



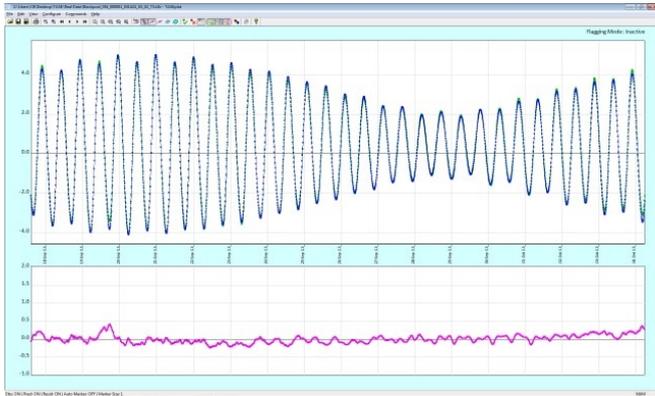
From Tide Gauge to Tide Table

A Collaboration Between Valeport Ltd and the National Oceanography Centre

The installation of a tide gauge is a valuable tool for real-time monitoring of the water level at your location. There is, however, another potential use for it that is often overlooked, and this is why Valeport and the National Oceanography Centre (NOC) have been working together.

The Process of Harmonic Analysis and Prediction

Many users of tide gauge technology will also at some point make use of traditional style tide tables. However, before these can be calculated, a high quality time series of water level recordings is needed – exactly what a Valeport tide gauge will give you.



The data can then be processed using a technique called **harmonic tidal analysis**. This mathematically identifies the amplitude and phase lag of over 100 separate harmonic constituents present in the tidal signal recorded by the gauge.

Once you have the harmonic constituents, unique to each location, you can then apply the process in reverse but for any time period, future or past, to derive predictions of what the tidal level will be. These can then be formatted into the traditional tide table layout most maritime users are familiar with.

MILFORD HAVEN																																															
Time Zone: GMT only																																															
Lat 51°42' N Long 5°01' W																																															
Year: 2017																																															
January			February			March			April																																						
Time	m		Time	m		Time	m		Time	m																																					
1	0151	1.29	16	0239	0.94	1	0251	1.00	16	0322	1.32	1	0157	0.53	16	0221	0.92	1	0258	0.65	16	0253	1.48																								
7	0755	6.87	16	0845	7.10	1	0857	6.98	16	0928	6.51	1	0800	7.38	16	0824	6.83	1	0903	7.07	16	0854	6.22																								
Su	1413	1.27	M	1507	1.05	W	1515	1.01	Th	1543	1.53	W	1418	0.49	Th	1439	1.09	Sa	1519	0.87	Su	1506	1.70	20	12	6.63	21	06	6.72	21	15	6.68	21	15	6.68	21	15	6.68									
2	0227	1.35	17	0318	1.24	2	0330	1.19	17	0354	1.70	2	0235	0.61	17	0251	1.19	2	0342	1.06	17	0325	1.81	2	0227	1.35	17	0318	1.24	2	0330	1.19	17	0354	1.70												
8	0853	6.78	17	0924	6.78	2	0939	6.76	17	1002	6.11	2	0839	7.26	17	0854	6.54	2	0950	6.61	17	1028	5.88	8	0853	6.78	17	0924	6.78	2	0939	6.76	17	1002	6.11												
M	1451	1.35	Tu	1545	1.40	Th	1557	1.24	F	1615	1.92	Th	1457	0.65	F	1507	1.41	M	1604	1.35	M	1539	2.05	M	1451	1.35	Tu	1545	1.40	Th	1557	1.24	F	1615	1.92	Th	1457	0.65	F	1507	1.41	M	1604	1.35	M	1539	2.05
20	2051	6.51	21	2145	6.36	21	2159	6.41	22	2222	5.79	20	2057	6.98	21	2109	6.34	22	2211	6.36	21	2148	5.80	20	2051	6.51	21	2145	6.36	21	2159	6.41	22	2222	5.79	20	2057	6.98	21	2109	6.34	22	2211	6.36	21	2148	5.80
3	0305	1.50	18	0356	1.60	3	0414	1.47	18	0430	2.09	3	0314	0.83	18	0321	1.53	3	0432	1.54	18	0404	2.15	3	0305	1.50	18	0356	1.60	3	0414	1.47	18	0430	2.09	3	0314	0.83	18	0321	1.53	3	0432	1.54	18	0404	2.15
9	0912	6.63	18	1004	6.39	3	1025	6.46	18	1041	5.69	3	0921	6.99	18	0925	6.19	3	1045	6.08	18	1008	5.51	9	0912	6.63	18	1004	6.39	3	1025	6.46	18	1041	5.69	3	0921	6.99	18	0925	6.19	3	1045	6.08	18	1008	5.51
Tu	1531	1.49	W	1623	1.78	F	1642	1.55	Sa	1654	2.31	F	1536	0.96	Sa	1536	1.77	M	1658	1.86	Tu	1620	2.40	Tu	1531	1.49	W	1623	1.78	F	1642	1.55	Sa	1654	2.31	F	1536	0.96	Sa	1536	1.77	M	1658	1.86	Tu	1620	2.40
21	2132	6.32	22	2226	5.57	22	2246	6.09	23	2306	5.40	21	2139	6.66	22	2142	5.98	23	2312	5.89	22	2235	5.45	21	2132	6.32	22	2226	5.57	22	2246	6.09	23	2306	5.40	21	2139	6.66	22	2142	5.98	23	2312	5.89	22	2235	5.45
4	0347	1.68	19	0436	1.98	4	0504	1.79	19	0518	2.48	4	0356	1.18	19	0353	1.91	4	0538	1.99	19	0456	2.47	4	0347	1.68	19	0436	1.98	4	0504	1.79	19	0518	2.48	4	0356	1.18	19	0353	1.91	4	0538	1.99	19	0456	2.47
10	0957	6.43	19	1045	5.99	4	1121	6.11	19	1130	5.29	4	1006	6.58	19	0959	5.79	4	1153	5.61	19	1102	5.17	10	0957	6.43	19	1045	5.99	4	1121	6.11	19	1130	5.29	4	1006	6.58	19	0959	5.79	4	1153	5.61	19	1102	5.17
W	1616	1.68	Th	1705	2.15	Sa	1739	1.87	Su	1750	2.66	Sa	1621	1.38	Su	1609	2.16	Tu	1813	2.25	W	1719	2.69	W	1616	1.68	Th	1705	2.15	Sa	1739	1.87	Su	1750	2.66	Sa	1621	1.38	Su	1609	2.16	Tu	1813	2.25	W	1719	2.69
22	19	6.09	23	11	5.60	23	50	5.79	23	50	5.79	22	2227	6.25	23	2220	5.59	24	2342	5.19	22	19	6.09	23	11	5.60	23	50	5.79	23	50	5.79	22	2227	6.25	23	2220	5.59	24	2342	5.19						

The accuracy of the tidal predictions is governed by the quality and duration of the tide gauge record that has been analysed. However, even a period of as little as a month can give a prediction of reasonable accuracy years into the future.

By combining Valeport's extensive track record in developing high precision pressure and radar tide gauges and the National Oceanography Centre's experience in harmonic analysis and prediction, a partnership is created that from a user's perspective, lets you go from tide gauge to tide table with the assistance of the two leading companies in their respective fields.

How Does It Work

If you are interesting in getting the most up-to-date tide tables that makes use of the data collected by your tide gauge, here's a simple step-by-step guide.

1. Install the tide gauge and collect the data – we can help advise on the most appropriate equipment, siting and data collection scenarios.
2. Once the required period of data has been collected, contact the Marine Data Products team at the National Oceanography Centre with as much information as is available on your project.
3. Send the data by e-mail (dataproducs@noc.ac.uk) or CD / USB memory stick including information on the position of the gauge and the datum to which the gauge is levelled (if known).
4. NOC will assess the data and let you know of any issues. The data will be QCed, and a complete harmonic analysis carried out.
5. You will be sent the harmonics and tidal predictions for the following 12 months, either in PDF format as a high/low water, tide table (3 pages per year) or hourly height of tide, table (1 month per page) or as a text file of 15 minute data, whichever you prefer.
6. If you require any follow up on the analyses as you gather more data, let NOC know up front as discounted pricing is available on future work.

For any further information on the NOC Tidal Analysis Service, please contact the Marine Data Products team at the National Oceanography Centre (dataproducs@noc.ac.uk).

For information on Tide Gauges and collection of Tidal Observations please contact Valeport Ltd (sales@valeport.co.uk).



Valeport's TideMaster as part of a permanent installation in a commercial port



Valeport's VR20 Radar Tide Gauge