Tides

When Sailing in tidal waters you need to know the tidal height and how it will change with time for example when you anchor, transit a region of shallow water or dock. In the Basic course you learned how to read a Tide Table for example the one for St. John on the last page of this document. Let's suppose you plan to anchor near St John. You plan to arrive on June 6 2010 at 1400 Daylight Savings Time and the charted water depth in the anchorage is 7 ft. Since the tide tables are in standard time the planned time of arrival is 1300 standard time. Looking at the table there is a low tide near this time at 1248 of 6.6 ft so the anticipated depth is:
7ft (charted depth) + 6.6 ft (tidal height) = 13.6 ft or nearly 14 ft.
Let's say you plan to stay there until the next morning at 0900 So during this time period the tidal heights are a minimum of 6.6 feet and a maximum of 26.6 feet. So the depth in that anchorage will vary between 13.6 ft and 33.6 ft (26.6ft + 7 ft). So no issue with grounding but you should plan for a scope appropriate to 34 feet of water for the overnight stay. When you arrive at the anchorage you should check the depth to see that it is close to the anticipated 14 feet.

Let's suppose however that you now are delayed and arrive at 1600 DST, (1500 PST) now what is the predicted depth? 1500 is between the times of low and high tide. There are various ways of calculating intermediate tidal heights however one of the simplest is the "Rule of Twelves". This says that the tidal height changes according to the following.
First we calculate the tidal range or difference in height between adjacent high and low tides which span the time range of interest. If we call this R then

1 hour after high (or low tide) the height has changed by 1/12 x R
1 hour later it has changed by a further 2/12 x R
1hour later it has changed by a further 3/12 x R
1hour later it has changed by a further 3/12 x R

1hour later it has changed by a further 2/12 x R
1 hour later it has changed by a further 1/12 x R
Since diurnal tides are a little less than 6 hours apart this spans the period between adjacent high and low tides or vice versa.

So we can tabulate this as below

Time after high or low tide	Total Change in depth
1 hour	+/- R/12
2 Hour	+/- 3R/12
3 Hour	+/- 6R/12
4 Hour	+/- 9R/12
5 hour	+/- 11R/12
6 Hour	+/- 12R/12 (+/- R)

Where + values are used if the tide is rising (i.e. Starting from low tide) and – values if it is falling (i.e. starting from high tide)

So using the example above 1500 PST is approximately 2 hours after the low tide at 1248 and the range R is 22.6-6.6 t or 16 ft.
From the formula above the tide will have risen by +3 x16/12 or 4ft.
So the tidal height will be 6.6 +4 ft. or 10.6 ft. so we now would expect to anchor in
7ft. (charted depth) + 10.6 ft. (tidal height) = 17.6 ft. or nearly 18 ft.

So when we arrive the water depth on our depthsounder should correspond to 18 ft.

TABLE DES MARÉES **2010** **SAINT JOHN** HNA Z+4

April-avril

Day	Time	Feet	Metres	jour	heure	pieds	mètres
1	0048	27.6	8.4	16	0026	25.6	7.8
	0707	1.0	0.3		0644	3.0	0.9
TH	1315	26.2	8.0	FR	1251	24.3	7.4
JE	1927	2.3	0.7	VE	1859	4.3	1.3
2	0135	26.9	8.2	17	0104	25.6	7.8
	0755	1.6	0.5		0723	3.0	0.9
FR	1404	25.3	7.7	SA	1330	24.3	7.4
VE	2015	3.3	1.0	SA	1940	4.3	1.3
3	0224	26.2	8.0	18	0145	25.3	7.7
	0844	3.0	0.9		0806	3.3	1.0
SA	1455	24.3	7.4	SU	1413	24.0	7.3
SA	2106	4.6	1.4	DI	2025	4.6	1.4
4	0315	24.9	7.6	19	0231	25.3	7.7
	0937	3.9	1.2		0854	3.6	1.1
SU	1548	23.3	7.1	MO	1502	23.6	7.2
DI	2159	5.6	1.7	LU	2116	5.2	1.6
5	0410	24.0	7.3	20	0323	24.6	7.5
	1033	4.9	1.5		0948	3.9	1.2
MO	1646	22.3	6.8	TU	1558	23.3	7.1
LU	2258	6.6	2.0	MA	2213	5.6	1.7
6	0510	23.3	7.1	21	0422	24.6	7.5
	1134	5.9	1.8		1048	4.3	1.3
TU	1748	22.0	6.7	WE	1700	23.3	7.1
MA				ME	2317	5.6	1.7
7	0001	7.2	2.2	22	0527	24.3	7.4
	0614	22.6	6.9		1153	4.3	1.3
WE	1236	6.2	1.9	TH	1807	23.6	7.2
ME	1851	21.7	6.6	JE			
8	0104	7.2	2.2	23	0023	4.9	1.5
	0716	22.6	6.9		0635	24.6	7.5
TH	1337	6.2	1.9	FR	1259	3.9	1.2
JE	1950	22.0	6.7	VE	1912	24.3	7.4
9	0204	6.9	2.1	24	0130	4.3	1.3
	0814	22.6	6.9		0741	24.9	7.6
FR	1431	5.9	1.8	SA	1401	3.3	1.0
VE	2043	22.6	6.9	SA	2014	25.3	7.7
10	0256	6.2	1.9	25	0232	3.3	1.0
	0905	23.0	7.0		0842	25.6	7.8
SA	1519	5.6	1.7	SU	1459	2.6	0.8
SA	2128	23.0	7.0	DI	2110	26.2	8.0
11	0341	5.6	1.7	26	0329	2.3	0.7
	0950	23.6	7.2		0939	25.9	7.9
SU	1601	4.9	1.5	MO	1552	2.3	0.7
DI	2208	23.6	7.2	LU	2203	26.9	8.2
12	0421	4.9	1.5	27	0422	1.3	0.4
	1029	24.0	7.3		1031	26.2	8.0
MO	1638	4.6	1.4	TU	1643	2.0	0.6
LU	2244	24.3	7.4	MA	2252	27.2	8.3
13	0457	3.9	1.2	28	0512	1.0	0.3
	1106	24.3	7.4		1121	26.2	8.0
TU	1713	4.3	1.3	WE	1731	2.3	0.7
MA	2318	24.9	7.6	ME	2339	27.2	8.3
14	0532	3.6	1.1	29	0559	1.3	0.4
	1140	24.3	7.4		1209	25.9	7.9
WE	1747	4.3	1.3	TH	1818	2.6	0.8
ME	2352	25.3	7.7	JE			
15	0607	3.0	0.9	30	0026	26.9	8.2
	1215	24.3	7.4		0646	1.6	0.5
TH	1822	3.9	1.2	FR	1255	25.3	7.7
JE				VE	1905	3.3	1.0

May-mai

Day	Time	Feet	Metres	jour	heure	pieds	mètres
1	0112	26.6	8.1	16	0043	26.2	8.0
	0733	2.3	0.7		0704	2.3	0.7
SA	1342	24.6	7.5	SU	1312	24.6	7.5
SA	1952	4.3	1.3	DI	1922	3.9	1.2
2	0159	25.9	7.9	17	0128	26.2	8.0
	0820	3.3	1.0		0751	2.6	0.8
SU	1430	24.0	7.3	MO	1359	24.6	7.5
DI	2040	4.9	1.5	LU	2011	3.9	1.2
3	0248	24.9	7.6	18	0218	25.9	7.9
	0910	4.3	1.3		0841	2.6	0.8
MO	1521	23.3	7.1	TU	1451	24.6	7.5
LU	2131	5.9	1.8	MA	2104	4.3	1.3
4	0340	24.0	7.3	19	0312	25.6	7.8
	1002	4.9	1.5		0936	3.0	0.9
TU	1614	22.6	6.9	WE	1547	24.3	7.4
MA	2226	6.6	2.0	ME	2202	4.6	1.4
5	0435	23.3	7.1	20	0411	25.3	7.7
	1057	5.9	1.8		1035	3.3	1.0
WE	1710	22.3	6.8	TH	1647	24.3	7.4
ME	2323	7.2	2.2	JE	2304	4.6	1.4
6	0534	22.6	6.9	21	0514	24.9	7.6
	1153	6.2	1.9		1136	3.6	1.1
TH	1808	22.0	6.7	FR	1750	24.6	7.5
JE				VE			
7	0022	7.2	2.2	22	0009	4.3	1.3
	0633	22.3	6.8		0619	24.6	7.5
FR	1250	6.6	2.0	SA	1239	3.6	1.1
VE	1904	22.3	6.8	SA	1853	24.9	7.6
8	0119	7.2	2.2	23	0113	3.6	1.1
	0729	22.3	6.8		0724	24.6	7.5
SA	1343	6.2	1.9	SU	1340	3.6	1.1
SA	1956	22.6	6.9	DI	1953	25.6	7.8
9	0211	6.6	2.0	24	0214	3.3	1.0
	0821	22.3	6.8		0825	24.9	7.6
SU	1432	5.9	1.8	MO	1438	3.6	1.1
DI	2042	23.0	7.0	LU	2050	25.9	7.9
10	0258	5.6	1.7	25	0312	2.6	0.8
	0908	22.6	6.9		0922	24.9	7.6
MO	1516	5.6	1.7	TU	1533	3.3	1.0
LU	2124	23.6	7.2	MA	2143	26.6	8.1
11	0341	4.9	1.5	26	0405	2.3	0.7
	0950	23.3	7.1		1015	24.9	7.6
TU	1557	5.2	1.6	WE	1624	3.3	1.0
MA	2204	24.3	7.4	ME	2234	26.6	8.1
12	0421	3.9	1.2	27	0455	2.0	0.6
	1030	23.6	7.2		1105	24.9	7.6
WE	1636	4.6	1.4	TH	1713	3.6	1.1
ME	2242	24.9	7.6	JE	2321	26.6	8.1
13	0459	3.3	1.0	28	0542	2.0	0.6
	1109	24.0	7.3		1152	24.9	7.6
TH	1715	4.3	1.3	FR	1800	3.9	1.2
JE	2320	25.6	7.8	VE			
14	0539	2.6	0.8	29	0007	26.2	8.0
	1148	24.3	7.4		0628	2.3	0.7
FR	1755	3.9	1.2	SA	1237	24.6	7.5
VE				SA	1846	4.3	1.3
15	0000	25.9	7.9	30	0052	25.9	7.9
	0620	2.3	0.7		0713	3.0	0.9
SA	1229	24.6	7.5	SU	1322	24.3	7.4
SA	1837	3.9	1.2	DI	1931	4.6	1.4
				31	0137	25.6	7.8
					0758	3.6	1.1
				MO	1407	24.0	7.3
				LU	2016	5.2	1.6

June-juin

Day	Time	Feet	Metres	jour	heure	pieds	mètres
1	0222	24.9	7.6	16	0204	27.2	8.3
	0843	4.3	1.3		0827	1.6	0.5
TU	1452	23.6	7.2	WE	1437	25.9	7.9
MA	2102	5.9	1.8	ME	2051	3.0	0.9
2	0309	24.3	7.4	17	0258	26.6	8.1
	0929	4.9	1.5		0921	2.0	0.6
WE	1539	23.3	7.1	TH	1532	25.6	7.8
ME	2150	6.6	2.0	JE	2147	3.3	1.0
3	0358	23.6	7.2	18	0356	25.9	7.9
	1016	5.6	1.7		1017	2.6	0.8
TH	1628	23.0	7.0	FR	1629	25.6	7.8
JE	2240	6.9	2.1	VE	2247	3.6	1.1
4	0449	22.6	6.9	19	0456	25.3	7.7
	1105	6.2	1.9		1116	3.3	1.0
FR	1719	22.6	6.9	SA	1730	25.3	7.7
VE	2333	7.2	2.2	SA	2349	3.6	1.1
5	0542	22.3	6.8	20	0600	24.6	7.5
	1156	6.6	2.0		1216	3.6	1.1
SA	1810	22.6	6.9	SU	1831	25.3	7.7
SA				DI			
6	0026	6.9	2.1	21	0053	3.6	1.1
	0636	22.0	6.7		0704	24.3	7.4
SU	1248	6.6	2.0	MO	1318	4.3	1.3
DI	1901	22.6	6.9	LU	1932	25.3	7.7
7	0119	6.6	2.0	22	0155	3.6	1.1
	0729	22.0	6.7		0807	24.0	7.3
MO	1338	6.6	2.0	TU	1418	4.6	1.4
LU	1950	23.0	7.0	MA	2031	25.3	7.7
8	0209	5.9	1.8	23	0254	3.3	1.0
	0819	22.0	6.7		0906	24.0	7.3
TU	1427	6.2	1.9	WE	1515	4.6	1.4
MA	2037	23.6	7.2	ME	2126	25.6	7.8
9	0257	5.2	1.6	24	0349	3.3	1.0
	0907	22.6	6.9		1000	24.0	7.3
WE	1513	5.6	1.7	TH	1608	4.6	1.4
ME	2123	24.3	7.4	JE	2218	25.6	7.8
10	0343	4.3	1.3	25	0439	3.0	0.9
	0953	23.3	7.1		1050	24.3	7.4
TH	1559	5.2	1.6	FR	1658	4.6	1.4
JE	2207	25.3	7.7	VE	2306	25.9	7.9
11	0428	3.3	1.0	26	0527	3.0	0.9
	1038	24.0	7.3		1136	24.3	7.4
FR	1644	4.6	1.4	SA	1744	4.6	1.4
VE	2252	25.9	7.9	SA	2351	25.9	7.9
12	0514	2.6	0.8	27	0611	3.3	1.0
	1123	24.6	7.5		1220	24.3	7.4
SA	1730	3.9	1.2	SU	1828	4.6	1.4
SA	2338	26.6	8.1	DI			
13	0559	2.0	0.6	28	0034	25.6	7.8
	1208	24.9	7.6		0653	3.3	1.0
SU	1817	3.3	1.0	MO	1301	24.3	7.4
DI				LU	1910	4.9	1.5
14	0025	26.9	8.2	29	0115	25.3	7.7
	0647	1.6	0.5		0734	3.6	1.1
MO	1255	25.6	7.8	TU	1342	24.3	7.4
LU	1906	3.0	0.9	MA	1951	5.2	1.6
15	0113	27.2	8.3	30	0157	24.9	7.6
	0736	1.3	0.4		0814	4.3	1.3
TU	1345	25.9	7.9	WE	1422	24.0	7.3
MA	1957	3.0	0.9	ME	2031	5.6	1.7

