	-0015	-0.4	-0.2	+0.2	0.0	6.8
526	English and Welsh Grounds	51 28	2 59	-0008	-0008	-0030	-0030	-0.5	-0.8	-0.3	0.0	6.5
527	Weston-super-Mare	51 21	2 59	-0020	-0030	-0130	-0030	-1.2	-1.0	-0.8	-0.2	6.1
River Parrett												
528	Burnham	51 14	3 00	-0020	-0025	-0030	0000	-2.3	-1.9	-1.4	-1.1	0
529	Bridgwater	51 08	3 00	-0015	-0030	+0305	+0455	-8.6	-8.1	§	§	0
530	Hinkley Point	51 13	3 08	-0020	-0025	-0100	-0040	-1.7	-1.6	+0.1	-0.1	5.0
531	Watchet	51 11	3 20	-0035	-0050	-0145	-0040	-1.9	-1.5	+0.1	+0.1	5.88
532	Minehead	51 13	3 28	-0035	-0045	-0100	-0100	-2.6	-1.9	-0.1	0.0	5.71
533	Porlock Bay	51 13	3 38	-0045	-0055	-0205	-0050	-3.0	-2.2	-0.1	-0.1	5.62
534	Lynmouth	51 14	3 49	-0055	-0115	0	0	-3.6	-2.7	0	0	0
496	MILFORD HAVEN	(see page 50)		0100 and 1300	0700 and 1900	0100 and 1300	0700 and 1900	7.0	5.2	2.5	0.7	
535	Ilfracombe	51 13	4 07	-0030	-0015	-0035	-0055	+2.2	+1.7	+0.5	0.0	4.98
Rivers Taw and Torridge												
536	Appledore	51 03	4 12	-0020	-0025	+0015	-0045	+0.5	0.0	-0.9	-0.5	3.64
537	Yelland Marsh	51 04	4 10	-0010	-0015	+0100	-0015	-0.4	-0.9	-1.7	-1.1	2.52
538	Fremington	51 05	4 07	-0010	-0015	+0030	-0030	-0.5	-1.2	-1.6	+0.1	0
539	Barnstaple	51 05	4 04	0000	-0015	-0155	-0245	-2.9	-3.8	-2.2	-0.4	0
540	Bideford	51 01	4 12	-0020	-0025	0000	0000	-1.1	-1.6	-2.5	-0.7	0
541	Clovelly	51 00	4 24	-0030	-0030	-0020	-0040	+1.3	+1.1	+0.2	+0.2	0
542	Lundy Island	51 10	4 40	-0030	-0030	-0020	-0040	+1.0	+0.7	+0.2	+0.1	4.2
543	Bude	50 50	4 33	-0040	-0040	-0035	-0045	+0.7	+0.6	0	0	0
544	Boscastle	50 41	4 42	-0045	-0010	-0110	-0100	+0.3	+0.4	+0.2	+0.2	4.02

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
475-482	+0.1	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1
482-512	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	+0.1	+0.1	0.0
513-534	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
535-544	+0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1

IRELAND, WEST COAST

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES				HEIGHT DIFFERENCES (IN METRES)				M.L. Z. m.
				High Water (Zone G.M.T.)	Low Water	0600 and 1800	1100 and 2300	0500 and 1700	1100 and 2300	MHWS	MHWN	
709	GALWAY	(see page 1:						5.1	3.9	2.0	0.6	
696	Clare Island	53 48	9 57	+0019	+0013	+0029	+0023	-1.0	-0.7	-0.4	-0.1	⊙
697	<i>Westport Bay</i> Inishraher	53 48	9 38	+0030	+0012	+0058	+0026	-0.6	-0.5	-0.3	-0.1	⊙
701	Killary Harbour	53 38	9 53	+0021	+0015	+0035	+0029	-1.0	-0.8	-0.4	-0.1	⊙
702	<i>Inishbofin</i> Bofin Harbour	53 37	10 13	+0013	+0009	+0021	+0017	-1.0	-0.8	-0.4	-0.1	1.0
703	Clifden Bay	53 29	10 04	+0005	+0005	+0016	+0016	-0.7	-0.5	⊙	⊙	⊙
704	Slyne Head	53 24	10 14	+0002	+0002	+0010	+0010	-0.7	-0.5	⊙	⊙	⊙
705	Roundstone Bay	53 23	9 55	+0003	+0003	+0008	+0008	-0.7	-0.5	-0.3	-0.1	⊙
706	Kilkieran Cove	53 20	9 44	+0005	+0005	+0016	+0016	-0.3	-0.2	-0.1	0.0	⊙
707	<i>Arán Islands</i> Killeany Bay	53 07	9 39	-0008	-0008	+0003	+0003	-0.4	-0.3	-0.2	-0.1	⊙
709	GALWAY	53 16	9 03	STANDARD PORT				See Table V				2.00
711	Liscannor	52 56	9 23	-0003	-0007	+0006	+0002	-0.4	-0.3	⊙	⊙	⊙
712	Seafield Point	52 48	9 30	-0006	-0014	+0004	-0004	-0.5	-0.4	⊙	⊙	⊙
715	TARBERT ISLAND	(see page 1:						5.0	3.8	1.7	0.5	
713	<i>River Shannon</i> Kilbaha Bay	52 34	9 51	-0045	-0025	-0100	+0005	-0.7	-0.5	-0.2	0.0	⊙
713a	Carrigaholt	52 36	9 42	-0030	-0040	-0030	-0030	-0.1	-0.1	+0.2	+0.2	⊙
714	Kilrush	52 38	9 30	-0010	-0010	-0005	-0005	0.0	-0.1	0.0	0.0	⊙
715	TARBERT ISLAND	52 35	9 22	STANDARD PORT				See Table V				2.79
716	Fovnes Island	52 37	9 07	+0030	+0025	+0020	+0020	+0.2	+0.2	+0.1	-0.2	⊙
717	Mellon Point	52 40	8 50	+0055	+0045	+0025	+0140	+0.9	+0.7	+0.2	-0.1	⊙
718	Limerick Dock	52 40	8 38	+0100	+0120	+0050	+0200	+0.9	+0.7	-0.5	-0.1	⊙
719	<i>River Fergus</i> Coney Island	52 43	8 59	+0050	+0045	+0015	+0130	+0.2	+0.1	⊙	⊙	⊙
751	COBH (RINGASKIDDY)	(see page 56						4.2	3.3	1.4	0.5	
721	<i>Tralee Bay</i> Fenit Pier	52 16	9 52	-0057	-0017	-0029	-0109	+0.5	+0.2	+0.3	+0.1	⊙
722	Smerwick Harbour	52 12	10 24	-0107	-0027	-0041	-0121	-0.3	-0.4	⊙	⊙	⊙
723	Dingle Harbour	52 07	10 15	-0111	-0041	-0049	-0119	-0.3	-0.4	0.0	0.0	⊙
724	<i>Castlemaine Harbour</i> Cromane Point	52 09	9 54	-0026	-0006	-0017	-0037	+0.4	+0.2	+0.4	+0.2	⊙
725	<i>Valentia Harbour</i> Knights Town	51 56	10 18	-0118	-0038	-0056	-0136	-0.3	-0.3	0.0	0.0	2.0
726	<i>Ballinskelligs Bay</i> Castle	51 49	10 16	-0119	-0039	-0054	-0134	-0.5	-0.5	-0.1	0.0	⊙
727	<i>Kenmare River</i> West Cove	51 46	10 03	-0113	-0033	-0049	-0129	-0.6	-0.5	-0.1	0.0	⊙
728	Dunkerron Harbour	51 52	9 38	-0117	-0027	-0050	-0140	-0.2	-0.3	+0.1	0.0	⊙
731	<i>Coulagh Bay</i> Ballycrovane Harbour	51 43	9 57	-0116	-0036	-0053	-0133	-0.6	-0.5	-0.1	0.0	⊙
732	Black Ball Harbour	51 36	10 02	-0115	-0035	-0047	-0127	-0.7	-0.6	-0.1	+0.1	⊙
733	<i>Bantry Bay</i> Castletown Bearhaven	51 39	9 54	-0048	-0012	-0025	-0101	-0.6	-0.6	-0.1	0.0	1.9
734	Bantry	51 41	9 28	-0045	-0025	-0040	-0105	-0.7	-0.7	-0.1	0.0	1.78
736	<i>Dunmanus Bay</i> Dunbeacon Harbour	51 37	9 33	-0057	-0025	-0032	-0104	-0.8	-0.7	-0.3	-0.1	⊙
737	Dunmanus Harbour	51 32	9 40	-0107	-0031	-0044	-0120	-0.7	-0.6	-0.2	0.0	⊙

⊙ No data.
x M.L. inferred.

IRELAND, SOUTH COAST, FÆROE ISLANDS

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES				HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.
				High Water (Zone G.M.T.)	Low Water	High Water (Zone G.M.T.)	Low Water	MHWS	MHWN	MLWN	MLWS	
751	COBH (RINGASKIDDY)	(see page 56)		0500 and 1700	1100 and 2300	0500 and 1700	1100 and 2300	4.2	3.3	1.4	0.5	
741	Crookhaven	51 28	9 43	-0057	-0033	-0048	-0112	-0.8	-0.6	-0.4	-0.1	⊙
742	Skull	51 31	9 32	-0040	-0015	-0015	-0110	-0.9	-0.6	-0.2	-0.1	1.85
743	Baltimore	51 29	9 23	-0025	-0005	-0010	-0050	-0.5	-0.3	+0.1	+0.1	2.12
744	Castletownshend	51 32	9 10	-0012	-0025	-0010	-0040	-0.6	-0.4	-0.2	0.0	2.2 x
745	Clonakilty Bay	51 35	8 50	-0033	-0011	-0019	-0041	-0.3	-0.2	⊙	⊙	⊙
746	Courtmaacsherry	51 38	8 42	-0029	-0007	+0005	-0017	-0.4	-0.3	-0.2	-0.1	⊙
747	Kinsale	51 42	8 31	-0019	-0005	-0009	-0023	-0.1	-0.1	+0.1	0.0	2.25
<i>Cork Harbour</i>												
751	COBH (RINGASKIDDY)	51 50	8 18	STANDARD PORT				See Table V				2.35
752	Passage West	51 52	8 20	+0005	+0005	+0005	+0005	+0.3	+0.3	+0.2	+0.2	⊙
753	Cork	51 54	8 27	+0020	+0020	+0020	+0020	+0.3	+0.1	0.0	0.0	⊙
754	Ballycotton	51 50	8 01	-0011	+0001	+0003	-0009	0.0	0.0	-0.1	0.0	⊙
755	Youghal	51 57	7 50	-0002	+0014	+0016	0000	0.0	0.0	-0.1	0.0	⊙
756	Dungarvan Harbour	52 05	7 34	+0004	+0012	+0007	-0001	0.0	+0.1	-0.2	0.0	⊙
<i>Waterford Harbour</i>												
761	Dunmore East	52 09	6 59	+0013	+0013	+0001	+0001	0.0	0.0	-0.2	0.0	⊙
761a	Cheekpoint	52 16	7 00	+0022	+0022	+0022	+0022	+0.4	+0.2	+0.2	0.0	2.49
762	Waterford	52 16	7 07	+0057	+0057	+0046	+0046	+0.4	+0.3	-0.1	-0.1	⊙
763	New Ross	52 24	6 57	+0100	+0030	+0055	+0130	+0.4	+0.5	+0.1	+0.1	2.59
765	Great Saltee	52 07	6 38	+0019	+0009	-0004	+0006	-0.3	-0.4	⊙	⊙	⊙
766	Carnsore Point	52 10	6 22	+0029	+0019	-0002	+0008	-1.1	-1.0	⊙	⊙	⊙
819	REYKJAVIK	(see page)		—	—	—	—	4.0	2.9	1.3	0.2	
Færoe Islands												
<i>Vidoy</i>												
780	Hvannesund	62 18	6 31	⊙	⊙	⊙	⊙	-2.7	-2.1	-0.8	-0.2	⊙
<i>Bordoy</i>												
782	Klaksvik	62 14	6 35	+0345	+0345	+0345	+0345	-2.6	-2.1	-0.8	-0.2	⊙
<i>Eysturoy</i>												
784	Nordskali	62 13	7 00	⊙	⊙	⊙	⊙	-2.0	-1.5	-0.7	-0.2	⊙
785	Oyndarfjordur	62 17	6 50	⊙	⊙	⊙	⊙	-2.3	-1.9	-0.6	-0.2	⊙
786	Fuglafjordur	62 14	6 48	⊙	⊙	⊙	⊙	-2.3	-1.9	-0.6	-0.2	⊙
787	Gotuvik (Nordragota)	62 12	6 44	⊙	⊙	⊙	⊙	-3.0	-2.3	-1.0	-0.2	⊙
788	Skalafjordur	62 06	6 43	No appreciable tide								⊙
<i>Streymoy</i>												
790	Hvalvik	62 12	7 01	No appreciable tide								⊙
791	Kollafjordur	62 06	6 56									
792	Torshavn	62 00	6 45	-0035	-0035	+0149	+0149	-3.7	-2.7	-1.2	-0.2	0.16
793	Vestmanna	62 09	7 10	+0145	+0145	+0145	+0145	-2.0	-1.5	-0.7	-0.2	⊙
<i>Vagar</i>												
795	Sorvagur	62 04	7 18	+0058	+0058	+0058	+0058	-2.2	-1.6	-0.8	-0.2	0.91
796	Midvagur	62 03	7 11	⊙	⊙	⊙	⊙	-2.3	-1.7	-0.9	-0.2	⊙
<i>Sandoy</i>												
798	Skopun	61 54	6 52	⊙	⊙	⊙	⊙	-2.2	-1.7	-0.7	-0.2	⊙
799	Sandur	61 50	6 48	+0100	+0100	+0100	+0100	-1.8	-1.5	-0.5	-0.2	⊙
<i>Suduroy</i>												
800	Trongisvagur	61 33	6 49	+0040	+0040	+0040	+0040	-2.7	-2.1	-0.9	-0.2	⊙
801	Vagur	61 28	6.48	+0050	+0050	+0050	+0050	-3.0	-2.3	-0.9	-0.2	⊙

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
696-712	+0.1	0.0	-0.1	-0.1	0.0	0.0	0.0	-0.1	-0.1	0.0	+0.1	+0.1	+0.1
713-719							Negligible						
721-737	+0.1	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1
741-766	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	0.0
780-801	+0.1	+0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	+0.1
819	+0.1	+0.1	+0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1

BELGIUM; FRANCE, NORTH COAST

No.	PLACE	Lat. N.	Long. E.	TIME DIFFERENCES				HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.	
				High Water (Zone -0100)	Low Water	MHWS	MHWN	MLWN	MLWS				
1539	ANTWERP (PROSPERPOLDER)	(see pag 24)		0000 and 1200	0500 and 1700	0000 and 1200	0600 and 1800	5.8	4.2	1.0	0.0	2.66	
Belgium													
1539a	Boudewijnsluit	51 17	4 20	+0013	+0005	+0025	+0020	0.0	+0.1	0.0	0.0	2.68	c
1539b	Royersluit	B 51 14	4 24	+0030	+0015	+0045	+0041	+0.3	+0.3	0.0	0.0	2.68	c
1539c	Boom	51 05	4 22	+0125	+0110	+0155	+0150	-0.2	+0.6	-0.4	+0.6	2.85	
1539d	Ghent	51 03	3 44	+0430	+0415	+0630	+0600	-3.5	-2.4	-0.8	+0.1	1.0	x
1534	VLISSINGEN (FLUSHING)			0300 and 1500	0900 and 2100	0400 and 1600	1000 and 2200	4.9	4.0	1.0	0.5		
1540	Cadzand (Wielingen Sluis)	51 23	3 23	-0030	-0025	-0020	-0025	-0.2	-0.2	-0.1	-0.1	0	
1562	Zeebrugge	BN 51 21	3 12	-0035	-0025	-0020	-0035	-0.1	-0.2	+0.1	-0.1	2.36	
1564	Oostende	B 51 14	2 55	-0055	-0040	-0030	-0045	+0.2	+0.2	+0.1	-0.1	2.36	
1565	Nieuwpoort	51 09	2 43	-0110	-0050	-0035	-0045	+0.4	+0.3	+0.2	-0.1	2.37	
1568	DUNKERQUE			0200 and 1400	0800 and 2000	0200 and 1400	0900 and 2100	5.8	4.8	1.5	0.6	3.20	
France													
1569	Gravelines	51 01	2 06	-0010	-0010	-0020	0000	+0.1	+0.1	-0.1	-0.1	3.19	
1570	CALAIS	50 58	1 51	STANDARD PORT					See Table V			4.02	
1571	Wissant	50 53	1 40	-0030	0	0	0	+1.7	+1.5	+0.6	+0.6	0	
1572	BOULOGNE	50 44	1 35	STANDARD PORT					See Table V			5.01	
1579	DIEPPE			0100 and 1300	0600 and 1800	0000 and 1200	0700 and 1900	9.3	7.2	2.6	0.7		
1573	Le Touquet, Étaples	50 31	1 35	+0012	0	0	0	-0.3	0.0	+0.2	+0.3	0	
1574	Berck	50 24	1 34	+0008	0	0	0	0.0	+0.1	+0.3	+0.3	0	
La Somme													
1575	Le Hourdel	50 13	1 34	+0021	+0026	0	0	+0.7	+0.7	0	0	0	
1576	St. Valéry	50 11	1 37	+0028	+0040	0	0	+0.7	+0.8	0	0	0	
1577	Cayeux	50 11	1 29	+0007	+0010	-0008	+0013	+0.9	+0.7	+0.2	+0.3	5.50	
1578	Le Treport	50 04	1 22	+0001	+0005	+0005	+0011	+0.1	+0.2	-0.1	0.0	5.02	
1579	DIEPPE	49 56	1 05	STANDARD PORT					See Table V			4.97	
1580	St. Valery-en-Caux	49 52	0 42	-0018	-0016	-0007	-0013	-0.4	-0.1	-0.1	+0.3	4.88	
1581	Pecamp	F 49 46	0 22	-0022	-0018	-0034	-0043	-1.4	-0.7	0.0	+0.1	4.47	
1581a	Antifer	49 39	0 09	-0046	-0039	-0051	-0100	-1.3	-0.6	+0.4	+0.5	4.73	
1582	LE HAVRE	(see pag 26)		0000 and 1200	0500 and 1700	0000 and 1200	0700 and 1900	7.9	6.6	3.0	1.2	4.87	
La Seine													
1583	Honfleur	49 25	0 14	-0140	-0015	+0005	+0040	+0.2	+0.1	0.0	0.0	0	*
1584	Tancarville	49 28	0 28	-0105	+0025	+0105	+0140	0.0	0.0	+0.3	+1.0	0	*
1585	Quillebeouf	49 28	0 32	-0045	+0030	+0120	+0200	0.0	+0.1	+0.5	+1.4	0	*
1586	Vatteville	49 29	0 40	+0004	+0100	+0225	+0250	+0.1	0.0	+1.1	+2.4	0	*
1587	Caudebec	49 32	0 44	+0020	+0115	+0230	+0300	-0.2	0.0	+1.2	+2.5	0	*
1588	Duclair	49 29	0 53	+0225	+0300	+0355	+0410	-0.2	-0.1	+1.7	+3.3	0	
1589	Rouen	49 27	1 06	+0440	+0415	+0525	+0525	-0.1	0.0	+1.9	+3.6	0	
1590	Trouville	49 22	0 05	-0035	-0015	0000	-0010	-0.1	-0.2	-0.2	-0.1	4.50	
N. W.													
1591	Dives	49 18	0 06	-0055	0	0	-0115	-0.4	-0.5	-0.6	-0.3	0	
1592	Quistreham	49 17	0 15	-0020	-0010	-0005	-0010	-0.2	-0.2	-0.2	-0.2	4.44	
1593	Courseulles	49 20	0 27	-0100	0	0	-0040	-0.8	-1.0	-0.7	-0.3	3.95	
1594	Port-en-Bessin	49 21	0 45	-0045	-0040	-0040	-0045	-0.7	-0.6	-0.3	-0.1	4.22	

0 No data.

* See notes on page 344.

B Tides predicted in Belgian Tide Tables.

F Tides predicted in French Tide Tables.

N Tides predicted in Netherlands Tide Tables.

x M.L. inferred.

FRANCE, NORTH COAST; CHANNEL ISLANDS

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES				HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.
				High Water (Zone -0100)	Low Water	MHWS	MHWN	MLWN	MLWS			
1600	CHERBOURG.			0300 and 1500	1000 and 2200	0400 and 1600	1000 and 2200	6.3	5.0	2.5	1.1	
1598	St. Vaast	49 35	1 16	+0105	+0055	+0120	+0100	+0.3	+0.3	-0.2	-0.2	3.80
1599	Barfleur	49 40	1 15	+0100	+0100	+0050	+0040	+0.2	+0.3	0.0	+0.1	3.94
1600	CHERBOURG.	49 39	1 38	STANDARD PORT				See Table V				3.78
1601	Omonville	49 43	1 50	-0015	-0010	-0020	-0025	-0.1	-0.1	+0.1	0.0	3.76
1602	Goury	49 43	1 56	-0100	-0045	-0110	-0120	+1.6	+1.5	+0.9	+0.1	4.84
1605	ST. HELIER			0300 and 1500	0900 and 2100	0200 and 1400	0900 and 2100	11.1	8.1	4.1	1.3	
Channel Islands		(Zone U.T. (G.M.T.))										
1603	<i>Alderney</i> Braye	49 43	2 12	+0050	+0040	+0025	+0105	-4.8	-3.4	-1.5	-0.5	3.62
1603a	<i>Sark</i> Maseline Pier	49 26	2 21	+0005	+0015	+0005	+0010	-2.1	-1.5	-0.6	-0.3	4.87
1604	<i>Guernsey</i> St. Peter Port	49 27	2 31	0000	+0012	-0008	+0002	-2.1	-1.4	-0.6	-0.3	4.99
1605	<i>Jersey</i> ST. HELIER	49 11	2 07	STANDARD PORT				See Table V				6.06
1606	St. Catherine Bay	49 13	2 01	0000	+0010	+0010	+0010	0.0	-0.1	0.0	+0.1	6.0 x
1606a	Bouley Bay	49 14	2 05	+0002	+0002	+0004	+0004	-0.3	-0.3	-0.1	-0.1	5.76
1607	Les Ecrehou	49 17	1 56	+0004	+0012	+0010	+0020	-0.2	+0.3	-0.3	0.0	6.12
1608	Les Minquiers	48 58	2 08	+0007	0000	-0008	+0013	+0.5	+0.8	-0.1	+0.1	6.48
1605	ST. HELIER			0100 and 1300	0800 and 2000	0200 and 1400	0700 and 1900	11.1	8.1	4.1	1.3	
France		(Zone -0100)										
1609	Iles Chausey	48 52	1 49	+0044	+0048	+0104	+0058	+1.9	+1.8	+0.8	+0.7	7.50
1610	Dielette	49 33	1 52	+0116	+0119	+0115	+0120	-1.4	-0.7	-0.5	0.0	5.51
1611	Carteret	49 22	1 47	+0100	+0110	+0120	+0115	+0.1	+0.4	0.0	+0.2	6.30
1612	Granville	48 50	1 36	+0040	+0049	+0115	+0053	+1.9	+1.7	+0.5	+0.1	7.21
1613	Cancale	48 40	1 51	+0035	+0050	+0115	+0100	+2.4	+2.2	+1.0	+0.8	7.76
1614	St. Malo	F 48 38	2 02	+0034	+0044	+0105	+0050	+1.1	+1.1	+0.3	+0.2	6.85
1615	Erquy	48 38	2 28	+0030	+0040	+0035	+0032	+0.3	+0.6	0.0	+0.1	6.40
1616	Dahouet	48 35	2 34	+0031	+0038	+0027	+0036	+0.2	+0.6	-0.2	0.0	6.3
1617	Le Légué	48 32	2 44	+0030	+0045	+0035	+0031	+0.3	+0.6	0.0	+0.1	6.3 x
1618	Binic	48 36	2 49	+0030	+0045	+0035	+0031	+0.3	+0.6	0.0	+0.1	6.3 x
1619	Portrieux	48 38	2 49	+0030	+0045	+0030	+0030	+0.3	+0.5	0.0	+0.1	6.38
1620	Paimpol	48 47	3 02	+0025	+0038	+0025	+0040	-0.6	-0.3	-0.9	-0.7	5.53
1621	Ile de Bréhat	48 51	3 00	+0020	+0040	+0010	+0015	-0.6	-0.1	-0.4	-0.1	5.86
1622	Les Heaux de Brehat	F 48 55	3 05	+0031	+0030	-0011	+0042	-1.2	-0.5	-0.7	-0.2	5.51
1623	Lezardrieux	48 47	3 06	+0026	+0038	+0015	+0035	-0.9	-0.5	-0.6	-0.3	5.56
1624	Plougrescant	48 51	3 13	-0005	+0004	-0005	+0010	-1.4	-0.6	-0.6	+0.1	5.55
1625	Tréguier	48 47	3 13	-0004	+0012	-0025	+0015	-1.3	-0.6	-0.8	-0.2	5.46
1626	Ploumanac'h	48 50	3 29	0000	+0005	-0025	0000	-2.1	-1.0	-0.7	-0.2	5.15

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
1534-1571	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	+0.1	+0.1	+0.1	0.0
1572-1581a	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1	0.0	0.0	0.0
1582-1602	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1	0.0
1603-1626	Negligible												

SECTION FOUR

TIDAL PREDICTIONS FOR STANDARD PORTS (PACIFIC)

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FOR FINDING THE HEIGHT OF THE TIDE AT
TIMES BETWEEN HIGH AND LOW WATER

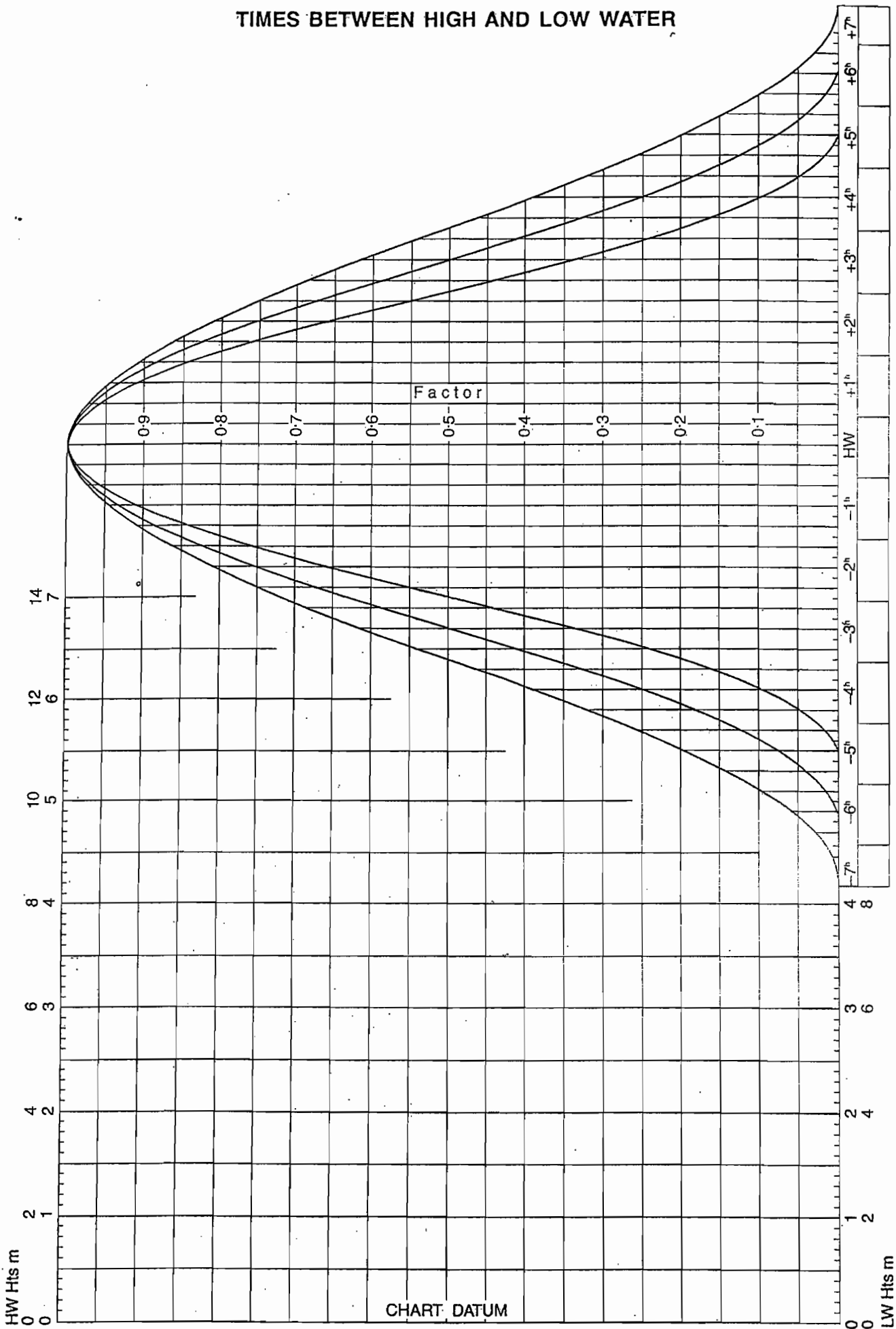


TABLE V - Part 1

TIDAL LEVELS IN METRES AT STANDARD PORT

Standard Port	LAT	MLWS	MLWN	MSL	MHWN	MHWS	HAT
Townsville	0.0	+0.4	+1.2	+1.6	+2.0	+2.9	+3.7
Mackay	0.0	+0.7	+2.0	+3.0	+4.1	+5.3	+6.4
Brisbane Bar	0.0	+0.3	+0.7	+1.2	+1.7	+2.1	+2.6
Exmouth	0.0	+0.5	+1.1	+1.5	+1.7	+2.3	+2.8
Port Hedland	0.0	+1.2	+3.3	+3.9	+4.6	+6.7	+7.5
Darwin	0.0	+1.4	+3.3	+4.2	+5.1	+7.0	+8.1
Auckland	0.0	+0.4	+0.8	+1.8	+2.8	+3.1	+3.6
Wellington	+0.4	+0.4	+0.5	+1.0	+1.3	+1.4	+1.7
Lyttelton	+0.1	+0.3	+0.4	+1.4	+2.1	+2.2	+2.7
Bluff	+0.3	+0.6	+0.9	+1.7	+2.3	+2.6	+3.1
Westport	-0.1	+0.3	+0.9	+1.8	+2.6	+3.2	+3.6
Pago Pago	-0.2	0.0	+0.1	+0.4	+0.7	+0.9	+1.1
Suva	+0.1	+0.3	+0.5	+1.1	+1.4	+1.6	+2.1
Kwajalein Atoll	-0.4	-0.2	+0.4	+0.6	+0.8	+1.3	+1.7
Minjiang Kou (Chuanshi Dao)	+0.2	+0.8	+2.2	+3.5	+4.9	+6.2	+6.9
Luhuashan	+0.3	+0.9	+2.0	+2.6	+3.3	+4.3	+5.1
Wusong	+0.1	+1.0	+1.4	+2.0	+2.5	+3.5	+4.6
Inch'on (Chemulpho)	-0.8	+0.4	+2.8	+4.5	+6.5	+8.6	+9.6
Naha Ko	-0.3	+0.4	+0.8	+1.2	+1.5	+2.0	+2.4
Moji	-0.4	+0.3	+0.9	+1.3	+1.7	+2.3	+2.6
Prince Rupert	-0.1	+1.2	+2.5	+3.8	+5.2	+6.5	+7.5
La Union	-0.6	-0.1	+0.6	+1.5	+2.5	+3.0	+3.5
Balboa	-0.9	-0.1	+1.1	+2.6	+3.8	+4.9	+5.8
Puerto Montt	-0.1	+0.7	+2.4	+3.6	+4.7	+6.5	+7.3
Davao	+0.3	-0.2	+0.5	+0.8	+1.0	+1.6	+1.9
Punta Loyola	0.0	+1.6	+3.8	+6.8	+9.5	+12.0	+13.6
Charleston	-0.5	0.0	+0.2	+0.9	+1.5	+1.7	+2.2
Hampton Roads	-0.2	0.0	+0.1	+0.4	+0.7	+0.8	+1.1
Baltimore	-0.2	0.0	+0.1	+0.2	+0.4	+0.4	+0.7
Sandy Hook (New York Bay)	-0.4	0.0	+0.3	+0.8	+1.3	+1.6	+2.0
Boston	-0.7	0.0	+0.4	+1.6	+2.7	+3.1	+3.8
Saint John NB	-0.2	+0.6	+1.7	+4.4	+6.9	+8.0	+9.0
Halifax	-0.1	+0.3	+0.5	+1.0	+1.5	+1.8	+2.1
Pointe-au-Pere	-0.1	+0.6	+1.4	+2.3	+3.1	+3.9	+4.9
Quebec	-0.2	+0.3	+1.0	+2.6	+3.9	+5.2	+6.0
Harrington Harbour	0.0	+0.3	+0.7	+1.1	+1.4	+1.8	+2.3
Argentia	+0.1	+0.3	+0.7	+1.2	+1.7	+2.2	+2.7
St. John's Harbour (Newfoundland)	0.0	+0.3	+0.5	+0.8	+0.9	+1.3	+1.6

Notes

- (a) The above levels, in metres, are referred to Chart Datum, which is same as the zero of the tidal predictions in all cases.
- (b) For definitions of tidal levels see page 4

TABLE V - Part 1

TIDAL LEVELS IN METRES AT STANDARD PORT

Standard Port	LAT	MLLW	MHLW	MSL	MLHW	MHHW	HAT
Port Moresby	0.0	+0.5	+1.4	+1.4	+1.5	+2.3	+2.9
Drager Harbour	0.0	+0.4	Δ	+0.7	Δ	+1.0	+1.3
Seeadler Harbour	0.0	+0.4	Δ	+0.7	Δ	+0.9	+1.2
Vila Harbour	0.0	+0.2	+0.5	+0.8	+1.1	+1.2	+1.6
Twin Island	0.0	+0.9	+1.1	+1.4	+1.6	+2.5	+3.0
Thursday Island	0.0	+0.6	+1.2	+1.4	+1.7	+2.5	+3.0
Goods Island	0.0	+1.3	+2.6	+2.6	+3.0	+3.2	+3.6
Booby Island	0.0	+0.6	+2.0	+2.4	+2.8	+4.2	+4.3
Newcastle	0.0	+0.4	+0.6	+1.0	+1.4	+1.6	+2.1
Sydney	0.0	+0.3	+0.6	+1.0	+1.3	+1.6	+2.1
Port Phillip Heads (Point Lonsdale)	-0.1	+0.4	+0.6	+0.9	+1.3	+1.5	+1.8
Melbourne	+0.1	+0.2	+0.5	+0.6	+0.6	+1.0	+1.0
Mersey River	0.0	+0.7	+0.9	+2.0	+3.0	+3.3	+3.6
Port Adelaide (outer harbour)	0.0	+0.3	+1.3	+1.3	+1.3	+2.3	+2.8
Walleroo	0.0	+0.2	+0.6	+1.0	+1.3	+1.7	+2.0
Whyalla	-0.1	+0.5	+1.3	+1.6	+1.9	+2.7	+3.3
Port Lincoln	+0.1	+0.2	+0.7	+0.9	+1.0	+1.5	+2.0
Albany	0.0	+0.5	Δ	+0.7	Δ	+1.0	+1.4
Carnarvon	-0.1	+0.6	+0.8	+1.0	+1.3	+1.5	+2.0
Gove	0.0	+0.7	+1.2	+1.8	+2.4	+2.9	+3.7
Karumba	0.0	+1.2	Δ	+2.1	Δ	+3.2	+4.8
Weipa	0.0	+0.7	+1.5	+1.8	+2.2	+2.9	+3.4
Honolulu	-0.2	0.0	+0.1	+0.2	+0.3	+0.6	+0.8
Beihai Gang	-0.1	+1.3	Δ	+2.5	Δ	+4.1	+5.9
Naozhou Dao	-0.2	+0.7	+1.3	+1.8	+2.1	+3.0	+4.1
Hong Kong	0.0	+0.6	+1.1	+1.4	+1.6	+2.2	+2.8
Tianjin Gang	-0.2	+0.7	+1.7	+2.4	+3.6	+3.7	+4.3
Qinhuangdao	-0.1	+0.5	Δ	+0.9	Δ	+1.2	+1.9
Yokohama	-0.1	+0.3	+0.9	+1.1	+1.6	+1.7	+2.1
Kamaishi	-0.2	+0.3	+0.8	+0.9	+1.1	+1.3	+1.6
Zaitiv Tukcharka	-0.2	+0.3	+1.2	+1.2	+1.5	+1.7	+1.9
Tofino	-0.1	+0.7	+1.4	+2.1	+3.0	+3.4	+4.1
Victoria, BC	-0.2	+0.8	+2.0	+1.9	+2.3	+2.6	+3.2
Vancouver	-0.2	+1.1	+2.9	+3.1	+3.9	+4.4	+5.0
San Francisco	-0.6	0.0	+0.7	+1.0	+1.4	+1.7	+2.2
San Diego	-0.6	0.0	+0.6	+0.9	+1.2	+1.7	+2.4
Valparaiso	+0.1	+0.4	+0.5	+0.9	+1.2	+1.5	+2.0
Cape Horn (Orange Bay)	+0.2	+0.5	+0.9	+1.3	+1.7	+2.2	+2.7

Δ Tide is usually diurnal

Notes

The above levels, in metres, are referred to Chart Datum, which is same as the zero of the tidal predictions in all cases.

TABLE V - Part 1

TIDAL LEVELS

The preceding tables give average tidal levels of all Standard Ports in this volume.

In general the levels are computed from at least a year's predictions. The values of Lowest Astronomical Tide (LAT) and Highest Astronomical Tide (HAT) are noted over a span of years and are defined below.

The table is in two parts. The first part on page xxvi covers those Standard Ports where the tide is mainly semi-diurnal. For those ports the levels of MHWS, MHWN, MLWN and MLWS are given. The second part on page xxvii covers those Standard Ports where the diurnal inequality is relatively large. For these ports the level of MHHW, MLHW, MHLW and MLLW are given. For details of the criteria used to establish the character of the tide at any port see page iv.

All levels in this table and all predictions in this volume are referred to Chart Datum of the largest scale Admiralty Chart of the area.

Tidal levels

HAT (Highest Astronomical Tide), LAT (Lowest Astronomical Tide). The highest and lowest levels respectively which can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions; these levels will not be reached every year. HAT and LAT are not the extreme levels which can be reached, as storm surges (see page i) may cause considerably higher and lower levels to occur.

MHWS (Mean High Water Springs), MLWS (Mean Low Water Springs). The height of mean high water springs is the average, throughout a year when the average maximum declination of the moon is $23\frac{1}{2}^{\circ}$, of the heights of two successive high waters during those periods of 24 hrs (approximately once a fortnight) when the range of the tide is greatest. The height of mean low water springs is the average height obtained by the two successive low waters during the same periods.

MHWN (Mean High Water Neaps), MLWN (Mean Low Water Neaps). The height of mean high water neaps is the average, throughout a year as defined above, of the heights of two successive high waters during those periods (approximately once a fortnight) when the range of the tide is least. The height of mean low water neaps is the average height obtained from the two successive low waters during the same periods.

Note: - The average value of MHWS, etc, varies from year to year in a cycle of approximately 18.6 years. The tidal levels given in Table V are average values for the whole cycle, obtained by computing values of a year or more and correcting the results by the value of f of M_2 .

MSL (Mean Sea Level). Mean sea level is the average level of the sea surface over a long period, preferably 18.6 years, or the average level which would exist in the absence of tides.

MHHW (Mean Higher High Water). The height of mean higher high water is the mean of the higher of the two daily high waters over a long period of time. When only one high water occurs on a day this is taken as the higher high water.

MLHW (Mean Lower High Water). The height of mean lower high water is the mean of the lower of the two daily high waters over a long period of time. When only one high water occurs on some days "Δ" is printed in the MLHW column indicating that the tide is usually diurnal.

MHLW (Mean Higher Low Water). The height of mean higher low water is the mean of the higher of the two daily low waters over a long period of time. When only one low water occurs on some days "Δ" is printed in the MHLW column indicating that the tide is usually diurnal.

MLLW (Mean Lower Low Water). The height of mean lower low water is the mean of the lower of the two daily low waters over a long period of time. When only one low water occurs on a day this is taken as the lower low water.

Note: - The average value of MHHW, etc, varies from year to year in a cycle of approximately 18.6 years. The tidal levels given in Table V are usually computed from a year when the levels are expected to be average that is when f of M_2 is 1.00.

TABLE V - Part 2

HIGHEST ASTRONOMICAL TIDE (HAT) IN METRES AT SECONDARY PORTS

No.	Standard Port	HAT(m)	No.	Standard Port	HAT(m)
2762	Plum Island	1.2	2833	Bangor	5.4
2764	Herod Point	2.1	2835	Centre Harbour	4.1
2765	Port Jefferson	2.6	2837	Blue Hill Harbour	3.8
2767	Lloyd Harbour	2.5	2838	Bar Harbour	4.1
2768	Kings Point	2.9	2840	Prospect Harbour	4.1
2769	Willetts Point	2.9	2842	Jonesport	4.3
			2843	Cutler (Little River)	5.2
2771	Stamford	2.9	2845	West Quoddy Head	7.3
2772	Bridgeport	2.7	2846	Eastport	7.9
2773	New Haven Harbour	2.5	2847	Outer Wood Island	6.0
2773a	Hoadley Point	1.9	2849	North Head	7.2
2774	Falkner Island	1.9	2853	Welshpool	7.7
2775	Saybrook Jetty	1.5	2858	St. Andrews	8.0
2776	New London	1.2	2860	Back Bay	7.7
2777	Watch Hill Point	1.4	2862	Lepreau Bay	8.0
2779	Block Island (Old Harbour)	1.3	2866	St. Martins	10.7
			2869	Herring Cove	11.6
2780	Point Judith	1.4			
2781	Newport (Rhode Island)	1.6	2871	Grindstone Island	13.5
2783	Providence	2.0	2872	Hopewell Cape	14.2
2784	Bristol	1.7	2874	Moncton	⊙
2785	Sakonnet	1.4	2875	Salisbury	⊙
2786	New Bedford	1.7	2877	Arnherst Harbour	15.4
2787	Cape Cod Canal W. Entrance	1.7	2878	Joggins Wharf	13.2
			2880	Cape Capstan	11.6
2790	Woods Hole (Great Harbour)	1.0	2881	Ile Haute	11.4
2791	Hyannis Port	1.1	2883	West Advocate	11.7
2792	Monomoy Point	1.7	2884	Fort Greville	12.8
2793	Vineyard Haven	0.9	2885	Parrsboro	13.9
2794	Gay Head	1.5	2886	Five Islands	14.8
2797	Siaconset	0.7	2888	Truro	9.9
2798	Great Point	1.2	2891	Burntcoat Head	15.6
2799	Nantucket Harbour	1.3			
2800	Muskeget Island	0.9	3156	Tacks Beach	2.3
			3157	Woody Island	2.5
2802	Chatham (Cape Cod)	1.8	3158	Come By Chance	2.6
2803	Race Point	3.4	3161	St. Bride's	2.4
2805	Cape Cod Canal E. Entrance	3.4	3162	Trepassey Harbour	1.9
2806	Gurnet Point	3.9	3163	Fermeuse Harbour	1.6
2807	Cohasset Harbour	3.6	3164	Bay Bulls	1.6
			3167	Holyrood	1.4
2811	Salem	3.6	3168	Harbour Grace	1.5
2813	Merrimack River Entrance	3.3	3169	Heart's Content	1.4
2814	Portsmouth	3.2			
2815	Cape Porpoise	3.6	3170	Bull Island	1.4
2816	Portland (Casco Bay)	3.6	3171	Randomhead Harbour	1.3
2818	Potts Harbour	3.8	3171a	Clarendville	1.6
2819	Fort Popham	3.5	3172	Port Union	1.3
			3173	King's Cove	1.2
2820	Bath (Kennebec River)	2.6	3174	Newman Sound	1.2
2821	Richmond	2.0			
2824	Monhegan Island	3.6	3177	Freshwater Bay	1.5
2825	Tenants Harbour	3.8	3178	Valleyfield	1.2
2827	Matinicus Harbour	3.8	3180	Funk Island	1.0
2828	Vinalhaven	3.7	3181	Carmanville	1.4
2829	Pulpit Harbour	3.9			
			3182	Fogo Harbour	1.8
2831	Rockland	3.9	3183	Twillingate Harbour	1.7
2832	Belfast	4.2	3185	Botwood	1.9

TABLE V - Part 2

HIGHEST ASTRONOMICAL TIDE (HAT) IN METRES AT SECONDARY PORTS

No.	Standard Port	HAT(m)	No.	Standard Port	HAT(m)
3186	Exploits Burnt Islands	1.4	3266a	Innetalling Island	1.7
3189	Little Bay Arm	1.4	3267	Great Whale Island	1.9
			3267a	Cape Jones	2.3
3191	Tilt Cove	1.5	3268	Fort George	2.2
3192	La Scie	1.3			
3193	Baie Verte	1.5	3270	Eastmain River	1.1
3194	Seal Cove	1.4	3271	Stag Island	3.0
3194a	Hampden	1.6			
			5737	Uvea (Uea) Island	1.7
3195	Sops Island	1.3	5738	Lifu Island	1.2
3196	Orange Bay	1.9	5739	Mare Island	1.4
3197	Wild Cove	1.9			
3198	Croque Harbour	1.8	5741	Huon Island	⊙
3199	Ariege Bay	1.9	5745	Pam Bay	2.0
			5746	Port Puebo	1.9
3200	St. Anthony	1.6	5747	Port Hyengen	1.3
3200a	Quirpon Harbour	1.5	5748	Tuo Bay	1.7
3201	Ship Cove	1.1	5749	Baie De Poro	1.4
3202	South Point	1.1	5749a	Baie De Kouaoua	1.5
3204	Battle Harbour	1.7			
3205	Port Marnham	1.6	5750	Baie D'Amata	1.0
3206	Port Hope Simpson	1.7	5750a	Thio	1.5
3214	Cartwright	2.1	5751	Uinne Bay	1.7
3216	Cabot Point	0.8	5752	Port Yate	1.6
3217	Jordans Point	2.6	5754	Kuto	1.4
			5755	Goro	1.2
3220	Terrington Basin	0.9			
3220a	North West River	1.0	5756	Baie Du Prony	1.0
3221	Smokey	1.9	5756a	Ouara	1.0
3225	Makkovik	2.2	5757	Ire	1.4
3226	Hopedale	2.4	5757a	La Tortue	1.5
3228	Davis Inlet	2.5	5758	Amedee Lighthouse	1.7
			5759	Noumea	1.7
3231	Nain	2.9	5760	Baie St. Vincent	2.1
3242	Williams Harbour	3.7	5761	Isle Pass	⊙
3244	Button Islands	5.5	5762	Uarai Bay	2.0
3245	Port Burwell	6.5	5763	Burail Bay	1.6
3248	Riviere Koksoak Entrance	13.2	5764	Poya Bay	1.8
3249	Fort Chimo	6.7			
			5765	Gomen Bay	1.8
3250	Lac Aux Feuilles	15.7	5766	Paagoumone Bay	1.8
3251	Hopes Advance Bay	13.1	5767	Banare	1.6
3252	Basking Island	10.8	5768	Aue Bay	⊙
3252a	Pikyulik Island	10.5	5770	Norfolk Island	1.9
3252b	Agvik Island	12.2	5772	Lord Howe Island	2.3
3254	Diana Bay	10.4	5774	Middleton Reef	2.2
			5775	Cato Island	2.2
3256	Stupart Bay	8.9			
3256a	Doctor Island	9.0	5778	Observatory Cay (Fred. Is)	⊙
3257	Wakeham Bay	11.0	5779	Middle Bellona Reef	⊙
3258	Douglas Harbour	8.6	5780	Long Island	⊙
3260	Deception Bay	5.8	5781	Marion Reef	2.3
3260a	Sugluk	5.5	5782	Mellish Reef	1.7
3261	Digges Harbour	3.6	5783	Observatory Cay (Lihou Rf.)	⊙
3262	Port De Boucherville	4.7	5785	Willis Islands	2.7
3263	Cape Acadia	1.4	5788	Osprey Reef	⊙
3265	Inoucdjouac	0.7	5790	Murray Islands	3.0
3266	Tukarak Island	1.3	5793	Bramble Cay	3.4

TABLE V - Part 2

HIGHEST ASTRONOMICAL TIDE (HAT) IN METRES AT SECONDARY PORTS

No.	Standard Port	HAT(m)	No.	Standard Port	HAT(m)
5794	Darnley Island	3.8	6436	Castlepoint	1.4
5798	Rennel Island	4.1	6438	Cape Palliser	1.5
5800	Dungeness Reef	3.8			
5802	Saibai Island	4.1	6441	Oteranga Bay	1.0
5807	Coconut Island	4.1	6442	Makara Beach	1.4
5808	Suarji Island	3.8	6443	Porirua Harbour	1.6
5808a	Moa Island (Banks Island)	3.4	6445	Manawatu River Entrance	2.8
5809	Hawkesbury Island	3.7	6447	Wanganui River Entrance	3.3
			6449	Patea	2.9
5811	East Strait Island	3.8			
5813	Tuesday Island (No. 1)	3.7	6451	Opunake Bay	3.7
5814	Wednesday Island (Ince Point)	3.7	6453	Collingwood	5.2
5818	Hammond Rock	3.7	6454	Motupipi River	5.5
5819	Round Island	3.3	6455	Astrolabe Road	5.4
6388	Scheigis Beacon	2.2	6458	Nelson	4.7
6388a	Omaia Island	2.5	6460	Croiselles Harbour	4.9
6388b	Dairy Factory Wharf	2.4	6462	Greville Harbour	4.1
6389	Mangonui	2.7			
			6464	Stephens Island	3.1
6390	Whangaroa	2.5	6466	Elmslie Bay	2.8
6390a	Waiti Bay	2.3	6467	Pelorus Sound Entrance	3.2
6391	Russell	2.7	6471	Havelock	3.3
6391a	Opua	2.7	6474	Long Island (New Zealand)	1.6
6391b	Whangamumu Harbour	2.2	6476	East Bay	1.5
6392	Whangaruru Harbour	2.3	6477	Piiton	1.6
6393	Tutukaka Harbour	2.5	6478	Okiwa Bay	1.6
6394	Marsden Point	3.0	6478a	Whekenui	1.5
			6479	Te Iro Bay	1.5
6395	Port Whangarei	3.4			
6396	Mokohinau Island	2.4	6481	Lucky Bay	1.5
6397	Bon Accord Harbour	2.6	6482	Port Underwood	1.7
6397a	Matakana River	2.9	6482	Lake Grassmere Entrance	1.8
6398	Mahurangi Harbour	⊙	6485	Cape Campbell	1.9
6398a	Tiritiri Matangi Island	3.0	6487	Kaikoura Peninsula	2.0
6399	Weiti River Entrance	3.0			
			6491	Akaroa	2.8
6401	Man o'War Bay	3.1	6492	Timaru	2.7
6401a	Matiata Bay	2.9	6494	Oamaru	2.4
6404	Rocky Point (Thames)	3.5	6496	Otago Harbour Entrance	2.2
6405	Coromandel Harbour	3.1	6497	Port Chalmers	2.4
6406	Nagle Cove	2.6	6498	Dunedin	2.4
6408	Port Jackson	2.8			
6411	Mercury Bay (Whitianga)	2.2	6500	Nugget Point	2.5
6412	Tairua	2.1	6502	Waipapa Point	3.0
6412a	Slipper Island	2.3	6505	New River Entrance	3.0
6415	Tauranga	2.1	6506	Colac Bay	2.6
6417	Whale Island	2.2	6507	Paterson Inlet	2.8
6418	Ohiwa	2.2	6728	Wailagilala Island	1.8
6419	Motunui Island	2.4	6729	Vanuabalavu Island	1.6
			6730	Tumbou	1.9
6421	Hicks Bay	2.2	6730a	Wainiyabia	1.6
6422	East Cape	2.2			
6423	Waipiro Bay	2.2	6732	Herald Sound	1.4
6424	Tolaga Bay	1.8	6733	Naroi	1.9
6425	Gisborne	2.2	6734	Matuku Harbour	2.0
6428	Portland Island	⊙	6735	Ngaloa Harbour	1.9
6429	Waikokopu	1.7	6735a	Namalata Bay	1.8
6430	Clyde	1.7	6739	Iles Wallis (Ile Urea)	2.0
6432	Napier No. 3 Wharf	2.0			

TABLE V - Part 2

HIGHEST ASTRONOMICAL TIDE (HAT) IN METRES AT SECONDARY PORTS

No.	Standard Port	HAT(m)	No.	Standard Port	HAT(m)
6740	Rotuma Island	2.0	7388	Huludao Gang	3.4
6744	Funafuti	2.2			
6750	Arorae	2.1	7392	Bar (Liao he)	4.0
6752	North Beru	1.6	7393	Bar Signal Station	4.6
6754	Tabiteuea	2.5	7394	Yingkou	4.5
6755	Nonouti	2.4	7397	Daitze Shan	4.5
6756	Abemama	2.2			
6759	Tarawa (Betio)	2.2	7401	Changxing Dao	2.4
			7403	Xizhong Dao	2.3
6760	Abaiang Atoll	2.2	1405	Boji Dao	2.8
6761	Butaritari (Makin)	2.2	7407	Hulu Dao	2.6
6763	Banaba	2.0			
6764	Nauru	2.4	7411	Yingzhengzi Wan	2.3
6766	Port Rhin	2.0	7414	Chang Zui	2.1
6767	Dodo Passage	1.9	7416	Lushun Gang	3.5
6768	Djarrit	2.2	7417	Xiaobing Dao	3.1
6769	South East Pass, Jaluit Atoll	2.0	7418	Yu Yan	3.2
6771	Ailinglapalap Atoll	1.8	7421	Dalian Gang (Dairen Ko)	3.8
6772	Maloelap Atoll	1.8	7424	Changjiang Ao	4.0
6775	Wotje Atoll	1.7	7427	Dachangshan Dao	4.7
6776	Kwajalein Atoll	1.8	7429	Haiyang Dao	4.7
6776a	Namuru To	1.8			
6777	Likiep Atoll	1.8	7432	Dawangjia Dao	5.3
			7435	Datu Dao	6.4
6782	Rongerik Atoll	1.8	7436	Takushan	5.9
6783	Rongelap Atoll	1.7	7439	Sin Do	7.1
6786	Bikini Atoll	1.8			
6787	Bnewetak Atoll	1.6	7440	Chao-Shih-Kou	6.3
6787a	Runit Island	1.6	7441	Tuyup'o	5.5
6788	Ujelang Atoll	1.6	7442	San-Tao-Lang-T'ou	⊙
			7443	An-tung	5.1
6790	Wake Island	1.0	7445	Suum Do	6.9
6792	Kusaie Island	1.9	7448	Tan Do	6.9
6795	Ponape Harbour	1.6			
6795a	Matalanin Harbour	1.7	7450	Nap To	6.6
6797	Orolok Island	1.2	7452	Unmu Do	7.5
6798	Nomoi Islands	1.3	7457	Sok To	5.4
6798a	Moro Tu	1.3	7458	Pi Do	6.4
6800	Hall Islands	1.1	7468	Monggum P'o	4.3
6800a	Nomuuin To	1.0	7469	Wollae Do (Getsnai Tau)	4.1
6801	Truk Islands	0.8	7470	Taeryonggi Bong	4.0
6802	Namonuito Islands	0.8	7471	Taechong Do	4.0
6802a	Onari To	0.8	7474	Sunwi Do	5.6
6803	Pulap Island	0.9	7475	Mu Do	7.0
6804	Puluwat Island	0.8	7477	Taeyonpyong Do	7.5
6807	Lamotrek	0.8	7479	Chumun Do	8.9
6811	Woleai Island	0.8	7480	Oep'on	9.2
6814	Ulithi Islands	1.4	7482	Seoul	⊙
6814a	Yasoru To	1.4	7484	Sun Tol Mok	⊙
6815	Yap Island	1.6	7487	Taemuui Do	9.0
6816	Ngulu Islet	1.5	7489	Tokchok To	8.4
6818	Garukoru (Ngaregur)	1.9	7492	Asan Myoji	9.7
6819	Toagel Mlungui	2.0	7494	Umu Do	8.4
6820	Malakal Harbour	2.1	7497	Manli Po	7.2
6821	Ngesebus	1.8			
6825	Helen Reef	1.9	7500	Sachang-Po	8.0

TABLE V - Part 2

HIGHEST ASTRONOMICAL TIDE (HAT) IN METRES AT SECONDARY PORTS

No.	Standard Port	HAT(m)	No.	Standard Port	HAT(m)
7501	Taecheon	7.2	8655	Windham Bay	6.1
7503	Daecheon Hang	6.2	8656	Cleveland Passage	6.0
7504	Kunsan (Outer Port)	7.6	8658	Slocum Arm (Falcon Ann)	3.8
7505	Kunsan	7.6	8659	Kimshan Cove	3.8
7507	Gogunso Gundo	6.6			
7510	Amma Do	5.7	8661	Lisianski Inlet	3.8
7512	Hampyeong Man	6.2	8662	Takanis Bay	3.7
7515	Buggang Sudo	4.9	8664	Port Althorp	3.9
7517	Mokp'o Hang	4.9	8665	Granite Cove	4.1
7519	Siha Do	4.3	8668	Lemesurier Island	4.3
			8670	Hoonah	5.5
			8673	Freshwater Bay, Alaska	5.8
7521	Hatas Do	4.0	8679	Sergius Narrows	4.8
7523	Bigeum Do	4.3			
7525	Daecheungsan Do	4.0	8680	Kakul Narrows	3.7
7529	Usuyong	4.1	8681	Nisimeni Cove	6.0
			8684	Fairway Island	5.8
7530	Hajo Do	3.5	8686	Kasnyku Bay	5.7
7531	Pyokpajin	4.3			
7532	Sangma Do (Joma To)	4.2	8690	Port Walter	4.1
7533	Oran Jin	4.0	8692	Cape Ommaney	3.7
7534	Chuk-To (Shaki To)	3.0	8695	Port Banks	3.7
7535	Hoasgunpo	3.0	8698	Biorika Island	3.7
7536	Sogwi-Po (Seikho Ko)	3.3			
7538	U Do	2.6	8700	Sitka	3.9
7539	Jeju Hang	3.1	8703	Whitestone Narrows	3.7
			8706	Gilmer Bay	3.8
7541	Sangchuja Do	3.6	8710	Point Thatcher	5.8
7542	Soan Do	3.8	8711	Favorite Bay	5.4
7543	Wan Do	4.4	8714	Funter Bay	6.1
7543a	Cheongsan Do	3.5	8716	Barlow Cove	6.2
7544	Geumdang Do	4.0			
7545	Geomun Do	3.7	8722	Windfall Harbour	6.2
7548	Nogdong	4.1	8723	Gambler Bay	6.0
			8724	Pybus Bay	5.8
8604	Rocky Point	4.2	8728	Security Bay	4.8
8605	Valdez	4.6	8732	Table Bay	4.0
8608	Windy Bay	4.5	8734	Port McArthur	3.8
8610	Port Etches	4.2	8738	Seclusion Harbour	6.0
8612	Whitshed Point	4.6	8743	Hamilton Bay	5.4
8613	Cordova	4.8			
8614	Middleton Island	3.9	9453	Puerto Corinto	2.5
8617	Controller Bay	3.7	9455	San Juan Del Sur	2.7
			9456	Bahia Elena	3.5
8622	Yakutat Bay	4.0	9457	Puerto Culebra	3.5
8626	Lituya Bay	3.6	9460	Puntarenas	3.3
8628	Cape Spencer	3.8	9462	Puerto Herradura	3.5
8629	Surveyor Seamount	3.5	9464	Bahia Uvita	3.5
8633	Bartlett Cove	5.9	9467	Bahia Del Rincon	3.5
8636	Swanson Harbour	6.1			
8639	William Henry Bay	6.3	9470	Chatham Bay	3.1
			9471	Puerto Armuelles	3.4
8641	Pyramid Harbour	6.4	9474	Isia Parida	3.9
8643	Skagway	6.4	9477	Bahia Honda (Panama)	3.9
8648	Fritz Cove	6.3	9478	Isia Coiba	4.1
8649	Juneau	6.3			
8651	Taku Point	6.5	9480	Isia Cebaco	3.9
8652	Taku Harbour	6.1	9484	Cabo Maia	4.1
			9488	Rio Chepo	5.6

TABLE V - Part 2

HIGHEST ASTRONOMICAL TIDE (HAT) IN METRES AT SECONDARY PORTS

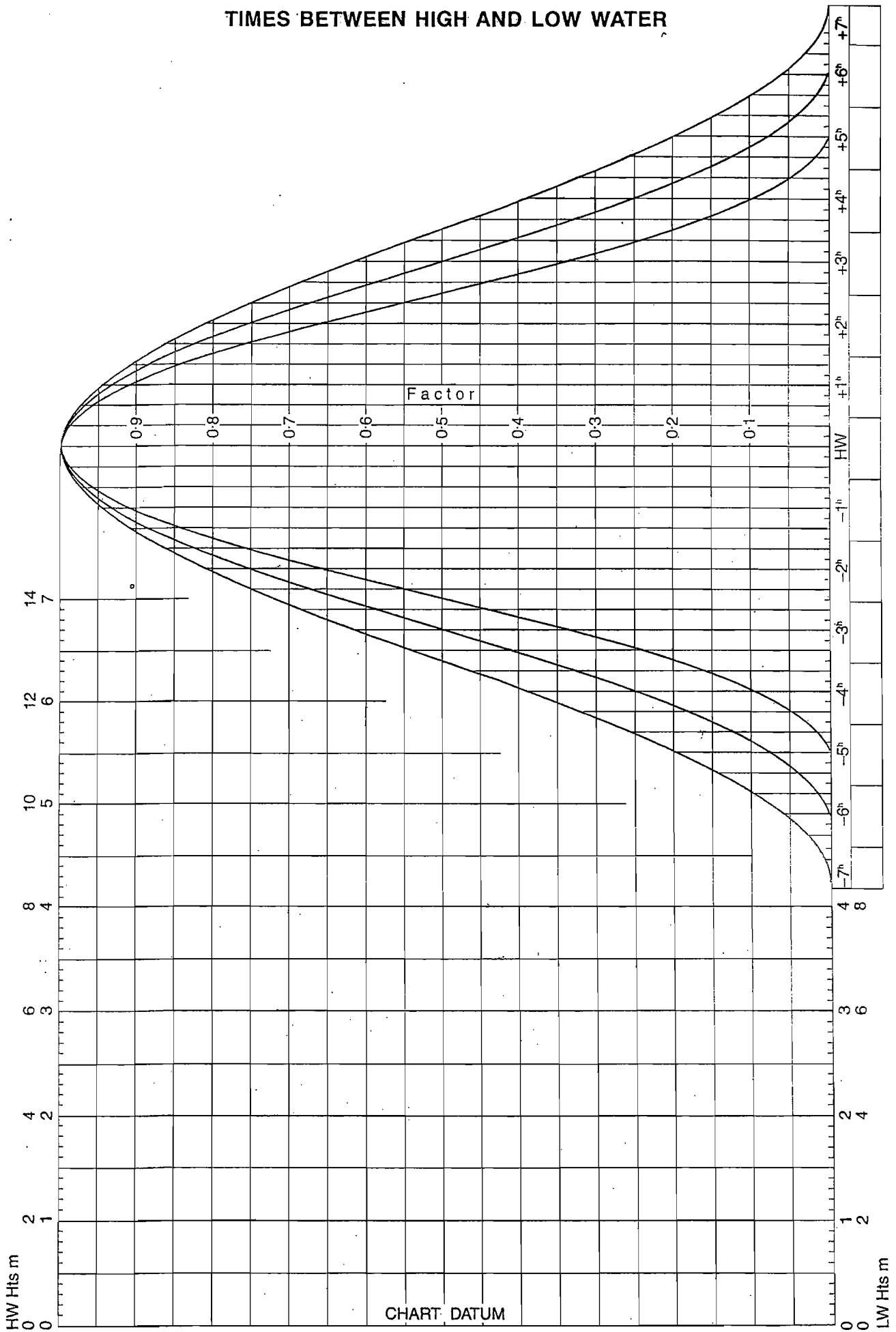
No.	Standard Port	HAT(m)	No.	Standard Port	HAT(m)
9492	Punta Garachine	5.0	9544	Guayaquil	4.7
9493	St Elmo Bay	5.0	9545	Puerto Bolívar	3.3
9496	Bahia Pinas	4.9	9547	Caleta Zorritos	2.0
9498	Bahia Octavia	4.8	9548	Lobitos	1.9
			9549	Bahia De Talara	1.8
9501	Puerto Utria	4.7	9551	Puerto De Paita	1.7
9503	Puerto Cuevita	4.7	9553	Puerto Bayovar	1.6
9505	Punta Chirambira	4.5	9554	Lobos De Afuera	1.5
9507	Buenaventura	4.6	9557	Puerto Eten	1.5
			9560	Puerto Chicama	1.3
9510	Rio Sanguiana	4.7	9562	Salaverry	1.3
9511	Puerto Tumaco	3.7	9563	Chimbote	1.3
9517	Bahia Darwin	2.6	9564	Bahia Ferrol	1.4
9519	Caleta Iguana	⊙	9566	Bahia Huarmey	1.2
			9568	Bahia Barnejo	⊙
9521	Caleta Aeolian	2.1			
9522	Bahia Post Office	1.9	9570	Puerto Huacho	1.1
9524	Bahia Agua Dulce	2.3	9573	Callao	1.2
9525	San Lorenzo	4.4	9575	Caletta Pucusana	⊙
9527	Esmeraldas	3.7	9577	Puerto Cerro Azul	⊙
9528	Bahia Atacames	4.6	9579	Pisco	1.0
9530	Muisne	3.5	9580	Bahia Independencia	⊙
9533	Cabo Pasado	3.6	9583	San Juan	1.1
9534	Bahia De Caraquez	3.3	9584	Punta Lomas	⊙
9535	Manta	3.1	9586	Rada Atico	⊙
9538	Puerto Lopez	3.4	9588	Caleta Quiica	⊙
9539	La Libertad	2.5	9589	Matarani	1.2
			9591	Puerto Ilo	1.3
9540	Posorja	2.8	9594	Arica	1.7
9540a	Puerto Maritimo De Guayaquil	4.8	9597	Caleta Junin	1.7
9541	Isla Santa Clara	2.3	9599	Iquique	1.7
9543	Puna	4.1			

The preceding table gives HAT tidal levels of all Secondary Ports in this volume, and are referred to Chart Datum, which is the same as the zero of the tidal predictions in all cases.

Notes:

⊙ No data

FOR FINDING THE HEIGHT OF THE TIDE AT
TIMES BETWEEN HIGH AND LOW WATER



AUSTRALIA, EAST COAST - BRISBANE BAR

LAT 27°22'S LONG 153°10'E

TIME ZONE -1000

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 0000

MAY				JUNE				JULY				AUGUST			
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M
1 0306	0.6	16 0346	0.5	1 0423	0.5	16 0508	0.6	1 0507	0.4	16 0519	0.5	1 0612	0.2	16 0538	0.3
SU 0843	2.0	M 0916	1.9	W 0943	1.8	TH 1028	1.6	F 1029	1.7	SA 1051	1.7	M 1156	2.0	TU 1135	1.9
O 1506	0.3	M 1523	0.3	W 1548	0.3	TH 1612	0.4	F 1623	0.2	SA 1638	0.4	M 1753	0.3	TU 1731	0.5
O 2126	2.4	2157	2.5	2230	2.5	2259	2.4	2304	2.6	2309	2.3			2336	2.1
2 0348	0.5	17 0435	0.6	2 0511	0.5	17 0546	0.6	2 0554	0.4	17 0547	0.5	2 0008	2.5	17 0604	0.4
0921	2.0	TU 0958	1.7	2 1033	1.7	17 1107	1.6	2 1121	1.8	17 1123	1.7	2 0649	0.2	17 1210	1.9
M 1538	0.3	TU 1557	0.3	TH 1629	0.3	F 1649	0.4	SA 1710	0.3	SU 1711	0.4	TU 1243	2.0	W 1808	0.6
2204	2.4	2238	2.5	2314	2.5	2335	2.3	2348	2.6	2339	2.2	1841	0.4		
3 0430	0.6	18 0521	0.6	3 0603	0.5	18 0620	0.6	3 0640	0.4	18 0615	0.5	3 0049	2.3	18 0004	2.0
0959	1.9	18 1040	1.6	3 1123	1.7	18 1145	1.6	3 1211	1.8	18 1159	1.7	3 0725	0.3	18 0632	0.4
TU 1610	0.3	W 1630	0.4	F 1713	0.4	SA 1725	0.5	SU 1758	0.3	M 1747	0.5	W 1332	2.1	TH 1248	1.9
2243	2.4	2318	2.4									1935	0.6	1849	0.7
4 0514	0.6	19 0606	0.7	4 0000	2.5	19 0009	2.2	4 0032	2.5	19 0010	2.2	4 0131	2.0	19 0035	1.8
1040	1.8	19 1122	1.6	4 0654	0.6	19 0653	0.7	4 0723	0.4	19 0645	0.5	4 0804	0.3	19 0701	0.4
W 1644	0.4	TH 1705	0.5	SA 1217	1.7	SU 1223	1.6	M 1302	1.8	TU 1237	1.7	TH 1428	2.1	F 1331	1.9
2323	2.4	2357	2.3	1800	0.4	1803	0.6	1850	0.4	1824	0.6	2038	0.7	1940	0.8
5 0601	0.6	20 0648	0.7	5 0048	2.5	20 0045	2.2	5 0117	2.4	20 0041	2.1	5 0220	1.8	20 0114	1.6
1125	1.7	20 1204	1.5	5 0748	0.6	20 0728	0.7	5 0807	0.4	20 0718	0.5	5 0848	0.4	20 0738	0.5
TH 1721	0.4	F 1740	0.6	SU 1314	1.7	M 1307	1.6	TU 1357	1.9	W 1319	1.7	F 1534	2.1	SA 1428	1.9
				1854	0.6	1846	0.7	1946	0.6	1909	0.7	2158	0.8	2052	0.9
6 0007	2.4	21 0037	2.2	6 0139	2.4	21 0123	2.1	6 0204	2.2	21 0115	1.9	6 0325	1.5	21 0213	1.5
0653	0.7	21 0731	0.8	6 0842	0.6	21 0808	0.7	6 0852	0.4	21 0754	0.5	6 0940	0.5	21 0833	0.5
F 1216	1.6	SA 1250	1.5	M 1419	1.7	TU 1358	1.6	W 1459	1.9	TH 1410	1.8	SA 1647	2.1	SU 1546	1.9
1804	0.5	1822	0.7	1958	0.7	1938	0.8	2052	0.7	2005	0.9	2334	0.8	2229	0.9
7 0056	2.3	22 0120	2.1	7 0235	2.3	22 0205	2.0	7 0256	2.1	22 0158	1.8	7 0450	1.4	22 0346	1.3
0753	0.7	22 0818	0.8	7 0937	0.6	22 0855	0.7	7 0939	0.4	22 0839	0.5	7 1045	0.5	22 0954	0.6
SA 1317	1.5	SU 1345	1.5	TU 1530	1.8	W 1504	1.7	TH 1606	2.0	F 1517	1.8	SU 1758	2.1	M 1708	2.0
1857	0.6	1911	0.8	2110	0.7	2043	0.9	2208	0.8	2121	0.9				

AUSTRALIA, TORRES STRAIT - HAMMOND ROCK LIGHTHOUSE

LAT 10°30'S LONG 142°13'E

TIDAL STREAM PREDICTIONS (RATES IN KNOTS)

TIME ZONE -1000

POSITIVE (+) DIRECTION 080 NEGATIVE (-) DIRECTION 260

YEAR 0000

JULY			AUGUST			SEPTEMBER																		
SLACK TIME	MAXIMUM TIME	RATE	SLACK TIME	MAXIMUM TIME	RATE	SLACK TIME	MAXIMUM TIME	RATE	SLACK TIME	MAXIMUM TIME	RATE	SLACK TIME	MAXIMUM TIME	RATE										
1 0409 0104 -3.6	0903 0642 2.7	F 1701 1309 -6.9	2254 1951 4.1	16 0552 0238 -3.0	1013 0807 1.7	SA 1821 1425 -5.4	2107 2107 3.0	1 0521 0219 -4.8	1054 0812 4.5	M 1818 1438 -7.6	2108 4.9	16 0553 0238 -2.8	1053 0825 1.9	TU 1830 1440 -3.8	2335 2058 1.9	1 0017 0337 -5.6	0656 0954 4.6	16 1132 0842 2.0	1255 1614 -5.3	1943 2224 3.5	F 1813 1447 -2.4	2250 2034 1.3		
2 0454 0151 -3.7	0955 0731 3.0	SA 1751 1359 -7.2	2344 2040 4.3	17 0009 0308 -2.7	0624 0836 1.5	SU 1040 1455 -4.8	1855 2136 2.4	2 0008 0310 -4.9	0616 0908 4.4	TU 1153 1532 -7.0	1912 2159 4.5	17 0616 0253 -2.7	1116 0848 1.7	W 1853 1502 -3.3	2339 2114 1.5	2 0108 0438 -5.2	0808 1107 4.0	17 0640 0248 -3.2	1412 1727 -4.1	2055 2331 2.6	SA 1838 1518 -1.8	2308 2057 1.0		
3 0545 0241 -3.8	1050 0823 3.1	SU 1844 1452 -7.1	2133 4.2	18 0030 0334 -2.4	0656 0905 1.2	M 1106 1523 -4.2	1929 2201 1.9	3 0055 0406 -4.9	0719 1009 4.0	W 1257 1633 -6.1	2011 2256 3.8	18 0646 0311 -2.6	1144 0915 1.5	TH 1917 1526 -2.7	2348 2132 1.2	3 0205 0551 -4.8	0930 1233 3.5	18 0739 0326 -3.1	1545 1856 -3.3	2223	SU 1921 1607 -1.2	2339 2136 0.7		
4 0036 0335 -3.9	0642 0921 3.1	M 1149 1549 -6.8	1941 2228 4.0	19 0046 0359 -2.3	0730 0934 1.0	TU 1131 1553 -3.6	2004 2226 1.4	4 0148 0508 -4.8	0830 1121 3.6	TH 1410 1742 -5.1	2120	19 0726 0337 -2.6	1218 0950 1.2	F 1948 1557 -2.2	2155 0.9	4 0313 0051 2.0	1057 0714 -4.7	19 0907 0427 -2.9	1723 1405 3.6	2353 2030 -3.1	M 2051 1742 -0.8	2253 0.4		
5 0129 0434 -4.0	0747 1024 3.0	TU 1254 1652 -6.3	2042 2328 3.7	20 0058 0425 -2.2	0810 1007 0.8	W 1159 1623 -3.0	2041 2253 1.0	5 0245 0001 3.1	0951 0618 -4.7	F 1538 1242 3.3	2237 1904 -4.2	20 0002 0413 -2.5	0826 1042 0.9	SA 1308 1644 -1.6	2034 2234 0.6	5 0430 0216 1.8	1215 0836 -4.9	20 0038 0606 -2.9	1843 1524 4.0	2147 -3.4	TU 1702 1949 -1.0	2254		
6 0224 0538 -4.1	0859 1137 2.8	W 1408 1801 -5.7	2149	21 0110 0457 -2.1	0903 1050 0.6	TH 1235 1703 -2.5	2125 2325 0.7	6 0348 0113 2.6	1114 0735 -4.8	SA 1711 1409 3.4	2357 2030 -3.8	21 0028 0511 -2.5	0952 1208 0.7	SU 1438 1807 -1.2	2154 2342 0.4	6 0106 0329 2.0	0544 0943 -5.3	21 0243 0057 0.5	1319 1627 4.4	1944 2245 -3.7	W 1813 1456 2.2	2103 -1.7		
7 0322 0033 3.3	1017 0647 -4.4	TH 1531 1255 2.8	2259 1916 -5.1	22 0128 0540 -2.2	1009 1150 0.4	F 1329 1757 -2.0	2221	7 0454 0228 2.3	1230 0850 -5.2	SU 1838 1531 3.8	2149 -3.7	22 0122 0640 -2.7	1122 1357 1.0	M 1650 2001 -1.1	2327	7 0200 0426 2.4	0646 1038 -5.6	22 0001 0229 1.3	1411 1717 4.6	2031 2330 -3.9	TH 1249 1549 3.2	1859 2153 -2.7		
8 0421 0139 3.0	1133 0756 -4.8	F 1659 1416 3.1	2033 -4.7	23 0157 0009 0.5	1121 0638 -2.3	SA 1459 1308 0.5	2324 1911 -1.7	8 0109 0338 2.3	0558 0956 -5.6	M 1335 1638 4.3	1951 2253 -3.8	23 0304 0122 0.5	1226 0811 -3.3	TU 1822 1517 1.8	2120 -1.6	8 0242 0513 2.7	0737 1124 -5.8	23 0049 0332 2.5	1456 1757 4.5	2108	F 1336 1634 4.1	1939 2236 -3.7		
9 0008 0244 2.8	0518 0903 -5.3	SA 1242 1531 3.5	1823 2146 -4.5	24 0248 0108 0.4	1218 0744 -2.7	SU 1650 1431 0.9	2032 -1.7	9 0210 0437 2.5	0656 1053 -6.0	TU 1430 1734 4.6	2048 2347 -3.9	24 0026 0245 1.1	0449 0921 -4.3	W 1317 1612 2.7	1920 2213 -2.3	9 0317 0007 -4.0	0819 0551 2.9	24 0134 0425 3.7	1534 1202 -5.6	2136 1830 4.2	SA 1421 1716 4.9	2018 2318 -4.8		
10 0114 0346 2.7	0612 1005 -5.9	SU 1344 1638 4.0	1939 2252 -4.4	25 0019 0213 0.6	0359 0848 -3.3	M 1304 1538 1.5	1821 2138 -2.0	10 0259 0527 2.6	0746 1141 -6.2	W 1519 1821 4.7	2134	25 0111 0347 2.0	0608 1016 -5.4	TH 1402 1658 3.7	2005 2258 -3.2	10 0345 0036 -3.9	0854 0623 2.9	25 0219 0515 4.8	1607 1234 -5.3	2157 1858 3.7	SU 1505 1758 5.4	O 2056		
11 0214 0442 2.7	0703 1059 -6.3	M 1440 1738 4.4	2043 2349 -4.2	26 0102 0312 1.0	0511 0944 -4.2	TU 1345 1631 2.3	1926 2231 -2.4	11 0341 0031 -3.9	0829 0608 2.6	TH 1601 1223 -6.1	2211 1900 4.5	26 0153 0440 3.0	0711 1106 -6.5	F 1445 1741 4.6	2046 2340 -4.1	11 0409 0100 -3.7	0924 0649 2.8	26 0305 0001 -5.6	1635 1301 -4.9	2212 1920 3.2	M 1550 1223 -7.4	2135 1840 5.5		
12 0308 0532 2.6	0750 1149 -6.5	TU 1531 1829 4.6	2139	27 0141 0406 1.7	0617 1034 -5.2	W 1427 1718 3.2	2020 2317 -2.9	12 0415 0108 -3.7	0906 0645 2.6	F 1638 1259 -5.9	2241 1934 4.0	27 0237 0529 4.1	0808 1153 -7.3	SA 1529 1823 5.2	O 2126	12 0430 0119 -3.5	0950 0712 2.7	27 0353 0045 -6.2	1658 1323 -4.4	2222 1937 2.7	TU 1635 1312 -7.1	2215 1924 5.3		
13 0355 0040 -4.0	0831 0617 2.4	W 1619 1234 -6.5	2227 1916 4.4	28 0220 0454 2.4	0716 1122 -6.1	TH 1509 1802 4.0	2107	13 0445 0138 -3.4	0938 0715 2.4	SA 1712 1330 -5.4	2304 2002 3.5	28 0322 0023 -4.8	0903 0618 4.9	SU 1614 1240 -7.8	2208 1907 5.5	13 0449 0134 -3.4	1014 0733 2.6	28 0443 0130 -6.5	1719 1344 -3.9	2227 1951 2.3	W 1723 1403 -6.4	2256 2009 4.7		
14 0438 0124 -3.7	0909 0658 2.2	TH 1702 1315 -6.3	2308 1957 4.1	29 0300 0002 -3.5	0811 0543 3.1	F 1553 1209 -7.0	O 2152 1847 4.6	14 0509 0201 -3.2	1006 0741 2.3	SU 1741 1356 -4.9	2319 2024 2.9	29 0409 0108 -5.4	0956 0707 5.4	M 1701 1329 -7.8	2249 1952 5.5	14 0508 0148 -3.3	1038 0753 2.4	29 0538 0219 -6.4	1737 1403 -3.4	2232 2004 1.9	TH 1816 1457 -5.4	2340 2058 3.9		
15 0517 0204 -3.4	0943 0734 2.0	F 1742 1352 -5.9	2342 2034 3.6	30 0344 0046 -4.1	0906 0631 3.8	SA 1639 1257 -7.6	2236 1932 5.0	15 0531 0221 -2.9	1030 0804 2.1	M 1807 1420 -4.4	2328 2042 2.3	30 0459 0154 -5.8	1052 0758 5.5	TU 1750 1420 -7.3	2332 2038 5.1	15 0531 0203 -3.3	1102 0815 2.2	30 0639 0311 -6.0	1753 1423 -2.9	2238 2017 1.6	F 1917 1600 -4.2	2154 2.9		
				31 0430 0132 -4.5	0959 0721 4.3	SU 1727 1346 -7.8	2321 2019 5.1					31 0554 0243 -5.8	1150 0853 5.2	W 1843 1513 -6.4	2128 4.4									

CURRENT INCLUDED IN PREDICTIONS.

AUSTRALIA, NORTH COAST - DARWIN

LAT 12°28'S LONG 130°51'E

TIME ZONE -0930

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 1988

JANUARY				FEBRUARY				MARCH				APRIL			
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M
1 0259	5.4	16 0154	5.2	1 0015	3.4	16 0438	5.5	1 0008	3.2	16 0443	5.8	1 0014	2.2	16 0012	1.1
1022	1.7	0927	2.0	0501	5.3	1126	1.4	0523	5.4	1114	1.6	0609	6.4	0616	7.2
F 1708	6.3	SA 1649	6.0	M 1158	1.8	TU 1817	7.0	TU 1155	2.1	W 1751	6.9	F 1220	1.9	SA 1217	1.6
2305	3.7	2241	4.0	1835	6.6			1820	6.4			1828	6.7	• 1815	7.2
2 0358	5.5	17 0318	5.3	2 0043	3.0	17 0019	2.8	2 0032	2.8	17 0001	2.3	2 0038	1.8	17 0050	0.6
1107	1.5	1031	1.6	2 0547	5.7	17 0538	6.2	2 0559	5.9	17 0540	6.5	2 0640	6.7	17 0700	7.5
SA 1753	6.6	SU 1740	6.6	TU 1236	1.6	W 1219	0.9	W 1228	1.8	TH 1204	1.1	SA 1246	1.8	SU 1253	1.7
2351	3.4	2336	3.6	O 1908	6.9	• 1858	7.5	1849	6.7	1830	7.4	O 1850	6.9	1843	7.3
3 0447	5.6	18 0427	5.6	3 0108	2.7	18 0059	2.2	3 0053	2.4	18 0041	1.5	3 0104	1.4	18 0124	0.4
1145	1.4	1126	1.1	3 0625	6.1	18 0631	6.8	3 0631	6.3	18 0631	7.2	3 0711	6.9	18 0738	7.6
SU 1832	6.9	M 1826	7.1	W 1307	1.4	TH 1304	0.5	TH 1254	1.5	F 1246	0.9	SU 1310	1.8	M 1327	1.8
				1938	7.1	1935	7.9	O 1914	6.9	• 1904	7.7	1908	7.0	1910	7.2
4 0024	3.1	19 0020	3.1	4 0131	2.5	19 0139	1.6	4 0114	2.1	19 0120	0.9	4 0130	1.1	19 0156	0.4
0531	5.8	0524	6.1	4 0702	6.3	19 0721	7.3	4 0701	6.6	19 0716	7.6	4 0740	7.1	19 0815	7.5
M 1219	1.3	TU 1217	0.7	TH 1334	1.3	F 1342	0.4	F 1319	1.4	SA 1323	0.9	M 1335	1.9	TU 1359	2.1
O 1907	7.0	• 1909	7.5	2004	7.2	2008	8.1	1937	7.1	1933	7.9	1926	7.0	1938	7.0
5 0053	2.9	20 0102	2.7	5 0157	2.2	20 0219	1.1	5 0138	1.8	20 0157	0.5	5 0157	1.0	20 0227	0.6
0611	6.0	0617	6.5	5 0735	6.5	20 0807	7.5	5 0730	6.8	20 0758	7.7	5 0809	7.2	20 0849	7.2
TU 1253	1.2	W 1303	0.5	F 1359	1.3	SA 1419	0.6	SA 1341	1.4	SU 1357	1.1	TU 1400	2.0	W 1430	2.5
1939	7.1	1949	7.7	2026	7.2	2037	8.1	1956	7.2	1959	7.8	1946	6.9	2004	6.6
6 0123	2.7	21 0143	2.3	6 0226	2.1	21 0257	0.8	6 0205	1.6	21 0232	0.4	6 0224	0.9	21 0256	1.0
0651	6.2	0708	6.8	6 0807	6.5	21 0850	7.4	6 0759	6.9	21 0837	7.6	6 0839	7.1	21 0922	6.8
W 1325	1.2	TH 1345	0.4	SA 1421	1.4	SU 1452	1.1	SU 1402	1.5	M 1428	1.6	W 1429	2.3	TH 1502	2.8
2010	7.1	2026	7.9	2047	7.2	2104	7.9	2013	7.2	2024	7.6	2008	6.7	2030	6.1
7 0155	2.6	22 0225	1.9	7 0256	2.0	22 0336	0.8	7 0232	1.4	22 0306	0.5	7 0253	1.0	22 0325	1.5
0728	6.2	0759	6.9	7 0838	6.5	22 0932	7.1	7 0827	6.9	22 0913	7.3	7 0913	6.9	22 0954	6.3
TH 1355	1.3	F 1425	0.6	SU 1438	1.7	M 1523	1.7	M 1423	1.8	TU 1458	2.1	TH 1503	2.6	F 1535	3.2
2038	7.0	2059	7.8	2107	7.1	2129	7.4	2030	7.1	2047	7.1	2035	6.4	2058	5.6
8 0229	2.5	23 0309	1.7	8 0326	1.9	23 0413	1.0	8 0259	1.3	23 0338	0.9	8 0325	1.3	23 0358	2.1
0804	6.1	0849	6.9	8 0911	6.3	23 1013	6.7	8 0857	6.8	23 0949	6.8	8 0951	6.6	23 1031	5.8
F 1423	1.6	SA 1504	1.0	M 1454	2.0	TU 1551	2.4	TU 1445	2.1	W 1527	2.7	F 1539	3.0	SA 1615	3.5
2106	6.9	2131	7.7	2125	6.9	2151	6.9	2047	6.9	2108	6.5	2104	6.0	2134	5.0
9 0304	2.5	24 0354	1.6	9 0358	1.9	24 0450	1.4	9 0327	1.4	24 0408	1.4	9 0403	1.7	24 0447	2.7
0840	6.0	0939	6.6	9 0948	6.1	24 1055	6.1	9 0931	6.7	24 1024	6.3	9 1036	6.1	24 1120	5.3
SA 1444	1.8	SU 1539	1.6	TU 1515	2.4	W 1617	3.1	W 1512	2.5	TH 1556	3.2	SA 1623	3.5	SU 1716	3.8
2132	6.7	2202	7.4	2144	6.6	2208	6.2	2107	6.6	2126	5.9	2138	5.5	2245	4.5

NEW ZEALAND, NORTH ISLAND - AUCKLAND

LAT 36°51'S LONG 174°46'E

TIME ZONE -1200

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 1988

JANUARY				FEBRUARY				MARCH				APRIL			
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M
1 0511	2.9	16 0410	2.8	1 0001	0.8	16 0558	3.0	1 0611	2.7	16 0536	3.0	1 0029	0.8	16 0034	0.4
F 1733	2.8	SA 1625	2.8	M 1236	1.0	TU 1820	2.9	TU 1837	2.6	W 1804	2.9	F 1265	0.8	SA 1302	0.2
2334	0.7	2248	0.7	1902	2.7							1933	2.8	• 1941	3.3
2 0610	2.9	17 0517	2.8	2 0049	0.8	17 0024	0.4	2 0020	0.9	17 0001	0.4	2 0111	0.7	17 0127	0.3
1208	0.9	17 1123	0.8	0731	2.9	17 0702	3.2	0703	2.8	17 0641	3.2	0747	2.9	17 0804	3.3
SA 1830	2.8	SU 1733	2.8	TU 1321	0.9	W 1257	0.5	W 1251	0.9	TH 1234	0.4	SA 1333	0.7	SU 1351	0.2
		2348	0.6	O 1949	2.8	• 1924	3.1	1925	2.7	1907	3.1	O 2011	2.9	2030	3.4
3 0025	0.7	18 0622	3.0	3 0132	0.7	18 0118	0.3	3 0104	0.8	18 0057	0.3	3 0150	0.6	18 0217	0.3
0703	2.9	18 1222	0.7	0813	2.9	18 0758	3.4	0745	2.9	18 0737	3.3	0824	2.9	18 0851	3.4
SU 1259	0.9	M 1839	2.9	W 1401	0.8	TH 1349	0.3	TH 1331	0.8	F 1326	0.2	SU 1409	0.6	M 1438	0.2
1922	2.8			2031	2.8	2020	3.3	O 2006	2.8	• 2002	3.3	2049	3.0	2116	3.4
4 0113	0.7	19 0045	0.4	4 0211	0.7	19 0209	0.2	4 0143	0.7	19 0148	0.2	4 0226	0.6	19 0305	0.4
0751	3.0	19 0722	3.2	0851	3.0	19 0850	3.5	0822	2.9	19 0828	3.5	0901	3.0	19 0937	3.3
M 1345	0.8	TU 1318	0.5	TH 1437	0.8	F 1438	0.2	F 1407	0.7	SA 1415	0.1	M 1444	0.5	TU 1524	0.2
O 2008	2.9	• 1940	3.1	2108	2.9	2112	3.4	2043	2.9	2052	3.4	2126	3.0	2201	3.4
5 0156	0.6	20 0137	0.3	5 0247	0.6	20 0257	0.1	5 0219	0.6	20 0237	0.2	5 0303	0.6	20 0352	0.6
0833	3.1	20 0817	3.4	0926	3.1	20 0938	3.6	0857	3.0	20 0916	3.5	0938	3.0	20 1021	3.3
TU 1426	0.8	W 1409	0.4	F 1511	0.7	SA 1526	0.1	SA 1441	0.6	SU 1502	0.1	TU 1519	0.5	W 1611	0.4
2050	2.9	2035	3.2	2144	2.9	2201	3.5	2118	3.0	2139	3.5	2204	3.1	2246	3.3

NEW ZEALAND, NORTH ISLAND - AUCKLAND

LAT 36°51'S LONG 174°46'E

TIME ZONE -1200

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 1988

MAY				JUNE				JULY				AUGUST													
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M										
1	0036	0.8		16	0108	0.5		1	0202	0.5		16	0247	0.7		1	0318	0.1		16	0328	0.6			
	0705	2.8			0739	3.2			0824	3.0			0916	2.9			0951	3.3		16	1006	2.8			
SU	1257	0.6	M	1329	0.3			F	1419	0.3	SA	1456	0.5	M	1536	0.1	TU	1541	0.5						
O	1936	2.9		2007	3.3				2059	3.3			2136	3.0			2219	3.4		TU	2220	2.9			
2	0119	0.7		17	0158	0.5		2	0250	0.4		17	0325	0.7		2	0407	0.1		17	0403	0.6			
	0747	2.9			0827	3.2			0916	3.1			0955	2.8			1041	3.3		17	1042	2.8			
M	1337	0.5	TU	1416	0.3		TH	1436	0.4	F	1521	0.5	SA	1506	0.3	SU	1534	0.6	TU	1626	0.2	W	1617	0.6	
	2017	3.0		2054	3.3				2149	3.3			2213	3.0			2307	3.4			2256	2.9			
3	0200	0.6		18	0246	0.5		3	0338	0.4		18	0402	0.7		3	0459	0.2		18	0439	0.6			
	0828	3.0			0913	3.2			1007	3.1			1034	2.8			1132	3.2		18	1120	2.8			
TU	1416	0.5	W	1501	0.4		F	1522	0.4	SA	1603	0.6	SU	1554	0.3	M	1612	0.6	W	1720	0.3	TH	1656	0.7	
	2058	3.1		2138	3.3				2238	3.4			2250	3.0			2356	3.3			2333	2.8			
4	0240	0.6		19	0332	0.6		4	0429	0.4		19	0440	0.7		4	0554	0.3		19	0519	0.7			
	0910	3.0			0957	3.1			1059	3.1			1112	2.8			1222	3.1		19	1159	3.7			
W	1455	0.5	TH	1546	0.5		SA	1610	0.4	SU	1646	0.7	M	1646	0.3	TU	1653	0.7	TH	1819	0.5	F	1740	0.8	
	2140	3.1		2221	3.2				2254	3.2			2319	3.0			2328	2.9							

CHINA - BEIHAI

LAT 21°29'N LONG 109°04'E

TIME ZONE -0800

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 1988

JANUARY				FEBRUARY				MARCH				APRIL											
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M								
1 F	0329 1257	4.3 0.9	16 SA	0253 1244	4.2 0.9	1 M	0437 1438	4.7 0.3	16 TU	0407 1357	5.0 0.0	1 TU	0413 1359	4.4 0.6	16 W	0356 1322	4.7 0.5	1 F	0531 1317 1918 2333	3.5 1.5 2.3 2.0	16 SA	0633 1301 1801	3.4 2.2 3.0
2 SA	0412 1357	4.6 0.5	17 SU	0336 1331	4.6 0.3	2 TU O	0524 1514	4.7 0.3	17 W ●	0507 1441	5.1 0.1	2 W	0504 1425	4.2 0.7	17 TH	0507 1400	4.6 0.9	2 SA O	0625 1323 1905	3.2 1.7 2.5	17 SU	0059 0758 1242 1826	1.2 3.0 2.6 3.5
3 SU	0456 1450	4.9 0.3	18 M	0423 1417	5.0 0.0	3 W	0607 1544	4.6 0.4	18 TH	0608 1521	5.0 0.4	3 TH O	0551 1444	4.1 0.9	18 F ●	0615 1430 1916 2341	4.3 1.3 2.0 1.5	3 SU	0050 0721 1326 1907	1.8 3.0 2.0 2.9	18 M	0212 0958 1126 1858	0.9 2.7 2.7 4.0
4 M O	0540 1536	5.0 0.1	19 TU ●	0514 1503	5.3 -0.2	4 TH	0648 1606	4.5 0.6	19 F	0708 1556 2129 2314	4.8 0.8 1.6 1.5	4 F	0635 1457 2149 2239	3.9 1.1 1.9 1.9	19 SA	0723 1449 1921	3.9 1.8 2.4	4 M	0154 0824 1321 1921	1.5 2.7 2.2 3.3	19 TU	0322 1935	0.7 4.4
5 TU	0621 1616	5.0 0.2	20 W	0607 1548	5.4 -0.2	5 F	0726 1623	4.3 0.8	20 SA	0809 1623 2107	4.4 1.4 2.0	5 SA	0718 1506 2052	3.7 1.4 2.1	20 SU	0114 0833 1449 1941	1.3 3.5 2.3 3.0	5 TU	0256 0948 1256 1944	1.3 2.5 2.4 3.7	20 W	0432 2015	0.6 4.7
6 W	0700 1651	4.9 0.3	21 TH	0701 1632	5.4 0.1	6 SA	0803 1635	4.1 1.1	21 SU	0121 0911 1634 2119	1.5 3.9 1.9 2.5	6 SU	0043 0803 1513 2042	1.9 3.4 1.7 2.4	21 M	0235 0950 1421 2011	1.1 3.0 2.6 3.5	6 W	0401 2016	1.1 4.2	21 TH	0546 2058	0.6 4.8
7 TH	0737 1719	4.8 0.5	22 F	0756 1712	5.2 0.5	7 SU	0841 1645 2334	3.8 1.4 2.2	22 M	0257 1018 1622 2146	1.5 3.4 2.3 3.0	7 M	0203 0852 1515 2049	1.8 3.1 2.0 2.8	22 TU	0353 1142 1311 2048	1.0 2.6 2.6 3.9	7 TH	0512 2055	0.9 4.6	22 F	0703 2144	0.6 4.8
8 F	0812 1741	4.6 0.7	23 SA	0854 1746	4.8 1.0	8 M	0144 0922 1652 2307	2.1 3.5 1.7 2.5	23 TU	0430 1138 1544 2225	1.5 2.9 2.5 3.5	8 TU	0319 0951 1508 2109	1.7 2.8 2.2 3.2	23 W	0516 2132	1.0 4.3	8 F	0630 2142	0.8 4.8	23 SA	0818 2232	0.7 4.7
9 SA	0846 1758	4.4 1.0	24 SU	0954 1808 2333	4.3 1.6 2.3	9 TU	0340 1010 1652 2313	2.2 3.1 2.0 2.9	24 W	0618 2314	1.5 3.9	9 W	0439 1117 1437 2141	1.6 2.5 2.3 3.7	24 TH	0654 2222	1.0 4.5	9 SA	0751 2238	0.6 5.0	24 SU	0920 2325	0.9 4.4
10 SU	0921 1812	4.1 1.3	25 M	0318 1059 1809 2350	2.0 3.7 2.1 2.8	10 W	0532 1117 1638 2339	2.1 2.6 2.2 3.4	25 TH	0837	1.3	10 TH	0612 2223	1.4 4.1	25 F	0841 2318	0.9 4.5	10 SU	0908 2345	0.5 5.0	25 M	1006	1.0
11 M	0958 1823	3.7 1.6	26 TU	0522 1218 1739	2.0 3.1 2.4	11 TH	0753 1345 1534	1.9 2.2 2.2	26 F	0011 1034	4.2 1.1	11 F	0800 2315	1.2 4.4	26 SA	1007	0.9	11 M	1012	0.5	26 TU	0026 1039	4.1 1.2
12 TU	1040 1827	3.2 1.8	27 W	0025 0756 1412 1638	3.3 1.9 2.5 2.4	12 F	0019 1012	3.8 1.4	27 SA	0113 1148	4.4 0.8	12 SA	-0939	0.9	27 SU	0021 1109	4.5 0.9	12 TU	0103 1106	4.8 0.7	27 W	0136 1101	3.8 1.4
13 W	0154 0708 1144 1819	2.9 2.6 2.7 2.0	28 TH	0110 1031	3.8 1.5	13 SA	0109 1127	4.2 0.9	28 SU	0216 1243	4.5 0.7	13 SU	0018 1051	4.7 0.6	28 M	0129 1154	4.3 0.9	13 W	0228 1152	4.5 0.9	28 TH	0249 1113 1837 2129	3.5 1.6 2.6 2.6
14 TH	0155 1037 1421 1740	3.3 2.1 2.2 2.1	29 F	0201 1201	4.2 1.0	14 SU	0206 1222	4.6 0.5	29 M	0317 1325	4.5 0.6	14 M	0129 1149	4.8 0.4	29 TU	0236 1227	4.1 1.0	14 TH	0351 1228 1800 2125	4.2 1.3 2.2 2.0	29 F	0402 1121 1757 2336	3.1 1.8 2.8 2.2
15 F	0218 1153	3.7 1.5	30 SA	0254 1304	4.5 0.7	15 M	0306 1311	4.8 0.2				15 TU	0243 1238	4.8 0.4	30 W	0338 1251	3.9 1.1	15 F	0512 1253 1748 2333	3.8 1.8 2.5 1.6	30 SA	0514 1124 1749	2.8 1.9 3.0
			31 SU	0347 1355	4.7 0.4							31 TH	0436 1307	3.7 1.3									

FOR INTERMEDIATE HEIGHTS USE HARMONIC CONSTANTS (SEE PART III) AND NP 159.

CHINA - HONG KONG

LAT 22°18'N LONG 114°12'E

TIME ZONE -0800

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 1988

Table with columns for months (MAY, JUNE, JULY, AUGUST) and days, listing tide times and heights (M, M') for each day.

FOR INTERMEDIATE HEIGHTS USE HARMONIC CONSTANTS (SEE PART III) AND NP 159.

JAPAN - TOMOGASIMA SUIDO

LAT 34°16'N LONG 135°00'E.

TIDAL STREAM PREDICTIONS (RATES IN KNOTS)

TIME ZONE -0900

POSITIVE (+) DIRECTION 355 NEGATIVE (-) DIRECTION 175

YEAR 0000

JULY			AUGUST			SEPTEMBER			
SLACK	MAXIMUM		SLACK	MAXIMUM		SLACK	MAXIMUM		
TIME	TIME	RATE	TIME	TIME	RATE	TIME	TIME	RATE	
1	0022 0231 -1.6		16	0026 0237 -1.7		1	0034 0336 -2.4		
	0544 0712 0.3			0537 0739 0.5		16	0633 1013 2.3		
F	0856 1347 -3.2	SA	0951 1402 -3.2		M	1134 1458 -2.9	TU	1207 1512 -2.7	
	1652 2105 3.4		1707 2112 3.2			1803 2148 2.6		1816 2143 2.1	
2	0058 0307 -1.6		17	0056 0309 -1.7		2	0056 0414 -2.5		
	0613 0803 0.4			0605 0831 0.8		17	0723 1114 2.5		
SA	1003 1427 -3.1	SU	1053 1443 -3.1		TU	1234 1542 -2.6	W	1307 1557 -2.3	
	1735 2143 3.3		1750 2148 3.0			1847 2223 2.2		1901 2219 1.8	
3	0130 0343 -1.6		18	0124 0343 -1.8		3	0124 0459 -2.4		
	0648 0906 0.6			0639 0928 1.0		18	0823 1218 2.6		
SU	1114 1510 -2.9	M	1158 1526 -2.8		W	1339 1631 -2.1	TH	1411 1649 -1.8	
	1820 2222 3.0		1834 2224 2.7			1937 2304 1.9		1953 2302 1.4	
4	0201 0421 -1.7		19	0151 0420 -1.9		4	0200 0554 -2.3		
	0730 1012 0.8			0723 1029 1.3		19	0816 1200 2.3		
M	1226 1558 -2.6	TU	1305 1615 -2.4		TH	1451 1730 -1.7	F	1526 1753 -1.3	
	1908 2304 2.7		1922 2305 2.3			2037 2350 1.5		2101 2353 1.0	
5	0232 0503 -1.8		20	0219 0501 -2.0		5	0232 0548 -2.2		
	0820 1117 1.2			0814 1130 1.6		20	0921 1304 2.5		
TU	1340 1652 -2.2	W	1417 1710 -2.0		F	1614 1848 -1.2	SA	1654 1923 -1.0	
	2004 2348 2.4		2019 2349 2.0			2152		2230	
6	0304 0550 -1.9		21	0249 0548 -2.1		6	0038 0214 0.4		
	0914 1219 1.5			0912 1232 1.9		21	0349 0835 -2.3		
W	1500 1756 -1.8	TH	1537 1820 -1.5		SA	1018 1351 2.5	SU	1028 1409 2.7	
	2107		2126			1750 2027 -1.1		1828 2105 -1.0	
7	0035 2.0		22	0037 1.6		7	0136 0319 0.5		
	0337 0644 -2.0			0321 0642 -2.2		22	0337 0811 -2.4		
TH	1010 1320 1.9	F	1012 1334 2.2		SU	1121 1456 2.8	M	1134 1516 2.9	
	1627 1919 -1.4		1708 1951 -1.2			1920 2152 -1.2		1945 2217 -1.3	
	2221		2245		8	0041 0233 0.6		23	0116 0253 0.5
8	0122 1.7		23	0127 1.2		8	0425 0907 -2.5		
	0412 0744 -2.2			0355 0747 -2.3		23	0436 0926 -2.6		
F	1106 1421 2.3	SA	1111 1437 2.6		M	1220 1602 3.0	TU	1235 1621 3.1	
	1803 2051 -1.3		1844 2122 -1.2			2028 2254 -1.4		2042 2309 -1.5	
	2337				9	0152 0331 0.5		24	0213 0355 0.5
9	0212 1.3		24	0006 0220 0.9		9	0519 1009 -2.8		
	0448 0846 -2.4			0433 0853 -2.5		24	0549 1027 -2.8		
SA	1158 1522 2.6	SU	1207 1541 2.9		TU	1314 1706 3.3	W	1330 1722 3.3	
	1932 2207 -1.4		2005 2233 -1.3			2122 2344 -1.6		2128 2352 -1.8	
10	0051 0303 0.9		25	0122 0313 0.6		10	0249 0429 0.4		
	0523 0942 -2.7			0513 0953 -2.7		25	0622 1102 -3.0		
SU	1249 1625 3.0	M	1300 1646 3.2		W	1405 1804 3.4	TH	1421 1814 3.3	
	2043 2309 -1.5		2107 2329 -1.5			2207		2208	
11	0200 0352 0.7		26	0229 0407 0.5		11	0026 -1.7		
	0558 1033 -2.9			0557 1046 -3.0		26	0327 0547 0.9		
M	1337 1726 3.3	TU	1350 1747 3.4		TH	0728 1149 -3.2	F	0812 1204 -3.2	
	2141		2158			1452 1852 3.4		1507 1859 3.2	
12	0001 -1.6		27	0016 -1.7		12	0103 -1.8		
	0304 0441 0.4			0324 0500 0.4		27	0353 0632 1.1		
TU	0634 1119 -3.1	W	0649 1133 -3.1		F	0830 1231 -3.3	SA	0909 1246 -3.2	
	1422 1823 3.5		1437 1840 3.5			1535 1935 3.3		1550 1937 3.0	
	2231		2242			2319		2311	
13	0046 -1.7		28	0057 -1.7		13	0136 -1.9		
	0358 0527 0.3			0407 0550 0.4		28	0427 0655 0.9		
W	0710 1202 -3.2	TH	0745 1216 -3.3		SA	0926 1311 -3.3	SU	1002 1325 -3.2	
	1505 1914 3.6		1520 1927 3.5			1616 2011 3.1		1630 2009 2.7	
	2314		2320			2348		2336	
14	0126 -1.7		29	0134 -1.7		14	0206 -1.9		
	0441 0611 0.3			0437 0635 0.5		29	0445 0750 1.7		
TH	0755 1242 -3.3	F	0842 1257 -3.3		SU	1020 1351 -3.2	M	1052 1405 -3.0	
	1546 1957 3.6		1602 2007 3.4			1655 2042 2.8		1708 2037 2.3	
	2352		2353					2356	
15	0203 -1.7		30	0207 -1.8		15	0012 0236 -2.0		
	0511 0653 0.4			0501 0718 0.7		30	0519 0818 1.4		
F	0851 1322 -3.3	SA	0939 1337 -3.3		M	1112 1431 -3.0	TU	1144 1445 -2.7	
	1627 2037 3.4		1642 2042 3.2			1735 2112 2.5		1747 2105 2.0	
16	0022 0237 -1.8		31	0022 0237 -1.8		16	0015 0302 -2.3		
	0526 0802 1.0			0526 0802 1.0		31	0551 0919 2.2		
SU	1036 1417 -3.1			1036 1417 -3.1			1238 1527 -2.4		
	1722 2115 2.9			1722 2115 2.9			1828 2136 1.6		

CURRENT NIL.

CANADA, BRITISH COLUMBIA - VANCOUVER HARBOUR

LAT 49°17'N LONG 123°07'W

TIME ZONE +0800

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 0000

JANUARY				FEBRUARY				MARCH				APRIL			
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M
1 0530 4.6		16 0505 4.5		1 0615 4.6		16 0550 4.7		1 0535 4.4		16 0500 4.5		1 0510 4.2		16 0455 4.5	
1005 3.7		0915 3.9		1 1130 3.5		16 1100 3.4		1 1110 3.0		16 1045 2.7		1 1140 1.9		16 1145 0.9	
F 1410 4.2		SA 1315 4.4		M 1600 3.9		TU 1540 4.3		TU 1600 3.8		W 1600 4.1		F 1735 3.9		SA 1815 4.3	
2215 0.7		2145 0.5		2320 0.9		2305 0.4		2255 1.2		2245 1.0		2325 2.2		• 2350 2.5	
2 0605 4.7		17 0545 4.7		2 0645 4.6		17 0620 4.8		2 0600 4.4		17 0525 4.6		2 0530 4.2		17 0525 4.4	
1105 3.7		1015 3.9		2 1205 3.4		17 1150 3.0		2 1145 2.8		17 1125 2.2		2 1215 1.6		17 1225 0.6	
SA 1500 4.1		SU 1420 4.5		TU 1640 4.0		W 1650 4.4		W 1650 3.9		TH 1700 4.2		SA 1820 4.0		SU 1915 4.5	
2255 0.7		2235 0.3		O 2355 0.9		• 2350 0.5		2330 1.3		2330 1.2		O			
3 0645 4.8		18 0625 4.8		3 0710 4.6		18 0650 4.8		3 0620 4.4		18 0555 4.6		3 0000 2.4		18 0040 2.9	
1155 3.7		1105 3.8		3 1245 3.2		18 1235 2.7		3 1210 2.6		18 1210 1.7		3 0545 4.2		18 0545 4.3	
SU 1540 4.1		M 1525 4.5		W 1720 3.9		TH 1750 4.3		TH 1730 3.9		F 1805 4.2		SU 1235 1.3		M 1305 0.5	
2330 0.7		2320 0.1						O 2355 1.5		•		1905 4.1		2010 4.5	
4 0715 4.8		19 0700 4.9		4 0025 1.0		19 0035 0.8		4 0640 4.4		19 0010 1.6		4 0035 2.7		19 0125 3.1	
1230 3.7		1200 3.7		4 0735 4.6		19 0720 4.8		4 1245 2.3		19 0625 4.6		4 0600 4.2		19 0615 4.2	
M 1615 4.0		TU 1625 4.5		TH 1320 3.0		F 1325 2.3		F 1815 3.9		SA 1255 1.3		M 1305 1.1		TU 1345 0.5	
O		•		1805 3.8		1855 4.2		1905 4.3		1955 4.3		1955 4.1		2105 4.5	

CANADA, BRITISH COLUMBIA - PRINCE RUPERT

LAT 54°19'N LONG 130°20'W

TIME ZONE +0800

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 0000

MAY				JUNE				JULY				AUGUST			
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M
1	0035 6.4	16	0100 6.9	1	0115 6.6	16	0205 6.3	1	0150 6.8	16	0230 6.1	1	0315 6.7	16	0315 5.8
SU	0705 1.0	M	0740 0.4	W	0805 0.5	TH	0850 0.8	F	0840 0.2	SA	0905 0.9	M	0940 0.5	TU	0925 1.4
O	1325 5.8	M	1400 6.0	W	1430 5.7	TH	1510 5.6	F	1500 5.9	SA	1520 5.7	M	1600 6.6	TU	1535 6.0
	1905 2.0		1940 2.1		2000 2.3		2045 2.5		2040 2.0		2115 2.3		2205 1.2		2150 1.8
2	0115 6.6	17	0140 6.7	2	0200 6.6	17	0245 6.1	2	0240 6.7	17	0305 5.9	2	0405 6.3	17	0350 5.5
M	0740 0.8	TU	0820 0.5	TH	0850 0.5	F	0930 0.9	SA	0920 0.3	SU	0935 1.1	TU	1020 0.9	W	0950 1.7
	1400 5.8		1445 5.9		1515 5.7		1550 5.5		1545 6.0		1555 5.7		1640 6.5		1605 5.9
	1940 2.1		2015 2.3		2045 2.4		2125 2.6		2130 2.0		2145 2.3		2300 1.3		2225 1.9
3	0140 6.6	18	0220 6.5	3	0245 6.5	18	0325 5.9	3	0330 6.5	18	0345 5.7	3	0500 5.8	18	0425 5.2
TU	0815 0.7	W	0905 0.7	W	0935 0.6	TH	1005 1.1	SU	1005 0.5	M	1025 1.3	M	1100 1.5	TH	1020 2.1
	1440 5.7		1525 5.7	F	1600 5.6	SA	1630 5.4	SU	1630 6.1	M	1625 5.6	W	1725 6.3	TH	1635 5.8
	2015 2.2		2100 2.5		2135 2.4		2210 2.7		2225 1.9		2225 2.3		2355 1.5		2310 2.0
4	0210 6.6	19	0300 6.2	4	0335 6.3	19	0410 5.6	4	0425 6.2	19	0420 5.4	4	0600 5.3	19	0510 4.9
W	0900 0.8	TH	0950 0.9	SA	1020 0.7	SU	1045 1.4	M	1050 0.8	TU	1035 1.6	TH	1150 2.1	F	1055 2.5
	1520 5.6		1610 5.4		1650 5.6		1705 5.3		1715 6.1		1655 5.6		1820 6.0		1715 5.6
	2055 2.4		2140 2.7		2235 2.5		2300 2.7		2325 1.9		2305 2.3				
5	0255 6.4	20	0345 5.9	5	0430 6.0	20	0455 5.3	5	0520 5.8	20	0500 5.1	5	0100 1.6	20	0000 2.2
TH	0940 0.9	F	1030 1.3	SU	1110 1.0	M	1120 1.7	TU	1135 1.2	W	1105 2.0	F	0710 4.9	SA	0605 4.6
	1615 5.4		1655 5.2		1745 5.5		1750 5.2		1805 6.0		1730 5.5		1245 2.7		1140 2.9
	2135 2.6		2230 3.0		2340 2.5		2355 2.8				2355 2.3		1920 5.8		1805 5.5
6	0340 6.2	21	0430 5.5	6	0535 5.7	21	0545 5.0	6	0025 1.8	21	0550 4.8	6	0215 1.8	21	0110 2.2
F	1030 1.1	SA	1120 1.6	M	1205 1.3	TU	1200 2.0	W	0620 5.4	TH	1145 2.3	SA	0835 4.6	SU	0730 4.4
	1700 5.2		1750 5.0		1845 5.6		1835 5.2		1225 1.7		1810 5.5		1400 3.0		1245 3.2
	2230 2.8		2330 3.1						1900 6.0				2035 5.6		1915 5.4
7	0430 5.9	22	0525 5.2	7	0050 2.3	22	0055 2.7	7	0135 1.8	22	0055 2.3	7	0330 1.7	22	0235 2.1
SA	1125 1.3	SU	1210 1.9	W	0645 5.4	TH	0640 4.7	TH	0735 5.0	F	0650 4.5	SU	1005 4.7	M	0915 4.4
	1800 5.1		1845 4.9		1305 1.6		1250 2.3		1325 2.2		1230 2.7		1535 3.1		1420 3.3
	2340 3.0				1945 5.7		1925 5.3		2000 5.9		1900 5.5		2145 5.6		2040 5.5

CANADA, BRITISH COLUMBIA - PRINCE RUPERT

LAT 54°19'N LONG 130°20'W

TIME ZONE +0800

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 1988

JANUARY				FEBRUARY				MARCH				APRIL			
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M
1 0520	3.0	16 0435	3.1	1 0115	5.6	16 0040	5.9	1 0040	5.6	16 0010	6.2	1 0055	6.2	16 0055	7.0
1125	6.4	16 1040	6.4	1 0640	2.7	16 0615	2.2	1 0625	2.5	16 0600	1.7	1 0700	1.5	16 0715	0.4
F 1810	1.2	SA 1740	1.2	M 1240	6.3	TU 1215	6.9	TU 1225	6.1	W 1205	6.7	F 1310	6.0	SA 1325	6.5
				1915	1.1	1900	0.3	1855	1.2	1835	0.6	1910	1.4	1920	1.3
2 0040	5.6	17 0010	5.5	2 0140	5.8	17 0120	6.4	2 0105	5.9	17 0050	6.6	2 0115	6.4	17 0130	7.1
0605	2.9	17 0530	2.8	2 0715	2.5	17 0705	1.7	2 0655	2.2	17 0650	1.2	2 0730	1.2	17 0755	0.3
SA 1205	6.5	SU 1135	6.7	TU 1315	6.4	W 1305	7.2	W 1300	6.2	TH 1255	6.9	SA 1345	6.0	SU 1410	6.4
1855	1.1	1830	0.7	O 1945	1.0	1940	0.2	1920	1.1	1910	0.5	O 1940	1.5	2000	1.6
3 0120	5.7	18 0100	5.8	3 0215	5.9	18 0200	6.7	3 0135	6.1	18 0125	6.9	3 0145	6.5	18 0215	7.0
0650	2.8	18 0625	2.5	3 0750	2.3	18 0745	1.3	3 0730	1.9	18 0735	0.8	3 0805	1.1	18 0840	0.4
SU 1250	6.5	M 1225	7.0	W 1350	6.4	TH 1355	7.2	TH 1330	6.3	F 1340	6.9	SU 1415	6.0	M 1455	6.2
1930	1.0	1915	0.4	2020	1.0	2020	0.2	O 1950	1.1	1950	0.6	2005	1.7	2040	1.9
4 0155	5.8	19 0140	6.2	4 0235	6.0	19 0235	6.9	4 0200	6.2	19 0200	7.1	4 0210	6.5	19 0245	6.8
0725	2.7	19 0715	2.2	4 0820	2.2	19 0835	1.1	4 0800	1.7	19 0815	0.5	4 0835	1.0	19 0920	0.6
M 1325	6.5	TU 1315	7.3	TH 1420	6.3	F 1440	7.0	F 1400	6.2	SA 1425	6.8	M 1450	5.9	TU 1540	5.8
O 2005	1.0	2000	0.2	2045	1.0	2055	0.5	2015	1.2	2030	0.9	2035	1.9	2115	2.3
5 0230	5.9	20 0220	6.4	5 0300	6.1	20 0310	7.0	5 0220	6.3	20 0240	7.1	5 0240	6.5	20 0320	6.4
0800	2.7	20 0800	1.9	5 0855	2.1	20 0920	1.0	5 0830	1.6	20 0900	0.5	5 0910	1.1	20 1005	1.0
TU 1400	6.4	W 1405	7.3	F 1455	6.2	SA 1525	6.7	SA 1435	6.2	SU 1510	6.5	TU 1530	5.6	W 1625	5.5
2045	1.0	2040	0.1	2110	1.2	2135	0.9	2040	1.3	2105	1.3	2105	2.2	2155	2.7
6 0300	5.9	21 0305	6.6	6 0325	6.1	21 0350	6.9	6 0250	6.4	21 0315	6.9	6 0310	6.4	21 0405	6.0
0840	2.7	21 0850	1.7	6 0925	2.1	21 1010	1.1	6 0900	1.5	21 0945	0.7	6 0950	1.2	21 1055	1.4
W 1440	6.3	TH 1455	7.1	SA 1525	6.0	SU 1610	6.2	SU 1515	6.0	M 1555	6.0	W 1610	5.4	TH 1715	5.1
2115	1.1	2125	0.3	2140	1.5	2210	1.5	2105	1.6	2140	1.9	2145	2.5	2245	3.0
31 0030	5.4	31 0600	3.0	31 0030	5.9	31 0630	1.8								
SU 1200	6.2	1845	1.2	TH 1230	5.9	1845	1.4								

PANAMA, PACIFIC COAST - BALBOA

LAT 8°57'N LONG 79°34'W

TIME ZONE +0500

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 1968

JANUARY				FEBRUARY				MARCH				APRIL			
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M
1 0130	4.3	16 0029	4.1	1 0253	4.0	16 0215	4.4	1 0237	3.8	16 0202	4.4	1 0321	4.2	16 0326	4.9
0751	0.7	0706	0.8	0911	0.5	0844	0.1	0849	0.6	0823	0.1	0932	0.4	0937	-0.2
F 1412	4.1	SA 1315	3.9	M 1534	4.0	TU 1452	4.5	TU 1510	4.0	W 1433	4.6	F 1540	4.4	SA 1545	5.2
2012	1.0	1927	1.0	2132	0.8	2109	0.2	2113	0.7	2049	0.0	2153	0.2	• 2203	-0.5
2 0220	4.4	17 0130	4.3	2 0338	4.1	17 0311	4.7	2 0318	4.0	17 0255	4.7	2 0356	4.3	17 0413	5.0
0844	0.5	0810	0.5	0950	0.3	0934	-0.3	0928	0.4	0914	-0.3	1005	0.2	1020	-0.3
SA 1500	4.1	SU 1412	4.2	TU 1612	4.2	W 1543	4.9	W 1545	4.2	TH 1521	5.0	SA 1611	4.6	SU 1630	5.3
2103	0.9	2029	0.7	O 2211	0.6	• 2158	-0.3	2150	0.5	2140	-0.4	O 2227	0.1	2245	-0.6
3 0306	4.4	18 0228	4.5	3 0418	4.2	18 0403	5.0	3 0356	4.2	18 0346	5.0	3 0431	4.4	18 0459	5.0
0927	0.4	0903	0.1	1027	0.2	1020	-0.6	1003	0.2	1000	-0.5	1038	0.2	1103	-0.2
SU 1546	4.2	M 1508	4.5	W 1648	4.3	TH 1633	5.2	TH 1619	4.4	F 1611	5.3	SU 1643	4.7	M 1713	5.2
2146	0.8	2124	0.3	2246	0.4	2243	-0.6	O 2223	0.2	• 2223	-0.7	2300	0.0	2327	-0.5
4 0350	4.4	19 0324	4.8	4 0454	4.3	19 0455	5.2	4 0428	4.3	19 0435	5.1	4 0504	4.5	19 0545	4.9
1008	0.3	0952	-0.3	1100	0.1	1104	-0.8	1035	0.1	1043	-0.7	1111	0.2	1145	-0.1
M 1630	4.3	TU 1602	4.8	TH 1721	4.5	F 1721	5.4	F 1649	4.5	SA 1656	5.4	M 1715	4.7	TU 1758	5.0
O 2227	0.7	• 2213	0.0	2321	0.3	2328	-0.7	2256	0.1	2307	-0.8	2334	0.0		
5 0432	4.4	20 0417	5.0	5 0529	4.4	20 0543	5.2	5 0502	4.4	20 0522	5.2	5 0540	4.5	20 0007	-0.2
1045	0.2	1039	-0.5	1133	0.1	1148	-0.8	1107	0.0	1125	-0.6	1145	0.2	0631	4.7
TU 1709	4.4	W 1652	5.1	F 1752	4.5	SA 1807	5.4	SA 1719	4.6	SU 1741	5.4	TU 1748	4.7	W 1227	0.2
2304	0.6	2300	-0.3	2354	0.3			2329	0.0	2350	-0.7			1841	4.8

U.S.A. - ADMIRALTY INLET

LAT 48°02'N LONG 122°38'W

TIDAL STREAM PREDICTIONS (RATES IN KNOTS)

TIME ZONE +0800

POSITIVE (+) DIRECTION 180 NEGATIVE (-) DIRECTION 005

YEAR 1988

APRIL			MAY			JUNE											
SLACK TIME	MAXIMUM TIME	RATE	SLACK TIME	MAXIMUM TIME	RATE	SLACK TIME	MAXIMUM TIME	RATE									
1 0426	0145 1.7	0802 -2.9	16 0411	0144 1.9	0800 -3.9	1 0333	0131 1.0	0741 -3.3	16 0001	0155 0.9	0345 0809 -4.0	1 0052	0212 0.4	0326 0819 -3.7	16 0305	0212 0.4	0907 -3.4
F 1141	1417 1.7	1656 2019 -2.4	SA 1135	1433 2.9	1743 2044 -2.6	SU 1126	1428 2.4	1744 2041 -2.0	M 1152	1504 3.2	1839 2129 -2.0	W 1208	1527 3.1	1910 2200 -1.8	TH 1254	1612 2.8	1951 2251 -1.9
2 0445	0217 1.6	0827 -3.0	17 0441	0226 1.6	0836 -4.0	2 0354	0202 0.8	0814 -3.4	17 0058	0238 0.7	0415 0847 -3.8	2 0144	0257 0.3	0405 0902 -3.7	17 0354	0217 1.6	0948 -3.1
SA 1206	1451 1.9	1741 2055 -2.3	SU 1216	1520 3.0	1837 2135 -2.4	M 1156	1503 2.6	1829 2124 -1.9	TU 1233	1549 3.1	1926 2218 -1.9	TH 1250	1609 3.1	1954 2246 -1.9	F 1332	1653 2.6	2025 2330 -1.9
3 0019	0242 1.4	0503 0855 -3.1	18 0055	0307 1.3	0510 0917 -3.9	3 0054	0235 0.6	0416 0845 -3.5	18 0158	0324 0.4	0444 0929 -3.5	3 0240	0346 0.3	0451 0949 -3.5	18 0439	0242 1.4	1030 -2.7
SU 1233	1523 2.1	1825 2132 -2.2	M 1258	1605 3.0	1930 2224 -2.2	TU 1231	1544 2.7	1914 2205 -1.8	W 1315	1633 2.9	2011 2305 -1.8	F 1335	1657 3.1	2037 2337 -2.0	SA 1410	1727 2.4	2057
4 0058	0314 1.1	0520 0922 -3.2	19 0149	0346 0.9	0538 0957 -3.7	4 0143	0314 0.5	0440 0920 -3.5	19 0406	0314 0.5	1011 -3.2	4 0444	0314 0.5	1042 -3.3	19 0012	0314 1.1	0530 0.0
W 1303	1558 2.2	1910 2212 -2.0	TU 1342	1652 2.8	2021 2316 -1.9	W 1309	1625 2.8	2002 2253 -1.8	TH 1358	1717 2.6	2055 2356 -1.7	SA 1424	1746 2.9	2119	SU 1449	1804 2.1	2127
5 0140	0343 0.9	0538 0951 -3.2	20 0250	0429 0.6	0604 1038 -3.3	5 0240	0355 0.3	0506 1000 -3.4	20 0466	0355 0.3	1055 -2.8	5 0442	0549 0.3	0657 1140 -2.9	20 0054	0343 0.9	0631 0.1
TU 1338	1640 2.3	1959 2259 -1.8	W 1428	1740 2.5	2114	TH 1353	1711 2.7	2051 2348 -1.7	F 1443	1800 2.3	2137	SU 1515	1835 2.7	2200	M 1531	1845 1.9	2156
6 0227	0413 0.6	0557 1028 -3.2	21 0013	-1.7	0515 0.2	6 0442	0.1	1049 -3.2	21 0051	-1.7	0553 -0.1	6 0539	0700 0.4	0829 1247 -2.4	21 0137	0413 0.6	0733 0.2
W 1419	1727 2.2	2053 2348 -1.6	TH 1519	1835 2.2	2208	F 1442	1804 2.6	2143	SA 1530	1848 2.0	2218	M 0829	1247 -2.4	1612 1926 2.3	TU 1617	1926 1.6	2224
7 0325	0454 0.4	0618 1109 -3.1	22 0114	-1.5	0613 0.0	7 0044	-1.7	0547 0.0	22 0143	-1.8	0701 -0.2	7 0630	0821 0.7	1017 1358 -2.0	22 0658	0454 0.4	0837 0.4
TH 1507	1817 2.1	2153	F 1616	1930 1.9	2303	SA 1146	-2.9	1537 1858 2.4	SU 1238	-2.0	1620 1939 1.8	TU 1017	1358 -2.0	1714 2021 2.0	W 1024	1358 -1.3	2250
8 0049	-1.4	0542 0.1	23 0219	-1.5	0725 -0.2	8 0147	-1.9	0703 0.0	23 0234	-2.0	0815 -0.1	8 0717	0938 1.2	1205 1518 -1.7	23 0729	0049 -1.4	0940 0.8
F 1201	-2.9	1604 1920 2.1	SA 1317	-2.2	1716 2032 1.7	SU 1251	-2.6	1638 1958 2.3	M 1340	-1.7	1714 2027 1.6	W 1205	1518 -1.7	1822 2117 1.7	TH 1207	1514 -1.1	2316
9 0204	-1.4	0651 0.0	24 0327	-1.6	0849 -0.1	9 0249	-2.2	0827 0.2	24 0323	-2.2	0930 0.2	9 0802	1045 1.7	1341 1636 -1.6	24 0801	0204 -1.4	1036 1.2
SA 1304	-2.7	1709 2028 2.0	SU 1433	-1.9	1819 2127 1.6	M 1415	-2.3	1744 2058 2.1	TU 1451	-1.5	1813 2116 1.4	TH 1341	1636 -1.6	1935 2212 1.3	F 1338	1628 -1.0	2343
10 0004	0315 -1.5	0821 0.0	25 0042	0422 -1.9	1009 0.1	10 0009	0345 -2.5	0757 0949 0.7	25 0005	0406 -2.4	0831 1031 0.6	10 0033	0448 -3.6	0846 1143 2.2	25 0834	0004 -1.5	1131 1.7
SU 1427	-2.5	1819 2137 2.1	M 1543	-1.8	1920 2224 1.5	TU 1143	1530 -2.1	1852 2156 2.0	W 1235	1606 -1.4	1914 2202 1.2	F 1500	1747 -1.6	2049 2304 1.0	SA 1452	1736 -1.1	2235 0.5
11 0100	0422 -1.9	0835 0951 0.3	26 0121	0506 -2.2	0924 1110 0.5	11 0051	0435 -3.0	0835 1100 1.3	26 0035	0442 -2.7	0855 1120 1.1	11 0110	0533 -3.8	0930 1236 2.6	26 0012	0100 -1.9	0507 -3.2
M 1107	1543 -2.5	1926 2237 2.1	TU 1254	1648 -1.8	2015 2310 1.5	W 1326	1647 -2.1	1959 2251 1.8	TH 1401	1706 -1.4	2017 2246 1.0	SA 1606	1849 -1.6	2200 2357 0.8	SU 1553	1837 -1.2	2157 2324 0.3
12 0148	0513 -2.4	0906 1104 0.8	27 0155	0542 -2.4	0945 1155 0.9	12 0130	0523 -3.4	0913 1155 1.9	27 0103	0520 -2.9	0921 1207 1.6	12 0146	0620 -3.9	1012 1325 2.9	27 0046	0148 -2.4	0549 -3.4
TU 1302	1700 -2.6	2028 2332 2.2	W 1414	1748 -1.8	2106 2345 1.4	TH 1449	1755 -2.1	2104 2341 1.6	F 1508	1806 -1.4	2117 2328 0.8	SU 1702	1946 -1.7	2306	M 1644	1926 -1.4	2257
13 0229	0601 -2.9	0941 1205 1.4	28 0224	0617 -2.7	1008 1236 1.4	13 0206	0605 -3.7	0952 1248 2.5	28 0130	0555 -3.1	0949 1246 2.0	13 0223	0705 -3.9	1054 1410 3.0	28 0128	0229 -2.9	0633 -3.6
W 1431	1802 -2.7	2126	TH 1517	1837 -1.9	2153	F 1557	1853 -2.1	2205	SA 1605	1855 -1.5	2215	M 1054	1410 3.0	1751 2035 -1.8	TU 1027	1348 2.9	2348
14 0305	0640 -3.3	1018 1259 2.1	29 0249	0645 -3.0	1032 1317 1.8	14 0241	0647 -3.9	1032 1338 2.9	29 0156	0630 -3.4	1020 1326 2.4	14 0008	0134 0.4	0258 0746 -3.8	29 0217	0305 -2.9	0640 -3.3
TH 1543	1903 -2.8	2220	F 1610	1920 -2.0	2239	SA 1657	1950 -2.1	2304	SU 1655	1945 -1.6	2309	TU 1135	1451 3.1	1834 2122 -1.8	W 1109	1431 3.1	2309
15 0339	0719 -3.7	1056 1348 2.6	30 0312	0714 -3.2	1058 1353 2.1	15 0314	0728 -4.0	1112 1421 3.1	30 0223	0704 -3.5	1053 1407 2.7	15 0106	0220 0.3	0333 0829 -3.6	30 0034	0305 -2.9	0719 -3.8
F 1646	1955 -2.7	2312	SA 1658	2000 -2.0	2324	SU 1175	2042 -2.1	1741 2029 -1.7	M 1053	1407 2.7	1741 2029 -1.7	W 1215	1534 3.0	1915 2205 -1.8	TH 1151	1511 3.3	2312
31 0001	0127 0.4	0252 0740 -3.7	TU 1129	1445 3.0	1827 2115 -1.8	31 0001	0127 0.4	0252 0740 -3.7	TU 1129	1445 3.0	1827 2115 -1.8	31 0001	0127 0.4	0252 0740 -3.7	TU 1129	1445 3.0	1827 2115 -1.8

U.S.A. - SAN FRANCISCO BAY ENTRANCE (GOLDEN GATE)

LAT 37°49'N LONG 122°29'W

TIDAL STREAM PREDICTIONS (RATES IN KNOTS)

TIME ZONE +0800

POSITIVE (+) DIRECTION 065 NEGATIVE (-) DIRECTION 245

YEAR 0000

JANUARY

FEBRUARY

MARCH

SLACK			MAXIMUM			SLACK			MAXIMUM			SLACK			MAXIMUM			SLACK			MAXIMUM													
TIME	TIME	RATE	TIME	TIME	RATE	TIME	TIME	RATE	TIME	TIME	RATE	TIME	TIME	RATE	TIME	TIME	RATE	TIME	TIME	RATE	TIME	TIME	RATE											
1	0211	-1.6	16	0123	-1.7	1	0101	0323	-1.8	16	0035	0251	-2.6	1	0024	0259	-2.2	16	0232	-3.4														
F	0504	0757	2.4	SA	0419	0719	2.4	M	0620	0912	2.5	TU	0555	0853	3.4	TU	0604	0855	2.7	W	0548	0843	3.7											
	1039	1408	-4.7		SA	1003	1338	-5.1		M	1154	1515	-4.6		TU	1142	1456	-4.3		W	1139	1445	-5.2											
	1814	2128	3.6			1743	2048	3.8			1918	2226	3.5			1855	2156	4.5			1848	2151	3.5											
2	0042	0257	-1.6	17	0018	0219	-1.8	2	0135	0352	-1.9	17	0114	0338	-3.1	2	0053	0322	-2.5	17	0033	0314	-4.1											
SA	0551	0840	2.4	SU	0512	0814	2.7	TU	0657	0947	2.5	W	0646	0943	3.7	W	0640	0933	2.9	TH	0636	0933	4.1											
	1123	1453	-4.7		SU	1055	1429	-5.6		TU	1234	1551	-4.5		W	1236	1552	-5.7		TH	1234	1533	-5.0											
	1857	2211	3.6			1831	2137	4.2		O	1952	2253	3.4		●	1938	2237	4.5			1919	2216	3.4											
3	0126	0334	-1.6	18	0106	0310	-2.1	3	0207	0422	-2.1	18	0151	0422	-3.6	3	0121	0351	-2.9	18	0107	0356	-4.6											
SA	0634	0922	2.3		0603	0903	2.9		W	0734	1023	2.6		TH	0738	1033	3.8		W	0715	1005	2.9		F	0725	1022	4.3							
	1205	1532	-4.7		M	1147	1518	-5.9		W	1313	1626	-4.4		TH	1331	1638	-5.3		TH	1302	1601	-4.1		F	1329	1617	-4.5						
	1939	2250	3.6			1918	2224	4.4			2024	2322	3.3			2020	2315	4.3		O	1947	2239	3.3		●	1948	2241	4.0						

UNITED STATES - SANDY HOOK

LAT 40°28'N LONG 74°01'W

TIME ZONE +0500

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 0000

JANUARY				FEBRUARY				MARCH				APRIL			
Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m
1 0543	0.3	16 0105	1.5	1 0040	1.3	16 0219	1.4	1 0537	0.2	16 0049	1.4	1 0043	1.5	16 0156	1.0
1203	1.2	0719	0.1	0710	0.2	0857	0.2	1144	1.2	0714	0.2	0741	0.2	0838	0.0
M 1822	0.1	TU 1318	1.3	TH 1305	1.2	F 1442	1.1	TH 1741	0.1	F 1315	1.2	SU 1335	1.3	M 1435	1.0
		1948	0.0	1917	0.1	2107	0.2			1923	0.3	1943	0.2	2053	0.0
2 0041	1.2	17 0159	1.4	2 0133	1.3	17 0315	1.3	2 0003	1.4	17 0141	1.4	2 0150	1.5	17 0253	1.0
0644	0.3	0827	0.1	0829	0.2	0955	0.2	0639	0.2	0819	0.2	0855	0.1	0933	0.0
TU 1251	1.2	W 1414	1.2	F 1406	1.2	SA 1543	1.1	F 1241	1.2	SA 1411	1.1	M 1443	1.3	TU 1532	1.0
1914	0.1	2046	0.0	2028	0.1	2201	0.2	1838	0.1	2029	0.3	2102	0.2	2150	0.0
3 0128	1.2	18 0255	1.4	3 0234	1.4	18 0413	1.4	3 0101	1.4	18 0237	1.3	3 0300	1.5	18 0350	1.0
0758	0.3	0929	0.1	0938	0.1	1047	0.1	0759	0.2	0920	0.2	0958	0.1	1021	0.0
W 1343	1.2	TH 1513	1.2	SA 1515	1.2	SU 1642	1.1	SA 1345	1.2	SU 1510	1.1	TU 1551	1.4	W 1627	1.0
2013	0.1	2140	0.0	2135	0.0	2251	0.2	1957	0.2	2130	0.3	2209	0.1	2240	0.0
4 0219	1.3	19 0351	1.4	4 0342	1.5	19 0507	1.4	4 0206	1.5	19 0336	1.3	4 0411	1.6	19 0444	1.0
0906	0.2	1024	0.1	1038	0.0	1134	0.1	0914	0.1	1013	0.2	1054	-0.1	1104	0.0
TH 1442	1.2	F 1612	1.2	SU 1624	1.2	M 1735	1.2	SU 1455	1.2	M 1610	1.2	W 1655	1.5	TH 1716	1.0
2111	0.1	2230	0.0	2237	-0.1	2338	0.1	2115	0.1	2223	0.2	2309	0.0	2327	0.0

UNITED STATES, LONG ISLAND SOUND TO CASCO BAY

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.
				MHW Zone +0500	MLW	MHWS	MHWN	MLWN	MLWS	
2809	BOSTON	(see page 104)				3.1	2.7	0.4	0.0	
2762	Plum Island	41 10	72 12	-0120	-0117	-2.2	-1.9	-0.2	0.0	0.46
2764	Herod Point	40 58	72 50	-0017	-0022	-1.1	-1.0	-0.1	0.0	0.94
2765	Port Jefferson	40 57	73 05	+0006	+0008	-0.9	-0.9	-0.1	0.0	1.07
2767	Lloyd Harbour	40 55	73 26	-0007	-0005	-0.7	-0.6	-0.1	0.0	1.22
2769	Willets Point	U 40 48	73 47	+0012	+0015	-0.6	-0.6	-0.1	-0.1	1.19
2771	Stamford	41 02	73 33	+0006	+0009	-0.6	-0.6	-0.1	-0.1	1.19
2772	Bridgeport	U 41 10	73 11	-0010	-0006	-0.9	-0.8	-0.1	0.0	1.10
2773	New Haven Harbour	41 18	72 55	0000	+0002	-1.0	-1.0	-0.2	-0.1	0.98
2773a	Hoadley Point	41 15	72 44	-0013	-0011	-1.3	-1.2	-0.2	0.0	0.9
2774	Falkner Island	41 13	72 39	-0023	-0033	-1.3	-1.2	-0.2	0.0	0.88
2740	SANDY HOOK	(see page 107)				1.6	1.3	0.3	0.0	
<i>Connecticut River</i>										
2775	Saybrook Jetty	41 16	72 21	+0254	+0255	-0.4	-0.3	-0.1	0.0	0.61
<i>River Thames</i>										
2776	New London	U 41 22	72 06	+0130	+0200	-0.7	-0.5	-0.1	0.0	0.49
ATLANTIC OCEAN										
2777	Watch Hill Point	41 18	71 52	+0045	+0050	-0.7	-0.6	-0.2	0.0	0.43
2779	Block Island (Old Harbour)	41 10	71 33	-0014	-0010	-0.6	-0.5	-0.1	0.0	0.46
<i>Narragansett Bay</i>										
2780	Point Judith	41 22	71 29	-0010	-0005	-0.5	-0.5	-0.1	0.0	0.49
2781	Newport	U 41 30	71 20	+0003	-0024	-0.4	-0.3	-0.1	0.0	0.55
2783	Providence	41 48	71 24	+0004	-0052	-0.1	-0.1	0.0	0.0	0.73
2784	Bristol	41 40	71 17	+0025	-0030	-0.2	-0.2	-0.1	0.0	0.67
2785	Sakonnet	41 28	71 12	-0010	-0025	-0.5	-0.5	-0.1	0.0	0.52
<i>Buzzards Bay</i>										
2786	New Bedford	41 36	70 54	+0010	-0025	-0.4	-0.3	-0.1	-0.1	0.58
2787	Cape Cod Canal W. Entrance	41 44	70 37	+0108	+0153	-0.4	-0.3	-0.1	0.0	0.58
<i>Nantucket Sound</i>										
2790	Woods Hole (Great Harbour)	41 31	70 40	-0022	+0119	-1.0	-0.8	-0.2	0.0	0.30
2791	Hyannis Port	41 38	70 18	+0435	+0355	-0.6	-0.4	-0.2	0.0	0.49
2792	Monomoy Point	41 33	70 00	+0413	+0407	-0.4	-0.2	-0.1	0.0	0.58
2793	Vineyard Haven	41 27	70 36	+0358	+0335	-1.0	-0.8	-0.2	0.0	0.27
2794	Gay Head	41 21	70 50	-0006	+0020	-0.6	-0.5	-0.2	0.0	0.46
2809	BOSTON	(see page 104)				3.1	2.7	0.4	0.0	
<i>Nantucket Island</i>										
2797	Siasconset	41 16	69 58	+0015	+0019	-2.7	-2.4	-0.3	0.0	0.18
2798	Great Point	41 23	70 03	+0041	+0026	-2.1	-1.8	-0.3	0.0	0.49
2799	Nantucket Harbour	41 17	70 06	+0107	+0052	-2.1	-1.8	-0.3	0.0	0.49
2800	Muskeget Island	41 20	70 18	+0023	+0013	-2.4	-2.1	-0.3	0.0	0.34
2802	Chatham	41 40	69 56	+0030	+0024	-0.9	-0.8	-0.1	0.0	1.07
2803	Race Point	42 04	70 15	-0003	-0004	-0.1	-0.1	0.0	0.0	1.46
2805	Cape Cod Canal E. Entrance	41 46	70 30	0000	0000	-0.3	-0.3	-0.1	-0.1	1.40
2806	Gumet Point	42 00	70 36	+0002	+0007	-0.1	-0.1	0.0	0.0	1.49
2807	Cohasset Harbour	42 15	70 47	+0002	-0004	-0.2	-0.2	0.0	0.0	1.43
2809	BOSTON	42 21	71 03	STANDARD PORT				See Table V		1.59
2811	Salem	42 31	70 53	+0002	+0001	-0.2	-0.2	0.0	0.0	1.43
2813	Merrimack River Entrance	42 49	70 49	+0010	+0015	-0.3	-0.3	-0.1	-0.1	1.34
2814	Portsmouth	43 05	70 45	+0003	+0003	-0.4	-0.4	-0.1	-0.1	1.28
2815	Cape Porpoise	43 22	70 26	0000	+0003	-0.2	-0.2	0.0	-0.1	1.43
2816	Portland	U 43 40	70 15	-0011	-0009	-0.1	-0.1	0.0	-0.1	1.49
2818	Potts Harbour	43 44	70 01	-0009	-0008	-0.1	-0.2	0.0	-0.1	1.46

- ⊙ No data.
- * See notes on page 360.
- U Tides predicted in United States Tide Tables.
- d Differences approximate.
- x M.L. inferred.

UNITED STATES; CANADA, BAY OF FUNDY

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.	
				MHW Zone +0500	MLW	MHWS	MHWN	MLWN	MLWS		
2809	BOSTON	(see page 104)				3.1	2.7	0.4	0.0		
	<i>Kennebec River</i>										
2819	Fort Popham	43 45	69 47	-0002	-0005	-0.3	-0.2	-0.1	-0.1	1.37	
2820	Bath	43 55	69 49	+0050	+0108	-1.0	-0.9	-0.1	0.0	1.04	
2821	Richmond	44 05	69 48	+0237	+0250	-1.3	-1.2	-0.2	0.0	0.85	
2824	Monhegan Island	43 46	69 19	-0025	-0018	-0.2	-0.1	0.0	-0.1	1.43	
2825	Tenants Harbour	43 58	69 12	-0022	-0020	0.0	0.0	0.0	-0.1	1.52	
	<i>Penobscot Bay</i>										
2827	Matinicus Harbour	43 52	68 53	-0028	-0021	-0.1	0.0	0.0	-0.1	1.46	
2828	Vinalhaven	44 03	68 50	-0024	-0015	0.0	0.0	0.0	-0.1	1.52	
2829	Pulpit Harbour	44 09	68 53	-0025	-0025	+0.2	+0.2	0.0	-0.1	1.62	
2831	Rockland	44 06	69 06	-0025	-0025	+0.2	+0.1	0.0	-0.1	1.58	
2832	Belfast	44 25	69 00	-0020	-0020	+0.2	+0.2	0.0	-0.1	1.65	
2833	Bangor	44 48	68 46	-0040	-0015	+1.4	+1.1	+0.2	-0.1	2.19	
2835	Centre Harbour	44 16	68 35	-0024	-0016	+0.3	+0.2	0.0	-0.1	1.65	
2864	SAINT JOHN, N.B.	(see page				8.0	6.9	1.7	0.6		
2837	Blue Hill Harbour	44 24	68 34	-0055	-0055	-4.6	-4.0	-1.3	-0.7	1.65	
2838	Bar Harbour	44 23	68 12	-0110	-0110	-4.5	-3.9	-1.3	-0.7	1.74	
2840	Prospect Harbour	44 24	68 01	-0105	-0108	-4.5	-3.9	-1.3	-0.6	1.74	
2842	Jonesport	44 32	67 36	-0105	-0105	-4.2	-3.6	-1.2	-0.7	1.89	
2843	Cutler, Little River	44 39	67 13	-0110	-0115	-3.5	-3.1	-1.2	-0.7	2.16	
2845	West Quoddy Head	44 49	66 59	-0052	-0040	-2.0	-1.7	-0.3	0.0	3.40	
2846	Eastport	U 44 54	66 59	-0102	-0054	-1.1	-0.9	-0.1	+0.1	3.85	
	Canada										
				Zone +0400							
	BAY OF FUNDY										
	<i>Grand Manan Island</i>										
2847	Outer Wood Island	44 36	66 48	-0027	-0029	-2.5	-2.2	-0.2	+0.1	3.09	
2849	North Head	44 46	66 45	-0004	-0007	-1.5	-1.3	-0.2	0.0	3.56	
2853	Welshpool	44 53	66 57	+0003	+0008	-1.3	-1.0	-0.2	+0.1	3.70	
	<i>Passamaquoddy Bay</i>										
2858	St. Andrews	45 04	67 03	+0011	+0018	-0.9	-0.7	-0.1	+0.1	3.90	
2860	Back Bay	45 03	66 52	-0003	-0007	-1.2	-1.0	+0.1	+0.3	3.85	
2862	Lepreau Bay	45 07	66 29	-0001	+0003	-0.8	-0.5	-0.2	+0.2	4.0	
2864	SAINT JOHN, N.B.	45 16	66 04	STANDARD PORT		See Table V				4.42	
2866	St. Martins	45 21	65 32	+0011	+0007	+1.5	+1.5	+0.5	+0.4	5.28	
	CHIGNECTO BAY										
2869	Herring Cove	45 34	64 58	+0013	+0016	+2.4	+2.4	+0.6	+0.4	5.81	
2871	Grindstone Island	45 43	64 37	+0016	+0025	+3.9	+3.6	+0.8	+0.4	6.56	
	<i>River Petitcodiac</i>										
2872	Hopewell Cape	45 51	64 35	+0010	+0029	+4.7	+4.2	+1.1	+0.5	6.94	
2874	Moncton	46 05	64 46	+0045	○	○	○	○	○	○	
2875	Salisbury	45 59	65 05	+0130	○	○	○	○	○	○	
	<i>Cumberland Basin</i>										
2877	Amherst Harbour	45 50	64 17	+0035	+0045	+5.6	+5.0	+0.9	+0.6	7.4	
2878	Joggins Wharf	45 41	64 28	+0019	+0025	+4.2	+3.9	+0.7	+0.4	6.61	
2880	Cape Capstan	45 28	64 51	+0011	+0013	+2.5	+2.3	+0.6	+0.4	5.75	
	MINAS BASIN AND CHANNEL										
2881	Ile Haute	45 15	65 00	+0011	+0006	+2.5	+2.2	+0.3	+0.3	6.0	
2883	West Advocate	45 21	64 49	0000	0000	+2.5	+2.3	+0.6	+0.4	5.76	
2884	Port Greville	45 24	64 33	+0029	+0031	+3.5	+3.3	+0.8	+0.5	6.35	
2885	Parrsboro	45 22	64 20	+0050	+0043	+4.5	+4.1	+0.7	+0.3	6.70	
2886	Five Islands	45 23	64 04	+0057	+0057	+5.6	+5.1	+1.0	+0.5	7.38	
2888	Truro	45 22	63 20	+0135	○	+0.1	-0.5	○	○	○	
2891	Burntcoat Head	45 18	63 49	+0105	+0110	+6.0	+5.4	+1.0	+0.5	7.53	

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Ja
2740	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	0.0	0.0	-
2762 - 2777	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	+0.1	0.0	0.0	-
2779 - 2891	Negligible												

CANADA: NEWFOUNDLAND AND LABRADOR

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.
				MHW Zone +0330	MLW	MHWS	MHWN	MLWN	MLWS	
3159	ARGENTIA					2.2	1.7	0.7	0.3	
	<i>Placentia Bay</i>									
3156	Tacks Beach	47 35	54 12	-0003	-0004	-0.2	-0.1	-0.1	-0.1	1.12
3157	Woody Island	47 47	54 12	+0015	+0015	-0.1	0.0	0.0	+0.1	1.22
3158	Come by Chance	47 49	54 01	-0004	-0008	+0.1	+0.2	+0.2	+0.2	1.37
3159	ARGENTIA	47 18	53 59	STANDARD PORT		See Table V				1.31
3161	St. Bride's	46 55	54 11	+0004	+0002	-0.1	-0.1	-0.1	-0.1	1.19
3162	Trepassey Harbour	46 44	53 23	-0025	-0010	-0.6	-0.4	-0.2	-0.1	0.86
3165	ST. JOHN'S HARBOUR	(see page				1.3	0.9	0.5	0.3	
3163	Fermeuse Harbour	46 58	52 58	-0009	-0015	0.0	0.0	-0.1	-0.2	0.70
3164	Bay Bulls	47 19	52 48	-0020	-0025	0.0	+0.1	0.0	-0.1	0.8
3165	ST. JOHN'S HARBOUR	47 34	52 41	STANDARD PORT		See Table V				0.76
3167	Holyrood	47 24	53 07	-0005	-0005	0.0	+0.1	+0.1	0.0	0.85
3168	Harbour Grace	47 41	53 13	-0025	-0025	-0.1	0.0	-0.1	-0.1	0.7
	<i>Trinity Bay</i>									
3169	Heart's Content	47 52	53 22	-0031	-0031	-0.2	0.0	0.0	0.0	0.70
3170	Bull Island	47 46	53 47	-0010	⊙	-0.2	-0.1	⊙	⊙	0.6
3171	Randomhead Harbour	48 06	53 34	-0020	⊙	-0.2	0.0	⊙	⊙	0.7
3171a	Clarenville	48 10	53 58	-0020	-0015	-0.1	-0.1	0.0	-0.1	0.70
3172	Port Union	48 30	53 05	-0025	-0025	-0.2	-0.1	0.0	0.0	0.64
3173	King's Cove	48 34	53 20	-0013	⊙	-0.3	-0.1	⊙	⊙	0.6
	<i>Bonavista Bay</i>									
3174	Newman Sound	48 35	53 57	-0034	-0019	-0.4	-0.2	-0.1	-0.2	0.52
3177	Freshwater Bay	48 49	54 03	+0005	⊙	-0.1	0.0	⊙	⊙	0.7
3178	Valleyfield	49 07	53 37	-0019	-0018	-0.3	-0.2	-0.1	-0.1	0.57
3180	Funk Island	49 46	53 11	-0028	⊙	-0.5	-0.3	⊙	⊙	0.5
3181	Cammanville	49 24	54 17	+0001	-0011	-0.1	0.0	+0.1	-0.1	0.73
3182	Fogo Harbour	49 43	54 17	-0023	-0023	+0.2	+0.2	+0.2	+0.1	0.9
3183	Twillingate Harbour	49 39	54 46	-0014	-0030	+0.1	+0.1	+0.2	+0.1	0.88
	<i>Bay of Exploits</i>									
3185	Botwood	49 09	55 20	-0020	-0045	+0.2	+0.2	+0.1	+0.1	⊙
3186	Exploits Burnt Islands	49 32	55 04	-0005	-0016	-0.2	-0.1	-0.1	-0.2	0.63
3189	Little Bay Arm	49 36	55 55	-0003	-0017	-0.2	-0.1	0.0	-0.2	0.64
3191	Tilt Cove	49 53	55 37	-0002	-0007	-0.1	0.0	0.0	-0.2	0.67
3192	La Scie	49 58	55 36	-0032	-0017	-0.1	0.0	0.0	-0.1	0.70
3193	Baie Verte	49 57	56 11	-0011	-0022	-0.1	0.0	0.0	-0.1	0.70
	<i>White Bay</i>									
3194	Seal Cove	49 56	56 22	-0015	-0015	-0.2	-0.1	-0.1	-0.2	0.63
3194a	Hampden	49 34	56 52	-0012	-0037	0.0	+0.1	+0.1	-0.1	0.80
3195	Sops Island	49 50	56 46	-0025	-0024	-0.2	-0.2	-0.1	-0.3	0.55
3196	Orange Bay	50 26	56 30	-0042	-0055	+0.1	+0.1	+0.1	0.0	⊙
3197	Wild Cove	50 42	56 10	-0052	-0103	+0.1	+0.1	+0.1	-0.1	⊙
3198	Croque Harbour	51 03	55 48	-0015	⊙	+0.1	+0.2	⊙	⊙	0.8
3199	Arifege Bay	51 10	56 00	-0015	⊙	+0.1	+0.1	-0.1	-0.3	0.7
3200	St. Anthony	51 22	55 35	-0040	-0050	0.0	+0.1	+0.2	+0.1	0.82
3200a	Quirpon Harbour	51 36	55 26	-0033	-0105	-0.3	-0.3	-0.1	-0.3	⊙
3201	Ship Cove	51 36	55 38	-0001	-0011	-0.4	-0.3	-0.2	-0.2	0.48
	<i>Belle Isle</i>									
3202	South Point	51 53	55 21	-0020	⊙	-0.4	-0.1	⊙	⊙	0.6
3159	ARGENTIA					2.2	1.7	0.7	0.3	
	<i>Labrador</i>									
						Zone +0400				
3204	Battle Harbour	52 16	55 36	-0149	-0137	-0.7	-0.6	0.0	+0.1	0.94
3205	Port Marmham	52 23	55 44	-0138	-0119	-0.9	-0.7	-0.1	-0.1	0.76
3206	Port Hope Simpson	52 33	56 18	-0201	-0135	-0.9	-0.7	-0.1	0.0	0.80

⊙ No data.
 C Tides predicted in Canadian Tide Tables.
 d Differences approximate.

p For predictions use harmonic constants (see Part III).
 t Time differences approximate.
 x M.L. inferred.

CANADA: LABRADOR TO HUDSON BAY

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.
				MHW Zone +0400	MLW	MHWS	MHWN	MLWN	MLWS	
3159	ARGENTIA					2.2	1.7	0.7	0.3	
3214	Cartwright	53 42	57 02	-0130	-0058	-0.4	-0.3	0.0	0.0	1.04
3216	Cabot Point	53 43	59 02	+0322	+0347	-1.6	-1.2	-0.4	-0.1	0.43
<i>Hamilton Inlet and Lake Melville</i>										
3217	Jordans Point	54 13	58 15	-0129	-0103	0.0	+0.1	+0.5	+0.5	1.52
3220	Terrington Basin	53 21	60 24	+0328	+0421	-1.5	-1.1	-0.3	-0.1	0.47
3220a	North West River	53 31	60 09	+0256	+0321	-1.3	-0.9	-0.1	+0.2	0.68
3221	Smokey	54 28	57 15	-0142	-0124	-0.6	-0.5	-0.1	-0.1	0.93
3225	Makkovik	55 05	59 10	-0143	-0118	-0.2	-0.2	+0.1	+0.1	1.19
3226	Hopedale	55 27	60 13	-0204	-0138	-0.2	-0.1	+0.1	+0.1	1.19
3228	Davis Inlet	55 53	60 54	-0200	-0135	0.0	+0.1	+0.3	+0.3	1.40
3231	Nain	56 32	61 41	-0045	-0020	+0.3	+0.2	+0.3	+0.1	1.46
2101	PUNTA LOYOLA					12.0	9.5	3.8	1.6	
3242	Williams Harbour	60 00	64 16	-0226	-0257	-9.4	-7.4	-3.1	-1.4	1.39
<i>UNGAVA BAY</i>										
3244	Button Islands	60 37	64 44	-0210	⊙	-6.8	-5.4	⊙	⊙	2.9
3245	Port Burwell	60 25	64 51	-0210	-0240	-6.2	-5.0	-2.2	-1.3	3.05
<i>Zone +0500</i>										
3248	Riviere Koksoak Entrance	58 32	68 12	-0230	-0255	+0.2	0.0	+0.2	-0.3	6.76
3249	Fort Chimo	58 09	68 16	-0114	⊙	-4.6	-3.8	⊙	⊙	4.1
3250	Lac Aux Feuilles	58 44	69 50	-0140	-0215	+1.2	+1.0	+0.7	+0.1	7.47
3251	Hopes Advance Bay	59 21	69 38	-0240	-0305	-0.1	-0.1	+0.4	+0.1	6.81
<i>HUDSON STRAIT (SOUTH)</i>										
<i>Payne Bay</i>										
3252	Basking Island	59 59	70 05	-0155	-0150	-2.2	-1.7	-0.4	-0.2	5.62
3252a	Pityulik Island	60 00	69 55	-0200	-0155	-2.6	-2.0	-0.5	-0.2	5.43
3252b	Agvik Island	60 01	69 42	-0240	-0305	-0.9	-0.7	+0.3	+0.2	6.46
3254	Diana Bay	C 60 52	70 04	-0245	-0305	-2.6	-2.3	-0.4	-0.4	5.36
3256	Stupart Bay	61 35	71 32	-0240	-0305	-3.4	-2.8	-0.8	-0.4	4.88
3256a	Doctor Island	61 41	71 34	-0220	-0220	-3.9	-3.9	0.0	-0.3	4.71
3257	Wakeham Bay	61 43	71 53	-0225	-0245	-1.2	-2.0	+0.3	-0.8	5.80
3258	Douglas Harbour	61 55	72 37	-0230	-0250	-4.1	-3.5	-1.1	-0.7	4.37
3260	Deception Bay	62 09	74 45	-0200	-0211	-6.5	-5.2	-1.8	-0.8	3.13
3260a	Sugluk	62 13	75 39	-0143	-0143	-7.1	-5.7	-2.0	-0.9	2.81
3261	Diggs Harbour	62 34	77 52	-0055	-0106	-8.8	-7.1	-2.6	-1.2	1.84
<i>Nottingham Island</i>										
3262	Port de Boucherville	63 10	77 35	-0108	-0130	-8.0	-6.6	-2.7	-1.6	1.98
3263	Cape Acadia	61 35	78 52	+0008	-0006	-10.8	-8.6	-3.3	-1.4	0.7
2935	HALIFAX		(see page 97)			1.8	1.5	0.5	0.3	
<i>HUDSON BAY</i>										
3265	Inoucdjouac	58 27	78 06	p	p	-1.3	-1.0	-0.2	-0.1	0.39
<i>Belcher Islands</i>										
3266	Tukarak Island	56 19	78 50	p	p	-0.3	-0.3	+0.1	0.0	0.91
3266a	Innetalling Island	55 54	79 04	p	p	-0.1	-0.2	0.0	-0.1	0.95
3267	Great Whale Island	55 16	77 46	p	p	-0.1	-0.1	-0.1	-0.2	0.91
<i>James Bay</i>										
3267a	Cape Jones	54 38	79 44	p	p	+0.3	+0.1	+0.2	0.0	1.19
3268	Fort George	53 50	79 02	p	p	+0.2	+0.2	+0.2	+0.1	1.19
3270	Eastmain River	52 15	78 33	+0620	+0540	-0.8	-0.6	-0.1	-0.1	0.64
3271	Stag Island	51 38	79 02	+0730	+0640	+1.0	+0.9	+0.4	+0.2	1.65

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1
2101							Negligible					
2935							Negligible					
3156 - 3189	0.0	+0.1	+0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0
3191 - 3206	+0.1	+0.1	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3214 - 3252b							Negligible					
3254 - 3271	+0.1	+0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	+0.1

KALIMANTAN, WEST AND SOUTH COASTS, JAVA SEA

No.	PLACE	Lat. N.	Long. E.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L. Z _n m.	
				HHW (Zone -0800)	LLW	MHHW	MLHW	MHLW	MLLW		
4848	AIR MUSI (OUTER BAR)		see page				3.1	Δ	Δ	0.9	
5193	Pulau Temaju.	0 30	108 50	-0220	-0117	-1.9		Δ	Δ	-0.5	0.80
5194	Pontianak Outer Bar (Kleine Kapocas)	I 0 05	109 08	-0119	-0100	-1.7		Δ	Δ	-0.4	0.90
		S.	E.								
5195	Pontianak	0 01	109 20	-0021	+0002	-1.9		Δ	Δ	-0.4	0.80
5196	Tanjong Saleh	0 05	109 10	-0055	-0020	-2.1		Δ	Δ	-0.4	0.80
5147	MIRI		see page				1.6	Δ	Δ	0.5	
5200	Sukadana	1 14	109 57	-1145	-1105	+0.4		Δ	Δ	0.0	1.19
5201	Sungai Pawan.	1 46	109 54	-1140	-1135	+0.2		Δ	Δ	0.0	1.10
JAVA SEA											
5204	Tanjung Kuala Jelai	2 59	110 44	p	p	-0.9		Δ	Δ	-0.2	0.50
5205	Sungai Kota Waringin Kuala Sapu.	I 2 54	111 26	p	p	-0.2		Δ	Δ	+0.1	1.00
5207	Sungai Aru Tobal	3 10	111 48	p	p	-0.4		Δ	Δ	-0.2	0.70
5208	Kuala Pembuang	3 25	112 34	p	p	+0.3		Δ	Δ	+0.3	1.30
5214	SUNGAI BARITO.		see page				2.2	1.5	1.2	0.3	
5209	Sampit Baai	I 3 00	113 03	p	p	+0.1	+0.1	0.0	+0.2	1.40	
5210	Sungai Mendawai Pegatan	3 17	113 21	+0019	+0035	0.0	-0.1	0.0	+0.2	1.30	
5211	Sungai Kahajan Tanjung Damaran	3 19	114 05	+0006	+0017	+0.1	+0.2	+0.3	+0.2	1.50	
5212	Pangkoh	3 05	114 10	+0124	+0156	-0.1	+0.2	+0.2	+0.4	1.50	
5214	Sungai Barito OUTER BAR	3 34	114 29	STANDARD PORT				See Table V		1.30	
5215	Banjermasin	3 20	114 36	+0116	+0117	-0.3	0.0	+0.2	+0.2	1.30	
5216	Sungai Tabanio	3 45	114 36	+0019	+0014	-0.4	0.0	+0.2	+0.3	1.30	
5228	BALIK PAPAN		see page 84	MHW	MLW	MHWS	MHWN	MLWN	MLWS		
5219	Selat Laut Kampung Baru	3 25	116 01	p	p	-0.3	0.0	0.0	+0.3	1.40	
SELAT MAKASAR											
5221	Teluk Klumpang	3 01	116 13	p	p	-0.2	0.0	0.0	+0.2	1.40	
5222	Tanjong Pamukan	2 34	116 29	+0004	+0003	-0.1	+0.1	-0.1	+0.1	1.40	

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
4718	+0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	+0.1	+0.1	+0.1
4848	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.1	-0.2	-0.2	-0.1	0.0	0.0	+0.1
4902	+0.2	+0.2	+0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	+0.1	+0.2	+0.2
5147	+0.1	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1
5167-5169	+0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1
5170, 5171	+0.2	+0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	+0.1	+0.1	+0.2
5172-5196	+0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1
5200-5214	+0.1	+0.1	+0.1	+0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1
5215	+0.2	+0.2	+0.1	0.0	0.0	0.0	-0.1	-0.2	-0.2	-0.1	0.0	+0.1	+0.2
5216-5222	+0.1	+0.1	+0.1	+0.1	0.0	0.0	-0.1	-0.2	-0.2	-0.1	0.0	+0.1	+0.1
5228	+0.2	+0.2	+0.2	+0.2	+0.1	0.0	-0.2	-0.3	-0.3	-0.2	0.0	+0.1	+0.2
6938	+0.2	+0.1	0.0	0.0	0.0	-0.1	-0.2	-0.2	-0.1	0.0	+0.2	+0.2	+0.2
6996	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1	0.0

AUSTRALIA

No.	PLACE	Lat. S.	Long. E.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L. Z _a m.
				MHW (Zone -0800)	MLW	MHWS	MHWN	MLWN	MLWS	
6323	DARWIN		see page 88			6.9	5.1	3.2	1.4	
	<i>Cambridge Gulf</i>									
6306	Lacrosse Island	14 45	128 20	-0022	-0028	-0.4	-0.1	-0.4	-0.1	3.89
6306a	Cape Domett	A 14 49	128 23	-0021	-0025	-0.2	-0.1	-0.1	0.0	4.04
6307	Webster Bluff	15 05	128 08	+0025	⊙	⊙	⊙	⊙	⊙	⊙
6309	Wyndham	A 15 27	128 06	+0104	+0104	+0.5	+0.5	-0.5	-0.6	4.36
6310	Pelican Island	14 46	128 47	+0100	+0053	+0.5	+0.6	+0.2	+0.2	4.48
										(Zone -0930)
	<i>Victoria River</i>									
6311	Turtle Point	14 50	129 14	+0140	+0140	-0.8	-0.6	-0.7	-0.5	3.5 x
6312	Holdfast Reach	15 14	129 49	+0320	⊙	⊙	⊙	⊙	⊙	⊙
6313	Mosquito Flat	15 25	130 08	+0605	⊙	⊙	⊙	⊙	⊙	⊙
6314	Sandy Island	15 28	130 22	+0700	⊙	⊙	⊙	⊙	⊙	⊙
6316	Pearce Point	14 26	129 22	+0120	+0120	-0.4	-0.3	-0.7	-0.6	3.7 x
6317	Port Keats	14 03	129 34	+0020	+0020	-0.4	-0.3	-0.7	-0.6	3.7 x
6319	Daly River	13 22	130 19	-0040	-0040	-0.4	-0.5	-0.5	-0.5	3.7 x
	<i>Bynoe Harbour</i>									
6320	Tapa Bay	12 27	130 36	-0004	-0004	-0.7	-0.7	-0.3	-0.3	3.66
6321	East Point	12 35	130 34	+0004	+0004	-0.5	-0.4	-0.2	-0.2	3.83
	<i>Port Darwin</i>									
6322	Night Cliff	12 23	130 50	+0006	+0006	-0.4	-0.4	-0.2	-0.2	3.85
6323	DARWIN	12 28	130 51	STANDARD PORT			See Table V			4.10
6325	Cape Hotham	12 03	131 17	+0114	+0114	-2.5	-1.7	-1.2	-0.4	2.69
6328	Two Hills Bay	11 31	132 04	+0145	+0145	-3.0	-2.1	-1.5	-0.6	2.33
	<i>Melville Island</i>									
6330	Camp Point	11 37	131 26	+0110	+0115	-3.2	-2.2	-1.6	-0.6	2.26
6332	Newby Shoal	11 52	129 11	-0112	-0117	-3.2	-2.4	-1.3	-0.6	2.23
6331	St. Asaph Bay	11 18	130 26	+0005	+0005	-2.9	-2.0	-1.7	-0.8	2.3 x
6331	Snake Bay	11 23	130 41	+0345	+0345	-5.1	-3.7	-2.4	-1.0	⊙ a
5425	BANDA		see page	HHW	LLW	MHHW 2.0	MLHW 1.8	MHLW 1.0	MLLW 0.4	
6336	Christies Bay	11 19	131 46	+0427	+0415	0.0	+0.2	+0.1	+0.1	1.41 t
6337	Port Essington	11 22	132 11	+0310	+0310	+0.5	+0.5	+0.2	+0.4	1.7 t
6339	Cape Croker	11 00	132 34	+0307	+0305	+0.1	+0.1	+0.1	+0.2	1.43
6327	DARWIN		see page 88	MHW	MLW	6.9	5.1	3.2	1.4	
6341	North Goulburn Island	13 33	133 26	+0045	+0043	-4.5	-3.2	-2.3	-1.0	1.4 t
	<i>Liverpool River</i>									
6343	Entrance Island	12 58	134 15	+0126	+0126	-3.7	-2.5	-2.2	-1.0	1.8 t
	<i>Millingimbi Inlet</i>									
6344	Yabooma Island	11 58	134 54	+0232	+0232	-3.0	-2.1	-2.1	-1.1	2.07 a
6345	Guluwuru Island	11 30	136 20	+0255	+0255	-3.8	-2.7	-2.0	-0.9	1.86 x
	<i>Marchinbar Island</i>									
6346	Jensen Bay	11 11	136 45	+0210	+0205	-3.5	-2.5	-1.8	-0.8	2.00 t
6347	Mallison Island	12 11	136 06	+0355	+0355	-2.2	-1.1	-2.0	-0.8	2.63

- ⊙ No data.
- Δ Tide is usually diurnal.
- A Tides predicted in Australian National Tide Tables.
- Z Tides predicted in New Zealand Tide Tables.
- a Data approximate.
- d Differences approximate.
- p For predictions use harmonic constants (Part III) and N.P.159.
- t Time differences approximate.
- x M.L., inferred.

ILES LOYALTY TO AUSTRALIA

No.	PLACE	Lat. S.	Long. E.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.	
				MHW (Zone -1100)	LLW	MHHW	MLHW	MHLW	MLLW		
5732	VILA HARBOUR					1.2	1.1	0.5	0.2		
	Iles Loyalty										
5737	Uvea (Uea) Island	20 27	166 37	-0015	-0005	+0.4	+0.5	+0.4	+0.4	1.2	dx
5738	Lifu Island	20 50	167 10	+0025	⊙	+0.4	+0.4	⊙	⊙	⊙	
5739	Maré Island	21 33	167 53	+0020	⊙	+0.4	+0.4	⊙	⊙	⊙	
	D'Entrecasteaux Reefs										
5741	Huon Island	18 03	162 58	-0010	⊙	+0.6	⊙	⊙	⊙	⊙	
	New Caledonia										
5745	Pam Bay	20 14	164 18	+0155	⊙	+0.2	+0.1	⊙	⊙	⊙	
5746	Port Pucbo	20 22	164 36	-0110	⊙	+0.1	0.0	-0.1	-0.1	0.7	tx
5747	Port Hyengen	20 41	164 58	+0020	⊙	+0.1	+0.1	⊙	⊙	⊙	
5748	Tuo Bay	20 47	165 14	+0015	⊙	+0.1	0.0	⊙	⊙	⊙	
5749	Baie de Poro	21 17	165 42	+0023	+0023	+0.1	+0.1	+0.1	+0.1	0.67	
5749a	Baie de Kouaoua	21 24	165 50	+0014	+0014	+0.2	+0.2	+0.2	+0.2	0.83	
5750	Baie d'Amata	21 27	165 59	+0033	+0031	-0.2	-0.2	-0.1	-0.1	0.6	x
5750a	Thio	F 21 37	166 15	+0018	+0012	0.0	+0.1	+0.1	+0.1	0.85	
5751	Uinné Bay	21 59	166 43	+0045	⊙	+0.1	0.0	⊙	⊙	⊙	
5752	Port Yate	22 09	166 57	-0045	⊙	⊙	⊙	⊙	⊙	⊙	
	Isle of Pines										
5754	Kuto	22 40	167 26	+0050	+0117	0.0	0.0	+0.1	+0.2	0.82	
5755	Goro	22 19	167 01	+0113	+0100	-0.2	-0.2	+0.1	+0.1	0.70	
5756	Baie du Prony	22 19	166 50	+0137	+0123	-0.1	-0.1	0.0	+0.1	0.70	
5756a	Ouara	22 25	166 50	+0135	+0120	-0.1	-0.2	0.0	0.0	0.69	
5757	Ire	22 24	166 47	+0142	+0127	0.0	0.0	+0.1	+0.2	0.82	
7280	LUHUASHAN			MHW	MLW	MHWS 4.3	MHWN 3.3	MLWN 2.0	MLWS 0.9		
5757a	La Tortue	22 48	166 46	-0159	-0146	-2.9	-2.2	-1.3	-0.5	0.91	
5758	Amédée Lighthouse	22 29	166 29	-0205	-0203	-2.8	-2.1	-1.3	-0.5	0.97	
5759	Nouméa	F 22 16	166 27	-0201	-0148	-2.8	-2.1	-1.3	-0.5	0.96	
5760	Baie St. Vincent	22 01	166 10	-0150	-0135	-2.5	-1.8	-1.0	-0.3	1.21	
5761	Isié Pass	21 54	165 46	-0135	⊙	-2.5	⊙	⊙	⊙	⊙	
5762	Uarai Bay	21 47	165 45	-0210	-0210	-2.6	-2.0	-1.3	-0.6	1.0	x
5763	Burail Bay	21 37	165 26	-0140	⊙	-2.9	⊙	⊙	⊙	⊙	
5764	Poya Bay	21 21	165 04	-0150	-0150	-2.8	-2.1	-1.2	-0.4	1.02	
5765	Gomen Bay	20 45	164 25	-0202	-0202	-2.8	-2.1	-1.5	-0.5	0.94	
5766	Paagoumene Bay	20 29	164 11	-0135	-0135	-2.7	-2.0	-1.3	-0.5	1.00	t
5767	Banare	20 14	164 01	-0210	-0210	-2.8	-2.1	-1.3	-0.4	0.96	
	Belip Islands										
5768	Auc Bay	19 40	163 38	-0300	-0300	⊙	⊙	⊙	⊙	⊙	t
6400	AUCKLAND	see page 89				3.2	2.7	0.8	0.3		
	TASMAN SEA										
	(Zone -1130)										
5770	Norfolk Island	A 29 04	167 56	+0055	+0058	-1.4	-1.4	-0.4	-0.1	0.88	tx
5998	BRISBANE BAR	see page 85				2.1	1.7	0.7	0.3		
	(Zone -1030)										
5772	Lord Howe Island	31 32	159 04	-0050	-0050	-0.1	-0.1	+0.1	+0.1	1.16	x
5774	Middleton Reef	29 28	159 04	-0055	⊙	-0.3	-0.2	⊙	⊙	⊙	d

⊙ No data.

Δ Tide is usually diurnal.

A Tides predicted in Australian National Tide Tables.

F Tides predicted in French Tide Tables.

a Data approximate.

d Differences approximate.

p For predictions use harmonic constants (Part III) and N.P.159.

t Time differences approximate.

x M.L. inferred.

AUSTRALIA

No.	PLACE	Lat. S.	Long. E.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.
				HHW (Zone -1000)	LLW	MHHW	MLHW	MHLW	MLLW	
5998	BRISBANE BAR	see page 85				2.2	1.8	0.6	0.4	
	CORAL SEA									
5775	Cato Island	23 15	155 32	-0135	-0139	-0.4	-0.4	0.0	0.0	1.06 tx
5778	Frederick Reef Observatory Cay	21 02	154 23	-0130	⊙	-0.5	⊙	⊙	⊙	⊙ d
5779	Middle Bellona Reef	21 24	158 51	-0150	⊙	-0.6	⊙	⊙	⊙	⊙ d
5780	Chesterfield Reef Long Island	19 53	158 19	-0140	⊙	-0.8	⊙	⊙	⊙	⊙ d
5781	Marion Reef	19 06	152 24	p	p	-0.5	-0.5	-0.3	-0.5	0.82
5782	Mellish Reef	17 25	155 52	p	p	-0.7	-0.6	+0.3	0.0	1.0 ax
5925	TOWNSVILLE			MHW	MLW	MHWS 2.9	MHWN 2.0	MLWN 1.2	MLWS 0.4	
5783	Lihou Reef Observatory Cay	17 08	152 07	-0200	⊙	-1.2	⊙	⊙	⊙	⊙ d
5785	Willis Islands	16 13	150 01	-0200	⊙	-1.2	⊙	⊙	⊙	⊙ d
5788	Osprey Reef	13 53	146 32	-0020	⊙	-1.2	⊙	⊙	⊙	⊙ d
5790	Murray Islands	9 55	144 02	+0050	⊙	-0.3	⊙	⊙	⊙	⊙ d
	Great North-East Channel									
5793	Bramble Cay	9 08	143 52	+0105	+0050	0.0	-0.1	+0.4	+0.2	1.74 a
5794	Darnley Island	9 36	143 46	+0100	+0100	-0.2	-0.2	+0.1	+0.1	1.58
5798	Rennel Island	9 46	143 16	+0135	+0130	0.0	0.0	+0.3	+0.2	1.78
5800	Dungeness Reef	9 59	142 59	+0205	+0150	0.0	-0.1	+0.4	+0.1	1.74
5810	TWIN ISLAND			HHW	LLW	MHHW 2.5	MLHW 1.6	MHLW 1.1	MLLW 0.9	
	TORRES STRAIT									
	Eastern Approaches									
5802	Saibai Island	9 23	142 37	+0039	-0041	-0.1	Δ	Δ	+0.3	1.70
5807	Coconut Island	10 03	143 04	-0113	-0108	+1.1	+1.2	+0.9	+0.8	2.56
5808	Suarji Island	10 10	142 31	-0011	-0033	+0.3	+0.4	+0.3	+0.1	1.80
5808a	Moa Island (Banks Island)	10 14	142 13	p	p	+0.2	Δ	Δ	+0.1	1.71
5809	Hawkesbury Island	10 23	142 08	p	p	-0.3	+0.4	+0.5	-0.5	1.52
5810	TWIN ISLAND	10 28	142 26	STANDARD PORT			See Table V			1.57
5811	East Strait Island	10 30	142 27	+0014	+0005	+0.1	+0.1	+0.2	+0.2	1.69
5813	Tuesday Islets (No. 1)	10 33	142 21	+0010	-0001	+0.1	-0.1	+0.1	-0.2	1.52
5817	THURSDAY ISLAND					2.5	1.7	1.2	0.6	
	Prince of Wales Channel									
5814	Wednesday Island (Ince Point)	10 30	142 19	-0031	-0037	0.0	-0.1	+0.2	+0.4	1.66
5817	THURSDAY ISLAND	10 35	142 13	STANDARD PORT			See Table V			1.52
5818	Hammond Rock	A 10 31	142 13	+0038	+0057	+0.2	+0.3	+0.8	+0.4	1.88 t
5820	GOOD'S ISLAND					3.2	3.0	2.6	1.3	
5819	Round Island	10 33	142 12	-0036	-0023	-0.6	-1.0	-0.7	-0.4	1.83 t
5820	GOOD'S ISLAND	10 34	142 10	STANDARD PORT			See Table V			2.48

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
5732-5788							Negligible						
5790-5814	0.0	0.0	0.0	+0.1	+0.1	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0
5817, 5818	+0.1	+0.1	+0.1	+0.1	0.0	-0.1	-0.1	-0.2	-0.1	-0.1	0.0	+0.1	+0.1
5819, 5820	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.2	-0.2	-0.1	-0.1	0.0	+0.1	+0.1
5925	0.0	+0.1	+0.1	+0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0
5998	0.0	0.0	0.0	+0.1	+0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0
6400							Negligible						
7280	-0.1	-0.2	-0.2	-0.1	0.0	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1

AUSTRALIA: NEW ZEALAND

No.	PLACE	Lat. S.	Long. E.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L. Z _m
				HHW (Zone -0930)	LLW	MHHW	MLHW	MHLW	MLLW	
5435	BANDA	see page				2.0	1.8	1.0	0.4	
GULF OF CARPENTARIA										
6348	Gove	A 12 13	136 48	p	p	+1.2	+0.4	+0.6	+0.2	1.90
6349	Caledon Bay	12 57	136 40	p	p	+0.1	-0.1	-0.1	0.0	1.2 x
6349a	Cape Grey	13 00	136 39	p	p	+1.3	+0.7	-0.1	-0.5	1.65
6351	Port Langdon	13 52	136 50	p	p	-1.0	-1.2	-0.6	-0.2	0.58
6351a	Milner Bay	13 50	136 30	p	p	-1.0	Δ	Δ	-0.2	0.61
6351b	Rose River	14 17	135 43	p	p	-0.3	-0.3	+0.4	+0.1	1.18
Sir Edward Pellew Group										
6352	Ataluma Point	15 45	136 49	p	p	+1.5	+0.8	+1.3	+1.6	2.53
6353	Turtle Island	15 35	137 06	p	p	+0.6	+0.5	+1.0	+1.0	2.07
6996	CUA CAM	see page			(Zone -1000)	2.9	Δ	Δ	0.9	
6355	Bayley Island	16 54	139 04	p	p	+0.1	Δ	Δ	-0.2	2.0 x
6356	Sweers Island	17 07	139 38	p	p	+0.1	Δ	Δ	+0.1	2.0 x
6357	Kangaroo Point	17 35	139 45	-0940	-0940	-0.3	Δ	Δ	+0.6	2.0 dx
6358	Karumba (Kimberley)	A 17 30	140 50	-0945	-0945	+0.1	Δ	Δ	+0.2	1.81
6359	Van Diemen Inlet	16 58	140 58	-1045	-1045	-0.6	Δ	Δ	+0.3	1.7 dx
6362	WEIPA	see page 129				2.3	1.9	1.6	0.7	
6362	WEIPA	12 41	141 53	STANDARD PORT			See Table V			1.64
6363	Pennecfather River	12 13	141 47	-0020	-0010	+0.1	+0.1	+0.1	0.0	1.7 lx
6526	WESTPORT	see page		MHW	MLW	MHWS 3.2	MHWN 2.6	MLWN 0.9	MLWS 0.3	
New Zealand, North Island (Zone -1200)										
6366	Port Taranaki	Z 39 04	174 02	-0106	-0106	+0.1	+0.1	+0.1	0.0	1.79
6367	Waitara River Entrance	38 59	174 14	-0106	-0106	+0.3	+0.3	+0.2	+0.1	2.0 x
6369	Kawhia	38 04	174 49	-0048	-0048	-0.2	-0.2	-0.1	-0.1	1.60
6370	Aotea Harbour	38 00	174 50	-0110	-0110	+0.5	+0.3	+0.3	+0.1	2.1 x
6371	Raglan	37 48	174 53	-0040	-0040	-0.2	-0.2	-0.2	-0.2	1.50
6372	Waikato River Entrance	37 24	174 45	-0110	-0110	+0.5	+0.4	+0.3	+0.2	2.1 x
Manukau Harbour										
6373	Paratutae Island	37 03	174 31	-0046	-0041	-0.1	-0.1	+0.1	+0.1	1.77
6374	Cornwallis	37 00	174 36	-0035	-0032	+0.3	+0.3	+0.2	+0.2	2.0 x
6375	Onchunga	Z 36 56	174 47	-0015	-0021	+0.9	+0.8	+0.5	+0.4	2.37
Kaipara Harbour										
6377	Pouto Point	36 22	174 11	-0020	-0020	0.0	-0.2	+0.2	0.0	1.7 x
6378	Shelly Beach	36 35	174 23	-0014	-0035	+1.0	+0.8	+0.6	+0.4	2.44
6379	Tinopai	36 15	174 15	-0005	-0005	+0.4	+0.2	+0.2	0.0	2.00
6380	Te Kopuru	36 02	173 56	+0050	+0130	+0.2	+0.4	0	0	0
Hokianga Harbour										
6381	Opononi	35 30	173 24	-0056	-0056	-0.4	-0.3	-0.2	-0.1	1.51
6382	Rawene	35 24	173 30	-0041	-0032	+0.1	0.0	0.0	+0.1	1.74
6384	Ahipara Bay	35 12	173 08	-0120	-0120	+0.4	+0.3	+0.2	+0.1	2.02
6385	Great Island (Three Kings Islands)	34 09	172 09	-0205	-0205	+0.2	+0.1	+0.1	0.0	1.8 x
6386	Cape Maria van Diemen	34 29	172 38	-0140	-0140	-0.8	-0.5	-0.3	0.0	1.4 x
6400	AUCKLAND	see page 89				3.1	2.8	0.8	0.4	
6387	Parengarenga	34 32	173 00	+0100	+0055	-1.8	-1.7	-0.4	-0.1	0.78
6387a	Houhora Harbour	34 49	173 07	+0100	+0035	-1.0	-0.9	-0.4	-0.3	1.11

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
5435	0.0	+0.1	+0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0
6306-6339	0.0	+0.1	+0.2	+0.2	0.0	-0.1	-0.2	-0.2	-0.1	0.0	0.0	0.0	0.0
6341-6353	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.2	-0.2	-0.1	0.0	0.0	+0.1	+0.1
6355-6363	+0.2	+0.3	+0.3	+0.2	0.0	-0.2	-0.3	-0.3	-0.3	-0.1	0.0	+0.1	+0.2
6366-6373						Negligible							
6374, 6375	0.0	0.0	0.0	+0.1	+0.1	+0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0
6377-6526						Negligible							
6996	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1	0.0

NEW ZEALAND

No.	PLACE	Lat. S.	Long. E.	TIME DIFFERENCES (Zone -1200)		HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.	
				MHW	MLW	MHWS	MHWN	MLWN	MLWS		
6400	AUCKLAND	see page 89				3.1	2.8	0.8	0.4		
<i>Aotearoa River</i>											
6388	Shegis Beacon	34 54	173 18	+0105	+0020	-0.0	-0.9	-0.3	-0.1	1.2	x
6388a	Omata Island	35 00	173 16	+0135	+0050	-0.8	-0.8	-0.3	-0.2	1.3	x
6388b	Dairy Factory Wharf	35 03	173 16	+0200	+0115	-0.9	-0.8	-0.3	-0.2	1.2	x
6389	Mangonui	34 59	173 32	+0045	+0037	-0.5	-0.4	0.0	+0.1	1.57	
6390	Whangaroa	35 01	173 45	+0030	+0020	-0.6	-0.6	0.0	+0.1	1.49	
<i>Motukawanui Island</i>											
6390a	Waiti Bay	35 01	173 56	+0024	+0015	-0.9	-0.8	-0.1	+0.1	1.34	
6391	Russell	35 16	174 07	+0010	+0025	-0.7	-0.7	-0.2	0.0	1.39	
6391a	Opua	35 19	174 07	+0022	+0020	-0.8	-0.7	-0.2	-0.1	1.32	
6391b	Whangamumu Harbour	35 15	174 18	+0030	+0050	-1.0	-0.9	-0.2	-0.1	1.23	a
6392	Whangaruru Harbour	35 22	174 21	+0025	+0035	-0.9	-0.8	-0.2	-0.1	1.30	
6393	Tutukaka Harbour	35 38	174 33	0000	-0030	-0.8	-0.8	-0.2	-0.1	1.3	dx
<i>Whangarei</i>											
6394	Marsden Point	Z 35 50	174 29	+0005	-0002	-0.5	-0.5	-0.1	0.0	1.52	
6395	Port Whangarei	Z 35 46	174 21	+0038	+0012	-0.2	-0.2	+0.1	+0.2	1.75	
6396	Mokohinau Island	35 54	175 07	-0022	+0032	-0.8	-0.7	-0.2	-0.1	1.30	
<i>Kawau Island</i>											
6397	Bon Accord Harbour	36 26	174 49	-0022	-0001	-0.5	-0.5	0.0	+0.1	1.55	
6397a	Matakana River	36 23	174 44	-0018	+0003	⊙	⊙	⊙	⊙	⊙	
6398	Mahurangi Harbour	36 29	174 43	+0002	+0012	⊙	⊙	⊙	⊙	⊙	
6398a	Tiritiri Matangi Island	36 36	174 53	+0015	-0003	-0.2	-0.2	0.0	+0.1	1.71	
6399	Weiti River	36 39	174 44	-0003	+0007	-0.3	-0.3	+0.1	+0.2	1.70	x
6400	AUCKLAND	36 51	174 46	STANDARD PORT		See Table V				1.76	
<i>Waiheke Island</i>											
6401	Man o' War Bay	36 47	175 09	-0021	-0003	-0.1	-0.2	-0.1	-0.1	1.63	
6401a	Matiata Bay	36 47	174 59	-0014	-0006	-0.3	-0.4	-0.2	-0.1	1.55	
6404	Rocky Point (Thames)	37 06	175 31	-0031	-0024	+0.2	+0.1	+0.1	+0.1	1.90	
6405	Coromandel Harbour	36 47	175 25	-0016	-0006	-0.3	-0.3	0.0	+0.1	1.67	ax
<i>Great Barrier Island</i>											
6406	Nagle Cove	36 09	175 19	-0024	-0011	-0.8	-0.7	-0.3	-0.1	1.31	
6408	Port Jackson	36 29	175 20	-0030	-0012	-0.5	-0.5	-0.1	0.0	1.49	a
6411	Mercury Bay (Whitianga)	36 50	175 42	-0012	-0002	-1.0	-0.9	-0.1	+0.1	1.27	
6412	Tairua	37 00	175 51	-0025	-0010	-1.2	-1.0	-0.3	0.0	1.17	
6412a	Slipper Island	37 04	175 57	-0048	-0014	-1.1	-1.0	-0.3	0.0	1.17	a
6415	Tauranga	Z 37 39	176 13	-0017	0000	-1.3	-1.2	-0.4	-0.1	1.13	
6417	Whale Island	37 54	176 58	-0045	-0045	-0.8	-0.8	-0.1	+0.1	1.37	
6418	Ohiwa	37 59	177 07	+0013	-0004	-1.2	-1.0	-0.3	0.0	1.16	
6419	Motunui Island	37 47	177 39	-0040	-0040	-1.0	-0.9	-0.1	+0.1	1.29	
6421	Hicks Bay	37 35	178 19	-0055	-0035	-0.9	-0.8	0.0	+0.1	1.33	
6422	East Cape	37 41	178 33	-0055	-0045	-1.0	-0.9	-0.1	+0.1	1.3	x
6423	Waipiro Bay	38 02	178 20	-0102	-0102	-1.1	-1.0	-0.2	+0.1	1.23	
6424	Tolaga Bay	38 22	178 19	-0114	-0114	-1.2	-1.0	-0.1	+0.1	1.2	x
6490	LYTTELTON	see page 1				2.2	2.1	0.4	0.3		
6425	Gisborne	38 41	178 02	+0125	+0128	-0.4	-0.4	+0.1	+0.1	1.15	
6428	Portland Island	39 17	177 52	+0115	+0115	⊙	⊙	⊙	⊙	⊙	
6429	Waikokopu	39 04	177 50	+0125	+0125	-0.6	-0.6	0.0	-0.1	0.9	x
<i>Wairoa River</i>											
6430	Clyde	39 03	177 26	+0120	+0120	-0.6	-0.6	-0.1	-0.1	0.9	x

⊙ No data.
 Z Tides predicted in New Zealand Tide Tables.
 a Data approximate.
 d Differences approximate.
 p For predictions use harmonic constants (Part III) and N.P.159.
 t Time differences approximate.
 x M.L. inferred.

NEW ZEALAND

No.	PLACE	Lat. S.	Long. E.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.
				MHW (Zone -1200)	MLW	MHWS	MHWN	MLWN	MLWS	
6439	WELLINGTON	see page				1.4	1.3	0.5	0.4	
<i>Napier</i>										
6432	No. 3 Wharf	Z 39 29	176 55	+0056	+0056	+0.2	+0.2	-0.2	-0.2	0.90
6436	Castle Point	40 55	176 13	+0015	+0015	-0.2	-0.2	-0.4	-0.4	0.61
6438	Cape Palliser	41 37	175 17	+0010	+0010	+0.1	+0.1	0.0	-0.1	0.9
6439	WELLINGTON	41 17	174 47	STANDARD PORT		See Table V				0.89
<hr/>										
6526	WESTPORT	see page				3.2	2.6	0.9	0.3	
6441	Oteranga Bay	41 18	174 37	p	p	-2.3	-1.9	-0.4	0.0	0.62
6442	Makara Bay	41 13	174 42	p	p	-1.9	-1.7	-0.2	0.0	0.79
6443	Porirua Harbour	41 04	174 51	p	p	-1.8	-1.6	-0.3	-0.1	0.78
6445	Manawatu River Entrance	40 28	175 13	-0125	-0125	-0.8	-0.8	0.0	-0.1	1.3
6447	Wanganui River Entrance	39 57	174 59	-0030	-0030	-0.5	-0.6	+0.1	0.0	1.5
6449	Patea	39 47	174 29	-0115	-0115	-0.7	-0.7	-0.1	-0.1	1.3
6451	Opunake Bay	39 28	173 51	-0110	-0110	+0.1	+0.1	+0.1	0.0	1.8
<i>New Zealand, South Island</i>										
<i>Golden Bay</i>										
6453	Collingwood	40 40	172 40	-0120	-0130	+1.2	+0.9	+0.2	-0.1	2.3
6454	Motupipi River	40 50	172 51	-0120	-0130	+1.5	+1.2	+0.3	0.0	2.5
<i>Tasman Bay</i>										
6455	Astrolabe Road	Z 40 58	173 03	-0115	-0125	+1.6	+1.2	+0.3	-0.1	2.5
6458	Nelson	Z 41 16	173 16	-0053	-0107	+0.5	+0.3	+0.2	0.0	1.99
6460	Croisilles Harbour	41 05	173 42	-0110	-0120	+0.9	+0.7	+0.1	-0.1	2.2
6462	Greville Harbour	40 52	173 49	-0115	-0125	0.0	-0.2	0.0	-0.3	1.63
6464	Stephen's Island	40 40	174 01	-0125	-0135	-0.7	-0.6	-0.1	0.0	1.4
6466	Elmslie Bay	40 56	173 51	-0145	-0205	-0.8	-0.8	-0.2	-0.2	1.26
6467	Pelorus Sound Entrance	40 55	173 59	-0155	-0225	-0.7	-0.7	-0.1	-0.1	1.3
6471	Havelock	41 17	173 46	-0050	-0100	-0.6	-0.6	0.0	-0.1	1.42
<i>Queen Charlotte Sound</i>										
6474	Long Island	41 07	174 17	-0200	-0248	-1.7	-1.6	-0.5	-0.3	0.73
6476	East Bay	41 14	174 08	-0210	-0305	-1.8	-1.6	-0.5	-0.3	0.70
6477	Picton	Z 41 17	174 00	-0157	-0245	-1.7	-1.6	-0.4	-0.3	0.73
6478	Okiwa Bay	41 17	173 55	-0200	-0250	-1.7	-1.6	-0.4	-0.3	0.73
6478a	Whakenui	41 12	174 18	p	p	-2.0	-1.7	-0.4	-0.1	0.7
<i>Tory Channel</i>										
6479	Te Iro Bay	41 14	174 11	-0215	-0255	-1.9	-1.7	-0.5	-0.3	0.66
<hr/>										
6490	LYTTELTON	see page				2.2	2.1	0.4	0.3	
6481	Lucky Bay	41 16	174 17	p	p	-0.9	-0.9	+0.1	+0.1	0.89
6482	Port Underwood	41 20	174 06	+0146	+0146	-0.7	-0.9	+0.2	+0.1	0.90
6484	Lake Grassmere Entrance	41 42	174 11	p	p	-0.5	-0.6	0.0	0.0	1.0
6485	Cape Campbell	41 44	174 15	p	p	-0.5	-0.5	+0.1	+0.1	1.05
6487	Kaikoura Peninsula	42 25	173 42	p	p	-0.5	-0.5	+0.1	+0.1	1.07
6490	LYTTELTON	43 36	172 43	STANDARD PORT		See Table V				1.23
6491	Akaroa	43 48	172 55	-0045	-0040	+0.2	+0.1	+0.3	+0.2	1.49
6492	Timaru	44 24	171 15	-0138	-0141	0.0	-0.1	+0.3	+0.2	1.37
<hr/>										
6504	BLUFF	see page				2.6	2.3	0.9	0.6	
6494	Oamaru	45 07	170 59	+0105	+0127	-0.5	-0.5	-0.2	-0.1	1.28
<i>Otago Harbour</i>										
6496	Entrance	45 47	170 44	+0054	+0114	-0.8	-0.7	-0.6	-0.5	0.98
6497	Port Chalmers	45 49	170 39	+0152	+0201	-0.8	-0.7	-0.6	-0.5	0.98
6498	Dunedin	Z 45 53	170 30	+0227	+0313	-0.8	-0.7	-0.6	-0.4	0.99
6500	Nugget Point	46 26	169 48	+0100	+0100	-0.3	-0.2	0.0	0.0	1.49
6502	Waipapa Point	46 39	168 51	+0017	+0016	+0.1	+0.2	0.0	0.0	1.68
6504	BLUFF	46 36	168 21	STANDARD PORT		See Table V				1.61
6505	New River Entrance	46 32	168 15	-0022	-0022	+0.2	+0.2	-0.2	-0.2	1.6
6506	Colac Bay	46 22	167 54	-0144	-0139	-0.2	-0.3	-0.2	-0.3	1.35
<i>Stewart Island</i>										
6507	Paterson Inlet	46 54	168 07	-0008	-0010	0.0	0.0	0.0	0.0	1.58

SEASONAL CHANGES IN MEAN LEVEL

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No. Jan. 1 Feb. 1 Mar. 1 Apr. 1 May 1 June 1 July 1 Aug. 1 Sep. 1 Oct. 1 Nov. 1 Dec. 1 Jan. 1

FIJI TO MARSHALL ISLANDS

No.	PLACE	Lat. S.	Long. W.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L. Z. m.	
				MHW (Zone -1200)	MLW	MHWS	MHWN	MLWN	MLWS		
6705	SUVA	see page 1				1.6	1.4	0.5	0.3		
6728	Wailagilala Island	16 45	179 06	-0020	-0005	-0.1	-0.1	-0.1	-0.1	0.83	a
6729	Vanuabalavu Island	17 17	178 59	-0037	-0036	-0.1	0.0	0.0	+0.1	0.96	a
<i>Lakemba Island</i>											
6730	Tumbou	18 14	178 46	-0002	-0001	0.0	0.0	0.0	0.0	0.94	a
6730a	Wainiyabia	18 12	178 50	-0004	-0003	-0.1	0.0	0.0	0.0	0.94	a
<i>Totoya</i>											
6732	Herald Sound	18 59	179 52	+0050	+0050	-0.3	-0.2	-0.3	-0.3	0.7	ix
		S.	E.								
<i>Moala</i>											
6733	Naroi	18 33	179 57	-0002	-0002	0.0	0.0	+0.1	+0.1	1.00	a
6734	Matuku Harbour	19 10	179 45	+0030	+0015	0.0	-0.1	0.0	0.0	0.9	ix
<i>Kandavu</i>											
6735	Ngaloa Harbour	19 05	178 11	0000	-0015	0.0	0.0	-0.3	-0.3	0.8	ix
6735a	Namalata Bay	19 03	178 09	-0004	-0004	+0.1	+0.1	+0.2	+0.3	1.16	a
<hr/>											
9700	PUERTO MONTT	see page 162				6.5	4.7	2.4	0.7		
		S.	W.								
6739	Iles Wallis (Ile Urea)	F 13 22	176 11	-0815	-0815	-4.8	-3.3	-1.8	-0.4	0.98	t
		S.	E.								
6740	Rotuma Island	12 29	177 07	-0825	-0825	-4.8	-3.3	-1.6	-0.3	1.07	
<i>Tuvalu</i>											
6744	Funafuti	8 31	179 12	-0853	-0852	-4.7	-3.4	-1.7	-0.5	1.0	x ^o
<i>Kiribati</i>											
6750	Arorae	2 39	176 50	-0905	-0905	-4.7	-3.4	-1.7	-0.6	1.0	x
6752	North Beru	1 17	176 00	-0935	-0935	-5.2	-3.8	-2.0	-0.7	0.62	a
6754	Tabiteuea	1 28	175 03	-0935	-0935	-4.5	-3.3	-1.7	-0.6	1.05	a
6755	Nonouti	0 40	177 27	-0935	-0935	-4.5	-3.2	-1.8	-0.5	1.06	t
		N.	E.								
6756	Abemama	0 29	173 52	-0900	-0900	-4.5	-3.3	-1.6	-0.5	1.07	t
6759	Tarawa	1 22	172 56	-0935	-0938	-4.6	-3.4	-1.7	-0.6	1.00	
6760	Abaiang Atoll	1 49	173 02	-0915	-0925	-4.4	-3.1	-1.4	-0.3	1.25	
6761	Butaritari (Makin)	3 02	172 48	-0935	-0938	-4.6	-3.4	-1.7	-0.6	1.00	t
		S.	E.								
6763	Ocean Island	0 52	169 35	-0917	-0916	-4.7	-3.4	-1.6	-0.4	1.04	t
6764	Nauru	0 32	166 54	-0938	-0941	-4.7	-3.5	-1.6	-0.5	1.0	x
<hr/>											
5062	DAVAO	see page 2				1.6	1.0	0.5	-0.2		
<i>Marshall Islands</i>											
		N.	E.								
<i>Mili Atoll</i>											
6766	Port Rhin	6 14	171 48	-0121	-0121	+0.3	+0.3	+0.2	+0.3	1.01	
<i>Arno Atoll</i>											
6767	Dodo Passage	7 08	171 42	-0129	-0129	+0.2	+0.3	+0.1	+0.4	0.97	
<i>Majuro Atoll</i>											
6768	Djarrit	7 08	171 21	-0129	-0129	+0.2	+0.2	+0.2	+0.4	0.98	
<i>Jaluit Atoll</i>											
6769	South-east Pass	5 55	169 39	-0133	-0133	0.0	+0.1	+0.2	+0.4	0.88	

- Δ Tide is usually diurnal.
- * See notes on page 388.
- F Tides predicted in French Tide Tables.
- J Tides predicted in Japanese Tide Tables.
- U Tides predicted in U.S. Tide Tables.
- a Data approximate.
- p For predictions use harmonic constants (Part III) and N.P.159.
- t Time differences approximate.
- x M.L. inferred.

MARSHALL TO PALAU ISLANDS

No.	PLACE	Lat. N.	Long. E.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L.L. Z_0 m.
				MHW (Zone -1200)	MLW	MHWS	MHWN	MLWN	MLWS	
5062	DAVAO	see page				1.6	1.0	0.5	-0.2	
6771	Ailinglapalap Atoll	7 17	168 45	-0117	-0117	+0.1	+0.1	+0.2	+0.4	0.92
6772	Maloclap Atoll	8 43	171 14	-0129	-0129	+0.1	+0.2	+0.2	+0.3	0.90
6775	Wotjc Atoll	9 28	170 14	-0135	-0135	0.0	+0.1	+0.1	+0.4	0.85
6776	Kwajalein Atoll	U 8 44	167 44	-0135	-0130	+0.1	+0.1	+0.2	+0.3	0.91
6776a	Nimuru To	9 27	167 29	-0131	-0132	+0.1	+0.2	+0.2	+0.4	0.92
6777	Likiep Atoll	9 49	169 17	-0125	-0125	0.0	+0.2	+0.2	+0.4	0.92
6782	Rongerik Atoll	11 23	167 31	-0138	-0138	0.0	+0.2	+0.2	+0.4	0.90
6783	Rongelap Atoll	11 09	166 54	-0131	-0131	0.0	+0.1	-0.2	+0.4	0.86
6786	Bikini Atoll	11 36	165 33	-0142	-0142	0.0	+0.1	+0.3	+0.4	0.92
6787	Enewetak Atoll	11 26	162 23	-0128	-0129	-0.3	-0.1	+0.1	+0.4	0.79
6787a	Runit Island	11 33	162 21	-0133	-0133	-0.2	0.0	+0.1	+0.4	0.79
6788	Ujelang Atoll	9 46	160 58	-0121	-0121	-0.2	-0.1	+0.1	+0.4	0.80
6790	Wake Island	19 17	166 37	-0200	-0200	-0.7	-0.4	-0.2	+0.2	0.43
Caroline Islands										
6792	Kusaic Island	5 20	163 01	-0125	-0125	0.0	+0.1	+0.3	+0.4	0.92
(Zone -1100)										
6795	Ponape Harbour	U 6 59	158 13	-0243	-0243	-0.4	-0.2	+0.1	+0.4	0.70
6795a	Matalanim Harbour	6 52	158 23	-0239	-0240	-0.2	-0.1	+0.2	+0.5	0.82
9644	VALPARAISO	see page		HHW	LLW	MHHW 1.5	MLHW 1.2	MHLW 0.5	MLLW 0.4	
6797	Oroluk Island	7 40	155 10	-0737	-0707	-0.6	-0.6	-0.1	0.0	0.59
6798	Nomoi Islands	5 20	153 44	p	p	-0.5	-0.6	-0.1	0.0	0.62
6798a	Moro Tu	5 29	153 33	p	p	-0.5	-0.6	-0.1	0.0	0.61
6800	Hall Islands	8 36	152 15	p	p	-0.7	-0.7	-0.1	0.0	0.51
6800a	Nomuvin To	8 27	151 47	p	p	-0.8	-0.8	-0.1	-0.1	0.47
(Zone -1000)										
5599	DREGER HARBOUR	see page				1.5	Δ	Δ	0.9	
6801	Truk Islands	JU 7 22	151 33	+0035	-0052	-0.8	Δ	Δ	-0.6	0.46
6802	Namonuito Islands	8 35	149 39	-0122	+0139	-0.9	Δ	Δ	-0.7	0.37
6802a	Onari To	8 45	150 20	-0057	+0123	-0.9	Δ	Δ	-0.7	0.39
6803	Pulap Island	7 39	149 25	-0033	+0110	-0.9	Δ	Δ	-0.6	0.41
6804	Puluwat Island	7 22	149 13	p	p	-0.9	Δ	Δ	-0.7	0.4
7940	YOKOHAMA	see page		MHW	LLW	2.7	2.6	0.9	0.3	
6807	Lamotrek	7 28	146 23	p	p	-1.0	-0.9	-0.5	-0.2	0.52
6811	Wolcai Island	7 22	143 54	p	p	-1.0	-0.9	-0.4	-0.2	0.51
6814	Ulithi Islands	9 55	139 40	+0313	+0307	-0.5	-0.4	-0.3	-0.1	0.80
6814a	Yasoro To	10 02	139 46	+0255	+0256	-0.5	-0.5	-0.2	0.0	0.82
6815	Yap Island	9 30	138 08	+0315	+0310	-0.3	-0.6	-0.1	+0.1	1.0
6816	Ngulu Islet	8 18	137 29	+0324	+0312	-0.4	-0.3	-0.3	0.0	0.86
7716	NAHA KO	see page		MHW	MLW	MHWS 2.0	MHWN 1.5	MLWN 0.8	MLWS 0.3	
Palau Islands (Zone -0900)										
6818	Garukoru (Ngaregur)	7 45	134 38	-0022	-0022	-0.2	-0.2	-0.1	0.0	1.05
6819	Toagel Mlungui	7 30	134 31	-0015	-0015	-0.2	-0.2	-0.1	+0.1	1.08
6820	Malakal Harbour	JU 7 20	134 28	+0012	+0012	-0.1	-0.1	0.0	0.0	1.11
6821	Ngesebus	7 03	134 16	+0012	+0011	-0.4	-0.2	-0.1	+0.1	1.00
6825	Helen Reef	2 59	131 49	-0003	-0003	-0.2	-0.2	0.0	+0.1	1.07

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
5062	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	0.0	0.0	-0.1
5599	Negligible												
6705-6764	Negligible												
6766-6788	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	0.0
6790-6798a	Negligible												
6800-6825	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	0.0	0.0
7716	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	+0.1	0.0	-0.1	-0.1
7940	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	+0.1	0.0	0.0	-0.1
9644, 9700	-1.20 Negligible												

CHINA: HONG KONG

No.	PLACE	Lat. N.	Long. E.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L. Z. m.
				HHW (Zone -0800)	LLW	MHHW	MLHW	MHLW	MLLW	
7110	HONG KONG	see page 1				2.2	1.5	1.2	0.8	
	<i>Zhu Jiang (Canton River)</i>									
7071	Zhuhai (Kauchau)	22 19	113 36	+0041	+0035	+0.3	+0.3	+0.3	+0.1	1.69
7073	Chiwan	22 28	113 53	+0145	+0125	+0.6	+0.7	-0.1	-0.2	1.68
7075	Heng Men Haikou (Wangmun Entrance)	22 36	113 36	+0230	0	-0.1	0	0	0	0
7076	Tailung Channel	22 48	113 20	+0420	0	-0.1	0	0	0	0
7078	Chuanbi Jiao	22 45	113 40	+0255	0	+0.2	0	0	0	0
7080	Huang-pu (Whampoa Dock)	C 23 05	113 25	+0351	+0406	+0.3	+0.4	-0.1	-0.2	1.55
7081	Kuang-chou (Canton)	C 23 05	113 15	+0519	+0530	0.0	+0.2	-0.2	-0.3	1.34
7086	Wailingding Dao	22 06	114 02	+0005	+0008	-0.2	-0.1	-0.1	-0.2	1.26
7087	Wenwei Zhou	21 49	113 56	+0013	+0025	-0.5	-0.4	-0.2	-0.3	1.1
7092	Tsim Bei Tsiu	22 29	114 01	+0120	+0216	+0.3	+0.3	-0.2	-0.3	1.8
7093	Tap Shek Kok	22 23	113 55	+0127	+0056	+0.1	+0.3	+0.2	0.0	1.6
7094	Tsing Shan Wan	22 23	113 59	+0031	+0046	+0.1	+0.1	-0.2	-0.2	1.47
7094a	Tai Lam Kok	22 22	114 01	+0103	+0055	+0.1	+0.1	+0.1	0.0	1.5
7096	Tai Mo To (West Brother)	22 20	113 58	+0052	+0052	+0.2	+0.2	0.0	-0.2	1.52
7096a	Chek Lap Kok	22 19	113 56	+0132	+0103	+0.1	+0.2	+0.1	-0.1	1.5
7097	Tai O	22 15	113 51	+0105	+0052	+0.1	+0.2	+0.1	+0.1	1.54
7098	Shap Long Bay	22 14	114 00	-0002	-0004	+0.1	+0.1	0.0	0.0	1.4
7102	Tsing Yi	22 20	114 06	+0006	+0006	0.0	+0.1	+0.1	-0.1	1.44
7102a	Tsuen Wan	22 22	114 07	+0023	+0016	0.0	+0.1	+0.1	-0.1	1.47
7106	Yung Shue Wan	22 14	114 06	-0012	-0006	-0.2	-0.3	0.0	-0.2	1.3
	<i>Hong Kong Island</i>									
7109	Aberdeen	22 15	114 09	-0004	-0001	0.0	0.0	0.0	-0.1	1.4
7110	HONG KONG HARBOUR	22 18	114 12	STANDARD PORT			See Table V			1.38
7115	Aldrich Bay	22 17	114 13	-0004	+0004	-0.1	0.0	0.0	-0.1	1.38
7122	Waglan Island	22 11	114 18	0000	0000	-0.2	-0.2	0.0	-0.1	1.30
7124	Sai Kung Hoi	22 23	114 17	-0018	-0007	-0.1	0.0	+0.1	-0.1	1.40
	<i>Mira Bay</i>									
7129	Hoi Ha (Jones Cove)	22 28	114 20	-0022	-0024	-0.2	-0.1	-0.2	-0.1	1.28
7132	Tai Po	22 28	114 11	+0120	+0035	0.0	0.0	0.0	0.0	1.3
7133	Tai Chau To Hoi (Double Haven)	22 32	114 18	+0019	-0016	-0.1	-0.2	-0.1	-0.2	1.30
7135	Peng Chau	22 33	114 26	-0002	+0004	-0.1	-0.1	-0.1	-0.2	1.3
7137	Tuoning Leidao	22 27	114 38	-0022	-0015	-0.3	-0.2	-0.1	-0.2	1.2
	<i>Daya Wan</i>									
7141	Tsang Chau	22 44	114 44	-0031	-0032	-0.2	-0.1	-0.1	-0.1	1.31
7145	Honghai Wan	22 44	115 11	-0039	-0021	-0.5	-0.4	-0.2	-0.2	1.1
7146	Shanwei Gang	C 22 45	115 21	-0035	-0027	-0.6	-0.5	-0.3	-0.3	1.00
5137	LABUAN	see page 1				2.0	1.5	1.4	0.7	
7147	Jicshi Wan	22 48	115 40	-0221	-0215	-0.2	-0.3	-0.3	0.0	1.22
5147	MIRI	see page 1				1.6	Δ	Δ	0.5	
7149	Jiazi Jiao	22 49	116 06	-0054	-0118	-0.1	Δ	Δ	0.0	1.1
5137	LABUAN	see page 1				2.0	1.5	1.4	0.7	
7151	Shibeishan Jiao	22 56	116 29	0000	+0006	-0.6	-0.1	-0.1	-0.2	1.1
7152	Pratas	20 42	116 43	-0150	-0138	-1.0	-0.9	-0.8	-0.4	0.7

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
4987	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	+0.1	0.0	0.0	-0.1
5137	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	0.0
5147	+0.1	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1
5172	+0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1
6994-7034	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1	0.0
7043-7063	0.0	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	0.0	+0.1	+0.2	+0.2	0.0
7066-7078	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1	0.0
7080	-0.1	-0.1	-0.2	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	+0.1	0.0	-0.1
7081	-0.2	-0.3	-0.3	-0.1	+0.1	+0.2	+0.2	+0.2	+0.1	+0.1	0.0	-0.1	-0.2
7086-7146	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	+0.1	+0.2	+0.1	0.0
7147-7152	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	+0.1	+0.1	0.0

CHINA: KOREA

No.	PLACE	Lat. N.	Long. E.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.
				HHW (Zone -0800)	LLW	MHHW	MLHW	MHLW	MLLW	
5998	BRISBANE BAR	see page 85				2.1	1.7	0.5	0.4	
7388	Huludao Gang	40 43	120 59	-0407	-0408	+1.0	+0.7	+0.4	+0.5	1.84
<i>Liao He</i>										
7392	Bar	40 32	122 04	-0449	-0448	+1.1	+0.7	+0.1	+0.1	1.7 tx
7393	Bar Signal Station	40 38	122 10	-0427	-0426	+1.2	+0.8	+0.1	+0.1	1.74 t
7394	Yingkou	40 41	122 16	-0458	-0504	+1.4	+0.8	-0.1	-0.1	1.7 tx
7397	Daitze Shan	40 18	122 06	-0509	-0511	+1.9	+1.3	+0.6	+0.6	2.30 t
7401	Changxing Dao	39 39	121 28	-0629	-0654	+0.1	-0.2	+0.3	+0.3	1.31 t
7403	Xizhong Dao	39 24	121 17	-0824	-0850	-0.2	-0.3	+0.4	+0.1	1.18 t
<i>Pulandian Wan</i>										
7405	Boji Dao	39 23	121 45	-0802	-0810	+0.2	+0.2	+0.4	+0.1	1.42 t
7407	Hulu Dao	39 16	121 36	-0847	-0906	+0.2	0.0	+0.5	+0.1	1.40 t
7486	INCH'ON	see page 93		MHW	MLW	MHWS 8.6	MHWN 6.5	MLWN 2.8	MLWS 0.4	
<i>BOHAI HAIXIA</i>										
7411	Yingzhengzi Wan	38 58	121 18	<i>p</i>	<i>p</i>	-6.7	-4.9	-2.0	0.0	1.18
7414	Chang Zui	38 47	121 08	+0613	+0613	-6.7	-5.0	-2.1	-0.1	1.07 t
7416	Lushun Gang	38 48	121 15	+0531	+0531	-6.0	-4.4	-1.9	0.0	1.49 t
7417	Xiaobing Dao	38 49	121 31	+0523	+0523	-5.9	-4.3	-1.9	0.0	1.57 t
7418	Yu Yan	38 34	121 39	+0511	+0515	-5.8	-4.3	-1.8	0.0	1.6 tx
<i>YALU GULF</i>										
7421	Dajian Gang (Dairen Ko)	CJ 38 56	121 39	+0511	+0511	-5.7	-4.2	-1.9	-0.1	1.63
7424	Changjiang Ao	39 08	122 06	+0442	+0442	-5.1	-3.7	-1.6	-0.1	2.01 t
7427	Dachangshan Dao	39 16	122 35	+0421	+0421	-4.5	-3.3	-1.4	+0.2	2.32 t
7429	Haiyang Dao	39 04	123 09	+0356	+0356	-4.6	-3.3	-1.3	+0.2	2.32 t
7432	Dwangjia Dao	39 27	123 03	+0402	+0406	-3.9	-2.7	-1.3	+0.2	2.64 t
7435	Dalu Dao	39 45	123 45	+0338	+0338	-3.1	-2.1	-1.1	+0.2	3.05 t
7436	Takushan	39 46	123 33	+0405	+0405	-3.3	-2.0	-1.3	+0.2	2.96 t
<i>Yalu Jiang (Amnok Kang)</i>										
7439	Sin Do	39 48	124 16	+0342	+0342	-2.2	-1.6	-0.7	+0.2	3.50 t
7440	Chao-shih-kou	39 53	124 12	+0340	+0442	-3.0	-2.1	-1.1	+0.1	3.05 *d
7441	Tuyup'o	39 56	124 20	+0353	+0513	-3.7	-2.5	-1.2	+0.2	2.78 *d
7442	San-tao-lang-t'ou	40 03	124 20	+0430	+0620	⊙	⊙	⊙	⊙	*d
7443	An-tung	40 07	124 24	+0605	+0640	-5.8	-4.2	-1.8	+0.1	1.65 *d
7445	Suun Do	39 42	124 25	+0325	+0331	-2.5	-1.7	-0.8	+0.3	3.37
<i>Korea, West Coast</i>										
(Zone -0900)										
7448	Tan-do (Tan Do)	39 31	124 40	+0423	+0423	-2.4	-1.7	-0.8	+0.3	3.45 t
7450	Nap To	39 16	124 43	+0407	+0407	-2.7	-2.0	-0.7	+0.3	3.30 t
7452	Unmu Do	39 25	125 07	+0423	+0423	-1.9	-1.3	-0.5	+0.4	3.76 t
<i>Taedong Gang</i>										
7457	Sok To	38 38	125 00	+0331	+0331	-3.8	-2.8	-1.1	+0.2	2.70 t
7458	P'i Do	K 38 40	125 10	+0346	+0346	-2.9	-1.8	-1.1	+0.3	3.20 *t
7468	Monggum P'o	38 11	124 47	+0232	+0233	-5.0	-3.7	-1.5	+0.1	2.14 t
<i>HUANG HAI (YELLOW SEA)</i>										
7469	Wollae Do (Getsnai Tau)	38 03	124 49	+0108	+0110	-5.1	-3.8	-1.5	+0.2	2.05 t
7470	Taeryonggi Bong	K 35 57	124 44	+0122	+0124	-4.8	-3.6	-1.1	+0.4	2.30 t
7471	Taechong Do	K 37 50	124 43	+0100	+0100	-5.2	-3.9	-1.4	+0.1	1.99 t
7474	Sunwi Do	K 37 45	125 20	+0033	+0033	-3.7	-2.8	-1.0	+0.2	2.88 t
7475	Mu Do	37 44	125 35	+0022	+0022	-2.5	-1.9	-0.7	+0.3	3.59 t
7477	Taeyonp'yong Do	K 37 40	125 43	+0026	+0021	-2.0	-1.6	-0.3	+0.4	3.70

⊙ No data.

* See notes on page 388.

C Tides predicted in Chinese Tide Tables.

J Tides predicted in Japanese Tide Tables.

K Tides predicted in Korean Tide Tables.

d Differences approximate.

p For predictions use harmonic constants (Part III) and N.P.159.

t Time differences approximate.

x M.L. inferred.

KOREA

No.	PLACE	Lat. N.	Long. E.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.
				MHW (Zone -0900)	MLW	MHWS	MHWN	MLWN	MLWS	
7486	INCH'ON	see page 93				8.6	6.5	2.8	0.4	
<i>Han Gan</i>										
7479	Chumun Do		37 39 126 14	+0017	+0018	-0.5	-0.4	-0.1	+0.3	4.39
7480	Oepori	K	37 42 126 23	+0043	+0041	-0.5	-0.5	+0.2	+0.5	4.50
7482	Seoul		37 33 126 57	+0430	⊙	⊙	⊙	⊙	⊙	⊙
<i>Yom Ha</i>										
7484	Sun Tol Mok		37 40 126 32	+0055	⊙	⊙	⊙	⊙	⊙	⊙
7486	INCH'ON (CHEMULPHO)		37 28 126 37	STANDARD PORT		See Table V				4.68
7487	Taemuni Do		37 23 126 27	-0006	-0006	-0.2	-0.2	0.0	+0.3	4.53
7489	Tokchok To	K	37 15 126 07	-0018	-0014	-0.9	-0.7	0.0	+0.5	4.30
7492	Asan Myoji (Gazan Byochi)		36 58 126 47	-0008	-0008	+0.3	+0.3	+0.1	+0.3	4.82
7494	Umu Do		37 02 126 27	-0027	-0027	-0.8	-0.6	-0.3	+0.3	4.24
7497	Manli Po		36 47 126 08	-0055	-0055	-2.0	-1.5	-0.6	+0.2	3.63
7500	Sachang-po (Chung Do)		36 23 126 26	-0108	-0108	-1.7	-1.3	-0.5	+0.2	3.76
7501	Daechon Hang	K	36 20 126 30	-0133	-0056	-2.9	-2.2	-0.7	+0.3	3.20
7503	Bocheong Do	K	36 07 125 59	-0141	-0141	-2.9	-2.3	-0.8	+0.1	3.10
7504	Kunsan (Outer Port)	K	35 58 126 38	-0203	-0130	-1.9	-1.4	-0.5	+0.5	3.61
7505	Kunsan	JK	35 59 126 43	-0109	-0108	-1.5	-1.8	-0.7	+0.3	3.41
7507	Gogunsan Gundo		35 49 126 24	-0153	-0153	-2.5	-1.8	-0.8	+0.2	3.36
7280	LUHUASHAN					4.3	3.3	2.0	0.9	
7510	Amma Do	K	35 21 126 01	+0457	+0457	+0.7	+0.6	-0.3	-0.3	2.80
7512	Hampyeong Man		35 09 126 21	+0449	+0449	+1.3	+1.1	-0.1	-0.2	3.15
7515	Buggang Sudo		34 53 126 06	+0400	+0400	+0.1	+0.1	-0.5	-0.4	2.47
7517	Mokp'o Hang	K	34 47 126 23	+0452	+0552	-0.5	-0.3	-0.8	-0.4	2.15
7519	Siha Do		34 42 126 15	+0400	+0400	-0.5	-0.2	-0.7	-0.3	2.27
7521	Hatae Do		34 32 126 03	+0300	+0301	-0.8	-0.6	-0.7	-0.4	2.02
7523	Bigeum Sudo		34 43 125 56	+0334	+0334	-0.4	-0.3	-0.6	-0.4	2.18
<i>Daeheugsan Gundo</i>										
7525	Daeheugsan Do	K	34 41 125 26	+0351	+0348	-1.0	-0.7	-0.8	-0.5	1.87
7529	Usuyong	K	34 35 126 19	+0336	+0333	-0.7	-0.4	-0.7	-0.3	2.10
7530	Hajo Do	K	34 18 126 03	+0326	+0309	-1.3	-1.0	-0.7	-0.3	1.80
7531	Pyokpajin		34 32 126 20	+0132	+0217	-0.8	-0.7	-0.6	-0.4	2.00
7532	Sangma Do (Joma To)		34 27 126 25	+0127	+0127	-0.6	-0.5	-0.5	-0.3	2.15
7533	Oran Jin		34 21 126 29	+0107	+0120	-0.7	-0.7	-0.6	-0.4	2.02
KOREA STRAIT										
<i>Jeju Do</i>										
7534	Chuk-to (Shaki To)		33 18 126.09	+0053	+0055	-1.7	-1.3	-0.9	-0.4	1.54
7535	Hoasgunpo		33 14 126 20	+0009	+0022	-1.6	-1.3	-0.8	-0.4	1.60
7536	Sogwi-po (Seikiho Ko)	K	33 14 126 33	-0015	-0014	-1.7	-1.3	-0.9	-0.5	1.53
7538	U Do		33 30 126 54	-0011	-0010	-2.0	-1.6	-1.0	-0.5	1.36
7539	Jeju Hang	K	33 31 126 32	+0057	+0056	-1.9	-1.5	-1.0	-0.5	1.42
<i>Chuja Gundo</i>										
7541	Sangchuja Do		33 58 126 18	+0111	+0124	-1.4	-1.1	-0.8	-0.4	1.70
7542	Soan Do		34 09 126 38	+0032	+0044	-0.9	-0.8	-0.6	-0.4	1.94
7543	Wan Do	K	34 19 126 45	+0056	+0123	-0.8	-0.7	-0.5	-0.3	2.05
7543a	Cheongsan Do		34 11 126 51	+0015	+0028	-1.1	-0.9	-0.7	-0.4	1.82
7544	Geumdang Do		34 25 127 05	-0007	+0005	-0.7	-0.6	-0.5	-0.3	2.10
7545	Geomun Do	K	34 01 127 19	-0028	-0028	-1.2	-0.7	-0.7	-0.5	1.76
7548	Nogdong	K	34 31 127 08	-0010	-0010	-0.6	-0.6	-0.5	-0.4	2.11

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
5998	0.0	0.0	0.0	+0.1	+0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0
7280	-0.1	-0.2	-0.2	-0.1	0.0	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1
7388-7468	-0.2	-0.2	-0.2	-0.1	0.0	+0.1	+0.2	+0.3	+0.2	+0.1	-0.1	-0.2	-0.2
7469-7533	-0.2	-0.2	-0.1	-0.1	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.2
7534-7548	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	+0.1	0.0	-0.1	-0.1

KOREA

No.	PLACE	Lat. N.	Long. E.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L. Z. m.
				MHW (Zone -0900)	MLW	MHWS	MHWN	MLWN	MLWS	
7486	INCH'ON	see page 93				8.6	6.5	2.8	0.4	
<i>Han Gan</i>										
7479	Chumun Do	37 39	126 14	+0017	+0018	-0.5	-0.4	-0.1	+0.3	4.39
7480	Oepori	K 37 42	126 23	+0043	+0041	-0.5	-0.5	+0.2	+0.5	4.50
7482	Seoul	37 33	126 57	+0430	0	0	0	0	0	0
<i>Yom Ha</i>										
7484	Sun Tol Mok	37 40	126 32	+0055	0	0	0	0	0	0
7486	INCH'ON (CHEMULPHO)	37 28	126 37	STANDARD PORT		See Table V				4.68
7487	Taemuni Do	37 23	126 27	-0006	-0006	-0.2	-0.2	0.0	+0.3	4.53
7489	Tokchok To	K 37 15	126 07	-0018	-0014	-0.9	-0.7	0.0	+0.5	4.30
7492	Asan Myoji (Gazan Byochi)	36 58	126 47	-0008	-0008	+0.3	+0.3	+0.1	+0.3	4.82
7494	Umu Do	37 02	126 27	-0027	-0027	-0.8	-0.6	-0.3	+0.3	4.24
7497	Manli Po	36 47	126 08	-0055	-0055	-2.0	-1.5	-0.6	+0.2	3.63
7500	Sachang-po (Chung Do)	36 23	126 26	-0108	-0108	-1.7	-1.3	-0.5	+0.2	3.76
7501	Dacheon Hang	K 36 20	126 30	-0133	-0056	-2.9	-2.2	-0.7	+0.3	3.20
7503	Eocheong Do	K 36 07	125 59	-0141	-0141	-2.9	-2.3	-0.8	+0.1	3.10
7504	Kunsan (Outer Port)	K 35 58	126 38	-0203	-0130	-1.9	-1.4	-0.5	+0.5	3.61
7505	Kunsan	JK 35 59	126 43	-0109	-0108	-1.5	-1.8	-0.7	+0.3	3.42
7507	Gogunsan Gundo	35 49	126 24	-0153	-0153	-2.5	-1.8	-0.8	+0.2	3.36
7280	LUHUASHAN	see page				4.3	3.3	2.0	0.9	
7510	Amma Do	K 35 21	126 01	+0457	+0457	+0.7	+0.6	-0.3	-0.3	2.80
7512	Hampyeong Man	35 09	126 21	+0449	+0449	+1.3	+1.1	-0.1	-0.2	3.15
7515	Buggang Sudo	34 53	126 06	+0400	+0400	+0.1	+0.1	-0.5	-0.4	2.47
7517	Mokp'o Hang	K 34 47	126 23	+0452	+0552	-0.5	-0.3	-0.8	-0.4	2.15
7519	Siha Do	34 42	126 15	+0400	+0400	-0.5	-0.2	-0.7	-0.3	2.27
7521	Hatac Do	34 32	126 03	+0300	+0301	-0.8	-0.6	-0.7	-0.4	2.02
7523	Bigcum Sudo	34 43	125 56	+0334	+0314	-0.4	-0.3	-0.6	-0.4	2.18
<i>Dacheugsan Gundo</i>										
7525	Dachcugsan Do	K 34 41	125 26	+0351	+0348	-1.0	-0.7	-0.8	-0.5	1.87
7529	Usuyong	K 34 35	126 19	+0336	+0333	-0.7	-0.4	-0.7	-0.3	2.10
7530	Hajo Do	K 34 18	126 03	+0326	+0309	-1.3	-1.0	-0.7	-0.3	1.80
7531	Pyokpajin	34 32	126 20	+0132	+0217	-0.8	-0.7	-0.6	-0.4	2.00
7532	Sangma Do (Joma To)	34 27	126 25	+0127	+0127	-0.6	-0.5	-0.5	-0.3	2.15
7533	Oran Jin	34 21	126 29	+0107	+0120	-0.7	-0.7	-0.6	-0.4	2.02
KOREA STRAIT										
<i>Jeju Do</i>										
7534	Chuk-to (Shaki To)	33 18	126 09	+0053	+0055	-1.7	-1.3	-0.9	-0.4	1.54
7535	Hoasgunpo	33 14	126 20	+0009	+0022	-1.6	-1.3	-0.8	-0.4	1.60
7536	Sogwi-po (Seikiho Ko)	K 33 14	126 33	-0015	-0014	-1.7	-1.3	-0.9	-0.5	1.53
7538	U Do	33 30	126 54	-0011	-0010	-2.0	-1.6	-1.0	-0.5	1.36
7539	Jeju Hang	K 33 31	126 32	+0057	+0056	-1.9	-1.5	-1.0	-0.5	1.42
<i>Chuja Gundo</i>										
7541	Sangchuja Do	33 58	126 18	+0111	+0124	-1.4	-1.1	-0.8	-0.4	1.70
7542	Soan Do	34 09	126 38	+0032	+0044	-0.9	-0.8	-0.6	-0.4	1.94
7543	Wan Do	K 34 19	126 45	+0056	+0123	-0.8	-0.7	-0.5	-0.3	2.05
7543a	Cheongsan Do	34 11	126 51	+0015	+0028	-1.1	-0.9	-0.7	-0.4	1.82
7544	Geumdang Do	34 25	127 05	-0007	+0005	-0.7	-0.6	-0.5	-0.3	2.10
7545	Geomun Do	K 34 01	127 19	-0028	-0028	-1.2	-0.7	-0.7	-0.5	1.76
7548	Nogdong	K 34 31	127 08	-0010	-0010	-0.6	-0.6	-0.5	-0.4	2.11

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
5998	0.0	0.0	0.0	+0.1	+0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0
7280	-0.1	-0.2	-0.2	-0.1	0.0	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1
7388-7468	-0.2	-0.2	-0.2	-0.1	0.0	+0.1	+0.2	+0.3	+0.2	+0.1	-0.1	-0.2	-0.2
7469-7533	-0.2	-0.2	-0.1	-0.1	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.2
7534-7548	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	+0.1	0.0	-0.1	-0.1

JAPAN

No.	PLACE	Lat. N.	Long. E.	TIME DIFFERENCES (Zone -0900)		HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₁ m.
				HHW	LLW	MHHW	MLHW	MHLW	MLLW	
7056	NAOZHOU DAO	see page 37				3.1	2.2	1.4	0.8	
8020	Tappi Saki	41 16	140 20	-0745	-0747	-2.6	-1.8	-1.1	-0.7	0.33
7994	KAMAISHI	see page 37				1.3	1.2	0.8	0.3	
Honshu, West Coast										
8021	Kodomari Wan	41 08	140 18	+1150	+1120	-1.0	-0.9	-0.6	-0.2	0.20
8025	Iwasaki	40 35	139 55	+1144	+1230	-1.0	-1.0	-0.6	-0.2	0.18
8027	Toga Ko	39 57	139 42	+1143	+1217	-1.0	-1.0	-0.6	-0.2	0.17
8029	Akita Ku	39 45	140 04	+1108	+1131	-1.0	-1.0	-0.6	-0.2	0.19
8033	Kamo Ko	38 48	139 44	+1150	+1121	-1.0	-0.9	-0.6	-0.2	0.22
8034	Awa Shima	38 28	139 15	+1124	+1230	-1.0	-1.0	-0.6	-0.2	0.20
Sado										
8035	Ryotsu (Yebisu) Ko	38 05	138 26	+1122	+1138	-1.0	-1.0	-0.6	-0.2	0.18
8037	Niigata Ko	J 37 57	139 04	+1120	+1207	-1.0	-1.0	-0.6	-0.2	0.17
8040	Naoetsu	37 11	138 15	+1120	+1157	-1.0	-1.0	-0.6	-0.2	0.18
8043	Fushiki	36 48	137 04	+1118	+1111	-1.0	-1.0	-0.6	-0.2	0.20
8046	Wajima	37 24	136 54	+1120	+1159	-1.0	-1.0	-0.6	-0.2	0.18
8049	Mikuni Ko	36 13	136 08	+1058	+1136	-1.0	-1.0	-0.6	-0.2	0.18
8052	Maizuru Ko	J 35 29	135 24	+1059	+1137	-1.0	-1.0	-0.6	-0.2	0.19
8055	Shibayama	35 40	134 40	+1103	+1054	-1.0	-1.0	-0.6	-0.2	0.17
8057	Akasaki	35 31	133 40	+1104	+1136	-1.0	-1.0	-0.6	-0.2	0.19
8058	Sakai	35 33	133 15	+1103	+1102	-1.1	-1.1	-0.7	-0.3	0.10
Dogo										
8059	Saigo Ko	36 12	133 20	+1104	+1143	-1.0	-1.0	-0.6	-0.2	0.18
4963	CEBU	see page 38				1.5	0.9	0.4	0.1	
8064	Sagi-Ura	35 27	132 41	+0231	+0224	-1.2	-0.7	-0.3	0.0	0.19
7110	HONG KONG	see page 37				2.2	1.5	1.2	0.8	
8066	Hamada	34 55	132 04	+0259	+0302	-1.8	-1.2	-1.0	-0.6	0.28
8067	Esaki Ko	34 39	131 39	+0218	+0210	-1.6	-1.1	-0.9	-0.6	0.36
4963	CEBU	see page 37				1.5	0.9	0.4	0.1	
8069	Hagi Ko	34 28	131 25	+0017	+0018	-0.8	-0.4	-0.1	+0.1	0.48
7056	NAOZHOU DAO	see page 37				3.1	2.2	1.4	0.8	
8070	Odomari	34 24	131 11	-0006	-0008	-2.2	-1.6	-1.0	-0.5	0.52
8072	Yuya Wan	34 24	130 57	-0033	-0046	-2.2	-1.5	-1.0	-0.5	0.58
7716	NAHA KO	see page 19		MHW	MLW	MHWS	MHWN	MLWN	MLWS	
						2.9	1.5	0.8	0.3	
8073	Kottoi	34 19	130 54	+0303	+0302	-0.8	-0.6	-0.2	0.0	0.73
8076	Yoshimo	34 05	130 52	+0244	+0242	-0.8	-0.6	-0.3	-0.1	0.71
7056	NAOZHOU DAO	see page 37		HHW	LLW	MHHW	MLHW	MHLW	MLLW	
						3.1	2.2	1.4	0.8	
Hokkaido, East Coast										
Tsugaru Kaikyo										
8078	Yoshioka	41 27	140 14	-0714	-0704	-2.5	-1.7	-1.1	-0.6	0.39
8080	Wakimoto	41 34	140 25	-0743	-0733	-2.2	-1.6	-0.9	-0.6	0.55

Δ Tide is usually diurnal.

* See notes on page 388.

J Tides predicted in Japanese Tide Tables.

p For predictions use harmonic constants (Part III) and N.P.159.

t Time differences approximate.

ALASKA

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.
				HHW (Zone +0900)	LLW	MHHW	MLHW	MHLW	MLLW	
9050	TOFINO					3.4	3.0	1.4	0.7	
8604	Valdez Arm Rocky Point	60 57	146 46	+0055	+0052	+0.2	+0.1	-0.4	-0.7	1.92
8605	Valdez	61 08	146 21	+0044	+0041	+0.2	0.0	-0.4	-0.7	1.92
8608	Orca Bay Windy Bay	60 34	145 58	+0022	+0050	+0.1	+0.1	-0.5	-0.7	1.92
8610	Port Etches	60 20	146 33	+0050	+0050	0.0	-0.1	-0.5	-0.7	1.8 dx
8612	Orca Inlet Whitshed Point	60 28	145 55	+0108	+0106	+0.1	0.0	-0.2	-0.7	1.98
8613	Cordova	U 60 33	145 46	+0044	+0046	+0.3	+0.2	-0.4	-0.7	2.01
8614	Middleton Island	59 28	146 19	+0137	+0037	-0.4	-0.3	-0.5	-0.7	1.67 d
8617	Controller Bay	60 05	144 48	+0037	+0037	-0.5	-0.5	-0.5	-0.7	1.6 dx
8622	Yakutat Bay	59 34	139 46	+0029	+0029	-0.4	-0.5	-0.5	-0.7	1.62 dx
8626	Lituya Bay	58 37	137 37	+0115	⊙	-0.8	-0.7	⊙	⊙	1.4 dx
8628	Cape Spencer	58 12	136 40	+0015	+0015	-0.3	-0.3	-0.5	-0.7	1.7 dx
8629	Surveyor Seamount	56 05	144 20	+0023	+0026	-0.7	-0.7	-0.5	-0.7	1.5 x
8850	PRINCE RUPERT	see page 99		MHW	MLW	MHWS 6.5	MHWN 5.2	MLWN 2.5	MLWS 1.2	
8633	Glacier Bay Bartlett Cove	58 27	135 54	-0005	-0005	-1.4	-1.6	-1.3	-1.2	2.4 x
8636	Swanson Harbour	58 13	135 07	-0030	-0030	-1.5	-1.4	-1.2	-1.1	2.5 x
8639	William Henry Bay	58 43	135 14	-0030	-0030	-1.5	-1.5	-1.3	-1.2	2.5 dx
8641	Pyramid Harbour	59 11	135 28	-0025	-0025	-1.4	-1.4	-1.2	-1.2	2.6 dx
8643	Skagway	59 27	135 18	-0023	-0023	-1.2	-1.2	-1.2	-1.2	2.65 t
8648	Fritz Cove	58 19	134 36	-0020	-0020	-1.5	-1.5	-1.3	-1.3	2.5 dx
8649	Juneau	U 58 18	134 24	-0027	-0027	-1.2	-1.3	-1.2	-1.2	2.65 dx
8651	Stephens Passage Taku Point	58 24	134 01	-0010	-0010	-1.2	-1.2	-1.2	-1.2	2.6 dx
8652	Taku Harbour	58 04	134 00	-0030	-0030	-1.4	-1.4	-1.2	-1.2	2.4 dx
8655	Windham Bay	57 33	133 30	-0035	-0035	-1.5	-1.4	-1.3	-1.2	2.5 dx
8656	Cleveland Passage	57 13	133 30	-0040	-0040	-1.7	-1.5	-1.3	-1.2	2.4 dx
9050	TOFINO			HHW	LLW	MHHW 3.4	MLHW 3.0	MHLW 1.4	MLLW 0.7	
Chicago Island										
8658	Slocum Arm	57 33	135 56	+0010	+0010	-0.3	-0.4	-0.5	-0.7	1.6 x
8659	Kimshan Cove	57 41	136 06	+0020	+0020	-0.4	-0.5	-0.4	-0.7	1.65 x
8661	Lisianski Strait	58 00	136 20	+0025	+0025	-0.3	-0.3	-0.5	-0.7	1.7 x
8662	Takanis Bay	57 55	136 31	+0015	+0015	-0.5	-0.5	-0.5	-0.7	1.6 x
8664	Cross Sound Port Althorp	58 07	136 17	0000	-0003	-0.4	-0.3	-0.4	-0.7	1.71
8665	Granite Cove	58 12	136 24	+0026	+0023	-0.2	-0.3	-0.5	-0.7	1.71
8850	PRINCE RUPERT	see page 99		MHW	MLW	MHWS 6.5	MHWN 5.2	MLWN 2.5	MLWS 1.2	
8668	Icy Strait Lemesurier Island	58 19	136 02	-0035	-0035	-2.3	-2.0	-1.4	-1.1	2.1 dx
8670	Hoonah	58 07	135 27	-0024	-0024	-1.6	-1.5	-1.3	-1.2	2.44 dx
8673	Chatham Strait Freshwater Bay	57 51	135 01	-0025	-0025	-2.0	-1.7	-1.4	-1.1	2.3 dx

⊙ No data.

U Tides predicted in U.S. Tide Tables.

d Differences approximate.

t Time differences approximate.

x M.L. inferred.

ALASKA

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.	
				HHW	LLW	MHHW	MLHW	MHLW	MLLW		
9050	TOFINO					3.4	3.0	1.4	0.7		
	<i>Peril Strait</i>										
8679	Sergius Narrows	57 24	135 38	+0037	+0031	+0.1	+0.3	-0.3	-0.7	2.13	
8680	Kakul Narrows	57 22	135 41	+0020	+0020	-0.4	-0.5	-0.5	-0.7	1.6 x	
8850	PRINCE RUPERT	see pag 99		MHW	MLW	MHWS 6.5	MHWN 5.2	MLWN 2.5	MLWS 1.2		
	<i>Baranof Island</i>										
8681	Nismeni Cove	57 34	135 25	-0020	-0020	-1.8	-1.7	-1.3	-1.2	2.3 dx	
8684	Fairway Island	57 27	134 53	-0035	-0035	-2.0	-1.8	-1.3	-1.1	2.3 dx	
	<i>Chatham Strait</i>										
8686	Kasnyku Bay	57 13	134 52	-0030	-0030	-2.0	-1.8	-1.4	-1.1	2.3 dx	
9050	TOFINO			HHW	LLW	MHHW 3.4	MLHW 3.0	MHLW 1.4	MLLW 0.7		
8690	Port Walter	56 23	134 40	+0020	+0020	0.0	-0.1	-0.5	-0.7	1.8 x	
8692	Cape Ommaney	56 10	134 40	+0005	+0005	-0.5	-0.5	-0.5	-0.7	1.6 x	
8695	Port Banks	56 34	134 59	+0005	+0005	-0.5	-0.5	-0.5	-0.7	1.6 x	
	<i>Sitka Sound</i>										
8698	Biorka Island	56 51	135 31	0000	0000	-0.5	-0.5	-0.5	-0.7	1.6 x	
8700	Sitka	U 57 03	135 20	+0012	+0012	-0.5	-0.5	-0.5	-0.7	1.58 x	
8703	Whitestone Narrows	57 15	135 34	+0015	+0015	-0.5	-0.5	-0.5	-0.7	1.6 x	
	<i>Kruzof Island</i>										
8706	Gilmer Bay	57 13	135 50	+0010	+0010	-0.4	-0.4	-0.5	-0.7	1.6 x	
8850	PRINCE RUPERT	see pag 99		MHW	MLW	MHWS 6.5	MHWN 5.2	MLWN 2.5	MLWS 1.2		
	<i>Admiralty Island</i>										
	<i>Chatham Strait</i>										
8711	Favourite Bay	57 29	134 32	-0010	-0010	-2.3	-1.9	-1.5	-1.1	2.1 dx	
	<i>Lynn Canal</i>										
8714	Funter Bay	58 15	134 55	-0020	-0020	-1.7	-1.6	-1.3	-1.2	2.4 dx	
8716	Barlow Cove	58 20	134 53	-0030	-0030	-1.6	-1.5	-1.3	-1.2	2.5 dx	
	<i>Stephens Passage</i>										
8722	Windfall Harbour	57 52	134 16	-0005	-0005	-1.4	-1.4	-1.2	-1.2	2.6 dx	
8723	Gambier Bay	57 29	133 54	-0035	-0035	-1.7	-1.6	-1.4	-1.3	2.3 dx	
8724	Pybus Bay	57 19	134 00	-0040	-0040	-1.8	-1.6	-1.4	-1.1	2.3 dx	
	<i>Kuiu Island</i>										
8728	Security Bay	56 51	134 21	-0050	-0050	-2.2	-1.9	-1.5	-1.1	2.2 dx	
9050	TOFINO			HHW	LLW	MHHW 3.4	MLHW 3.0	MHLW 1.4	MLLW 0.7		
8732	Table Bay	56 10	134 15	0000	0000	-0.1	-0.1	-0.5	-0.7	1.8 x	
	<i>Summer Strait</i>										
8734	Port McArthur	56 04	134 07	+0005	+0005	-0.6	-0.3	-0.5	-0.7	1.7 dx	
8738	Seclusion Harbour	56 33	133 52	+0020	+0020	+0.3	+0.2	-0.5	-0.7	2.0 dx	
8850	PRINCE RUPERT	see pag 99		MHW	MLW	MHWS 6.5	MHWN 5.2	MLWN 2.5	MLWS 1.2		
	<i>Kupreanof Island</i>										
8743	Hamilton Bay	56 55	133 50	-0045	-0045	-2.1	-1.8	-1.4	-1.1	2.2 dx	

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
8604-8743	+0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1
8850	+0.1	+0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1
9050	0.0	+0.1	+0.1	+0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0

NICARAGUA TO ECUADOR

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.	
				MHW (Zone +0600)	MLW	MHWS	MHWN	MLWN	MLWS		
9448	LA UNION					3.0	2.5	0.6	-0.1		
	Nicaragua										
9453	Puerto Corinto	12 29	87 10	-0010	-0010	-0.7	-0.4	-0.4	+0.1	1.2	x
9455	San Juan del Sur	11 15	85 53	-0021	-0006	-0.7	-0.6	-0.1	+0.2	1.16	
	Costa Rica										
9456	Bahia Elena	10 56	85 49	-0010	-0010	-0.2	-0.3	-0.1	+0.1	1.4	x
9457	Puerto Culebra	10 38	85 40	-0010	-0010	-0.2	-0.3	0.0	+0.1	1.4	x
	<i>Golfo de Nicoya</i>										
9460	Puntarenas	U 9 58	84 50	-0014	-0008	-0.2	-0.3	0.0	+0.1	1.40	
9462	Puerto Herradura	9 38	84 39	-0015	-0015	-0.2	-0.3	0.0	+0.1	1.4	x
9464	Bahia Uvitá	9 09	83 45	-0030	-0030	-0.2	-0.3	0.0	+0.1	1.4	x
	<i>Golfo Dulce</i>										
9467	Bahia del Rincon	8 42	83 29	-0010	-0010	-0.2	-0.3	0.0	+0.1	1.4	x
	<i>Isla del Coco</i>										
9470	Chatham Bay	5 33	87 03	-0035	-0035	-0.5	-0.5	+0.2	+0.3	1.4	x
9487	BALBOA	see page 101				4.9	3.8	1.1	-0.1		
	Panama										
										(Zone +0500)	
9471	Puerto Armuelles	8 16	82 51	-0010	-0010	-1.9	-1.5	-0.3	+0.2	1.46	
9474	Isla Parida	8 08	82 19	-0005	-0005	-1.6	-1.3	-0.2	+0.2	1.7	x
9477	Bahia Honda	7 46	81 31	-0005	-0005	-1.6	-1.3	-0.2	+0.1	1.7	x
9478	Isla Coiba	7 24	81 39	-0005	-0005	-1.4	-1.1	-0.2	+0.2	1.8	x
9480	Isla Cebaco	7 31	81 13	-0005	-0005	-1.6	-1.3	-0.2	+0.1	1.7	x
9484	Cabo Maia	7 28	80 00	-0005	-0005	-1.6	-1.4	-0.2	+0.2	1.7	x
9487	BALBOA	8 57	79 34	STANDARD PORT			See Table V			2.56	
9488	Rio Chepo	8 59	79 07	0000	0000	-0.1	+0.1	+0.1	+0.3	2.5	x
9492	Punta Garachiné	8 05	78 25	-0005	-0005	-0.7	-0.5	0.0	+0.3	2.2	x
	<i>Isla del Rey</i>										
9493	St. Elmo Bay	8 18	78 54	-0005	-0005	-0.7	-0.5	0.0	+0.3	2.2	x
9496	Bahia Piñas	7 34	78 11	-0005	-0005	-0.8	-0.6	0.0	+0.3	2.1	x
	Colombia										
9498	Bahia Octavia	6 52	77 40	+0005	-0005	-0.9	-0.7	-0.2	+0.1	2.0	x
9501	Puerto Utria	6 00	77 21	+0015	0000	-1.0	-0.8	-0.2	+0.1	2.0	x
9503	Puerto Cuevita (Cabita)	5 28	77 31	+0020	0000	-1.0	-0.8	-0.2	+0.1	2.0	x
9505	Punta Chirambira	4 17	77 30	+0020	0000	-1.1	-0.8	-0.2	+0.1	1.9	x
9507	Buenaventura	EU 3 54	77 05	+0025	+0004	-0.9	-0.7	-0.2	+0.1	1.98	
9510	Rio Sanguiangá	2 40	78 19	+0020	+0006	-1.0	-0.8	-0.1	+0.2	2.0	x
9511	Puerto Tumaco	1 50	78 44	+0015	0000	-1.1	-0.8	-0.2	+0.1	1.9	x
9448	LA UNION					3.0	2.5	0.6	-0.1		
	Ecuador										
										(Zone +0600)	
	<i>Archipelago de Colon (Islas Galapagos)</i>										
9517	Bahia Darwin	0 19	89 57	-0020	-0008	-1.0	-1.0	-0.2	+0.1	0.9	dx
		S.	W.								
9519	Caleta Iguana	0 58	91 27	-0020	⊙	-1.2	⊙	⊙	⊙	⊙	d
9521	Caleta Aeolian	0 26	90 17	-0019	-0003	-1.2	-1.1	-0.2	+0.1	0.91	d
9522	Bahia Post Office	1 15	90 27	-0015	-0007	-1.5	-1.3	-0.3	+0.1	0.8	dx
9524	Bahia Agua Dulce	E 0 54	89 37	-0017	-0001	-1.0	-0.9	0.0	+0.3	1.13	

- ⊙ No data.
- * See notes on page 388.
- C Tides predicted in Chilean Tide Tables.
- E Tides predicted in Ecuador Tide Tables.
- P Tides predicted in Peruvian Tide Tables.
- U Tides predicted in U.S. Tide Tables.
- d Differences approximate.
- t Time differences approximate.
- x M.L. inferred.

ECUADOR TO CHILE

No.	PLACE	Lat. N.	Long. W.	TIME DIFFERENCES		HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.	
				MHW (Zone +0500)	MLW	MHWS	MHWN	MLWN	MLWS		
9487	BALBOA		see page 10			4.9	3.8	1.1	-0.1		
9525	San Lorenzo	E 1 18	78 51	+0020	+0023	-1.2	-0.8	0.0	+0.5	2.02	
9527	Esmeraldas	E 1 00	79 39	-0008	-0010	-1.7	-1.2	-0.2	+0.4	1.76	
9528	Bahia Atacames	0 53	79 52	+0025	+0025	-1.0	-0.8	-0.1	+0.2	2.0	
9530	Muisne	E 0 37	80 01	+0017	+0017	-1.9	-1.5	-0.2	+0.4	1.63	
		S.	W.								
9533	Cabo Pasado	0 22	80 30	+0005	+0005	-1.8	-1.3	-0.5	+0.1	1.6	
9534	Bahia de Caraquez	E 0 35	80 26	+0011	+0009	-2.2	-1.6	-0.3	+0.4	1.51	
9535	Manta	E 0 57	80 44	-0002	-0003	-2.3	-1.7	-0.3	+0.4	1.46	
9538	Puerto Lopez	E 1 34	80 50	+0004	+0003	-2.0	-1.5	-0.2	+0.4	1.62	
9539	La Libertad	E 2 12	80 55	-0008	-0007	-2.8	-2.2	-0.6	+0.1	1.07	
Golfo de Guayaquil											
9540	Posorja	E 2 43	80 14	+0130	+0127	-2.4	-1.7	-0.5	+0.3	1.34	
9540a	Puerto Maritimo de Guayaquil	E 2 17	79 55	+0301	+0252	-0.9	-0.5	+0.1	+0.5	2.30	
9541	Isla Santa Clara	3 10	80 26	0000	⊙	-3.0	-2.4	-0.8	-0.1	0.9	
9543	Puna	E 2 44	79 55	+0156	+0155	-1.3	-0.8	-0.1	+0.5	2.0	
9544	Guayaquil	EU 2 12	79 52	+0423	+0511	-0.8	-0.4	-0.1	+0.4	2.20	
9545	Puerto Bolivar	E 3 18	80 00	+0154	+0139	-2.0	-1.5	-0.2	+0.4	1.61	
Peru											
9547	Caleta Zorritos	P 3 39	80 40	+0104	+0054	-3.2	-2.4	-0.6	+0.3	0.97	
7280	LUHUASHAN					4.3	3.3	2.0	0.9		
9548	Lobitos	P 4 27	81 17	+0616	+0628	-2.7	-2.1	-0.3	-0.8	0.86	
9549	Bahia de Talara	EPU 4 35	81 17	+0616	+0628	-2.8	-2.1	-1.6	-0.9	0.79	
9551	Puerto de Paita	P 5 05	81 07	+0624	+0636	-2.9	-2.2	-1.6	-0.8	0.77	
9553	Puerto Bayovar	P 5 48	81 02	+0634	+0647	-3.0	-2.3	-1.6	-0.8	0.73	
9554	Lobos de Tierra	6 26	80 50	+0710	⊙	-2.9	⊙	⊙	⊙	0.7	
9644	VALPARAISO			HHW	LLW	MHHW	MLHW	MHLW	MLLW		
						1.5	1.2	0.5	0.4		
9557	Puerto Eten	P 6 57	79 52	-0603	-0620	-0.4	-0.4	-0.2	-0.2	0.62	
9560	Puerto Chicama	P 7 42	79 27	-0548	-0605	-0.5	-0.4	-0.2	-0.2	0.56	
9562	Salaverry	P 8 13	78 59	-0534	-0637	-0.5	-0.4	-0.2	-0.2	0.58	
9563	Chimbote	P 9 05	78 37	-0521	-0540	-0.4	-0.4	0.0	-0.1	0.68	
9564	Bahia Ferrol	9 08	78 36	-0506	-0526	-0.4	-0.3	-0.1	-0.2	0.67	
9566	Bahia Huarmey	P 10 05	78 09	-0508	-0527	-0.7	-0.6	-0.2	-0.3	0.48	
9568	Puerto Bermejo	10 33	77 53	-0500	⊙	-0.4	⊙	⊙	⊙	0.7	
9570	Puerto Huacho	P 11 08	77 37	-0443	-0553	-0.7	-0.7	-0.3	-0.3	0.42	
9573	Callao	EPU 12 04	77 10	-0418	-0531	-0.6	-0.6	-0.2	-0.2	0.52	
9575	Caleta Pucusana (Chilca)	12 30	76 50	-0410	⊙	-0.7	⊙	⊙	⊙	0.5	
9577	Puerto Cerro Azul	13 03	76 31	-0400	⊙	-0.7	⊙	⊙	⊙	0.5	
9579	Pisco	P 13 43	76 14	-0342	-0400	-0.8	-0.7	-0.3	-0.3	0.40	
9580	Bahia Independencia	14 18	76 08	-0445	⊙	-0.7	⊙	⊙	⊙	0.5	
9583	San Juan	P 15 21	75 09	-0249	-0240	-0.7	-0.8	-0.4	-0.3	0.37	
9584	Punta Lomas	15 33	74 52	-0300	⊙	-0.7	⊙	⊙	⊙	0.5	
9586	Rada Atico	16 13	73 43	-0210	⊙	-0.7	⊙	⊙	⊙	0.5	
9588	Caleta Quilca	16 42	72 27	-0205	⊙	-0.6	⊙	⊙	⊙	0.5	
9589	Matarani	EPU 17 00	72 07	-0214	-0219	-0.6	-0.6	-0.4	-0.3	0.43	
9591	Puerto de Ilo	P 17 38	71 21	-0215	-0216	-0.6	-0.6	-0.4	-0.3	0.44	
Chile (Zone +0400)											
9594	Arica	C 18 28	70 20	-0108	-0117	-0.2	-0.2	0.0	0.0	0.80	
9597	Caleta Junin	19 39	70 11	-0110	-0110	-0.3	-0.3	-0.3	-0.3	0.6	
9599	Iquique	C 20 13	70 09	-0100	-0102	-0.2	-0.2	0.0	0.0	0.80	

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
7280	-0.1	-0.2	-0.2	-0.1	0.0	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1
9448-9480	0.0	0.0	-0.1	-0.1	0.0	0.0	+0.1	+0.1	0.0	0.0	0.0	0.0	0.0
9484-9496	0.0	-0.1	-0.2	-0.1	0.0	0.0	+0.1	0.0	0.0	+0.1	+0.1	+0.1	0.0
9498-9511	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	0.0	0.0
9415-9644	Negligible												

JAPAN

No.	PLACE	Lat. N.	Long. E.	TIME DIFFERENCES (Zone -0900)		HEIGHT DIFFERENCES (IN METRES)				M.L. Z ₀ m.
				HHW	LLW	MHHW	MLLW	MHLW	MLLW	
7994	KAMAISHI	see page				1.3	1.2	0.8	0.3	
8083	Hakodate	J 41 47	140 44	+0007	+0025	-0.4	-0.4	-0.3	-0.1	0.57
8085	Shiokubi Misaki	41 43	140 58	-0001	+0025	0.0	-0.1	+0.1	0.0	0.88
8088	Usujiri	41 56	140 57	-0032	-0008	-0.1	-0.1	0.0	0.0	0.82
	<i>Iburi Wan</i>									
8090	Mori Ko	42 07	140 36	-0033	-0009	-0.1	-0.1	0.0	0.0	0.84
8093	Usu Wan	42 31	140 46	-0028	-0002	0.0	0.0	0.0	0.0	0.92
8094	Muroran Ko	J 42 21	140 57	-0006	-0014	+0.1	+0.1	+0.1	+0.1	1.01
8097	Urakawa	J 42 10	142 46	-0016	-0017	+0.1	0.0	+0.1	+0.1	0.96
8098	Utaro	41 58	143 12	-0034	-0005	-0.1	-0.1	0.0	0.0	0.86
8102	Rupeshibetsu	42 13	143 20	-0042	-0007	-0.1	-0.1	0.0	0.0	0.82
8105	Kushiro Ko	J 42 58	144 22	-0038	-0010	-0.1	0.0	0.0	0.0	0.87
8106	Akkeshi Wan	43 02	144 52	-0027	-0045	0.0	-0.1	0.0	0.0	0.86
8107	Hamanaka Wan	43 04	145 10	-0045	-0011	-0.1	-0.2	0.0	0.0	0.81
8109	Hanasaki	43 17	145 35	-0036	-0044	0.0	-0.1	0.0	0.0	0.86
8111	Nemuro Ko	43 20	145 35	-0025	-0043	0.0	-0.1	0.0	0.0	0.87
8137	LABUAN	see page				2.0	1.5	1.4	0.7	
	<i>Hokkaido, North-east Coast</i>									
8115	Koiseboi	44 03	144 57	-0841	-0850	-1.0	-0.8	-0.8	-0.4	0.64
8117	Abashiri Ko	44 01	144 17	-0835	-0837	-0.9	-0.8	-0.8	-0.4	0.68
8119	Monbetsu Ko	J 44 21	143 22	-0909	-0904	-0.9	-0.7	-0.7	-0.4	0.71
8121	Omu Ko	44 35	142 58	-0904	-0906	-1.1	-0.8	-0.7	-0.4	0.65
8123	Esashi Ko	44 57	142 35	-0838	-0854	-1.2	-0.3	-0.8	-0.5	0.57
6882	BANGKOK BAR	see page				3.5	3.0	2.3	1.2	
8125	Soya Misaki	45 31	141 57	-0221	-0205	-3.2	-2.8	-2.1	-1.1	0.19
5147	MIRU	see page				1.6	Δ	Δ	0.5	
	<i>Hokkaido, West Coast</i>									
8126	Wakkanai	45 25	141 41	+0339	+0329	-1.3	Δ	Δ	-0.4	0.18
8128	<i>Rishiri Shima</i> Oshidomari Wan	45 14	141 14	+0354	+0345	-1.4	Δ	Δ	-0.4	0.17
7994	KAMAISHI	see page				2.3	1.2	0.8	0.3	
8132	Tomamai	44 19	141 39	+1213	+1307	-1.1	-1.0	-0.6	-0.2	0.19
8136	Otaru	J 43 13	141 01	+1159	+1258	-1.1	-1.0	-0.6	-0.2	0.16
8138	Kamoi Misaki	43 20	140 24	+1158	+1247	-1.1	-1.0	-0.6	-0.2	0.17
8141	Setana Ko	42 28	139 50	+1145	+1253	-1.0	-0.9	-0.6	-0.2	0.20
	<i>Okushiri Shima</i>									
8143	Aonae Wan	42 04	139 27	+1157	+1240	-1.0	-0.9	-0.6	-0.2	0.22
8145	Matsumae Ko	41 25	140 06	p	p	-0.9	-1.0	-0.6	-0.2	0.23

SEASONAL CHANGES IN MEAN LEVEL

No.	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
4963	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1	0.0	0.0	-0.1
5137	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	0.0
5147	+0.1	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1
6882	+0.2	+0.1	0.0	0.0	-0.1	-0.1	-0.2	-0.2	-0.1	0.0	+0.1	+0.2	+0.2
7056	0.0	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	0.0	+0.1	+0.2	+0.2	0.0
7110	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	+0.1	+0.2	+0.1	0.0
7716	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	+0.1	0.0	-0.1	-0.1
7994	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	0.0	0.0	0.0
8020-8049	0.0	-0.1	-0.2	-0.2	-0.1	0.0	+0.1	+0.1	+0.1	+0.1	+0.1	0.0	0.0
8052-8076	-0.1	-0.1	-0.2	-0.2	-0.1	0.0	+0.1	+0.2	+0.2	+0.1	0.0	0.0	-0.1
8078-8085	0.0	-0.1	-0.1	-0.1	-0.1	0.0	+0.1	+0.1	+0.1	+0.1	0.0	0.0	0.0
8088-8125	0.0	0.0	-0.1	-0.1	-0.1	0.0	+0.1	+0.1	0.0	0.0	0.0	0.0	0.0
8126-8145	0.0	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	0.0	0.0	0.0	0.0

Standard Port	Date
Secondary Port	

TIMES

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Standard Port Pred _____
 Sec. Port Diffs _____
 Sec. Port Preds _____

HEIGHTS

	Range
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Standard Port Pred _____
 St. Port S/C _____
 Standard Port Pred _____
 Sec. Port Diffs _____
 Sec. Port Preds _____
 Sec. Port S/C _____
 Sec Port Pred _____

Time
Differences Time Required =
Time To Apply =
Time
Differences Time Required =
Time To Apply =
Ht
M WS Diff M WN Diff
Diff Ht. Required =
Ht To Apply =
Ht
M WS Diff M WN Diff
Diff Ht. Required =
Ht To Apply =

