

NO-A163 249 TIDAL AND LUNAR DATA FOR POINT MUGU SAN NICHOLAS ISLAND 171
AND THE BARKING SANDS AREA DURING 1986(U) PACIFIC
MISSILE TEST CENTER POINT MUGU CA R DIXON 31 DEC 85
UNCLASSIFIED PHTC-TP-00035 F/G 8/3 NL

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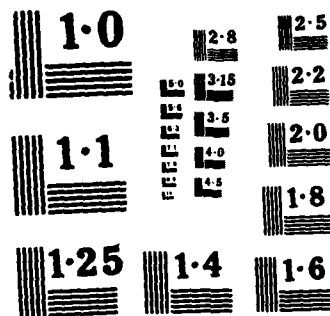
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**TIDAL AND LUNAR DATA FOR
POINT MUGU, SAN NICOLAS ISLAND,
AND THE BARKING SANDS AREA
DURING 1986**

Compiled by
RICH DIXON
Geophysics Division

31 December 1985

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JAN 23 1986

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PACIFIC MISSILE TEST CENTER

Point Mugu, California 93042-5000

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PACIFIC MISSILE TEST CENTER

AN ACTIVITY OF THE NAVAL AIR SYSTEMS COMMAND

Mr. J. S. Rosenthal, Head, Geophysical Sciences Branch; Mr. R. W. Dixon, Task Engineer; Mr. D. A. Lea, Program Manager; Mr. P. D. Wilson, Associate Range Operations Officer; and CAPT C. K. Hutchinson, Director, Range Directorate, have approved this report for publication.

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19 ABSTRACT (Continue on reverse if necessary and identify by block number) Basic lunar and tidal data for Point Mugu, San Nicolas Island, and the Barking Sands Area during 1986 are provided. The data presented are (1) tidal data, (2) times of moonrise and moonset, (3) times of lunar phases, and (4) times of sunrise and sunset.			
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INTRODUCTION

This publication combines into a single source all tidal and lunar data for operational locations of the Pacific Missile Test Center for use in Calendar Year 1986.

The data presentations are in two main divisions: one for Point Mugu and San Nicolas Island, and the other for the Barking Sands area. Within each division, the times of moonrise and moonset and tidal data are given. An appendix provides information regarding lunar phases. Since all such data change from year to year, this publication will be reissued annually.

Sunrise-sunset times for these locations, and associated solar data which do not change significantly from year to year, are issued as a single, permanent publication. Further information regarding any of these data may be obtained from the Geophysics Division of the Range Operations Department.

DATA SOURCE AND TIME REFERENCES

The data given here have been prepared from information contained in Tide Tables for the West Coast of North and South America including the Hawaiian Islands, 1986.*

For Point Mugu and San Nicolas Island, all times listed are Pacific Standard Time (PST); add eight hours to obtain Greenwich Mean Time (GMT or Z).**

For the Barking Sands Area, all times listed are Alaska-Hawaii Standard Time (AHST); add ten hours to obtain GMT. Daylight Saving Time is not observed in Hawaii.

*National Ocean Survey, Tide Tables for the West Coast of North and South America including the Hawaiian Islands, 1986. Washington, D.C., GPO, 1985.

**When Daylight Savings Time (PDT) is in effect, 1 hour is to be added to the times given. In 1986, Pacific Daylight Time is scheduled to commence at 0200 PST on Sunday, 27 April (add 1 hour), and to end at 0200 PDT on Sunday, 26 October (subtract 1 hour).

TIDAL DATA

The ranges of tidal heights that may be expected at Point Mugu and San Nicolas Island are shown in table 1. The range of heights for the primary harbor in the Barking Sands area, Port Allen, is shown in table 2. The times and height of high and low tides for 1986 at Point Mugu are given in the even-numbered tables 4 through 26, and at San Nicolas Island in the odd-numbered tables 5 through 27. Similar tide data for Port Allen are given in tables 29 through 40.

Table 1. Tidal Ranges for Point Mugu and San Nicolas Island.

Tidal Levels	Point Mugu	San Nicolas Island
	Height (Feet)	Height (Feet)
Extreme high water	7.3	6.7
Mean higher high water	5.3	4.9
Mean high water	4.5	4.1
Mean tide level*	2.7	2.5
Mean low water	0.9	0.8
Mean lower low water	0.0	0.0
Extreme low water	-2.0	-1.8

* The mean tide level is also called mean sea level.

Table 2. Tidal Ranges for Port Allen.

Tidal Levels	Height (Feet)
Extreme high water	2.6
Mean higher high water	1.6
Mean high water	1.2
Mean tide level*	0.7
Mean low water	0.2
Mean lower low water	0.0
Extreme low water	-0.4

* The mean tide level is also called mean sea level.

These tables list the times and heights of high and low tide for each month of the year and chronologically through each day. The heights are all measured from mean lower low water (see tables 1 and 2) and are values for a sea unaffected by wind waves or swell. The height and character of the sea surface are influenced by factors other than the predictable positions of the moon and sun, and is thus likely to be higher or lower than computed values may indicate. Information regarding the height of the tide at any time will be found in appendix A.

LUNAR DATA

Times of moonrise and moonset for the Point Mugu-San Nicolas Island area in 1986 are given in table 3, and for the Barking Sands area in table 28, preceding the tidal data for the respective stations. Information regarding the phases of the moon in 1986 will be found in appendix B.

Table 3. Moonrise and Moonset, Point Mugu, California, 1986.
Pacific Standard Time

Date	January		February		March		April		May		June		Date
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	
1	2229	1049		1048	2351	0924	0110	1043	0135	1157	0134	1356	1
2	2333	1117	0048	1124		1004	0207	1149	0209	1302	0159	1453	2
3		1145	0159	1205	0103	1051	0254	1258	0239	1404	0223	1550	3
4	0039	1215	0311	1256	0212	1147	0333	1404	0305	1503	0250	1648	4
5	0147	1248	0420	1355	0315	1250	0406	1508	0330	1601	0319	1747	5
6	0259	1326	0521	1502	0409	1358	0434	1610	0354	1658	0353	1846	6
7	0413	1412	0614	1612	0454	1506	0500	1709	0419	1756	0432	1943	7
8	0526	1508	0657	1722	0532	1614	0525	1807	0447	1855	0517	2036	8
9	0635	1612	0733	1829	0603	1718	0550	1905	0517	1954	0609	2125	9
10	0734	1723	0804	1933	0631	1819	0616	2004	0552	2052	0705	2207	10
11	0824	1834	0831	2033	0657	1919	0644	2103	0633	2148	0805	2245	11
12	0904	1943	0856	2132	0722	2017	0716	2202	0720	2240	0907	2317	12
13	0937	2048	0921	2230	0747	2116	0753	2300	0814	2327	1008	2346	13
14	1006	2149	0947	2328	0814	2214	0836	2355	0911		1110		14
15	1032	2248	1015		0844	2313	0926		1012	0008	1213	0014	15
16	1056	2345	1046	0026	0918		1021	0045	1115	0044	1317	0041	16
17	1121		1122	0125	0957	0012	1121	0131	1218	0116	1425	0109	17
18	1147	0042	1204	0223	1043	0109	1224	0210	1322	0145	1536	0140	18
19	1216	0139	1254	0319	1136	0203	1329	0245	1427	0213	1652	0216	19
20	1249	0237	1349	0412	1234	0252	1434	0317	1535	0241	1809	0300	20
21	1328	0336	1451	0500	1337	0336	1541	0346	1647	0311	1922	0353	21
22	1413	0434	1556	0542	1442	0414	1649	0415	1802	0345	2028	0457	22
23	1505	0530	1702	0619	1549	0449	1800	0445	1920	0426	2121	0609	23
24	1604	0621	1809	0651	1656	0520	1914	0517	2036	0515	2205	0723	24
25	1707	0706	1915	0721	1804	0549	2031	0554	2146	0614	2240	0836	25
26	1812	0746	2022	0750	1913	0618	2147	0638	2244	0721	2310	0944	26
27	1917	0821	2130	0819	2024	0648	2259	0730	2332	0833	2337	1047	27
28	2022	0852	2240	0850	2138	0722		0832		0944		1148	28
29	2127	0920			2252	0801	0001	0939	0010	1053	0002	1246	29
30	2232	0948				0847	0053	1049	0042	1157	0027	1344	30
31	2339	1017			0004	0941			0109	1257			31
Date	July		August		September		October		November		December		Date
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	
1	0053	1442	0110	1626	0240	1720	0333	1650	0537	1643	0654	1643	1
2	0121	1541	0158	1718	0343	1753	0437	1717	0650	1721	0810	1744	2
3	0154	1639	0252	1804	0446	1822	0542	1745	0806	1805	0918	1854	3
4	0231	1737	0351	1845	0549	1850	0649	1815	0921	1859	1016	2008	4
5	0314	1832	0452	1921	0653	1917	0759	1848	1032	2003	1102	2122	5
6	0404	1922	0555	1952	0757	1944	0911	1927	1133	2113	1139	2232	6
7	0500	2007	0657	2020	0903	2014	1025	2013	1224	2224	1211	2337	7
8	0559	2046	0759	2047	1012	2048	1137	2109	1305	2334	1238		8
9	0701	2119	0902	2114	1123	2129	1242	2213	1339		1304	0040	9
10	0802	2149	1005	2142	1235	2217	1338	2323	1408	0041	1329	0140	10
11	0904	2217	1111	2212	1344	2315	1425		1434	0144	1355	0239	11
12	1005	2243	1220	2248	1447		1503	0033	1459	0245	1423	0338	12
13	1108	2310	1332	2331	1541	0021	1536	0142	1525	0345	1455	0438	13
14	1212	2339	1444		1625	0132	1604	0248	1551	0445	1532	0538	14
15	1320		1553	0023	1702	0244	1630	0351	1621	0545	1614	0637	15
16	1431	0012	1654	0125	1734	0353	1656	0453	1654	0645	1703	0733	16
17	1545	0050	1746	0235	1802	0500	1722	0554	1733	0746	1757	0823	17
18	1659	0138	1829	0349	1828	0604	1749	0654	1817	0844	1854	0908	18
19	1808	0236	1904	0501	1854	0705	1820	0755	1908	0938	1954	0947	19
20	1907	0344	1935	0611	1921	0806	1855	0856	2003	1027	2053	1020	20
21	1955	0457	2002	0717	1950	0907	1936	0956	2101	1110	2153	1050	21
22	2035	0612	2028	0820	2022	1008	2023	1053	2201	1147	2252	1117	22
23	2108	0724	2054	0921	2059	1108	2115	1145	2302	1219	2352	1142	23
24	2137	0831	2121	1021	2142	1207	2212	1232		1248		1208	24
25	2203	0934	2151	1121	2231	1302	2312	1313	0002	1315	0054	1235	25
26	2228	1035	2225	1221	2326	1353		1349	0103	1341	0200	1305	26
27	2254	1134	2304	1320		1438	0013	1420	0206	1408	0310	1341	27
28	2322	1233	2350	1417	0025	1517	0116	1449	0312	1438	0424	1425	28
29	2353	1332		1511	0127	1551	0218	1516	0422	1512	0540	1520	29
30		1431	0042	1600	0230	1622	0322	1543	0537	1552	0653	1627	30
31	0029	1530	0139	1643			0428	1612			0758	1741	31

TABLE 4

POINT MUGU TIDES

JANUARY 1986

34 DEG 06 MIN N.

119 DEG 06 MIN W - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0122	3.7	0606	2.7	1142	4.6	1911	3.3	1	0129	3.4	0616	2.5	1149	4.2	1921	3.3
2	0206	4.0	0737	2.5	1251	3.9	1955	1.7	2	0213	3.7	0747	2.3	1258	3.6	2005	1.6
3	0252	4.3	0920	2.0	1424	3.4	2041	1.2	3	0259	4.0	0930	1.8	1431	3.1	2051	1.1
4	0338	4.8	1046	1.3	1616	3.1	2140	1.6	4	0345	4.4	1056	1.2	1623	2.8	2150	1.5
5	0426	5.3	1155	.5	1754	3.1	2235	1.9	5	0433	4.8	1205	.4	1801	2.8	2245	1.8
6	0516	5.8	1250	-4	1911	3.3	2338	2.1	6	0523	5.3	1300	-4	1918	3.0	2348	1.9
7	0603	6.2	1339	-1.1	2007	3.6	----	----	7	0610	5.7	1349	-1.0	2014	3.3	----	----
8	0033	2.1	0652	6.1	1427	-1.4	2057	3.7	8	0043	1.9	0659	6.0	1437	-1.3	2104	3.4
9	0126	2.1	0740	6.7	1512	-1.7	2140	3.8	9	0136	1.9	0747	6.2	1522	-1.6	2147	3.5
10	0217	2.0	0825	6.8	1555	-1.7	2220	3.9	10	0227	1.8	0832	6.2	1605	-1.6	2227	3.6
11	0307	2.0	0911	6.6	1637	-1.4	2302	3.9	11	0317	1.8	0918	6.1	1647	-1.3	2309	3.6
12	0355	2.0	0956	6.2	1717	-1.2	2347	4.0	12	0405	1.8	1003	5.7	1727	-1.1	2354	3.7
13	0446	2.0	1038	5.7	1755	-6	----	----	13	0456	1.8	1045	5.2	1805	-5	----	----
14	0029	4.0	0539	2.1	1124	4.9	1832	0.0	14	0036	3.7	0549	1.9	1131	4.5	1842	0.0
15	0112	4.1	0648	2.2	1212	4.1	1909	.6	15	0119	3.8	0658	2.0	1219	3.8	1919	.6
16	0157	4.2	0807	2.1	1315	3.4	1948	1.2	16	0204	3.9	0817	1.9	1322	3.1	1958	1.1
17	0246	4.3	0950	1.9	1453	2.8	2027	1.7	17	0253	4.0	1000	1.8	1500	2.6	2037	1.6
18	0338	4.4	1119	1.4	1703	2.6	2123	2.2	18	0345	4.0	1129	1.3	1710	2.4	2133	2.0
19	0425	4.6	1222	.9	1849	2.8	2226	2.5	19	0432	4.2	1232	.8	1856	2.6	2236	2.3
20	0514	4.8	1307	.4	1948	3.0	2327	2.6	20	0521	4.4	1317	.4	1955	2.7	2337	2.4
21	0556	5.1	1342	-1	2024	3.2	----	----	21	0603	4.7	1352	-1	2031	2.9	----	----
22	0020	2.6	0633	5.4	1417	-4	2052	3.4	22	0030	2.4	0640	4.9	1427	-4	2059	3.1
23	0102	2.5	0710	5.6	1446	-7	2118	3.5	23	0112	2.3	0717	5.1	1456	-6	2125	3.2
24	0140	2.3	0745	5.9	1516	-9	2143	3.6	24	0150	2.1	0752	5.4	1526	-8	2150	3.3
25	0216	2.2	0820	6.0	1546	-1.0	2208	3.6	25	0226	2.0	0827	5.5	1556	-9	2215	3.3
26	0252	2.0	0855	6.0	1616	-9	2236	3.8	26	0302	1.8	0902	5.5	1626	-8	2243	3.5
27	0331	1.9	0930	5.9	1644	-8	2307	3.9	27	0341	1.8	0937	5.4	1654	-7	2314	3.6
28	0412	1.8	1009	5.5	1715	-5	2337	4.1	28	0422	1.7	1016	5.0	1725	-4	2344	3.8
29	0502	1.7	1048	5.0	1745	0.0	----	----	29	0512	1.6	1055	4.6	1755	0.0	----	----
30	0011	4.3	0558	1.7	1137	4.3	1818	.5	30	0018	4.0	0608	1.6	1144	4.0	1829	.4
31	0051	4.5	0714	1.5	1239	3.6	1853	1.1	31	0058	4.1	0724	1.4	1246	3.3	1903	1.0

* -- TIDE OCCURS ON NEXT DATE.

ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

* -- TIDE OCCURS ON NEXT DATE.

ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 6

POINT MUCU TIDES
FEBRUARY 1986
34 DEG 06 MIN N. 119 DEG 06 MIN W - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0136	4.7	0947	1.3	1422	2.9	1938	1.7	2040	2.2
2	0239	4.9	1029	1.8	1644	2.7	2040	2.2	2216	2.5
3	0346	5.2	1153	1.1	1836	2.9	2216	2.5	2339	2.5
4	0453	5.5	1250	-1.6	1936	3.3	2339	2.5	---	---
5	0556	5.9	1337	-1.1	2015	3.6	---	---	---	---
6	0741	2.2	0649	6.2	1422	-1.4	2050	3.8	---	---
7	0134	1.9	0738	6.3	1458	-1.5	2122	4.0	---	---
8	0221	1.6	0823	6.3	1534	-1.4	2151	4.2	---	---
9	0306	1.4	0902	6.1	1609	-1.2	2223	4.3	---	---
10	0348	1.3	0944	5.8	1638	-1.8	2254	4.4	---	---
11	0428	1.2	1019	5.2	1707	-2.2	2326	4.4	---	---
12	0514	1.3	1059	4.5	1735	-4	2355	4.4	---	---
13	0605	1.4	1141	3.8	1800	1.0	---	---	---	---
14	0702	4.3	0704	1.5	1232	3.1	1820	1.5	---	---
15	0106	4.2	0830	1.5	1401	2.5	1834	2.1	---	---
16	0154	4.1	1026	1.3	---	---	---	---	---	---
17	0306	4.1	1153	1.9	---	---	---	---	---	---
18	0426	4.3	1244	1.4	2000	3.1	2319	2.9	---	---
19	0530	4.6	1321	0.0	2009	3.3	---	---	---	---
20	0615	2.6	0615	5.0	1350	-4	2027	3.5	---	---
21	0057	2.3	0657	5.4	1418	-7	2045	3.6	---	---
22	0134	2.0	0733	5.7	1447	-9	2104	3.8	---	---
23	0209	1.6	0808	5.8	1512	-9	2125	4.1	---	---
24	0245	1.3	0843	5.8	1540	-8	2150	4.3	---	---
25	0324	1.1	0922	5.6	1606	-6	2216	4.6	---	---
26	0406	1.8	1001	5.2	1635	-1	2243	4.8	---	---
27	0454	1.7	1046	4.5	1704	-4	2318	5.0	---	---
28	0550	1.6	1139	3.8	1733	1.1	2358	5.0	---	---

* -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 7

SAN NICOLAS ISLAND TIDES
FEBRUARY 1986
33 DEG 16 MIN N. 119 DEG 30 MIN W - CENTRAL PART NE COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0143	4.3	0857	1.2	1429	2.6	1948	1.6	---	---
2	0246	4.5	1039	1.7	1651	2.5	2050	2.0	---	---
3	0353	4.8	1203	1.1	1843	2.6	2226	2.3	---	---
4	0500	5.0	1300	-1.5	1943	3.0	2349	2.3	---	---
5	0603	5.4	1347	-1.0	2022	3.3	---	---	---	---
6	0051	2.0	0656	5.7	1432	-1.3	2057	3.5	---	---
7	0144	1.8	0745	5.8	1508	-1.4	2129	3.7	---	---
8	0231	1.5	0830	5.8	1544	-1.3	2158	3.9	---	---
9	0316	1.3	0909	5.6	1619	-1.1	2230	4.0	---	---
10	0358	1.2	0951	5.3	1648	-7	2301	4.0	---	---
11	0438	1.1	1026	4.8	1717	-2	2333	4.0	---	---
12	0524	1.2	1106	4.1	1745	-4	0002	4.0*	---	---
13	0615	1.3	1148	3.5	1810	1.9	---	---	---	---
14	0034	4.0	0714	1.4	1239	2.8	1830	1.4	---	---
15	0113	3.9	0840	1.4	1408	2.3	1844	1.9	---	---
16	0201	3.8	1036	1.2	---	---	---	---	---	---
17	0313	3.8	1203	1.8	---	---	---	---	---	---
18	0433	4.0	1254	1.4	2007	2.8	2329	2.6	---	---
19	0537	4.2	1331	0.0	2016	3.0	---	---	---	---
20	0025	2.4	0622	4.6	1400	-4	2034	3.2	---	---
21	0107	2.1	0704	4.9	1428	-6	2052	3.3	---	---
22	0144	1.8	0740	5.2	1457	-8	2111	3.5	---	---
23	0219	1.5	0815	5.3	1522	-8	2132	3.8	---	---
24	0255	1.2	0850	5.3	1550	-7	2157	4.0	---	---
25	0334	1.0	0929	5.1	1616	-5	2223	4.2	---	---
26	0416	1.7	1008	4.8	1645	-1	2250	4.4	---	---
27	0504	1.6	1053	4.1	1714	1.4	2325	4.6	---	---
28	0600	1.5	1146	3.5	1743	1.0	0005	4.6*	---	---

* -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 8

POINT MUGU TIDES

MARCH 1986

34 DEG 06 MIN N, 119 DEG 06 MIN W - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0659	.6	1253	3.1	1803	1.6	1842	2.2	---	---
2	0044	5.0	0832	.6	1500	2.6	2012	2.7	---	---
3	0154	4.9	1018	.3	1754	2.8	2238	2.8	---	---
4	0322	4.9	1140	-.3	1855	3.2	0001	2.4*	---	---
5	0446	5.1	1238	-.7	1925	3.6	---	---	---	---
6	0555	5.5	1323	-1.0	1955	3.8	---	---	---	---
7	0054	1.9	0648	5.7	1400	-1.2	2022	4.1	---	---
8	0139	1.4	0734	5.8	1434	-1.1	2049	4.4	---	---
9	0220	1.1	0815	5.7	1503	-.9	2112	4.6	---	---
10	0257	.8	0853	5.5	1531	-.5	2137	4.7	---	---
11	0334	.6	0929	5.1	1556	-.1	2202	4.8	---	---
12	0412	.6	1004	4.6	1617	.4	2224	4.8	---	---
13	0450	.6	1041	4.0	1640	1.0	2249	4.7	---	---
14	0530	.7	1121	3.5	1657	1.4	2313	4.6	---	---
15	0618	.9	1213	2.9	1706	1.9	2339	4.4	---	---
16	0727	1.1	1354	2.4	1650	2.3	---	---	---	---
17	0021	4.1	0917	1.1	---	---	---	---	---	---
18	0129	3.9	1100	.8	---	---	---	---	---	---
19	0328	3.3	1201	.4	1930	3.3	2313	2.9	---	---
20	0452	4.2	1239	0.0	1932	3.5	0007	2.5*	---	---
21	0546	4.6	1308	-.3	1941	3.6	---	---	---	---
22	0044	2.0	0632	5.0	1336	-.5	1956	4.0	---	---
23	0121	1.5	0710	5.2	1405	-.6	2014	4.3	---	---
24	0156	1.0	0750	5.4	1430	-.5	2036	4.7	---	---
25	0235	.5	0831	5.3	1459	-.3	2101	5.1	---	---
26	0314	0.0	0913	5.0	1524	0.0	2130	5.4	---	---
27	0400	-.3	0959	4.6	1555	.5	2201	5.6	---	---
28	0449	-.5	1051	4.0	1625	1.1	2236	5.6	---	---
29	0544	-.4	1157	3.4	1656	1.6	2318	5.4	---	---
30	0653	-.2	1328	2.9	1734	2.2	---	---	---	---
31	0011	5.1	0823	-.1	1559	2.8	1824	2.7	---	---

* -- TIDE OCCURS ON NEXT DATE.

ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 9

SAN NICOLAS ISLAND TIDES

MARCH 1986

33 DEG 16 MIN N, 119 DEG 30 MIN W - CENTRAL PART NE COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0709	.5	1300	2.8	1813	1.5	---	---	---	---
2	0051	4.6	0842	.5	1507	2.4	---	---	---	---
3	0201	4.5	1028	.3	1801	2.6	---	---	---	---
4	0329	4.5	1150	-.3	1902	2.9	---	---	---	---
5	0453	4.7	1248	-.6	1932	3.3	---	---	---	---
6	0602	5.0	1333	-.9	2002	3.5	---	---	---	---
7	0104	1.8	0855	5.2	1410	-1.1	---	---	---	---
8	0149	1.3	0741	5.3	1444	-1.0	---	---	---	---
9	0230	1.0	0822	5.2	1513	-.8	---	---	---	---
10	0307	.7	0900	5.0	1541	-.4	---	---	---	---
11	0344	.5	0936	4.7	1606	-.1	---	---	---	---
12	0422	.5	1011	4.2	1627	.4	---	---	---	---
13	0500	.5	1048	3.7	1650	.9	---	---	---	---
14	0540	.6	1128	3.2	1707	1.3	---	---	---	---
15	0628	.8	1200	2.6	1716	1.8	---	---	---	---
16	0737	1.0	1401	2.2	1700	2.1	---	---	---	---
17	0028	3.8	0927	1.0	---	---	---	---	---	---
18	0136	3.6	1110	.7	---	---	---	---	---	---
19	0335	3.6	1211	.4	1937	3.0	---	---	---	---
20	0459	3.9	1249	0.0	1939	3.2	---	---	---	---
21	0553	4.2	1318	-.3	1948	3.3	---	---	---	---
22	0054	1.8	0639	4.6	1346	-.4	---	---	---	---
23	0131	1.4	0717	4.8	1415	-.5	---	---	---	---
24	0206	.9	0757	4.9	1440	-.4	---	---	---	---
25	0245	.4	0838	4.8	1509	-.3	---	---	---	---
26	0324	0.0	0920	4.6	1534	0.0	---	---	---	---
27	0410	-.3	1006	4.2	1605	.4	---	---	---	---
28	0459	-.4	1058	3.7	1635	1.0	---	---	---	---
29	0554	-.4	1204	3.1	1706	1.5	---	---	---	---
30	0703	-.2	1335	2.6	1744	2.0	---	---	---	---
31	0018	4.7	0833	-.1	1606	2.6	---	---	---	---

* -- TIDE OCCURS ON NEXT DATE.

ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 10

POINT MUGU TIDES

APRIL 1986

34 DEG 06 MIN N, 119 DEG 06 MIN W - OCEAN PIER

DATE	TIME	HGT	TIME	HGT	TIME	HGT	TIME	HGT	TIME	HGT
	PST	FT	PST	FT	PST	FT	PST	FT	PST	FT
1	0128	4.8	0957	-2	1745	3.2	2103	2.9		
2	0308	4.6	1116	-4	1824	3.6	2300	2.6		
3	0439	4.7	1209	-6	1854	3.9	0007	2.0*		
4	0546	4.9	1252	-7	1921	4.2				
5	0654	1.4	0638	5.0	1327	-6	1946	4.5		
6	0135	1.0	0724	5.0	1359	-3	2008	4.8		
7	0214	1.5	0803	4.8	1424	0.0	2030	5.0		
8	0250	1.2	0841	4.6	1448	1.4	2051	5.1		
9	0321	0.0	0917	4.2	1510	1.8	2112	5.2		
10	0353	-1.1	0953	3.8	1531	1.2	2135	5.1		
11	0429	-1.1	1034	3.5	1547	1.5	2156	5.0		
12	0510	1.1	1120	3.1	1605	1.9	2219	4.8		
13	0552	1.3	1221	2.7	1613	2.2	2249	4.6		
14	0652	1.5	2323	4.3						
15	0818	1.7								
16	0923	4.0	0349	1.6						
17	0215	3.8	1055	1.4	1832	3.4	2247	2.9		
18	0358	3.9	1140	1.2	1833	3.6	2343	2.3		
19	0504	4.2	1212	0.0	1845	4.0				
20	0624	1.7	0559	4.4	1244	-1.1	1903	4.4		
21	0102	1.0	0648	4.6	1313	0.0	1922	4.9		
22	0142	1.3	0734	4.6	1342	1.2	1950	5.4		
23	0221	-1.4	0822	4.6	1414	1.5	2018	5.8		
24	0306	-1.9	0911	4.3	1447	1.9	2051	6.0		
25	0351	-1.2	1004	4.0	1519	1.2	2126	6.1		
26	0444	-1.2	1105	3.6	1556	1.7	2209	6.0		
27	0542	-1.2	1219	3.3	1637	2.2	2256	5.7		
28	0648	-1.9	1356	3.1	1729	2.6	2355	5.2		
29	0807	-1.6	1541	3.3	1908	2.9				
30	0116	4.7	0925	-1.5	1652	3.6	2122	2.8		

* -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 11

SAN NICOLAS ISLAND TIDES

APRIL 1986

33 DEG 16 MIN N, 119 DEG 30 MIN W - CENTRAL PART NE COAST

DATE	TIME	HGT	TIME	HGT	TIME	HGT	TIME	HGT	TIME	HGT
	PST	FT	PST	FT	PST	FT	PST	FT	PST	FT
1	0135	4.4	1007	-2	1752	2.9	2113	2.6		
2	0315	4.2	1126	-4	1831	3.3	2310	2.4		
3	0446	4.3	1219	-5	1901	3.6	0017	1.8*		
4	0553	4.5	1302	-6	1928	3.9				
5	0104	1.3	0645	4.6	1337	-5	1953	4.1		
6	0145	1.9	0731	4.6	1409	-3	2015	4.4		
7	0224	1.4	0810	4.4	1434	0.0	2037	4.6		
8	0300	1.2	0848	4.2	1458	1.4	2058	4.7		
9	0331	0.0	0924	3.9	1520	1.7	2119	4.8		
10	0403	-1.1	1000	3.5	1541	1.1	2142	4.7		
11	0439	-1.1	1041	3.2	1557	1.4	2203	4.6		
12	0520	1.1	1127	2.8	1615	1.8	2226	4.4		
13	0602	1.3	1238	2.5	1623	2.0	2256	4.2		
14	0702	1.4	2330	4.0						
15	0828	1.6								
16	0930	3.7	0959	1.5						
17	0222	3.5	1105	1.4	1839	3.1	2257	2.6		
18	0405	3.6	1150	1.2	1840	3.3	2353	2.1		
19	0511	3.9	1222	0.0	1852	3.7				
20	0634	1.6	0606	4.0	1254	-1	1910	4.0		
21	0112	1.9	0655	4.2	1323	0.0	1929	4.5		
22	0152	1.3	0741	4.2	1352	1.2	1957	4.9		
23	0231	-1.4	0829	4.2	1424	1.4	2025	5.3		
24	0316	-1.8	0918	4.0	1457	1.8	2058	5.5		
25	0401	-1.1	1011	3.7	1529	1.1	2133	5.6		
26	0454	-1.1	1112	3.3	1606	1.6	2216	5.5		
27	0552	-1.1	1226	3.0	1647	2.0	2303	5.2		
28	0658	-1.8	1403	2.8	1739	2.4	0002	4.8*		
29	0817	-1.5	1548	3.0	1918	2.6				
30	0123	4.3	0935	-1.4	1659	3.3	2132	2.6		

* -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 12

POINT MUGU TIDES

MAY 1986

34 DEG 06 MIN N, 119 DEG 06 MIN W - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0252	4.4	1032	-4	1734	3.9	2300	2.3	0259	4.0	1042	-4
2	0418	4.3	1127	-2	1809	4.3	2359	1.6	0425	4.0	1137	-2
3	0529	4.2	1209	0.0	1838	4.7	---	---	0536	3.9	1219	0.0
4	0648	1.1	0626	4.2	1243	.2	1902	4.9	0633	3.9	1253	.2
5	0129	.6	0713	4.1	1314	.6	1925	5.2	0720	3.8	1324	.5
6	0206	.1	0758	3.9	1340	.9	1947	5.3	0805	3.6	1350	.8
7	0238	-2	0837	3.7	1402	1.2	2007	5.4	0844	3.4	1412	1.1
8	0309	-4	0916	3.6	1424	1.5	2029	5.5	0923	3.3	1434	1.4
9	0343	-4	0956	3.4	1446	1.8	2054	5.4	1003	3.1	1456	1.7
10	0417	-4	1038	3.2	1507	2.1	2119	5.3	1045	2.9	1517	1.9
11	0457	-3	1127	3.0	1526	2.3	2148	5.1	1134	2.7	1536	2.1
12	0541	-1	1239	2.8	1545	2.6	2220	4.9	1246	2.6	1555	2.4
13	0632	.1	1259	4.6	---	---	---	---	1246	2.6	---	---
14	0735	.2	2356	4.2	---	---	---	---	2306	4.2	---	---
15	0838	.3	1657	3.3	---	---	---	---	0003	3.9	---	---
16	0119	3.9	0935	.3	1953	3.2	---	---	0033	3.9	---	---
17	0255	3.7	1024	.4	1708	3.6	2157	2.8	0126	3.6	1715	3.3
18	0418	3.7	1103	.4	1724	3.9	2307	2.2	0302	3.4	1731	3.6
19	0527	3.8	1140	.6	1742	4.4	2356	1.4	0425	3.4	1749	4.0
20	0641	.6	0629	3.9	1807	5.0	---	---	0534	3.5	1814	4.6
21	0126	-3	0726	3.9	1219	.8	1836	5.5	0636	3.6	1229	.7
22	0212	-1.0	0819	3.9	1254	1.0	1908	6.0	0733	3.6	1304	.9
23	0300	-1.4	0915	3.8	1334	1.2	1944	6.3	0826	3.6	1344	1.1
24	0350	-1.6	1012	3.6	1412	1.5	2024	6.5	0922	3.5	1422	1.4
25	0441	-1.6	1115	3.6	1454	1.8	2106	6.5	1019	3.3	1504	1.7
26	0537	-1.4	1226	3.5	1539	2.1	2153	6.3	1122	3.3	1549	1.9
27	0637	-1.2	1338	3.5	1635	2.4	2246	6.0	1233	3.2	1645	2.2
28	0741	-8	1451	3.6	1744	2.7	2348	5.4	1345	2.5	1754	2.5
29	0857	4.7	0843	-4	1920	2.8	---	---	1458	3.3	1930	2.6
30	0223	4.2	0941	0.0	1550	3.9	2105	2.6	0853	-4	1557	3.6
31	0349	3.8	1032	.4	1638	4.3	2235	2.0	0951	0.0	1645	4.0
					1716	4.7	2340	1.4	1042	.4	1723	4.3

* -- TIDE OCCURS ON NEXT DATE.

ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 13

SAN NICOLAS ISLAND TIDES

MAY 1986

33 DEG 16 MIN N, 119 DEG 30 MIN W - CENTRAL PART NE COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0259	4.0	1042	-4	1741	3.6	2310	2.1	0259	4.0	1042	-4
2	0425	4.0	1137	-2	1816	4.0	0009	1.5*	0425	4.0	1137	-2
3	0536	3.9	1219	0.0	1845	4.3	---	---	0536	3.9	1219	0.0
4	0658	1.0	0633	3.9	1253	.2	1909	4.5	0633	3.9	1253	.2
5	0139	.5	0720	3.8	1324	.5	1932	4.8	0720	3.8	1324	.5
6	0216	.1	0805	3.6	1350	.8	1954	4.8	0805	3.6	1350	.8
7	0249	-2	0844	3.4	1412	1.1	2014	4.9	0844	3.4	1412	1.1
8	0319	-4	0923	3.3	1434	1.4	2036	5.0	0923	3.3	1434	1.4
9	0353	-4	1003	3.1	1456	1.7	2101	4.9	1003	3.1	1456	1.7
10	0427	-4	1045	2.9	1517	1.9	2126	4.8	1045	2.9	1517	1.9
11	0507	-3	1134	2.7	1536	2.1	2155	4.7	1134	2.7	1536	2.1
12	0551	-1	1246	2.6	1555	2.4	2227	4.5	1246	2.6	1555	2.4
13	0642	.1	2306	4.2	---	---	---	---	2306	4.2	---	---
14	0745	.2	0003	3.9	---	---	---	---	0003	3.9	---	---
15	0848	.3	1704	3.0	2003	2.9	---	---	1704	3.0	2003	2.9
16	0126	3.6	0945	.3	1715	3.3	2207	2.6	0945	.3	1715	3.3
17	0302	3.4	1034	.4	1731	3.6	2317	2.0	1034	.4	1731	3.6
18	0425	3.4	1113	.4	1749	4.0	0006	1.3*	1113	.4	1749	4.0
19	0534	3.5	1150	.5	1814	4.6	---	---	1150	.5	1814	4.6
20	0651	.5	0636	3.6	1229	.7	1843	5.0	0636	3.6	1229	.7
21	0136	-3	0733	3.6	1304	.9	1915	5.5	0733	3.6	1304	.9
22	0222	-9	0826	3.6	1344	1.1	1951	5.8	0826	3.6	1344	1.1
23	0310	-1.3	0922	3.5	1422	1.4	2031	6.0	0922	3.5	1422	1.4
24	0400	-1.5	1019	3.3	1504	1.7	2113	6.0	1019	3.3	1504	1.7
25	0451	-1.5	1122	3.3	1549	1.9	2200	5.8	1122	3.3	1549	1.9
26	0547	-1.3	1233	3.2	1645	2.2	2253	5.5	1233	3.2	1645	2.2
27	0647	-1.1	1345	2.5	1754	2.5	2355	4.9	1345	2.5	1754	2.5
28	0751	-7	1458	3.3	1930	2.6	---	---	1458	3.3	1930	2.6
29	0104	4.3	0853	-4	1557	3.6	2115	2.4	0853	-4	1557	3.6
30	0230	3.9	0951	0.0	1645	4.0	2245	1.8	0951	0.0	1645	4.0
31	0356	3.5	1042	.4	1723	4.3	2350	1.3	1042	.4	1723	4.3

* -- TIDE OCCURS ON NEXT DATE.

ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 14

POINT MUGU TIDES

JUNE 1986

34 DEG 06 MIN N, 119 DEG 06 MIN W - OCEAN PIER

DATE	TIME		HGT		TIME		HGT		TIME		HGT	
	PST	FT	PST	FT	PST	FT	PST	FT	PST	FT	PST	FT
1	0505	3.6	1116	.8	1749	5.0	---	---	1817	5.2	---	---
2	0036	.9	0610	3.5	1154	1.2	---	---	1842	5.4	---	---
3	0118	.4	0710	3.4	1226	1.4	---	---	1908	5.5	---	---
4	0154	0.0	0758	3.4	1254	1.7	---	---	1933	5.6	---	---
5	0229	-3	0843	3.4	1323	2.0	---	---	2001	5.1	---	---
6	0304	-5	0924	3.3	1348	2.2	---	---	2030	5.6	---	---
7	0336	-6	1004	3.3	1417	2.3	---	---	2101	5.6	---	---
8	0411	-6	1046	3.2	1445	2.5	---	---	2135	5.4	---	---
9	0449	-5	1134	3.2	1517	2.6	---	---	2210	5.2	---	---
10	0528	-4	1227	3.2	1548	2.8	---	---	2249	4.9	---	---
11	0611	-2	1322	3.2	1641	2.9	---	---	2339	4.5	---	---
12	0653	0.0	1417	3.4	1750	3.0	---	---	---	---	---	---
13	0736	.2	1459	3.6	1928	3.0	---	---	---	---	---	---
14	0043	4.1	0825	.4	1536	3.9	---	---	2112	2.6	---	---
15	0206	3.6	0910	.7	1607	4.3	---	---	2231	1.9	---	---
16	0339	3.4	0956	1.0	1639	4.9	---	---	2337	1.2	---	---
17	0508	3.3	1042	1.2	1716	5.4	---	---	---	---	---	---
18	0028	.3	0623	3.4	1130	1.5	---	---	1756	6.0	---	---
19	0118	-6	0729	3.5	1215	1.8	---	---	1838	6.4	---	---
20	0207	-1.2	0829	3.6	1307	1.9	---	---	1921	6.7	---	---
21	0255	-1.6	0924	3.6	1353	2.1	---	---	2007	6.9	---	---
22	0344	-1.7	1015	3.7	1445	2.1	---	---	2056	7.0	---	---
23	0433	-1.7	1108	3.7	1537	2.2	---	---	2148	6.5	---	---
24	0523	-1.4	1202	3.8	1636	2.3	---	---	2237	6.0	---	---
25	0613	-1.1	1256	3.9	1742	2.4	---	---	2334	5.5	---	---
26	0659	-6	1351	4.1	1859	2.5	---	---	---	---	---	---
27	0032	4.7	0749	0.0	1443	4.3	---	---	2030	2.3	---	---
28	0144	4.0	0838	.6	1531	4.5	---	---	2202	1.9	---	---
29	0307	3.5	0924	1.2	1618	4.8	---	---	2315	1.4	---	---
30	0444	3.1	1013	1.6	1656	5.0	---	---	---	---	---	---

* -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAV

TABLE 15

SAN NICOLAS ISLAND TIDES

JUNE 1986

JUNE 1968
33 DEG 16 MIN N, 119 DEG 30 MIN W - CENTRAL PART NE COAST

DATE	TIME		HGT		TIME		HGT		TIME		HGT	
	PST	FT	PST	FT	PST	FT	PST	FT	PST	FT	PST	FT
1	0512	3.3			1126	.7			1756	4.6		
2	0046	.8			0617	3.2			1204	1.1	1824	4.8
3	0128	.4			0717	3.1			1236	1.3	1849	4.9
4	0204	0.0			0805	3.1			1304	1.6	1915	5.0
5	0239	-3			0850	3.1			1333	1.8	1940	5.1
6	0314	-4			0931	3.0			1358	2.0	2008	5.2
7	0346	-5			1011	3.0			1427	2.1	2037	5.1
8	0421	-5			1053	2.9			1455	2.3	2108	5.1
9	0459	-4			1141	2.9			1527	2.4	2142	4.9
10	0538	-4			1234	2.9			1558	2.6	2217	4.8
11	0621	-2			1329	2.9			1651	2.6	2256	4.5
12	0703	0.0			1424	3.1			1800	2.7	2346	4.1
13	0746	.2			1506	3.3			1938	2.7		
14	0050	3.8			0835	.4			1543	3.6	2122	2.4
15	0213	3.3			0920	.6			1614	4.0	2241	1.8
16	0346	3.1			1006	.9			1646	4.5	2347	1.1
17	0515	3.0			1052	1.1			1723	4.9		
18	0038	.3			0630	3.1			1140	1.4	1803	5.5
19	0128	-5			0736	3.2			1225	1.7	1845	5.9
20	0217	-1.1			0836	3.3			1317	1.8	1928	6.2
21	0305	-1.5			0931	3.3			1403	1.9	2014	6.3
22	0354	-1.6			1022	3.4			1455	1.9	2103	6.4
23	0443	-1.6			1115	3.4			1547	2.0	2155	6.0
24	0533	-1.3			1209	3.5			1646	2.1	2244	5.5
25	0623	-1.0			1303	3.6			1752	2.2	2341	5.0
26	0709	-5			1358	3.8			1909	2.3		
27	0039	4.3			0759	0.0			1450	4.0	2040	2.1
28	0151	3.7			0848	.5			1538	4.1	2212	1.8
29	0314	3.2			0934	1.1			1625	4.4	2325	1.3
30	0451	2.8			1023	1.5			1703	4.6		

* -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

POINT MUGU TIDES

DATE	TIME		HGT		TIME		HGT		TIME		HGT	
	PST	FT	PST	FT	PST	FT	PST	FT	PST	FT	PST	FT
1	0017	.9	0609	3.1	1058	2.0	1732	5.2				
2	0105	.5	0718	3.1	1140	2.3	1808	5.4				
3	0145	.1	0809	3.3	1222	2.4	1840	5.6				
4	0220	-.2	0851	3.3	1257	2.5	1915	5.7				
5	0252	-.4	0927	3.4	1333	2.6	1947	5.8				
6	0326	-.5	1001	3.5	1408	2.5	2019	5.9				
7	0359	-.6	1031	3.5	1444	2.5	2054	5.9				
8	0430	-.6	1107	3.6	1522	2.6	2129	5.8				
9	0504	-.5	1141	3.6	1602	2.6	2201	5.5				
10	0536	-.3	1216	3.7	1649	2.6	2240	5.2				
11	0608	0.0	1251	3.8	1749	2.6	2326	4.7				
12	0643	.3	1330	4.1	1859	2.5	---	---				
13	0019	4.1	0718	.8	1409	4.4	2029	2.1				
14	0137	3.5	0801	1.2	1457	4.8	2202	1.6				
15	0324	3.1	0849	1.7	1546	5.2	2318	.9				
16	0516	3.0	0949	2.1	1639	5.7	---	---				
17	0020	.1	0644	3.2	1055	2.3	1729	6.0				
18	0113	-.7	0744	3.5	1201	2.4	1824	6.5				
19	0204	-.2	0833	3.6	1257	2.3	1913	6.8				
20	0249	-1.4	0918	3.9	1352	2.2	2003	6.9				
21	0334	-1.5	1000	4.0	1445	2.0	2051	6.8				
22	0416	-1.4	1039	4.2	1536	1.9	2137	6.5				
23	0455	-1.1	1121	4.3	1629	1.9	2215	6.0				
24	0534	-.6	1200	4.4	1725	1.9	2314	5.3				
25	0613	0.0	1242	4.5	1827	2.0	---	---				
26	0003	4.5	0650	.7	1327	4.6	1944	2.0				
27	0105	3.7	0726	1.2	1412	4.6	2117	1.8				
28	0233	3.2	0807	1.9	1505	4.7	2242	1.4				
29	0439	2.9	0856	2.4	1558	4.8	2359	1.1				
30	0630	3.0	1005	2.7	1651	5.0	---	---				
31	0047	.6	0739	3.3	1114	2.9	1740	5.2				

SAN NICOLAS ISLAND TIDES

DATE	TIME		HGT		TIME		HGT		TIME		HGT	
	PST	FT	PST	FT	PST	FT	PST	FT	PST	FT	PST	FT
1	0027	.8	0616	2.8	1108	1.8	1739	4.8				
2	0115	.4	0725	2.8	1150	2.1	1815	4.9				
3	0155	.1	0816	3.0	1232	2.2	1847	5.1				
4	0230	-.2	0858	3.0	1307	2.3	1922	5.2				
5	0302	-.4	0934	3.1	1343	2.4	1954	5.3				
6	0336	-.4	1008	3.2	1418	2.3	2026	5.4				
7	0409	-.5	1038	3.2	1454	2.3	2101	5.4				
8	0440	-.5	1114	3.3	1532	2.4	2136	5.3				
9	0514	-.4	1148	3.3	1612	2.4	2208	5.0				
10	0546	-.3	1223	3.4	1659	2.4	2247	4.8				
11	0618	0.0	1258	3.5	1759	2.4	2333	4.3				
12	0653	.3	1337	3.8	1909	2.3	---	---				
13	0026	3.8	0728	.7	1416	4.0	2039	1.9				
14	0144	3.2	0811	1.1	1504	4.4	2212	1.5				
15	0331	2.8	0859	1.6	1553	4.8	2328	.8				
16	0523	2.7	0959	1.9	1646	5.2	---	---				
17	0030	.1	0651	2.9	1105	2.1	1736	5.5				
18	0123	-.6	0751	3.2	1211	2.2	1831	6.0				
19	0214	-1.1	0840	3.3	1307	2.1	1920	6.2				
20	0259	-1.3	0925	3.6	1402	2.0	2010	6.3				
21	0344	-1.4	1007	3.7	1455	1.8	2058	6.2				
22	0426	-1.3	1046	3.9	1546	1.8	2144	6.0				
23	0505	-1.0	1128	4.0	1639	1.8	2232	5.5				
24	0544	-.5	1207	4.0	1735	1.8	2321	4.8				
25	0623	0.0	1249	4.1	1837	1.8	---	---				
26	0010	4.1	0700	.6	1334	4.2	1954	1.8				
27	0112	3.4	0736	1.1	1419	4.2	2127	1.7				
28	0240	2.9	0817	1.8	1512	4.3	2252	1.3				
29	0446	2.6	0906	2.2	1605	4.4	0009	1.0*				
30	0637	2.7	1015	2.5	1658	4.6	---	---				
31	0057	.5	0746	3.0	1124	2.6	1747	4.8				

EFFECT.

* -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVING

TABLE 18

POINT MUGU TIDES
AUGUST 1986

34 DEC 06 MIN N, 119 DEG 06 MIN W - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0129	.2	0817	3.5	1210	2.9	1822	5.4		
2	0207	-1.1	0843	3.6	1255	2.7	1900	5.7		
3	0236	-3	0905	3.6	1331	2.6	1938	5.9		
4	0304	-4	0930	3.8	1406	2.4	2010	6.0		
5	0331	-5	0955	3.9	1442	2.2	2043	6.0		
6	0401	-5	1020	4.0	1520	2.1	2117	5.9		
7	0426	-3	1045	4.2	1558	2.0	2153	5.6		
8	0453	0.0	1113	4.4	1642	1.9	2231	5.1		
9	0521	.4	1142	4.5	1734	1.8	2315	4.5		
10	0550	.9	1219	4.7	1840	1.7	---	---		
11	0612	3.8	0622	1.3	1301	4.9	2004	1.5		
12	0136	3.2	0658	1.9	1354	5.1	2140	1.2		
13	0352	2.9	0750	2.4	1501	5.3	2309	.6		
14	0601	3.1	0923	2.8	1615	5.6	---	---		
15	0015	-1	0707	3.5	1100	2.8	1720	6.0		
16	0107	-7	0747	3.7	1209	2.6	1822	6.3		
17	0152	-1.0	0821	4.0	1307	2.2	1913	6.6		
18	0234	-1.2	0852	4.3	1356	1.9	2000	6.7		
19	0311	-1.1	0927	4.5	1443	1.6	2042	6.5		
20	0346	-9	0956	4.7	1529	1.4	2124	6.1		
21	0418	-5	1028	4.9	1614	1.3	2206	5.6		
22	0449	.1	1102	4.9	1700	1.3	2249	4.9		
23	0515	.7	1134	4.9	1752	1.4	2338	4.2		
24	0544	1.3	1206	4.8	1851	1.5	---	---		
25	0634	3.5	0610	1.9	1246	4.7	2014	1.6		
26	0212	3.0	0627	2.5	1335	4.6	2157	1.4		
27	1448	4.5	2330	1.2	---	---	---	---		
28	1611	4.6	---	---	---	---	---	---		
29	0022	.7	0737	3.6	1119	3.2	1713	4.9		
30	0103	.4	0752	3.7	1212	2.9	1802	5.2		
31	0136	.1	0810	3.8	1252	2.6	1844	5.6		

* -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 19

SAN NICOLAS ISLAND TIDES
AUGUST 1986

33 DEC 16 MIN N, 119 DEG 30 MIN W - CENTRAL PART NE COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0139	.2	0824	3.2	1220	2.6	1829	4.9		
2	0217	-1.1	0850	3.3	1305	2.5	1907	5.2		
3	0246	-3	0912	3.3	1341	2.4	1945	5.4		
4	0314	-4	0937	3.5	1416	2.2	2017	5.5		
5	0341	-4	1002	3.6	1452	2.0	2050	5.5		
6	0411	-4	1027	3.7	1530	1.9	2124	5.4		
7	0436	-3	1052	3.9	1608	1.8	2200	5.1		
8	0503	0.0	1120	4.0	1652	1.8	2238	4.7		
9	0531	.4	1149	4.1	1744	1.7	2322	4.1		
10	0600	.8	1226	4.3	1850	1.6	---	---		
11	0019	3.5	0632	1.2	1308	4.5	2014	1.4		
12	0143	2.9	0708	1.8	1401	4.7	2150	1.1		
13	0359	2.6	0800	2.2	1508	4.8	2319	.5		
14	0608	2.8	0933	2.6	1622	5.1	---	---		
15	0025	-1	0714	3.2	1110	2.6	1727	5.5		
16	0117	-6	0754	3.4	1219	2.4	1829	5.8		
17	0202	-9	0828	3.7	1317	2.0	1920	6.1		
18	0244	-1.1	0859	4.0	1406	1.8	2007	6.2		
19	0321	-1.0	0934	4.1	1453	1.5	2049	6.0		
20	0356	-8	1003	4.3	1539	1.3	2131	5.6		
21	0428	-4	1035	4.5	1624	1.2	2213	5.1		
22	0459	.1	1109	4.5	1710	1.2	2256	4.5		
23	0525	.6	1141	4.5	1802	1.3	2345	3.9		
24	0554	1.2	1213	4.4	1901	1.4	---	---		
25	0041	3.2	0620	1.8	1253	4.3	2024	1.5		
26	0219	2.7	0637	2.3	1342	4.2	2207	1.3		
27	1455	4.1	2340	1.1	---	---	---	---		
28	1618	4.2	---	---	---	---	---	---		
29	0032	.6	0744	3.3	1129	2.9	1720	4.5		
30	0113	.4	0759	3.4	1222	2.6	1809	4.8		
31	0146	.1	0817	3.5	1302	2.4	1851	5.1		

* -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 20

POINT MUGU TIDES
SEPTEMBER 1986

34 DEG 06 MIN N, 119 DEG 06 MIN W - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0202	-1	0925	4.0	1323	2.3	1919	5.8		
2	0230	-3	0844	4.2	1359	1.9	1953	5.9		
3	0252	-3	0906	4.5	1432	1.6	2028	5.9		
4	0318	-2	0927	4.7	1510	1.3	2105	5.7		
5	0342	-1	0951	5.0	1548	1.1	2142	5.3		
6	0408	.5	1016	5.2	1631	1.0	2226	4.8		
7	0436	1.0	1046	5.3	1723	.9	2313	4.1		
8	0502	1.4	1123	5.4	1826	.9				
9	0519	3.5	1206	5.3	1948	.9	1948	.9		
10	0214	3.0	0606	2.6	1306	5.2	2131	.7		
11	1434	5.2	2301	.3						
12	0626	3.6	0951	3.2	1606	5.4	0002	-2*		
13	0655	3.9	1124	2.9	1719	5.7				
14	0052	-6	0726	4.2	1225	2.3	1818	6.0		
15	0131	-7	0752	4.6	1314	1.8	1909	6.1		
16	0207	-7	0820	4.9	1359	1.3	1952	6.0		
17	0236	-4	0845	5.1	1438	1.0	2033	5.9		
18	0307	-1	0913	5.3	1517	.8	2112	5.5		
19	0332	.4	0938	5.4	1556	.7	2152	4.9		
20	0358	.9	1004	5.4	1638	.7	2233	4.4		
21	0420	1.4	1028	5.3	1720	.8	2318	3.7		
22	0441	2.0	1054	5.1	1809	1.0				
23	0018	3.3	0453	2.5	1123	4.9	1918	1.2		
24	0223	2.9	0435	2.8	1205	4.6	2101	1.2		
25	1318	4.3	2240	1.1						
26	1518	4.3	2340	.8						
27	0704	3.7	1119	3.3	1641	4.5				
28	0020	.5	0710	3.9	1201	2.8	1735	4.8		
29	0049	.3	0723	4.2	1238	2.3	1817	5.1		
30	0116	.1	0736	4.5	1310	1.8	1857	5.4		

* --- TIDE OCCURS ON NEXT DATE.

ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 21

SAN NICOLAS ISLAND TIDES

SEPTEMBER 1986

33 DEG 16 MIN N, 119 DEG 30 MIN W - CENTRAL PART NE COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0212	-1	0832	3.7	1333	2.1	1926	5.3		
2	0240	-3	0851	3.9	1409	1.8	2000	5.4		
3	0302	-3	0913	4.1	1442	1.5	2035	5.4		
4	0328	-2	0934	4.3	1520	1.2	2112	5.2		
5	0352	.1	0958	4.6	1558	1.0	2149	4.8		
6	0418	.4	1023	4.8	1641	.9	2233	4.4		
7	0446	.9	1053	4.8	1733	.8	2320	3.8		
8	0512	1.3	1130	4.9	1836	.8				
9	0026	3.2	0541	1.8	1213	4.8	1958	.8		
10	0221	2.7	0616	2.4	1313	4.8	2141	.6		
11	1441	4.8	2311	.3						
12	0633	3.3	1001	2.9	1613	4.9	0012	-2*		
13	0702	3.6	1134	2.6	1726	5.2				
14	0102	-5	0733	3.9	1235	2.1	1825	5.5		
15	0141	-6	0759	4.2	1324	1.7	1916	5.6		
16	0217	-6	0827	4.5	1409	1.2	1959	5.5		
17	0246	-4	0852	4.7	1448	.9	2040	5.4		
18	0317	-1	0920	4.8	1527	.7	2119	5.0		
19	0342	.4	0945	4.9	1606	.6	2159	4.5		
20	0408	.8	1011	4.9	1648	.6	2240	4.0		
21	0430	1.3	1035	4.8	1730	.7	2325	3.4		
22	0451	1.8	1101	4.7	1819	.9				
23	0025	3.0	0503	2.3	1130	4.5	1928	1.1		
24	0230	2.6	0445	2.6	1212	4.2	2111	1.1		
25	1325	4.0	2250	1.0						
26	1525	4.0	2350	.7						
27	0711	3.4	1129	3.0	1648	4.1				
28	0030	.4	0717	3.6	1211	2.6	1742	4.4		
29	0059	.3	0730	3.9	1248	2.1	1824	4.7		
30	0126	.1	0743	4.1	1320	1.7	1904	4.9		

* --- TIDE OCCURS ON NEXT DATE.

ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

POINT MUGU TIDES
OCTOBER 1986
34 DEG 06 MIN N.

DATE	TIME		HGT		TIME		HGT		TIME		HGT	
	PST	FT	PST	FT	PST	FT	PST	FT	PST	FT	PST	FT
1	0141	.1	0754	4.8	1342	1.3	1934	5.4				
2	0206	.2	0813	5.2	1420	.9	2012	5.4				
3	0232	.4	0837	5.5	1435	.4	2054	5.2				
4	0257	.7	0903	5.8	1537	.1	2137	4.8				
5	0326	1.1	0931	6.0	1622	-.1	2226	4.3				
6	0354	1.5	1003	6.0	1715	-.1	2326	3.7				
7	0422	2.1	1042	5.9	1819	.1	---	---				
8	0051	3.3	0454	2.6	1131	5.6	1940	.2				
9	0321	3.2	0539	3.1	1242	5.3	2116	.2				
10	0512	3.6	0806	3.4	1421	5.0	2235	0.0				
11	0553	3.9	1026	3.1	1600	5.0	2335	-.2				
12	0622	4.3	1137	2.5	1714	5.2	---	---				
13	0020	-.3	0650	4.7	1230	1.8	1812	5.3				
14	0057	-.2	0716	5.1	1314	1.2	1859	5.3				
15	0131	.1	0741	5.4	1354	.8	1943	5.2				
16	0157	.4	0806	5.6	1430	.4	2025	4.9				
17	0225	.8	0828	5.8	1505	.1	2103	4.6				
18	0247	1.2	0850	5.8	1540	.1	2143	4.2				
19	0308	1.6	0915	5.7	1616	.1	2225	3.8				
20	0327	2.0	0937	5.6	1657	.3	2315	3.5				
21	0345	2.4	1002	5.3	1742	.5	---	---				
22	0021	3.1	0353	2.8	1030	5.0	1842	.8				
23	1105	4.7	2003	1.0	---	---	---	---				
24	1203	4.3	2130	.9	---	---	---	---				
25	0638	3.6	0846	3.6	1355	4.1	2234	.8				
26	0609	3.8	1052	3.3	1545	4.1	2316	.6				
27	0617	4.1	1138	2.7	1652	4.3	2353	.5				
28	0629	4.4	1215	2.0	1743	4.5	---	---				
29	0023	.5	0644	4.9	1252	1.3	1830	4.6				
30	0049	.6	0702	5.3	1328	.7	1916	4.7				
31	0118	.7	0727	5.8	1404	0.0	2002	4.6				

SAN NICOLAS ISLAND TIDES
OCTOBER 1986

DATE	TIME		HGT		TIME		HGT		TIME		HGT	
	PST	FT	PST	FT	PST	FT	PST	FT	PST	FT	PST	FT
1	0151	.1	0801	4.4	1352	1.2	1941	4.9				
2	0216	.2	0820	4.8	1430	.8	2019	4.9				
3	0242	.4	0844	5.0	1505	.4	2101	4.8				
4	0307	.6	0910	5.3	1547	.1	2144	4.4				
5	0336	1.0	0938	5.5	1632	-.1	2233	4.0				
6	0404	1.4	1010	5.5	1725	-.1	2333	3.4				
7	0432	1.9	1049	5.4	1829	.1						
8	0508	3.0	0504	2.4	1138	5.1	1950	.2				
9	0328	2.9	0549	2.8	1249	4.8	2126	.2				
10	0319	3.3	0816	3.1	1428	4.6	2245	0.0				
11	0600	3.6	1036	2.8	1607	4.6	2345	-.2				
12	0629	4.0	1147	2.3	1721	4.8						
13	0030	-.3	0657	4.3	1240	1.7	1819	4.8				
14	0107	-.2	0723	4.7	1324	1.1	1906	4.8				
15	0141	.1	0748	4.9	1404	.7	1950	4.8				
16	0207	.4	0813	5.1	1440	.4	2032	4.5				
17	0235	.7	0835	5.3	1515	.1	2110	4.2				
18	0257	1.1	0857	5.3	1550	.1	2150	3.9				
19	0318	1.5	0922	5.2	1626	.1	2232	3.5				
20	0337	1.8	0944	5.1	1707	.3	2322	3.2				
21	0355	2.2	1009	4.8	1752	.4						
22	0428	2.8	0403	2.6	1037	4.6	1852	.7				
23	1112	4.3	2013	.9								
24	1210	4.0	2140	.8								
25	0645	3.3	0856	3.3	1402	3.8	2244	.7				
26	0616	3.5	1102	3.0	1652	3.8	2326	.5				
27	0624	3.8	1148	2.5	1659	4.0	0003	.4*				
28	0636	4.0	1225	1.8	1750	4.1						
29	0033	.4	0651	4.5	1302	1.2	1637	4.2				
30	0059	.5	0709	4.8	1338	.6	1923	4.3				
31	0128	.6	0734	5.3	1414	0.0	2009	4.2				

* -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAV

* -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

* -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAV

* -- TIDE OCCURS ON NEXT DATE.
ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 24

POINT HUGU TIDES
NOVEMBER 1986
34 DEC 06 MIN N, 119 DEG 06 MIN W - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0146	1.0	0752	6.1	1446	-5	2049	4.5
2	0217	1.2	0824	6.4	1528	-9	2139	4.2
3	0249	1.6	0859	6.5	1617	-1.0	2238	3.8
4	0325	2.0	0936	6.4	1713	-9	2347	3.6
5	0401	2.5	1022	6.2	1814	-7	---	---
6	0417	3.4	1053	2.9	1118	5.8	1928	-4
7	0300	3.5	0611	3.2	1231	5.2	2047	-2
8	0418	3.8	0834	3.2	1406	4.8	2154	-1
9	0504	4.2	1023	2.7	1542	4.6	2253	.1
10	0540	4.7	1133	2.0	1658	4.5	2338	.3
11	0612	5.1	1225	1.3	1801	4.4	---	---
12	0017	.6	0637	5.4	1310	-8	1855	4.3
13	0049	.9	0702	5.7	1349	.3	1942	4.2
14	0118	1.2	0727	5.9	1424	-1	2025	4.0
15	0142	1.5	0750	6.0	1456	-3	2106	3.8
16	0207	1.9	0815	6.0	1532	-4	2146	3.6
17	0232	2.1	0840	5.9	1604	-3	2231	3.5
18	0251	2.4	0906	5.7	1644	-2	2321	3.3
19	0314	2.6	0934	5.5	1728	0.0	---	---
20	0024	3.1	0332	2.9	1006	5.2	1816	.3
21	1044	4.9	1914	.5	---	---	---	---
22	1133	4.5	2014	.6	---	---	---	---
23	0441	3.6	0730	3.5	1243	4.1	2111	.7
24	0452	3.8	0950	3.2	1425	3.8	2200	.8
25	0507	4.2	1100	2.5	1559	3.7	2239	.9
26	0527	4.6	1153	1.7	1708	3.7	2317	1.0
27	0551	5.1	1231	1.0	1809	3.8	2353	1.2
28	0614	5.7	1313	.2	1907	3.9	---	---
29	0031	1.3	0646	6.1	1355	-6	2000	3.9
30	0107	1.6	0721	6.5	1438	-1.2	2052	3.9

* --- TIDE OCCURS ON NEXT DATE.

ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 25

SAN NICOLAS ISLAND TIDES
NOVEMBER 1986
33 DEC 16 MIN N, 119 DEG 30 MIN W - CENTRAL PART NE COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0156	.9	0759	5.6	1456	-4	2056	4.1
2	0227	1.1	0831	5.9	1538	-8	2146	3.9
3	0259	1.5	0906	6.0	1627	-9	2245	3.5
4	0335	1.8	0943	5.9	1723	-8	2354	3.3
5	0411	2.3	1029	5.7	1824	-6	---	---
6	0124	3.1	0503	2.6	1125	5.3	1938	-4
7	0307	3.2	0621	2.9	1238	4.8	2057	-2
8	0425	3.5	0844	2.9	1413	4.4	2204	-1
9	0511	3.9	1033	2.5	1549	4.2	2303	.1
10	0547	4.3	1143	1.8	1705	4.1	2348	.3
11	0619	4.7	1235	1.2	1808	4.0	---	---
12	0027	.5	0644	4.9	1320	.7	1902	4.0
13	0059	.8	0709	5.2	1359	.3	1949	3.9
14	0128	1.1	0734	5.4	1434	-1	2032	3.7
15	0152	1.4	0757	5.5	1506	-3	2113	3.5
16	0217	1.8	0822	5.5	1542	-4	2153	3.3
17	0242	1.9	0847	5.4	1614	-3	2238	3.0
18	0301	2.2	0913	5.2	1654	-2	---	---
19	0324	2.4	0941	5.0	1738	0.0	---	---
20	0031	2.8	0342	2.6	1013	4.8	1826	.3
21	1051	4.5	1924	.4	---	---	---	---
22	1140	4.1	2024	.5	---	---	---	---
23	0448	3.3	0740	3.2	1250	3.8	2121	.6
24	0459	3.5	1000	2.9	1432	3.5	2210	.7
25	0514	3.9	1110	2.3	1606	3.4	2249	.8
26	0534	4.2	1203	1.6	1715	3.4	2327	.9
27	0558	4.7	1241	.9	1816	3.5	0003	1.1*
28	0621	5.2	1323	.2	1914	3.6	---	---
29	0041	1.2	0653	5.6	1405	-5	2007	3.6
30	0117	1.5	0728	6.0	1448	-1.1	2059	3.6

* --- TIDE OCCURS ON NEXT DATE.

ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 26

POINT MUGU TIDES

DECEMBER 1986

34 DEC 06 MIN N.

119 DEG 06 MIN W - OCEAN PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0145	1.9	0800	6.9	1526	-1.4	2151	3.8		
2	0227	2.0	0842	6.9	1614	-1.5	2246	3.7		
3	0313	2.2	0927	6.7	1707	-1.4	2348	3.6		
4	0403	2.5	1016	6.4	1803	-1.2				
5	0055	3.6	0507	2.7	1113	5.9	1903	-8		
6	0207	3.7	0632	2.9	1219	5.2	2005	-3		
7	0313	4.1	0817	2.8	1340	4.5	2106	.1		
8	0405	4.4	1002	2.3	1509	3.9	2158	.5		
9	0447	4.8	1116	1.6	1639	3.6	2245	1.0		
10	0525	5.2	1216	1.0	1753	3.6	2331	1.3		
11	0559	5.5	1302	.5	1859	3.5	0009	1.6*		
12	0628	5.7	1344	0.0	1951	3.5				
13	0041	1.9	0658	5.8	1419	-3	2034	3.5		
14	0113	2.2	0723	5.9	1454	-5	2118	3.5		
15	0142	2.3	0753	5.9	1526	-6	2156	3.5		
16	0210	2.4	0823	5.9	1558	-6	2236	3.4		
17	0242	2.5	0853	5.8	1633	-5	2314	3.4		
18	0314	2.6	0925	5.6	1711	-4	2357	3.3		
19	0346	2.7	0957	5.4	1747	-2				
20	0046	3.4	0428	2.9	1032	5.1	1827	.1		
21	0135	3.5	0525	3.0	1114	4.6	1906	.3		
22	0224	3.6	0648	3.0	1205	4.1	1948	.6		
23	0306	3.8	0834	2.8	1322	3.6	2033	1.0		
24	0341	4.2	1011	2.2	1505	3.2	2122	1.2		
25	0418	4.7	1119	1.4	1645	3.1	2211	1.5		
26	0455	5.2	1212	.6	1809	3.2	2300	1.8		
27	0535	5.8	1303	-3	1916	3.4	2353	2.0		
28	0617	6.2	1347	-1.0	2011	3.6				
29	0041	2.0	0701	6.6	1435	-1.4	2103	3.6		
30	0131	2.1	0747	6.9	1521	-1.8	2149	3.7		
31	0222	2.0	0833	7.0	1606	-1.8	2237	3.8		

* -- TIDE OCCURS ON NEXT DATE.

ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

TABLE 27

SAN NICOLAS ISLAND TIDES

DECEMBER 1986

33 DEC 16 MIN N.

119 DEG 30 MIN W - CENTRAL PART NE COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0155	1.7	0807	6.2	1536	-1.3	2158	3.5		
2	0237	1.8	0849	6.3	1624	-1.4	2253	3.4		
3	0323	2.0	0934	6.2	1717	-1.3	2355	3.3		
4	0413	2.3	1023	5.9	1813	-1.1				
5	0102	3.3	0517	2.5	1120	5.4	1913	-7		
6	0214	3.4	0642	2.6	1226	4.8	2015	-3		
7	0320	3.8	0827	2.6	1347	4.1	2116	.1		
8	0412	4.0	1012	2.1	1516	3.6	2208	.4		
9	0454	4.4	1126	1.5	1646	3.3	2255	.9		
10	0532	4.8	1226	.9	1800	3.3	2341	1.2		
11	0606	5.0	1312	.4	1906	3.2	0019	1.5*		
12	0635	5.2	1354	0.0	1958	3.2				
13	0051	1.8	0705	5.3	1429	-3	2041	3.2		
14	0123	2.0	0730	5.4	1504	-4	2125	3.2		
15	0152	2.1	0800	5.4	1536	-5	2203	3.2		
16	0220	2.2	0830	5.4	1608	-5	2243	3.1		
17	0252	2.3	0900	5.3	1643	-4	2321	3.1		
18	0324	2.4	0932	5.1	1721	-4	0004	3.0*		
19	0356	2.5	1004	4.9	1757	-2				
20	0053	3.1	0438	2.6	1039	4.7	1837	.1		
21	0142	3.2	0535	2.7	1121	4.2	1916	.3		
22	0231	3.3	0658	2.7	1212	3.8	1958	.5		
23	0313	3.5	0844	2.6	1329	3.3	2043	.9		
24	0348	3.9	1021	2.0	1512	2.9	2132	1.1		
25	0425	4.3	1129	1.3	1652	2.8	2221	1.4		
26	0502	4.8	1222	.5	1816	2.9	2310	1.7		
27	0542	5.3	1313	-3	1923	3.1	0003	1.8*		
28	0624	5.7	1357	-9	2018	3.3				
29	0051	1.8	0708	6.1	1445	-1.3	2110	3.3		
30	0141	1.9	0754	6.3	1531	-1.7	2156	3.4		
31	0232	1.8	0840	6.4	1616	-1.7	2244	3.5		

* -- TIDE OCCURS ON NEXT DATE.

ADD ONE HOUR WHEN DAYLIGHT SAVINGS TIME IS IN EFFECT.

Table 28. Moonrise and Moonset, Barking Sands, Hawaii, 1986.
Hawaii-Aleutian Standard Time

Date	January		February		March		April		May		June		Date
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	
1	2325	1125	0015	1152		1034	0123	1209	0156	1310	0219	1442	1
2		1200	0117	1235	0015	1121	0221	1313	0237	1408	0250	1533	2
3	0022	1236	0221	1324	0121	1214	0312	1415	0312	1502	0321	1623	3
4	0120	1313	0328	1419	0226	1312	0356	1515	0345	1554	0354	1715	4
5	0221	1354	0434	1521	0328	1415	0435	1612	0416	1645	0430	1808	5
6	0326	1440	0535	1626	0424	1519	0510	1706	0447	1736	0509	1902	6
7	0433	1533	0631	1732	0514	1622	0543	1758	0519	1827	0553	1956	7
8	0542	1633	0719	1835	0557	1722	0614	1849	0553	1920	0641	2049	8
9	0649	1738	0801	1934	0635	1819	0645	1941	0630	2013	0733	2138	9
10	0750	1845	0838	2031	0710	1913	0718	2033	0710	2108	0828	2224	10
11	0843	1951	0912	2124	0742	2005	0753	2126	0756	2201	0924	2306	11
12	0929	2052	0944	2216	0814	2057	0831	2220	0845	2253	1019	2344	12
13	1008	2150	1016	2307	0846	2149	0913	2314	0938	2341	1115		13
14	1043	2244	1048	2358	0919	2241	1000		1033		1210	0019	14
15	1116	2335	1122		0955	2334	1051	0007	1129	0026	1305	0054	15
16	1147		1159	0050	1035		1145	0058	1226	0107	1402	0128	16
17	1218	0026	1241	0144	1119	0028	1242	0146	1322	0145	1502	0204	17
18	1250	0116	1327	0238	1207	0122	1339	0230	1419	0220	1606	0243	18
19	1326	0207	1418	0333	1300	0215	1437	0310	1517	0256	1714	0327	19
20	1404	0300	1513	0425	1357	0306	1536	0349	1617	0331	1826	0418	20
21	1448	0354	1612	0515	1455	0353	1634	0425	1721	0410	1936	0518	21
22	1536	0449	1711	0602	1555	0437	1735	0501	1829	0452	2042	0624	22
23	1629	0543	1811	0644	1654	0517	1838	0539	1940	0541	2139	0734	23
24	1726	0635	1910	0723	1753	0555	1944	0620	2051	0637	2228	0843	24
25	1825	0723	2009	0800	1853	0632	2053	0705	2159	0740	2310	0947	25
26	1924	0808	2108	0836	1955	0709	2204	0757	2300	0847	2346	1047	26
27	2023	0848	2208	0913	2058	0747	2312	0855	2351	0955		1143	27
28	2120	0926	2310	0951	2204	0829		0958		1100	0020	1236	28
29	2218	1002			2312	0916	0015	1104	0035	1201	0051	1328	29
30	2315	1037				1008	0109	1209	0113	1257	0123	1419	30
31		1113			0019	1106			0147	1351			31

Date	July		August		September		October		November		December		Date
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	
1	0155	1511	0232	1639	0358	1741	0436	1728	0613	1748	0712	1806	1
2	0230	1604	0322	1730	0456	1820	0532	1802	0718	1834	0824	1911	2
3	0308	1657	0416	1819	0552	1856	0629	1838	0827	1926	0932	2020	3
4	0351	1751	0512	1904	0648	1931	0729	1915	0937	2025	1032	2130	4
5	0437	1845	0609	1944	0744	2005	0831	1956	1045	2130	1123	2236	5
6	0529	1935	0705	2022	0841	2040	0936	2043	1147	2237	1207	2338	6
7	0623	2022	0801	2057	0940	2118	1043	2136	1241	2343	1245		7
8	0719	2105	0856	2130	1041	2200	1151	2236	1328		1319	0036	8
9	0815	2145	0951	2204	1145	2247	1255	2340	1408	0046	1351	0130	9
10	0910	2221	1047	2239	1252	2342	1353		1444	0145	1423	0223	10
11	1005	2255	1145	2318	1357		1444	0046	1517	0241	1456	0316	11
12	1100	2328	1247		1500	0042	1528	0150	1549	0334	1531	0408	12
13	1155		1352	0001	1556	0147	1607	0251	1621	0427	1609	0502	13
14	1252	0002	1459	0051	1646	0254	1642	0350	1655	0520	1651	0557	14
15	1352	0039	1606	0148	1729	0358	1715	0445	1731	0613	1737	0651	15
16	1456	0119	1708	0252	1808	0500	1748	0539	1810	0708	1828	0745	16
17	1604	0206	1804	0400	1843	0559	1821	0633	1854	0803	1921	0836	17
18	1714	0300	1852	0508	1916	0655	1855	0726	1941	0857	2015	0923	18
19	1821	0402	1934	0613	1949	0749	1933	0821	2033	0950	2110	1005	19
20	1923	0510	2012	0714	2022	0843	2014	0916	2126	1040	2203	1044	20
21	2016	0620	2046	0812	2058	0937	2059	1011	2221	1125	2256	1119	21
22	2102	0728	2119	0907	2137	1031	2148	1105	2316	1207	2349	1152	22
23	2141	0831	2152	1001	2219	1126	2240	1157		1244		1224	23
24	2217	0930	2226	1054	2306	1221	2335	1245	0010	1320	0042	1257	24
25	2250	1026	2302	1148	2356	1314		1330	0103	1353	0137	1332	25
26	2322	1120	2342	1242		1405	0030	1410	0158	1426	0225	1410	26
27	2354	1212		1336	0050	1452	0126	1448	0253	1501	0338	1454	27
28		1304	0026	1430	0146	1536	0221	1523	0352	1538	0445	1546	28
29	0029	1357	0114	1523	0243	1616	0316	1557	0454	1620	0556	1646	29
30	0106	1451	0206	1613	0339	1653	0413	1632	0602	1709	0707	1754	30
31	0147	1545	0302	1659			0511	1708			0812	1906	31

TABLE 29

PORT ALLEN TIDES

JANUARY 1986

21 DEC 54 MIN N, 159 DEG 35 MIN W - HANAPEPE BAY

DATE	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT
1	2351	.3*	0654	1.6	1437	.1	2027	.8
2	0104	.5	0736	1.4	1512	0.0	2148	.9
3	0252	.6	0821	1.2	1551	-.1	2257	1.2
4	0505	.7	0920	.9	1630	-.1	---	---
5	2356	1.5*	0701	.5	1029	.7	1714	-.2
6	0048	1.8	0822	.3	1145	.6	1759	-.2
7	0133	2.0	0921	.3	1254	.4	1844	-.3
8	0219	2.1	1010	.1	1357	.4	1932	-.3
9	0304	2.2	1052	.1	1451	.4	2021	-.3
10	0346	2.2	1130	0.0	1540	.4	2103	-.2
11	0426	2.1	1209	0.0	1630	.5	2149	-.1
12	0505	2.0	1244	0.0	1721	.5	2234	0.0
13	0543	1.9	1318	.1	1816	.6	2319	.2
14	0615	1.6	1350	.1	1919	.7	---	---
15	0015	.3	0647	1.4	1419	.1	2032	.9
16	0124	.6	0722	1.2	1451	.1	2147	1.0
17	0312	.7	0752	.9	1526	.1	2257	1.2
18	0540	.7	0834	.8	1601	.1	---	---
19	2351	1.4*	0750	.5	0945	.6	1645	0.0
20	0038	1.5	0842	.4	1118	.5	1730	0.0
21	0118	1.6	0920	.3	1229	.4	1816	0.0
22	0156	1.8	0949	.3	1326	.4	1858	-.1
23	0231	1.9	1018	.2	1407	.4	1937	-.1
24	0304	2.0	1044	.2	1449	.5	2019	-.2
25	0335	2.0	1111	.1	1525	.5	2054	-.1
26	0407	2.0	1137	.1	1607	.6	2136	-.1
27	0439	1.9	1202	.1	1649	.7	2219	0.0
28	0511	1.8	1227	0.0	1740	.8	2307	.2
29	0539	1.6	1255	0.0	1837	.9	---	---
30	0004	.3	0615	1.4	1325	0.0	1946	1.0
31	0121	.5	0647	1.1	1400	-.1	2102	1.2

* -- TIDE OCCURS ON PREVIOUS DATE.

TABLE 30

PORT ALLEN TIDES

FEBRUARY 1986

21 DEC 54 MIN N, 159 DEG 35 MIN W - HANAPEPE BAY

DATE	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT
1	0314	.6	0729	.9	1442	-.1	2221	1.4
2	0550	.5	0821	.6	1532	-.1	---	---
3	2330	1.6*	0745	.3	1000	.4	1633	-.1
4	0028	1.8	0840	.3	1154	.3	1732	-.1
5	0121	2.0	0919	.1	1310	.4	1835	-.2
6	0208	2.0	0951	.1	1407	.4	1930	-.2
7	0250	2.0	1023	0.0	1453	.5	2019	-.2
8	0329	2.0	1051	0.0	1534	.6	2105	-.2
9	0404	2.0	1119	0.0	1614	.7	2150	-.1
10	0437	1.8	1145	0.0	1656	.9	2232	.1
11	0505	1.6	1209	0.0	1741	.9	2319	.3
12	0534	1.4	1233	0.0	1830	1.0	---	---
13	0013	.3	0558	1.2	1257	.1	1925	1.0
14	0119	.5	0623	.9	1323	.1	2028	1.1
15	0257	.6	0642	.8	1356	.1	2144	1.2
16	1441	.1	2258	1.4	---	---	---	---
17	1540	.1	---	---	---	---	---	---
18	2357	1.4*	0833	.3	1113	.4	1648	.1
19	0045	1.6	0852	.3	1230	.4	1747	.1
20	0126	1.7	0914	.2	1318	.5	1843	0.0
21	0202	1.8	0935	.1	1400	.5	1929	-.1
22	0235	1.9	0957	.1	1436	.7	2014	-.1
23	0307	1.9	1019	0.0	1513	.8	2056	-.1
24	0339	1.8	1041	0.0	1551	.9	2141	-.1
25	0410	1.7	1102	0.0	1637	1.0	2227	.1
26	0439	1.5	1127	-.1	1719	1.2	2321	.2
27	0510	1.3	1153	-.1	1814	1.3	---	---
28	0025	.3	0542	1.0	1225	-.1	1912	1.4

* -- TIDE OCCURS ON PREVIOUS DATE.

TABLE 31

PORT ALLEN TIDES

MARCH 1986

21 DEG 54 MIN N. 159 DEG 35 MIN W - HANAPEPE BAY

DATE	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT
1	0149	.4	0615	.9	1258	-1.1	2026	1.4
2	0356	.5	0653	.6	1344	0.0	2145	1.5
3	0743	.3	0815	.2	1406	.7	2201	.2
4	0102	1.8	0850	.1	1447	.8	2247	.3
5	0147	1.9	0915	0.0	1519	.9	2303	.3
6	0226	1.8	0940	0.0	1555	1.0	2333	.3
7	0301	1.7	1002	0.0	1630	1.1	2377	.2
8	0331	1.6	1024	0.0	1709	1.2	2434	1.3
9	0403	1.4	1042	0.0	1751	1.3	2509	0.0
10	0452	1.1	1119	0.0	1835	1.3	2557	.2
11	0515	.9	1142	0.0	1925	1.3	2611	.4
12	0537	.8	1206	.1	2009	0.0	2659	.3
13	0559	.6	1235	.1	2057	0.0	2711	.3
14	0612	.3	1256	0.0	2100	.2	2757	.3
15	0626	.5	1308	.6	2150	0.0	2805	.3
16	0642	.4	1343	.8	2243	.1	2848	1.6
17	0657	.2	1419	.9	2309	0.0	2897	1.6
18	0711	.4	1457	1.1	2377	.2	2947	1.6
19	0724	.3	1536	1.3	2434	.8	2997	1.6
20	0737	1.5*	1603	.3	2500	0.0	3047	1.6
21	0750	.2	1625	.5	2557	.2	3097	1.6
22	0804	1.6	1650	.6	2611	.4	3147	1.6
23	0817	1.6	1672	.8	2665	.6	3197	1.6
24	0830	1.6	1694	.9	2719	.9	3247	1.6
25	0843	1.4	1716	1.1	2773	1.1	3297	1.6
26	0856	1.3	1738	1.3	2827	1.3	3347	1.6
27	0909	1.1	1760	1.5	2881	1.5	3397	1.6
28	0922	.9	1782	1.7	2935	1.7	3447	1.6
29	0935	.7	1804	1.9	2989	1.9	3497	1.6
30	0948	.5	1826	2.1	3043	2.1	3547	1.6
31	0961	.3	1848	2.3	3097	2.3	3597	1.6

* -- TIDE OCCURS ON PREVIOUS DATE.

TABLE 32

PORT ALLEN TIDES

APRIL 1986

21 DEG 54 MIN N. 159 DEG 35 MIN W - HANAPEPE BAY

DATE	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT
1	0611	.2	0930	.3	1409	.2	2230	1.6
2	0657	.1	1130	.4	1556	.2	2230	1.6
3	0735	1.6*	0729	.1	1633	.5	1725	.2
4	0828	1.6	0801	0.0	1718	.7	1839	.2
5	0913	1.5	0826	0.0	1807	.9	1937	.2
6	1000	1.4	0844	-.1	1896	1.1	2029	.2
7	1047	1.4	0905	-.1	1985	1.2	2115	.2
8	1134	1.2	0921	-.1	2074	1.4	2201	.2
9	1221	1.0	0941	-.1	2163	1.4	2247	.3
10	1308	.9	0959	-.1	2252	1.5	2333	.3
11	1395	.8	1018	0.0	2341	1.5	2333	.3
12	1482	.7	1036	.6	2430	1.5	2333	.3
13	1569	.6	1054	.5	2519	1.5	2333	.3
14	1656	.5	1072	.4	2608	1.4	2333	.3
15	1743	.4	1090	.3	2697	1.4	2333	.3
16	1830	.3	1108	.2	2786	1.4	2333	.3
17	1917	.2	1126	.1	2875	1.4	2333	.3
18	2004	.1	1144	.0	2964	1.4	2333	.3
19	2051	.0	1162	.0	3053	1.4	2333	.3
20	2138	.0	1180	.0	3142	1.4	2333	.3
21	2225	.0	1198	.0	3231	1.4	2333	.3
22	2312	.0	1216	.0	3320	1.4	2333	.3
23	2359	.0	1234	.0	3409	1.4	2333	.3
24	2446	.0	1252	.0	3498	1.4	2333	.3
25	2533	.0	1270	.0	3587	1.4	2333	.3
26	2620	.0	1288	.0	3676	1.4	2333	.3
27	2707	.0	1306	.0	3765	1.4	2333	.3
28	2754	.0	1324	.0	3854	1.4	2333	.3
29	2841	.0	1342	.0	3943	1.4	2333	.3
30	2928	.0	1360	.0	4032	1.4	2333	.3
31	3015	.0	1378	.0	4121	1.4	2333	.3

* -- TIDE OCCURS ON PREVIOUS DATE.

TABLE 33

PORT ALLEN TIDES

MAY 1986

21 DEG 54 MIN N. 159 DEG 35 MIN W - HANAPEPE BAY

DATE	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT
1	0559	0.0	1132	.5	1544	.3	2250	1.5		
2	0634	0.0	1223	.8	1722	.3				
3	2345	1.4*	0700	-1	1306	.9	1839	.3		
4	0027	1.3	0724	-1	1341	1.2	1943	.3		
5	0106	1.1	0745	-1	1413	1.4	2038	.3		
6	0142	.9	0804	-1	1445	1.4	2128	.3		
7	0214	.9	0825	-1	1517	1.6	2216	.3		
8	0245	.7	0845	-1	1546	1.7	2303	.3		
9	0317	.6	0907	-1	1621	1.7				
10	2351	.3*	0945	.5	0929	-1	1656	1.7		
11	0044	.3	0412	.4	0953	0.0	1734	1.7		
12	0142	.3	0459	.3	1018	0.0	1816	1.6		
13	0247	.3	0558	.3	1057	.1	1906	1.6		
14	0350	.2	0728	.3	1135	.2	1957	1.5		
15	0433	.2	0917	.3	1244	.3	2055	1.4		
16	0509	.1	1043	.5	1435	.4	2148	1.4		
17	0537	0.0	1135	.8	1620	.4	2242	1.3		
18	0602	0.0	1220	1.0	1753	.4				
19	2331	1.2*	0627	-1	1259	1.3	1909	.3		
20	0020	1.0	0655	-2	1341	1.5	2018	.3		
21	0105	.9	0724	-3	1423	1.8	2123	.2		
22	0151	.8	0756	-3	1505	2.0	2222	.1		
23	0236	.6	0831	-3	1547	2.0	2321	.1		
24	0325	.5	0907	-3	1635	2.1				
25	0025	.1	0417	.3	0946	-3	1725	2.1		
26	0129	.1	0516	.3	1031	-2	1816	2.0		
27	0231	.1	0632	.3	1120	0.0	1907	1.9		
28	0324	0.0	0807	.3	1219	.2	2003	1.7		
29	0415	0.0	0944	.5	1342	.3	2058	1.5		
30	0456	0.0	1103	.7	1528	.5	2154	1.4		
31	0526	0.0	1155	.9	1712	.5	2242	1.1		

* -- TIDE OCCURS ON PREVIOUS DATE.

TABLE 34

PORT ALLEN TIDES

JUNE 1986

21 DEG 54 MIN N. 159 DEG 35 MIN W - HANAPEPE BAY

DATE	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT
1	0555	-1	1241	1.2	1842	.5				
2	2332	.9*	0621	-1	1316	1.4			1956	.4
3	0017	.9	0647	-1	1353	1.5			2054	.4
4	0055	.7	0711	-1	1425	1.7			2147	.3
5	0137	.6	0737	-1	1457	1.8			2232	.3
6	0216	.5	0802	-1	1530	1.8			2317	.3
7	0251	.4	0830	-1	1604	1.9				
8	2356	.2*	0333	.4	0859	-1			1637	1.9
9	0041	.2	0415	.3	0931	0.0			1714	1.9
10	0123	.2	0501	.3	1003	0.0			1751	1.8
11	0202	.2	0557	.3	1041	.1			1832	1.7
12	0245	.2	0711	.4	1133	.3			1914	1.6
13	0320	.1	0837	.5	1236	.3			1955	1.5
14	0352	.1	0956	.7	1415	.5			2044	1.4
15	0422	0.0	1056	.9	1608	.6			2136	1.2
16	0456	-1	1148	1.3	1754	.6			2232	.9
17	0528	-2	1237	1.5	1925	.4				
18	2328	.8*	0603	-3	1321	1.8			2039	.3
19	0030	.6	0642	-3	1407	2.0			2141	.2
20	0129	.5	0721	-3	1453	2.1			2237	.1
21	0224	.4	0806	-3	1538	2.2			2328	.1
22	0320	.4	0849	-3	1622	2.2				
23	0015	0.0	0416	.4	0934	-2			1709	2.1
24	0104	0.0	0515	.4	1023	-1			1754	2.0
25	0249	0.0	0622	.4	1115	.1			1836	1.9
26	0329	0.0	0737	.6	1214	.3			1922	1.6
27	0308	0.0	0901	.7	1328	.5			2005	1.4
28	0343	0.0	1017	.9	1509	.6			2047	1.2
29	0417	0.0	1116	1.1	1707	.7			2133	.9
30	0447	0.0	1210	1.4	1855	.6			2226	.8

* -- TIDE OCCURS ON PREVIOUS DATE.

TABLE 35

PORT ALLEN TIDES

JULY 1986

21 DEC 54 MIN N, 159 DEG 35 MIN W - HANAPEPE BAY

DATE	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT
1	0519	0.0	1254	1.5	2017	.5	---	---	---	---	---	---
2	2324	.6*	0551	0.0	1329	1.7	2113	.4	---	---	---	---
3	0023	.5	0629	0.0	1404	1.8	2202	.3	---	---	---	---
4	0115	.5	0702	-.1	1439	1.9	2234	.3	---	---	---	---
5	0201	.4	0737	-.1	1514	2.0	2305	.3	---	---	---	---
6	0246	.4	0812	-.1	1546	2.0	---	---	---	---	---	---
7	2341	.2*	0326	.4	0848	0.0	1618	2.0	---	---	---	---
8	0006	.2	0405	.5	0920	0.0	1651	2.0	---	---	---	---
9	0038	.2	0451	.5	1001	.1	1723	1.9	---	---	---	---
10	0110	.2	0543	.6	1043	.2	1755	1.8	---	---	---	---
11	0136	.2	0642	.7	1135	.3	1829	1.6	---	---	---	---
12	0206	.1	0752	.8	1241	.5	1906	1.4	---	---	---	---
13	0235	.1	0904	1.0	1414	.7	1948	1.2	---	---	---	---
14	0311	0.0	1017	1.2	1616	.7	2033	.9	---	---	---	---
15	0350	0.0	1119	1.4	1826	.6	2139	.8	---	---	---	---
16	0435	-.1	1217	1.7	1955	.5	2258	.6	---	---	---	---
17	0525	-.1	1307	2.0	2057	.3	---	---	---	---	---	---
18	0018	.5	0615	-.2	1355	2.1	2150	.2	---	---	---	---
19	0127	.5	0706	-.2	1440	2.2	2225	.2	---	---	---	---
20	0224	.5	0754	-.2	1524	2.3	2307	.1	---	---	---	---
21	0317	.5	0847	-.2	1606	2.2	---	---	---	---	---	---
22	2344	.1*	0409	.6	0935	-.1	1645	2.1	---	---	---	---
23	0019	.1	0501	.7	1021	0.0	1723	2.0	---	---	---	---
24	0049	.1	0554	.8	1113	.2	1802	1.7	---	---	---	---
25	0121	.1	0656	.9	1209	.4	1834	1.5	---	---	---	---
26	0153	.1	0802	1.0	1321	.6	1906	1.3	---	---	---	---
27	0223	.2	0916	1.1	1457	.8	1938	1.0	---	---	---	---
28	0258	.2	1027	1.3	1717	.8	2016	.9	---	---	---	---
29	0337	.2	1126	1.4	1927	.6	2115	.7	---	---	---	---
30	0420	.2	1217	1.6	2039	.5	2249	.6	---	---	---	---
31	0509	.2	1302	1.7	2108	.4	---	---	---	---	---	---

* -- TIDE OCCURS ON PREVIOUS DATE.

TABLE 36

PORT ALLEN TIDES

AUGUST 1986

21 DEC 54 MIN N, 159 DEG 35 MIN W - HANAPEPE BAY

DATE	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT
1	0016	.5	0559	.1	1340	1.9	2136	.3	---	---	---	---
2	0113	.5	0645	.1	1417	1.9	2201	.3	---	---	---	---
3	0157	.6	0727	.1	1450	2.0	2229	.3	---	---	---	---
4	0236	.6	0806	0.0	1522	2.0	2252	.3	---	---	---	---
5	0315	.7	0845	0.0	1551	2.0	2316	.3	---	---	---	---
6	0354	.8	0923	.1	1623	2.0	---	---	---	---	---	---
7	2338	.2*	0436	.9	1005	.2	1651	1.8	---	---	---	---
8	0004	.2	0518	.9	1051	.3	1720	1.6	---	---	---	---
9	0028	.2	0610	1.0	1143	.4	1751	1.4	---	---	---	---
10	0054	.1	0709	1.2	1257	.6	1823	1.3	---	---	---	---
11	0126	.1	0821	1.4	1435	.7	1859	1.0	---	---	---	---
12	0205	.1	0936	1.5	1658	.7	1947	.8	---	---	---	---
13	0254	.1	1050	1.7	1908	.5	2117	.6	---	---	---	---
14	0353	.1	1156	1.9	2014	.4	2213	.5	---	---	---	---
15	0501	.1	1249	2.0	2049	.3	---	---	---	---	---	---
16	0036	.5	0608	0.0	1339	2.1	2124	.3	---	---	---	---
17	0137	.6	0707	0.0	1423	2.2	2155	.2	---	---	---	---
18	0227	.7	0756	0.0	1505	2.1	2226	.2	---	---	---	---
19	0312	.9	0848	0.0	1541	2.0	2253	.2	---	---	---	---
20	0356	.9	0937	.1	1616	2.0	2320	.2	---	---	---	---
21	0438	1.0	1022	.2	1648	1.7	---	---	---	---	---	---
22	2343	.2*	0524	1.1	1111	.3	1717	1.5	---	---	---	---
23	0009	.2	0610	1.2	1206	.5	1742	1.3	---	---	---	---
24	0033	.2	0706	1.3	1313	.7	1807	1.1	---	---	---	---
25	0059	.3	0805	1.4	1455	.8	1835	.9	---	---	---	---
26	0131	.3	0921	1.4	---	---	---	---	---	---	---	---
27	0217	.3	1030	1.5	---	---	---	---	---	---	---	---
28	0319	.3	1135	1.6	2003	.5	2311	.6	---	---	---	---
29	0435	.3	1225	1.7	2029	.4	---	---	---	---	---	---
30	0025	.6	0538	.3	1308	1.8	2050	.3	---	---	---	---
31	0110	.7	0631	.3	1343	1.9	2112	.3	---	---	---	---

* -- TIDE OCCURS ON PREVIOUS DATE.

TABLE 37

PORT ALLEN TIDES

SEPTEMBER 1986

21 DEG 54 MIN N.

159 DEG 35 MIN W - MANAPEPE BAY

DATE	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	DATE	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT
1	0147	.8	0715	.2	1418	2.0	2134	.3	1	0206	1.2	0756	.3	1407	1.7	2052	.2
2	0223	.9	0759	.2	1450	1.9	2155	.3	2	0238	1.4	0844	.3	1439	1.5	2115	.1
3	0258	1.0	0843	.2	1518	1.9	2214	.2	3	0313	1.5	0933	.3	1511	1.4	2135	.1
4	0334	1.1	0925	.2	1547	1.8	2236	.2	4	0355	1.7	1026	.3	1543	1.3	2159	0.0
5	0413	1.3	1012	.3	1615	1.6	2257	.2	5	0437	1.8	1122	.4	1615	1.0	2228	0.0
6	0456	1.4	1103	.3	1645	1.4	2323	.1	6	0521	1.9	1232	.4	1650	.9	2256	.1
7	0547	1.5	1204	.5	1717	1.2	---	---	7	0618	1.9	1358	.5	1729	.7	2332	.1
8	0631	1.6	1235	.6	1749	1.0	---	---	8	0720	1.9	1552	.4	1835	.5	---	---
9	0703	1.7	1320	.7	1826	.8	1826	.8	9	0817	.2	0833	1.9	1828	.4	2050	.5
10	0746	1.8	1402	.8	1903	.6	1939	.6	10	0126	.3	0950	1.9	1823	.3	2300	.6
11	0829	1.9	1456	.9	1941	.4	2209	.5	11	0312	.4	1059	1.9	1858	.3	---	---
12	0912	2.0	1528	1.0	2009	.3	---	---	12	0009	.8	0455	.4	1154	1.8	1927	.2
13	0955	2.1	1606	.3	2042	.2	2042	.2	13	0055	.9	0611	.4	1243	1.8	1953	.2
14	1038	2.2	1659	.4	2110	.2	2110	.2	14	0134	1.1	0714	.3	1325	1.6	2017	.1
15	1121	2.3	1730	.5	2143	.2	2143	.2	15	0212	1.4	0810	.3	1400	1.5	2039	.1
16	1204	2.4	1801	.6	2157	.2	2157	.2	16	0248	1.5	0901	.3	1433	1.4	2057	.1
17	1247	2.5	1853	.7	2218	.2	2218	.2	17	0318	1.6	0951	.3	1501	1.2	2116	.1
18	1330	2.6	1926	.8	2236	.2	2236	.2	18	0354	1.7	1038	.4	1529	1.0	2136	.1
19	1413	2.7	2009	.9	2257	.2	2257	.2	19	0427	1.8	1130	.4	1555	.9	2154	.2
20	1452	2.8	2043	1.0	2318	.3	2318	.3	20	0502	1.8	1225	.5	1623	.8	2216	.2
21	1534	2.9	2124	.1	---	---	---	---	21	0541	1.8	1335	.5	1648	.7	2238	.3
22	1616	3.0	2201	.2	---	---	---	---	22	0629	1.7	1508	.5	1731	.6	2306	.3
23	1658	3.1	2239	.3	---	---	---	---	23	0724	1.7	1634	.4	1903	.5	---	---
24	1740	3.2	2318	.4	---	---	---	---	24	2344	.4*	0827	1.6	1733	.4	2153	.5
25	1822	3.3	2357	.5	1845	.4	2135	.5	25	0050	.4	0931	1.6	1805	.3	2319	.6
26	1904	3.4	2436	.6	1911	.4	---	---	26	0253	.5	1030	1.6	1829	.3	---	---
27	2000	3.5	2500	.7	1936	.5	1936	.5	27	0001	.8	0436	.5	1122	1.6	1851	.2
28	2040	3.6	2540	.8	1953	.6	1953	.6	28	0036	1.0	0554	.5	1207	1.5	1909	.2
29	2057	3.7	2557	.9	2012	.7	2012	.7	29	0108	1.2	0655	.4	1246	1.4	1932	.1
30	0130	1.0	0707	.3	2034	.2	2034	.2	30	0143	1.4	0754	.4	1321	1.4	1954	0.0
31	---	---	---	---	---	---	---	---	31	0219	1.6	0850	.3	1400	1.2	2017	.1

* --- TIDE OCCURS ON PREVIOUS DATE.

* -- TIDE OCCURS ON PREVIOUS DATE.

TABLE 39

PORT ALLEN TIDES
NOVEMBER 1986
21 DEG 54 MIN N, 159 DEG 35 MIN W - HANAPEPE BAY

DATE	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT
1	0257	1.9	0944	.3	1435	1.0	2045	-.1
2	0339	2.0	1043	.3	1514	.9	2113	-.1
3	0421	2.1	1145	.3	1553	.7	2146	-.1
4	0507	2.1	1254	.3	1641	.6	2221	0.0
5	0602	2.1	1414	.3	1737	.5	2302	.1
6	0701	2.0	1536	.3	1912	.4	---	---
7	2353	2.2*	0804	1.9	1639	.3	2121	.5
8	0107	.3	0911	1.8	1728	.2	2302	.7
9	0300	.5	1013	1.7	1803	.1	---	---
10	0001	.9	0450	.6	1109	1.5	1831	.1
11	0043	1.1	0616	.5	1157	1.4	1859	0.0
12	0125	1.4	0725	.5	1239	1.2	1922	0.0
13	0157	1.5	0825	.4	1318	1.1	1945	0.0
14	0229	1.7	0919	.4	1354	.9	2004	0.0
15	0301	1.8	1010	.4	1429	.8	2025	0.0
16	0333	1.9	1056	.3	1500	.7	2049	0.0
17	0408	1.9	1142	.3	1532	.6	2111	0.0
18	0440	1.9	1234	.3	1604	.5	2136	.1
19	0518	1.9	1330	.3	1646	.5	2205	.2
20	0600	1.8	1429	.3	1742	.4	2237	.3
21	0642	1.8	1527	.3	1907	.4	2309	.3
22	0733	1.7	1613	.3	2106	.5	---	---
23	0814	.4	0825	1.6	1645	.3	2233	.7
24	0204	.6	0920	1.4	1713	.2	---	---
25	2324	1.9*	0357	.6	1012	1.4	1739	.1
26	0007	1.1	0537	.6	1101	1.3	1805	0.0
27	0045	1.4	0655	.5	1153	1.1	1831	-.1
28	0121	1.6	0801	.4	1239	.9	1900	-.2
29	0200	1.9	0905	.3	1324	.8	1932	-.2
30	0242	2.0	1002	.3	1411	.7	2007	-.3

* -- TIDE OCCURS ON PREVIOUS DATE.

TABLE 40

PORT ALLEN TIDES
DECEMBER 1986
21 DEG 54 MIN N, 159 DEG 35 MIN W - HANAPEPE BAY

DATE	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT
1	0324	2.2	1101	.2	1459	.6	2044	-.3
2	0409	2.3	1157	.2	1547	.5	2123	-.2
3	0457	2.2	1256	.2	1643	.4	2205	-.1
4	0546	2.1	1353	.2	1752	.4	2250	0.0
5	0637	2.0	1450	.1	1920	.4	---	---
6	2349	2.2*	0730	1.9	1539	.1	2057	.6
7	0105	.4	0823	1.6	1625	.1	2229	.8
8	0248	.6	0917	1.4	1701	0.0	---	---
9	2335	1.0*	0445	.7	1012	1.2	1730	0.0
10	0021	1.3	0626	.6	1108	1.0	1759	0.0
11	0103	1.4	0745	.5	1153	.9	1826	-.1
12	0140	1.6	0852	.4	1242	.7	1855	-.1
13	0215	1.8	0944	.3	1324	.6	1923	-.1
14	0249	1.9	1026	.3	1406	.5	1952	-.1
15	0321	2.0	1108	.3	1445	.5	2020	-.1
16	0352	2.0	1143	.3	1524	.4	2052	0.0
17	0424	2.0	1222	.3	1601	.4	2121	0.0
18	0459	1.9	1301	.3	1646	.4	2153	.1
19	0533	1.9	1339	.2	1737	.4	2231	.2
20	0608	1.9	1415	.2	1844	.5	2311	.3
21	0647	1.6	1450	.2	2001	.6	---	---
22	0009	.4	0726	1.5	1522	.1	2127	.7
23	0135	.6	0809	1.4	1553	.1	2235	.9
24	0332	.7	0856	1.1	1625	0.0	---	---
25	2328	1.2*	0534	.7	0955	.9	1700	-.1
26	0017	1.5	0712	.5	1057	.8	1738	-.2
27	0102	1.8	0826	.4	1203	.6	1818	-.3
28	0147	2.0	0922	.3	1305	.5	1901	-.3
29	0230	2.1	1013	.2	1401	.4	1943	-.3
30	0315	2.3	1103	.1	1455	.4	2029	-.3
31	0400	2.3	1145	0.0	1549	.4	2115	-.3

* -- TIDE OCCURS ON PREVIOUS DATE.

APPENDIX A

HEIGHT OF THE TIDE AT ANY TIME*

The height of the tide at times intermediate to the times of high and low water is needed on occasion, and may be computed by either numerical or graphical methods. One example of each method is presented here, using the predicted tides for a day at Point Mugu.

Problem: Given that the predicted times and heights of the tides are:

Time	Height	Time	Height	Time	Height	Time	Height
0039	4.9	0814	0.2	1510	3.1	1933	2.4

Find the height of the tide at 0300.

Numerical Method

The duration of fall is $08^h 14^m - 00^h 39^m = 7^h 35^m$.

The time after high water for which the height is required is $03^h 00^m - 00^h 39^m = 02^h 21^m$.

The range of tide is $4.9 - 0.2 = 4.7$ feet.

Entering table A-1 at the duration of fall of $7^h 40^m$, which is the nearest value to $7^h 35^m$, the nearest value on the horizontal line to $2^h 21^m$ is $2^h 18^m$ after high water. Following down this column to its intersection with a range of 4.5 feet which is the nearest tabular value to 4.7 feet, one obtains 0.9 which, being calculated from high water, must be subtracted from it. The approximate height at $03^h 00^m$ is, therefore, $4.9 - 0.9 = 4.0$ feet.

When the duration of rise or fall is greater than $10^h 40^m$, enter the table with one-half the given duration and with one-half the time from the nearest high or low water; but if the duration of rise or fall is less than 4 hours, enter the table with double the given duration and with double the time from the nearest high or low water.

*This information is adapted from table 3 of the data source for this publication (see page 1).

Table A-1. Height of the Tide at Any Time

A. m.	Time from the nearest high water or low water															
	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.	A. m.
4 00	0 08	0 16	0 24	0 32	0 40	0 48	0 56	1 04	1 12	1 20	1 28	1 36	1 44	1 52	2 00	2 08
4 20	0 09	0 17	0 25	0 33	0 41	0 49	0 57	1 05	1 13	1 21	1 29	1 37	1 45	1 53	2 01	2 09
4 40	0 09	0 19	0 28	0 37	0 47	0 56	1 05	1 15	1 24	1 33	1 43	1 52	2 01	2 11	2 20	2 29
5 00	0 10	0 20	0 30	0 40	0 50	1 00	1 10	1 20	1 30	1 40	1 50	2 00	2 10	2 20	2 30	2 40
5 20	0 11	0 21	0 32	0 43	0 53	1 04	1 15	1 25	1 36	1 47	1 57	2 08	2 19	2 29	2 40	2 50
5 40	0 11	0 23	0 34	0 45	0 57	1 08	1 19	1 31	1 42	1 53	2 05	2 16	2 27	2 39	2 50	3 00
6 00	0 12	0 24	0 36	0 48	1 00	1 12	1 24	1 36	1 48	2 00	2 12	2 24	2 36	2 48	3 00	3 10
6 20	0 13	0 25	0 38	0 51	1 03	1 16	1 29	1 41	1 54	2 07	2 19	2 32	2 45	2 57	3 10	3 20
6 40	0 13	0 27	0 40	0 53	1 07	1 20	1 33	1 47	2 00	2 13	2 27	2 40	2 53	3 07	3 20	3 30
7 00	0 14	0 28	0 42	0 56	1 10	1 24	1 38	1 52	2 06	2 20	2 34	2 48	3 02	3 16	3 30	3 40
7 20	0 15	0 29	0 44	0 59	1 13	1 28	1 43	1 57	2 12	2 27	2 41	2 56	3 11	3 25	3 40	3 50
7 40	0 15	0 31	0 46	1 01	1 17	1 32	1 47	2 03	2 18	2 33	2 49	3 04	3 19	3 35	3 50	4 00
8 00	0 16	0 32	0 48	1 04	1 20	1 36	1 52	2 08	2 24	2 40	2 56	3 12	3 28	3 44	4 00	4 10
8 20	0 17	0 33	0 50	1 07	1 23	1 40	1 57	2 13	2 30	2 47	3 03	3 20	3 37	3 53	4 10	4 20
8 40	0 17	0 35	0 52	1 09	1 27	1 44	2 01	2 19	2 36	2 53	3 11	3 28	3 45	4 03	4 20	4 30
9 00	0 18	0 36	0 54	1 12	1 30	1 48	2 06	2 24	2 42	3 00	3 18	3 36	3 54	4 12	4 30	4 40
9 20	0 19	0 37	0 56	1 15	1 33	1 52	2 11	2 29	2 48	3 07	3 25	3 44	4 03	4 21	4 40	4 50
9 40	0 19	0 39	0 58	1 17	1 37	1 56	2 15	2 35	2 54	3 13	3 33	3 52	4 11	4 31	4 50	5 00
10 00	0 20	0 40	1 00	1 20	1 40	2 00	2 20	2 40	3 00	3 20	3 40	4 00	4 20	4 40	5 00	5 10
10 20	0 21	0 41	1 02	1 23	1 43	2 04	2 25	2 45	3 06	3 27	3 47	4 08	4 29	4 49	5 10	5 20
10 40	0 21	0 43	1 04	1 25	1 47	2 08	2 29	2 51	3 12	3 33	3 55	4 16	4 37	4 59	5 20	5 30

Ft.	Correction to height															
	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.
0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
1.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5
1.5	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.8
2.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.0
2.5	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.2	1.2
3.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.8	0.9	1.0	1.2	1.3	1.5	1.5
3.5	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.6	0.7	0.9	1.0	1.2	1.4	1.6	1.8	1.8
4.0	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.7	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.0
4.5	0.0	0.0	0.1	0.2	0.3	0.4	0.6	0.7	0.9	1.1	1.3	1.6	1.8	2.0	2.2	2.2
5.0	0.0	0.1	0.1	0.2	0.3	0.5	0.6	0.8	1.0	1.2	1.5	1.7	2.0	2.2	2.5	2.5
5.5	0.0	0.1	0.1	0.2	0.4	0.5	0.7	0.9	1.1	1.4	1.6	1.9	2.2	2.5	2.8	2.8
6.0	0.0	0.1	0.1	0.3	0.4	0.6	0.8	1.0	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.0
6.5	0.0	0.1	0.2	0.3	0.4	0.6	0.8	1.1	1.3	1.6	1.9	2.2	2.6	2.9	3.2	3.2
7.0	0.0	0.1	0.2	0.3	0.5	0.7	0.9	1.2	1.4	1.8	2.1	2.4	2.8	3.1	3.5	3.5
7.5	0.0	0.1	0.2	0.3	0.5	0.7	1.0	1.2	1.5	1.9	2.2	2.6	3.0	3.4	3.8	3.8
8.0	0.0	0.1	0.2	0.3	0.5	0.8	1.0	1.3	1.6	2.0	2.4	2.8	3.2	3.6	4.0	4.0
8.5	0.0	0.1	0.2	0.4	0.6	0.8	1.1	1.4	1.8	2.1	2.5	2.9	3.4	3.8	4.2	4.2
9.0	0.0	0.1	0.2	0.4	0.6	0.9	1.2	1.5	1.9	2.2	2.7	3.1	3.6	4.0	4.5	4.5
9.5	0.0	0.1	0.2	0.4	0.6	0.9	1.2	1.6	2.0	2.4	2.8	3.3	3.8	4.3	4.8	4.8
10.0	0.0	0.1	0.2	0.4	0.7	1.0	1.3	1.7	2.1	2.5	3.0	3.5	4.0	4.5	5.0	5.0
10.5	0.0	0.1	0.3	0.5	0.7	1.0	1.3	1.7	2.2	2.6	3.1	3.6	4.2	4.7	5.2	5.2
11.0	0.0	0.1	0.3	0.5	0.7	1.1	1.4	1.8	2.3	2.8	3.3	3.8	4.4	4.9	5.5	5.5
11.5	0.0	0.1	0.3	0.5	0.8	1.1	1.5	1.9	2.4	2.9	3.4	4.0	4.6	5.1	5.8	5.8
12.0	0.0	0.1	0.3	0.5	0.8	1.1	1.5	2.0	2.5	3.0	3.6	4.1	4.8	5.4	6.0	6.0
12.5	0.0	0.1	0.3	0.5	0.8	1.2	1.6	2.1	2.6	3.1	3.7	4.3	5.0	5.6	6.2	6.2
13.0	0.0	0.1	0.3	0.6	0.9	1.2	1.7	2.2	2.7	3.2	3.9	4.5	5.1	5.8	6.5	6.5
13.5	0.0	0.1	0.3	0.6	0.9	1.3	1.7	2.2	2.8	3.4	4.0	4.7	5.3	6.0	6.8	6.8
14.0	0.0	0.2	0.3	0.6	0.9	1.3	1.8	2.3	2.9	3.5	4.2	4.8	5.5	6.3	7.0	7.0
14.5	0.0	0.2	0.4	0.6	1.0	1.4	1.9	2.4	3.0	3.6	4.3	5.0	5.7	6.5	7.2	7.2
15.0	0.0	0.2	0.4	0.6	1.0	1.4	1.9	2.5	3.1	3.8	4.4	5.2	5.9	6.7	7.5	7.5
15.5	0.0	0.2	0.4	0.7	1.0	1.5	2.0	2.6	3.2	3.9	4.6	5.4	6.1	6.9	7.8	7.8
16.0	0.0	0.2	0.4	0.7	1.1	1.5	2.1	2.6	3.3	4.0	4.7	5.5	6.3	7.2	8.0	8.0
16.5	0.0	0.2	0.4	0.7	1.1	1.6	2.1	2.7	3.4	4.1	4.9	5.7	6.5	7.4	8.2	8.2
17.0	0.0	0.2	0.4	0.7	1.1	1.6	2.2	2.8	3.5	4.2	5.0	5.9	6.7	7.6	8.5	8.5
17.5	0.0	0.2	0.4	0.8	1.2	1.7	2.2	2.9	3.6	4.4	5.2	6.0	6.9	7.8	8.8	8.8
18.0	0.0	0.2	0.4	0.8	1.2	1.7	2.3	3.0	3.7	4.5	5.3	6.2	7.1	8.1	9.0	9.0
18.5	0.1	0.2	0.5	0.8	1.2	1.8	2.4	3.1	3.8	4.6	5.5	6.4	7.3	8.3	9.2	9.2
19.0	0.1	0.2	0.5	0.8	1.3	1.8	2.4	3.1	3.9	4.8	5.6	6.6	7.5	8.5	9.5	9.5
19.5	0.1	0.2	0.5	0.8	1.3	1.9	2.5	3.2	4.0	4.9	5.8	6.7	7.7	8.7	9.8	9.8
20.0	0.1	0.2	0.5	0.9	1.3	1.9	2.6	3.3	4.1	5.0	5.9	6.9	7.9	9.0	10.0	10.0

Obtain from the predictions the high water and low water, one of which is before and the other after the time for which the height is required. The difference between the times of occurrence of these tides is the duration of rise or fall, and the difference between their heights is the range of tide for the above table. Find the difference between the nearest high or low water and the time for which the height is required.

Enter the table with the duration of rise or fall, printed in heavy-faced type, which most nearly agrees with the actual value, and on that horizontal line find the time from the nearest high or low water which agrees most nearly with the corresponding actual difference. The correction sought is in the column directly below, on the line with the range of tide.

When the nearest tide is high water, subtract the correction.

When the nearest tide is low water, add the correction.

Graphical Method

If the height of the tide is required for a number of times on a certain day the full tide curve for the day may be obtained by the *one-quarter, one-tenth rule*. The procedure is as follows:

1. On cross-section paper plot the high and low water points in the order of their occurrence for the day, measuring time horizontally and height vertically. These are the basic points for the curve.
2. Draw light straight lines connecting the points representing successive high and low waters.
3. Divide each of these straight lines into four equal parts. The halfway point of each line gives another point for the curve.
4. At the quarter point adjacent to high water, draw a vertical line above the point, and at the quarter point adjacent to low water, draw a vertical line below the point, making the length of these lines equal to one-tenth of the range between the high and low waters used. The points marking the ends of these vertical lines give two additional intermediate points for the curve.
5. Draw a smooth curve through the points of high and low waters and the intermediate points, making the curve well rounded near high and low waters. This curve will approximate the actual tide curve and heights for any time of the day may be readily scaled from it. The resulting graph is shown in figure A-1.

CAUTION

Both methods presented are based on the assumption that the rise and fall conform to simple cosine curves. Therefore the heights obtained will be approximate. The roughness of approximation will vary as the tide curve differs from a cosine curve.

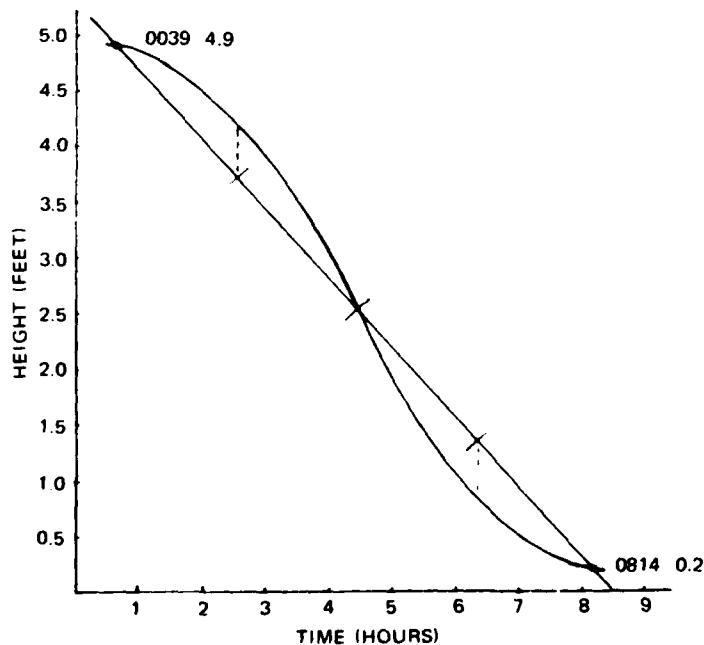


Figure A-1. Tidal Curve for Solution of the Problem.

APPENDIX B

EQUINOXES, SOLSTICES, AND LUNAR PHASES DURING 1986

The dates and times for Vernal and Autumnal Equinoxes and Summer and Winter Solstices during 1986 are listed in the table B-1. The 1986 dates and times for phases of the moon are given in table B-2. Both tables have been calculated for Point Mugu and San Nicolas Island. Two hours must be subtracted for times in the Barking Sands area.

Table B-1. Equinoxes and Solstices, 1986, Point Mugu and San Nicolas Island.

NOTE: All times are Pacific Standard Time; add 1 hour when Daylight Savings Time (PDT) is in effect. Subtract 2 hours for times in the Barking Sands area.

Vernal Equinox	20 March, 1403 PST	Beginning of Spring; day and night of equal length.
Summer Solstice	21 June, 0830 PST	Beginning of Summer; greatest duration of daylight.
Autumnal Equinox	22 September, 1159 PST	Beginning of Autumn; day and night of equal length.
Winter Solstice	21 December, 2002 PST	Beginning of Winter; greatest duration of darkness.

Table B-2. Lunar Phases, 1986, Point Mugu and San Nicolas Island.

NOTE: All times are Pacific Standard Time; add 1 hour when Daylight Savings Time (PDT) is in effect. Subtract 2 hours for times in the Barking Sands area.

Phase	January		February		March		April	
	Date	Time	Date	Time	Date	Time	Date	Time
Last Quarter	03	1147	01	2241	03	0417	01	1130
New Moon	10	0422	08	1655	10	0652	08	2208
First Quarter	17	1413	16	1155	18	0839	17	0235
Full Moon	25	1631	24	0702	25	1902	24	0446
Last Quarter	--	----	--	----	--	----	30	1922
Phase	May		June		July		August	
	Date	Time	Date	Time	Date	Time	Date	Time
New Moon	08	1410	07	0600	07	2055	05	1036
First Quarter	16	1700	15	0400	14	1210	12	1821
Full Moon	23	1245	21	1942	21	0240	19	1054
Last Quarter	30	0455	28	1653	28	0734	27	0038
Phase	September		October		November		December	
	Date	Time	Date	Time	Date	Time	Date	Time
New Moon	03	2310	03	1055	01	2202	01	0843
First Quarter	10	2341	10	0528	08	1311	08	0001
Full Moon	17	2134	17	1122	16	0412	15	2304
Last Quarter	25	1917	25	1426	24	0850	24	0117
New Moon	--	----	--	----	--	----	30	1910

Because the earth's period of revolution about the sun ($365.24 +$ days) is not evenly divisible by the moon's period of revolution about the earth ($27.32 +$ days), the dates and times of lunar phases, moonrise and moonset, and tidal data must be recomputed for each year. The following information, however, is based on geometrical relationships and holds true for all times:

1. The New Moon rises at sunrise, crosses the meridian at noon, and sets at sunset.
2. The First Quarter Moon rises at noon, crosses the meridian at sunset, and sets at midnight.
3. The Full Moon rises at sunset, crosses the meridian at midnight, and sets at sunrise.
4. The Last Quarter Moon rises at midnight, crosses the meridian at sunrise, and sets at noon.

APPENDIX C
SUNRISE AND SUNSET TABLES

Sunrise, Sunset, and Duration of Twilight for Point Mugu, CA
34°07' N, 119°07' W

Note: All times are Pacific Standard Time (120th meridian); add 1 hour when Daylight Savings Time is in effect.

Date	January		February		March		April		May		June		Date
	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	
1	0702	1658	0654	1727	0626	1753	0544	1817	0507	1840	0446	1903	1
2	0703	1659	0653	1728	0624	1753	0543	1818	0506	1841	0446	1903	2
3	0703	1700	0652	1729	0623	1754	0541	1819	0505	1842	0445	1904	3
4	0703	1700	0652	1730	0622	1755	0540	1819	0504	1843	0445	1904	4
5	0703	1701	0651	1731	0621	1756	0539	1820	0503	1843	0445	1905	5
6	0703	1702	0650	1732	0619	1757	0537	1821	0502	1844	0445	1905	6
7	0703	1703	0649	1733	0618	1758	0536	1822	0502	1845	0445	1906	7
8	0703	1704	0648	1734	0617	1758	0535	1822	0501	1846	0444	1906	8
9	0703	1705	0647	1734	0615	1759	0533	1823	0500	1846	0444	1907	9
10	0703	1705	0647	1735	0614	1800	0532	1824	0459	1847	0444	1907	10
11	0703	1706	0646	1736	0613	1801	0531	1825	0458	1848	0444	1908	11
12	0703	1707	0645	1737	0611	1802	0530	1825	0457	1849	0444	1908	12
13	0703	1708	0644	1738	0610	1802	0528	1826	0456	1849	0444	1909	13
14	0702	1709	0643	1739	0609	1803	0527	1827	0456	1850	0444	1909	14
15	0702	1710	0642	1740	0607	1804	0526	1828	0455	1851	0444	1909	15
16	0702	1711	0641	1741	0606	1805	0525	1829	0454	1852	0444	1910	16
17	0702	1712	0640	1742	0605	1806	0523	1829	0453	1852	0444	1910	17
18	0701	1713	0638	1743	0603	1806	0522	1830	0453	1853	0445	1910	18
19	0701	1714	0637	1744	0602	1807	0521	1831	0452	1854	0445	1911	19
20	0701	1715	0636	1745	0601	1808	0520	1832	0451	1855	0445	1911	20
21	0700	1716	0635	1746	0559	1809	0518	1832	0451	1855	0445	1911	21
22	0700	1717	0634	1747	0558	1809	0517	1833	0450	1856	0445	1911	22
23	0659	1718	0633	1747	0556	1810	0516	1834	0450	1857	0446	1911	23
24	0659	1719	0632	1748	0555	1811	0515	1835	0449	1857	0446	1912	24
25	0658	1720	0630	1749	0554	1812	0514	1835	0449	1858	0446	1912	25
26	0658	1721	0629	1750	0552	1813	0513	1836	0448	1859	0446	1912	26
27	0657	1722	0628	1751	0551	1813	0512	1837	0448	1900	0447	1912	27
28	0657	1723	0627	1752	0550	1814	0511	1838	0447	1900	0447	1912	28
29	0656	1724	0626	1752	0548	1815	0509	1839	0447	1901	0447	1912	29
30	0655	1725			0547	1816	0508	1839	0447	1901	0448	1912	30
31	0655	1726			0546	1816			0446	1902			31
	Average twilight Civil: 27 min. Nautical: 38 min.		Average twilight Civil: 26 min. Nautical: 35 min.		Average twilight Civil: 25 min. Nautical: 34 min.		Average twilight Civil: 24 min. Nautical: 37 min.		Average twilight Civil: 23 min. Nautical: 31 min.		Average twilight Civil: 29 min. Nautical: 45 min.		
Date	July		August		September		October		November		December		Date
	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	
1	0448	1912	0507	1858	0530	1823	0551	1741	0616	1704	0644	1647	1
2	0449	1912	0508	1857	0530	1821	0551	1740	0617	1703	0645	1647	2
3	0449	1912	0509	1856	0531	1820	0552	1738	0618	1702	0646	1647	3
4	0450	1912	0510	1855	0532	1819	0553	1737	0619	1701	0646	1647	4
5	0450	1912	0510	1854	0532	1817	0554	1736	0620	1700	0647	1647	5
6	0451	1911	0511	1853	0533	1816	0554	1734	0621	1659	0648	1647	6
7	0451	1911	0512	1852	0534	1815	0555	1733	0621	1658	0649	1647	7
8	0452	1911	0512	1851	0535	1813	0556	1732	0622	1658	0650	1647	8
9	0452	1911	0513	1850	0535	1812	0557	1730	0623	1657	0650	1647	9
10	0453	1910	0514	1849	0536	1810	0557	1729	0624	1656	0651	1647	10
11	0453	1910	0515	1848	0537	1809	0558	1728	0625	1655	0652	1647	11
12	0454	1910	0515	1847	0537	1808	0559	1726	0626	1655	0653	1648	12
13	0454	1909	0516	1846	0538	1806	0600	1725	0627	1654	0653	1648	13
14	0455	1909	0517	1845	0539	1805	0601	1724	0628	1653	0654	1648	14
15	0456	1909	0518	1844	0539	1803	0601	1723	0629	1653	0655	1648	15
16	0456	1908	0518	1843	0540	1802	0602	1721	0630	1652	0655	1649	16
17	0457	1908	0519	1841	0541	1801	0603	1720	0631	1652	0656	1649	17
18	0458	1907	0520	1840	0541	1759	0604	1719	0632	1651	0657	1650	18
19	0458	1907	0520	1839	0542	1758	0605	1718	0633	1651	0657	1650	19
20	0459	1906	0521	1838	0543	1756	0606	1717	0634	1650	0658	1650	20
21	0500	1906	0522	1837	0544	1755	0606	1715	0635	1650	0658	1651	21
22	0500	1905	0523	1835	0544	1754	0607	1714	0636	1649	0659	1651	22
23	0501	1904	0523	1834	0545	1752	0608	1713	0637	1649	0659	1652	23
24	0502	1904	0524	1833	0546	1751	0609	1712	0637	1649	0700	1653	24
25	0502	1903	0525	1832	0546	1749	0610	1711	0638	1648	0700	1653	25
26	0503	1902	0525	1830	0547	1748	0611	1710	0639	1648	0700	1654	26
27	0504	1902	0526	1829	0548	1747	0611	1709	0640	1648	0701	1654	27
28	0504	1901	0527	1828	0549	1745	0612	1708	0641	1647	0701	1655	28
29	0505	1900	0528	1827	0549	1744	0613	1707	0642	1647	0702	1655	29
30	0506	1859	0528	1825	0550	1742	0614	1706	0643	1647	0702	1656	30
31	0507	1858	0529	1824			0615	1705			0702	1657	31
	Average twilight Civil: 29 min. Nautical: 43 min.		Average twilight Civil: 26 min. Nautical: 38 min.		Average twilight Civil: 25 min. Nautical: 35 min.		Average twilight Civil: 25 min. Nautical: 34 min.		Average twilight Civil: 27 min. Nautical: 37 min.		Average twilight Civil: 28 min. Nautical: 39 min.		

Retain for use in future years. These data valid through 2026.

Sunrise, Sunset, and Duration of Twilight for Barking Sands, Kauai, HI
22°02' N, 159°47' W

Note: All times are Alaska-Hawaii Standard Time (150th Meridian).

Date	January		February		March		April		May		June		Date
	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	
1	0718	1807	0718	1828	0700	1843	0632	1854	0607	1905	0555	1919	1
2	0719	1808	0717	1829	0659	1843	0631	1855	0607	1906	0555	1919	2
3	0719	1809	0717	1830	0659	1844	0630	1855	0606	1906	0555	1920	3
4	0719	1809	0716	1830	0658	1844	0629	1855	0606	1906	0555	1920	4
5	0719	1810	0716	1831	0657	1845	0628	1856	0605	1907	0555	1920	5
6	0720	1811	0715	1831	0656	1845	0627	1856	0604	1907	0555	1921	6
7	0720	1811	0715	1832	0655	1846	0627	1856	0604	1908	0555	1921	7
8	0720	1812	0714	1833	0654	1846	0626	1857	0603	1908	0555	1921	8
9	0720	1813	0714	1833	0653	1846	0625	1857	0603	1909	0555	1922	9
10	0720	1813	0713	1834	0653	1847	0624	1857	0602	1909	0555	1922	10
11	0720	1814	0713	1834	0652	1847	0623	1858	0602	1909	0555	1922	11
12	0721	1815	0712	1835	0651	1847	0622	1858	0601	1910	0555	1923	12
13	0721	1815	0712	1835	0650	1848	0621	1858	0601	1910	0555	1923	13
14	0721	1816	0711	1836	0649	1848	0620	1859	0600	1911	0555	1923	14
15	0721	1817	0710	1836	0648	1848	0620	1859	0600	1911	0555	1924	15
16	0721	1818	0710	1837	0647	1849	0619	1859	0559	1912	0555	1924	16
17	0721	1818	0709	1837	0646	1849	0618	1900	0559	1912	0556	1924	17
18	0721	1819	0709	1838	0645	1850	0617	1900	0559	1913	0556	1925	18
19	0721	1820	0708	1838	0644	1850	0616	1900	0558	1913	0556	1925	19
20	0720	1820	0707	1839	0643	1850	0615	1901	0558	1914	0556	1925	20
21	0720	1821	0706	1839	0642	1851	0615	1901	0558	1914	0556	1925	21
22	0720	1822	0706	1840	0641	1851	0614	1902	0557	1914	0557	1925	22
23	0720	1822	0705	1840	0641	1851	0613	1902	0557	1915	0557	1926	23
24	0720	1823	0704	1841	0640	1852	0612	1902	0557	1915	0557	1926	24
25	0720	1824	0703	1841	0639	1852	0612	1903	0557	1916	0557	1926	25
26	0719	1824	0703	1842	0638	1852	0611	1903	0556	1916	0558	1926	26
27	0719	1825	0702	1842	0637	1853	0610	1904	0556	1917	0558	1926	27
28	0719	1826	0701	1843	0636	1853	0609	1904	0556	1917	0558	1926	28
29	0719	1826	0701	1843	0635	1853	0609	1904	0556	1917	0558	1926	29
30	0718	1827			0634	1854	0608	1905	0555	1918	0559	1927	30
31	0718	1828			0633	1854			0555	1918			31
	Average twilight Civil: 24 min. Nautical: 31 min.		Average twilight Civil: 23 min. Nautical: 49 min.		Average twilight Civil: 22 min. Nautical: 48 min.		Average twilight Civil: 23 min. Nautical: 30 min.		Average twilight Civil: 24 min. Nautical: 33 min.		Average twilight Civil: 25 min. Nautical: 33 min.		
Date	July		August		September		October		November		December		Date
	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	
1	0559	1927	0611	1919	0622	1856	0630	1827	0643	1802	0702	1755	1
2	0559	1927	0612	1919	0622	1855	0631	1826	0643	1802	0702	1755	2
3	0600	1927	0612	1918	0623	1854	0631	1825	0644	1801	0703	1755	3
4	0600	1927	0612	1918	0623	1853	0631	1824	0645	1801	0703	1755	4
5	0600	1927	0613	1917	0623	1852	0632	1823	0645	1800	0704	1755	5
6	0601	1927	0613	1916	0623	1851	0632	1822	0646	1800	0705	1756	6
7	0601	1927	0614	1916	0624	1850	0632	1821	0646	1759	0705	1756	7
8	0602	1927	0614	1915	0624	1849	0633	1820	0647	1759	0706	1756	8
9	0602	1926	0614	1914	0624	1848	0633	1819	0647	1758	0707	1756	9
10	0602	1926	0615	1914	0625	1847	0633	1819	0648	1758	0707	1757	10
11	0603	1926	0615	1913	0625	1846	0634	1818	0649	1758	0708	1757	11
12	0603	1926	0616	1912	0625	1845	0634	1817	0649	1757	0709	1757	12
13	0603	1926	0616	1912	0625	1844	0634	1816	0650	1757	0709	1758	13
14	0604	1926	0616	1911	0626	1843	0635	1815	0650	1757	0710	1758	14
15	0604	1926	0617	1910	0626	1842	0635	1814	0651	1756	0710	1758	15
16	0605	1925	0617	1909	0626	1841	0636	1813	0652	1756	0711	1759	16
17	0605	1925	0617	1909	0626	1840	0636	1813	0652	1756	0712	1759	17
18	0606	1925	0618	1908	0627	1839	0636	1812	0653	1756	0712	1800	18
19	0606	1925	0618	1907	0627	1838	0637	1811	0654	1755	0713	1800	19
20	0606	1924	0618	1906	0627	1837	0637	1810	0654	1755	0713	1800	20
21	0607	1924	0619	1905	0628	1836	0638	1810	0655	1755	0714	1801	21
22	0607	1924	0619	1905	0628	1836	0638	1809	0656	1755	0714	1801	22
23	0608	1923	0619	1904	0628	1835	0639	1808	0656	1755	0715	1802	23
24	0608	1923	0620	1903	0628	1834	0639	1807	0657	1755	0715	1803	24
25	0608	1922	0620	1902	0629	1833	0639	1807	0658	1755	0716	1803	25
26	0609	1922	0620	1901	0629	1832	0640	1806	0658	1755	0716	1804	26
27	0609	1922	0621	1900	0629	1831	0640	1805	0659	1755	0716	1804	27
28	0610	1921	0621	1859	0630	1830	0641	1805	0700	1755	0717	1805	28
29	0610	1921	0621	1859	0630	1829	0641	1804	0700	1755	0717	1805	29
30	0610	1920	0621	1858	0630	1828	0642	1803	0701	1755	0718	1806	30
31	0611	1920	0622	1857			0642	1803			0718	1807	31
	Average twilight Civil: 25 min. Nautical: 34 min.		Average twilight Civil: 23 min. Nautical: 30 min.		Average twilight Civil: 22 min. Nautical: 48 min.		Average twilight Civil: 23 min. Nautical: 49 min.		Average twilight Civil: 24 min. Nautical: 31 min.		Average twilight Civil: 25 min. Nautical: 32 min.		

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