AD-A149 733 TIDAL AND LUNAR DATA FOR POINT MUGU SAN NICOLAS ISLAND AND THE BARKING SANDS AREA DURING 1985(U) PACIFIC MISSILE TEST CENTER POINT MUGU CA R DIXON 31 DEC 84 1/2

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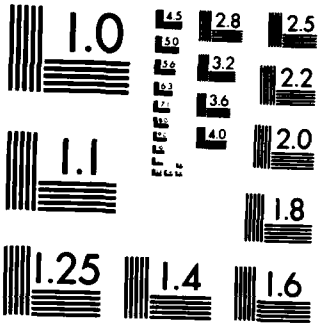

Technical Publication TP000029

TIDAL AND LUNAR DATA FOR POINT MUGU, SAN NICOLAS ISLAND AND THE BARKING SANDS AREA DURING 1985

Compiled by

RICH DIXON
Geophysics Division

31 December 1984

PACIFIC MISSILE TEST CENTER

Point Mugu, California 93042-5000

PACIFIC MISSILE TEST CENTER

AN ACTIVITY OF THE NAVAL AIR SYSTEMS COMMAND

Mr. J.S. Rosenthal, Head, Geophysical Sciences Branch; and **CDR F. M. Reynolds,** Geophysics Officer, have approved this report for publication.

Dr. K. I. LICHTI
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20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

Basic lunar and tidal data for Point Mugu, San Nicolas Island, and the Barking Sands area during 1985 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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CONTENTS

CONTENTS (Concluded)

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 1985.

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, permament 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, 1985.*

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, 1985. Washington, D.C., GPO, 1984.

**When Daylight Savings Time (PDT) is in effect, 1 hour is to be added to the times given. In 1985, Pacific Daylight Time is scheduled to commence at 0200 PST on Sunday, 28 April (add 1 hour), and to end at 0200 PDT on Sunday, 27 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 1985 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 1985 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 1985 will be found in appendix B.

Table 3. Moonrise and Moonset, Point Mugu, California, 1985.

Date	January		February		March		April		May		June		Date
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	
1	1306	0155	1331	0340	1210	0226	1410	0338	1520	0319	1748	0328	1
2	1337	0252	1426	0440	1308	0323	1521	0416	1631	0351	1903	0410	2
3	1412	0353	1528	0538	1413	0416	1633	0451	1745	0423	2015	0459	3
4	1455	0455	1637	0629	1523	0504	1745	0523	1900	0458	2119	0556	4
5	1545	0557	1748	0714	1635	0546	1859	0556	2016	0537	2214	0700	5
6	1643	0656	1900	0753	1748	0623	2013	0629	2129	0622	2258	0807	6
7	1748	0751	2011	0828	1900	0657	2128	0706	2237	0716	2335	0913	7
8	1857	0839	2121	0901	2012	0729	2241	0748	2335	0815	.....	1016	8
9	2007	0920	2230	0932	2124	0801	2349	0836	.....	0919	0006	1116	9
10	2116	0957	2339	1003	2236	0835	.....	0930	0023	1024	0033	1213	10
11	2224	1029	.....	1037	2347	0913	0051	1030	0103	1127	0058	1309	11
12	2331	1100	0048	1115	.....	0956	0143	1132	0136	1228	0122	1404	12
13	.....	1130	0156	1159	0056	1044	0226	1235	0204	1325	0146	1500	13
14	0038	1202	0302	1249	0159	1139	0302	1336	0230	1421	0212	1557	14
15	0146	1237	0403	1345	0256	1238	0333	1435	0254	1516	0241	1655	15
16	0255	1316	0458	1445	0344	1340	0401	1532	0318	1611	0314	1755	16
17	0403	1402	0544	1547	0425	1442	0426	1627	0343	1707	0353	1855	17
18	0509	1454	0623	1649	0459	1542	0450	1722	0410	1805	0439	1952	18
19	0610	1553	0657	1750	0529	1640	0514	1817	0440	1904	0532	2045	19
20	0702	1655	0726	1848	0556	1737	0539	1914	0515	2003	0632	2132	20
21	0747	1759	0752	1944	0621	1833	0607	2011	0556	2102	0736	2214	21
22	0825	1901	0817	2039	0645	1928	0638	2110	0643	2158	0842	2250	22
23	0857	2000	0841	2134	0709	2023	0715	2210	0738	2249	0949	2322	
24	0925	2058	0907	2230	0736	2120	0757	2307	0839	2333	1055	2352	24
25	0951	2153	0934	2327	0804	2218	0847	.....	0943	.....	1201	.....	25
26	1015	2248	1004	.....	0837	2317	0944	0001	1049	0013	1308	0021	26
27	1040	2343	1039	0026	0916	.....	1046	0051	1156	0048	1417	0051	27
28	1106	.....	1121	0126	1001	0016	1152	0134	1303	0119	1528	0124	28
29	1134	0040	.....	.....	1054	0113	1301	0213	1411	0149	1641	0202	29
30	1207	0138	.....	.....	1154	0207	1410	0247	1521	0220	1754	0247	30
31	1245	0239	.....	.....	1300	0255	.....	.....	1634	0252	.....	.....	31

Date	July		August		September		October		November		December		Date
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	
1	1901	0340	2001	0543	1951	0734	1910	0815	1938	1000	2021	1029	1
2	2000	0441	2032	0647	2016	0830	1941	0912	2029	1055	2124	1109	2
3	2049	0547	2100	0749	2041	0926	2015	1011	2127	1145	2228	1145	3
4	2130	0654	2125	0847	2109	1023	2056	1109	2228	1230	2332	1217	4
5	2204	0800	2149	0944	2141	1121	2143	1206	2333	1310	.....	1246	5
6	2233	0903	2214	1040	2218	1220	2237	1300	.....	1345	0037	1315	6
7	2259	1002	2241	1136	2302	1319	2338	1350	0039	1417	0144	1344	7
8	2324	1059	2310	1234	2353	1416	.....	1434	0146	1447	0253	1416	8
9	2348	1155	2344	1332	.....	1509	0043	1513	0254	1517	0405	1452	9
10	.....	1250	.....	1431	0051	1558	0150	1548	0405	1548	0521	1535	10
11	0014	1347	0024	1530	0156	1641	0259	1620	0518	1623	0638	1627	11
12	0041	1445	0112	1627	0304	1718	0409	1651	0634	1703	0751	1729	12
13	0113	1544	0207	1720	0413	1752	0520	1722	0752	1751	0856	1837	13
14	0149	1644	0309	1806	0524	1824	0633	1755	0907	1848	0950	1948	14
15	0232	1743	0416	1847	0634	1855	0747	1832	1015	1951	1034	2057	15
16	0323	1838	0525	1923	0744	1926	0903	1915	1113	2059	1110	2202	16
17	0421	1928	0634	1955	0856	2000	1018	2006	1200	2207	1140	2304	17
18	0525	2012	0743	2026	1009	2038	1128	2104	1239	2313	1206	.....	18
19	0632	2050	0851	2056	1122	2123	1229	2207	1311	.....	1231	0002	19
20	0740	2124	1000	2127	1232	2214	1321	2313	1338	0014	1255	0059	20
21	0847	2155	1110	2201	1337	2313	1403	.....	1404	0113	1320	0155	21
22	0954	2224	1220	2240	1434	.....	1438	0018	1428	0210	1347	0251	22
23	1101	2254	1331	2326	1521	0016	1508	0121	1452	0306	1417	0349	23
24	1208	2325	1439	.....	1601	0121	1534	0221	1517	0402	1452	0447	24
25	1318	.....	1541	0019	1635	0225	1559	0319	1545	0458	1533	0546	25
26	1428	0001	1636	0119	1703	0328	1623	0416	1616	0556	1620	0643	26
27	1539	0042	1722	0224	1730	0427	1647	0511	1653	0655	1715	0737	27
28	1647	0130	1800	0330	1754	0525	1713	0608	1736	0754	1814	0826	28
29	1748	0227	1832	0434	1818	0622	1742	0705	1825	0850	1917	0909	29
30	1841	0330	1901	0536	1843	0718	1815	0803	1921	0942	2021	0947	30
31	1925	0436	1926	0636			1853	0902			2125	1019	31

TABLE 4

POINT MUGU TIDES
JANUARY 1985
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
1	0512	4.3	1238	.9	1839	3.0	2308	2.1
2	0544	5.1	1317	.4	1934	3.2	2354	2.3
3	0618	5.4	1352	-.1	2016	3.3	----	---
4	0033	2.3	0652	5.7	1424	-.6	2054	3.4
5	0114	2.3	0726	6.0	1501	-.9	2130	3.5
6	0153	2.3	0803	6.1	1537	-1.1	2206	3.6
7	0232	2.2	0839	6.2	1613	-1.2	2243	3.6
8	0314	2.2	0921	6.2	1651	-1.2	2323	3.7
9	0359	2.2	1004	6.0	1731	-1.0	----	---
10	0005	3.8	0454	2.2	1049	5.6	1813	-.6
11	0050	4.0	0600	2.2	1142	4.9	1855	-.1
12	0136	4.3	0724	2.1	1250	4.1	1941	.5
13	0228	4.6	0902	1.7	1421	3.4	2030	1.1
14	0322	4.9	1035	1.2	1613	3.0	2130	1.6
15	0418	5.3	1151	.4	1758	3.1	2234	2.0
16	0511	5.7	1250	-.3	1913	3.3	2337	2.2
17	0601	6.0	1340	-.9	2009	3.5	----	---
18	0036	2.2	0650	6.1	1424	-1.2	2054	3.6
19	0123	2.2	0732	6.2	1502	-1.2	2130	3.7
20	0208	2.1	0814	6.2	1538	-1.2	2206	3.8
21	0250	2.0	0853	6.1	1614	-1.1	2238	3.8
22	0329	2.0	0929	5.9	1646	-.8	2312	3.8
23	0408	2.0	1004	5.5	1718	-.5	2345	3.8
24	0451	2.0	1039	5.0	1750	0.0	----	---
25	0016	3.9	0536	2.1	1117	4.4	1818	.5
26	0052	3.9	0632	2.1	1200	3.7	1844	1.0
27	0131	3.9	0751	2.1	1256	3.2	1915	1.5
28	0216	4.0	0941	1.9	1438	2.6	1947	2.0
29	0307	4.2	1116	1.4	1729	2.5	2039	2.4
30	0406	4.4	1216	.9	1904	2.8	2205	2.6
31	0500	4.7	1258	.3	1946	3.1	2325	2.6

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

TABLE 5

SAN NICOLAS ISLAND TIDES
JANUARY 1985
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
1	0530	4.4	1237	.8	1857	2.7	2307	1.9
2	0602	4.7	1316	.4	1952	2.9	2353	2.1
3	0636	4.9	1351	-.1	2034	3.0	----	---
4	0032	2.1	0710	5.2	1423	-.5	2112	3.1
5	0113	2.1	0744	5.5	1500	-.8	2148	3.2
6	0152	2.1	0821	5.6	1536	-1.0	2224	3.3
7	0231	2.0	0857	5.7	1612	-1.1	2301	3.3
8	0313	2.0	0939	5.7	1650	-1.1	2341	3.4
9	0358	2.0	1022	5.5	1730	-.9	----	---
10	0023	3.5	0453	2.0	1107	5.1	1812	-.5
11	0108	3.7	0559	2.0	1200	4.5	1854	-.1
12	0154	4.0	0723	1.9	1308	3.8	1940	.4
13	0246	4.2	0901	1.6	1439	3.1	2029	1.0
14	0340	4.5	1034	1.1	1631	2.7	2129	1.5
15	0436	4.8	1150	.4	1816	2.8	2233	1.8
16	0529	5.2	1249	-.3	1931	3.0	2336	2.0
17	0619	5.5	1339	-.8	2027	3.2	----	---
18	0035	2.0	0708	5.6	1423	-1.1	2112	3.3
19	0122	2.0	0750	5.7	1501	-1.1	2148	3.4
20	0207	1.9	0832	5.7	1537	-1.1	2224	3.5
21	0249	1.8	0911	5.6	1613	-1.0	2256	3.5
22	0328	1.8	0947	5.4	1645	-.7	2330	3.5
23	0407	1.8	1022	5.0	1717	-.4	0003	3.5*
24	0450	1.8	1057	4.6	1749	0.0	----	---
25	0034	3.6	0535	1.9	1135	4.0	1817	.4
26	0110	3.6	0631	1.9	1218	3.4	1843	.9
27	0149	3.6	0750	1.9	1314	2.9	1914	1.4
28	0234	3.7	0940	1.8	1456	2.4	1946	1.8
29	0325	3.9	1115	1.3	1747	2.3	2038	2.2
30	0424	4.0	1215	.8	1922	2.6	2204	2.4
31	0518	4.3	1257	.3	2004	2.8	2324	2.4

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

TABLE 6

POINT MUGU TIDES
FEBRUARY 1985
34 DEG 06 MIN N. 119 DEG 06 MIN W - U.S. NAVY PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0548	5.1	1335	- 3	2014	3.3	----	---
2	0020	2.5	0631	5.6	1408	- .7	2040	3.5
3	0107	2.3	0713	6.0	1440	-1.1	2108	3.6
4	0148	2.0	0752	6.2	1517	-1.2	2136	3.8
5	0230	1.7	0835	6.3	1549	-1.3	2209	4.1
6	0314	1.5	0916	6.2	1623	-1.2	2240	4.3
7	0402	1.3	1000	5.9	1659	- .9	2315	4.5
8	0456	1.2	1047	5.3	1734	- .3	2354	4.7
9	0554	1.2	1139	4.5	1810	.4	----	---
10	0036	4.8	0707	1.1	1248	3.6	1848	1.1
11	0129	4.9	0836	1.0	1425	3.0	1937	1.7
12	0230	4.9	1023	.6	1648	2.7	2046	2.3
13	0342	5.1	1145	0.0	1833	3.0	2223	2.5
14	0454	5.3	1246	- .5	1932	3.4	2349	2.5
15	0556	5.5	1335	- .8	2011	3.6	----	---
16	0047	2.3	0646	5.7	1413	-1.0	2042	3.8
17	0133	2.0	0730	5.9	1445	-1.1	2108	3.9
18	0212	1.7	0809	5.9	1517	-1.0	2133	4.0
19	0247	1.5	0844	5.8	1545	- .8	2158	4.1
20	0321	1.3	0916	5.5	1611	- .5	2220	4.2
21	0356	1.3	0948	5.1	1633	- .1	2245	4.2
22	0430	1.2	1020	4.7	1657	.4	2307	4.2
23	0507	1.2	1055	4.1	1715	.8	2332	4.2
24	0552	1.3	1132	3.6	1734	1.3	2358	4.2
25	0648	1.4	1219	2.9	1749	1.7	----	---
26	0033	4.1	0811	1.4	1357	2.4	1744	2.2
27	0123	4.1	1014	1.2	----	---	----	---
28	0243	4.1	1140	.8	----	---	----	---

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

TABLE 7

SAN NICOLAS ISLAND TIDES
FEBRUARY 1985
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
1	0606	4.7	1334	- 3	2032	3.4	----	---
2	0019	2.3	0649	5.1	1407	.6	2058	3.5
3	0106	2.1	0731	5.5	1439	-1.0	2126	3.3
4	0147	1.8	0810	5.7	1516	-1.1	2154	3.5
5	0229	1.6	0853	5.8	1548	-1.2	2227	3.8
6	0313	1.4	0934	5.7	1622	-1.1	2258	4.0
7	0401	1.2	1018	5.4	1658	- .8	2333	4.1
8	0455	1.1	1105	4.8	1743	- .3	0012	4.3*
9	0553	1.1	1157	4.1	1809	.4	----	---
10	0054	4.4	0706	1.0	1306	3.3	1847	1.0
11	0147	4.5	0835	.9	1443	2.7	1936	1.6
12	0248	4.5	1022	.5	1706	2.5	2045	2.1
13	0400	4.7	1144	0.0	1851	2.7	2222	2.3
14	0512	4.8	1245	- .4	1950	3.1	2347	2.3
15	0614	5.0	1334	- .7	2029	3.3	----	---
16	0046	2.1	0704	5.2	1412	- .9	2100	3.5
17	0132	1.8	0748	5.4	1444	-1.0	2126	3.6
18	0211	1.6	0827	5.4	1516	- .9	2151	3.7
19	0246	1.4	0902	5.3	1544	- .7	2216	3.8
20	0320	1.2	0934	5.0	1610	- .4	2238	3.9
21	0355	1.2	1006	4.7	1632	- .1	2303	3.9
22	0429	1.1	1038	4.3	1656	.4	2325	3.9
23	0506	1.1	1113	3.8	1714	.7	2350	3.9
24	0551	1.2	1150	3.3	1733	1.2	0016	3.9*
25	0647	1.3	1237	2.6	1748	1.6	----	---
26	0051	3.8	0810	1.3	1415	2.1	1743	2.0
27	0141	3.8	1013	1.1	----	---	----	---
28	0301	3.8	1139	.7	----	---	----	---

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

TABLE 8

POINT MUGU TIDES
MARCH 1985
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
1	0415	4.4	1228	.2	1939	3.2	2316	2.8
2	0520	4.8	1306	-.3	1949	3.5	----	---
3	0015	2.4	0610	5.3	1339	-.8	2007	3.7
4	0100	1.9	0658	5.7	1411	-1.1	2029	4.0
5	0143	1.4	0740	6.0	1443	-1.2	2057	4.3
6	0225	1.0	0825	6.0	1517	-1.1	2123	4.7
7	0311	.6	0908	5.9	1548	-.8	2155	5.0
8	0356	.2	0956	5.4	1620	-.3	2227	5.2
9	0446	.1	1045	4.8	1655	.3	2305	5.3
10	0546	.1	1142	3.9	1730	1.0	2347	5.3
11	0651	.2	1258	3.3	1806	1.6	----	---
12	0035	5.1	0820	.3	1458	2.8	1851	2.3
13	0145	4.6	1002	.2	1732	2.9	2034	2.8
14	0312	4.7	1126	-.2	1842	3.4	2247	2.7
15	0442	4.8	1228	-.5	1917	3.6	0007	2.4*
16	0548	5.0	1310	-.7	1946	3.9	----	---
17	0054	1.9	0640	5.2	1349	-.7	2011	4.1
18	0133	1.5	0722	5.2	1416	-.6	2031	4.2
19	0205	1.2	0757	5.2	1443	-.5	2051	4.4
20	0240	1.0	0830	5.1	1506	-.2	2112	4.5
21	0309	.8	0901	4.8	1526	.1	2128	4.6
22	0338	.6	0933	4.5	1546	.5	2149	4.7
23	0412	.5	1008	4.1	1604	.9	2208	4.7
24	0448	.5	1041	3.6	1624	1.2	2230	4.7
25	0526	.6	1123	3.2	1638	1.7	2255	4.5
26	0616	.8	1219	2.7	1643	2.1	2326	4.4
27	0728	.9	----	---	----	---	----	---
28	0006	4.2	0908	.9	----	---	----	---
29	0130	4.0	1042	.5	----	---	----	---
30	0326	4.1	1141	.1	1854	3.4	2308	2.7
31	0445	4.5	1220	-.3	1905	3.6	0004	2.1*

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

TABLE 9

SAN NICOLAS ISLAND TIDES
MARCH 1985
33 DEG 16 IN 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	0433	4.0	1227	.2	1957	2.9	2315	2.6
2	0538	4.4	1305	-.3	2007	3.2	----	---
3	0014	2.2	0628	4.8	1338	-.7	2025	3.4
4	0059	1.8	0716	5.2	1410	-1.0	2047	3.7
5	0142	1.3	0758	5.5	1442	-1.1	2115	4.0
6	0224	.9	0843	5.5	1516	-1.0	2141	4.3
7	0310	.5	0926	5.4	1547	-.7	2213	4.6
8	0355	.2	1014	4.9	1619	-.3	2245	4.8
9	0445	.1	1103	4.4	1654	.3	2323	4.8
10	0545	.1	1200	3.6	1729	.9	0005	4.8*
11	0650	.2	1316	3.0	1805	1.5	----	---
12	0053	4.7	0819	.3	1516	2.6	1850	2.1
13	0203	4.4	1001	.2	1750	2.6	2033	2.6
14	0330	4.3	1125	-.2	1900	3.1	2246	2.5
15	0500	4.4	1227	-.4	1935	3.3	0006	2.2*
16	0606	4.6	1309	-.6	2004	3.6	----	---
17	0053	1.8	0658	4.8	1348	-.6	2029	3.8
18	0132	1.4	0740	4.8	1415	-.5	2049	3.9
19	0204	1.1	0815	4.8	1442	-.4	2109	4.0
20	0239	.9	0848	4.7	1505	-.2	2130	4.1
21	0308	.7	0919	4.4	1525	.1	2146	4.2
22	0337	.5	0951	4.1	1545	.4	2207	4.3
23	0411	.4	1026	3.8	1603	.8	2226	4.3
24	0447	.4	1059	3.3	1623	1.1	2248	4.3
25	0525	.5	1141	2.9	1637	1.6	2313	4.1
26	0615	.7	1237	2.5	1642	1.9	2344	4.0
27	0727	.8	----	---	----	---	----	---
28	0024	3.9	0907	.8	----	---	----	---
29	0148	3.7	1041	.4	----	---	----	---
30	0344	3.8	1140	.1	1912	3.1	2307	2.5
31	0503	4.1	1219	-.3	1923	3.3	0003	1.9*

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

TABLE 10

POINT MUGU TIDES
APRIL 1985
34 DEG 06 MIN N 119 DEG 06 MIN W - OCEAN SIDE

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0547	4.9	1257	-.6	1923	4.1	----	---
2	0049	1.4	0639	5.2	1331	-.3	1946	4.5
3	0132	.6	0725	5.5	1403	-.2	2012	5.0
4	0215	.1	0813	5.4	1437	-.5	2041	5.4
5	0300	-.5	0902	5.2	1509	-.1	2113	5.8
6	0349	-.8	0951	4.7	1544	.5	2146	5.9
7	0438	-.9	1048	4.1	1616	1.1	2225	5.9
8	0534	-.8	1151	3.6	1651	1.5	2307	5.6
9	0643	-.5	1317	3.1	1734	2.2	2358	5.2
10	0802	-.3	1527	3.0	1832	2.7	----	---
11	0110	4.7	0933	-.2	1720	3.3	2059	3.0
12	0247	4.3	1052	-.2	1809	3.6	2255	2.6
13	0423	4.3	1148	-.3	1838	3.9	0001	2.1*
14	0532	4.4	1233	-.3	1903	4.2	----	---
15	0046	1.6	0621	4.5	1308	-.2	1928	4.4
16	0123	1.2	0705	4.5	1334	0.0	1947	4.6
17	0155	.8	0742	4.4	1358	.3	2005	4.8
18	0225	.5	0817	4.3	1420	.6	2024	4.9
19	0254	.2	0849	4.1	1438	.9	2044	5.1
20	0326	0.0	0925	3.8	1500	1.2	2102	5.1
21	0357	-.1	1001	3.6	1519	1.5	2124	5.1
22	0433	-.1	1043	3.3	1537	1.8	2148	5.0
23	0513	0.0	1133	3.0	1553	2.1	2214	4.9
24	0600	.2	1248	2.7	1600	2.4	2246	4.7
25	0706	.3	2334	4.4	----	---	----	---
26	0825	.3	----	---	----	---	----	---
27	0051	4.2	0942	.2	1744	3.3	2109	3.1
28	0239	4.0	1042	0.0	1749	3.6	2247	2.5
29	0409	4.2	1127	-.1	1807	4.1	2347	1.8
30	0521	4.4	1207	-.2	1832	4.6	----	---

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

TABLE 11

SAN NICOLAS ISLAND TIDES
APRIL 1985
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
1	0605	4.5	1256	-.5	1941	3.9	----	---
2	0048	1.3	0657	4.8	1330	-.2	2004	4.1
3	0131	.7	0743	5.0	1402	-.6	2030	4.6
4	0214	.1	0831	4.9	1436	-.4	2059	4.9
5	0259	-.4	0920	4.8	1508	-.1	2131	5.2
6	0348	-.7	1009	4.3	1543	.4	2204	5.4
7	0437	-.8	1106	3.8	1615	1.0	2243	5.4
8	0533	-.7	1209	3.3	1650	1.5	2325	5.1
9	0642	-.4	1335	2.8	1733	2.0	0016	4.8*
10	0801	-.3	1545	2.7	1831	2.5	----	---
11	0128	4.3	0932	-.2	1738	3.0	2058	2.7
12	0305	4.0	1051	-.2	1827	3.3	2254	2.4
13	0441	4.0	1147	-.3	1856	3.6	0000	1.9*
14	0550	4.0	1232	-.3	1921	3.9	----	---
15	0045	1.5	0639	4.1	1307	-.2	1946	4.0
16	0122	1.1	0723	4.1	1333	0.0	2005	4.2
17	0154	.7	0800	4.0	1357	.3	2023	4.4
18	0224	.4	0835	4.0	1419	.5	2042	4.5
19	0253	.2	0907	3.8	1437	.9	2102	4.7
20	0325	0.0	0943	3.5	1459	1.1	2120	4.7
21	0356	-.1	1019	3.3	1518	1.4	2142	4.7
22	0432	-.1	1101	3.0	1536	1.7	2206	4.6
23	0512	0.0	1151	2.7	1552	1.9	2232	4.5
24	0559	.2	1306	2.5	1559	2.2	2304	4.3
25	0705	.3	2352	4.0	----	---	----	---
26	0824	.3	----	---	----	---	----	---
27	0109	3.9	0941	.2	1802	3.0	2108	2.0
28	0257	3.7	1041	0.0	1807	3.3	2246	1.7
29	0427	3.9	1126	-.1	1825	3.3	2346	1.7
30	0539	4.0	1206	-.2	1850	4.2	----	---

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

TABLE 12

POINT MUGU TIDES
MAY 1985
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
1	0035	1.0	0620	4.6	1244	-.1	1859	5.2
2	0121	.1	0713	4.6	1320	.1	1929	5.7
3	0206	.5	0806	4.6	1354	.4	2003	6.0
4	0254	-1.2	0902	4.3	1430	.9	2038	6.3
5	0341	-1.4	0955	4.0	1508	1.2	2115	6.3
6	0433	-1.4	1056	3.6	1547	1.7	2156	6.1
7	0528	-1.2	1203	3.4	1629	2.2	2240	5.8
8	0631	-1.0	1329	3.2	1721	2.6	2336	5.2
9	0740	-.6	1509	3.3	1845	2.9	----	---
10	0043	4.6	0854	-.3	1621	3.6	2049	2.9
11	0211	4.2	1001	-.1	1716	3.8	2234	2.5
12	0341	3.9	1055	.1	1748	4.1	2340	2.0
13	0456	3.8	1140	.3	1817	4.4	----	---
14	0030	1.4	0555	3.8	1215	.6	1838	4.7
15	0105	1.0	0644	3.7	1244	.8	1859	4.9
16	0141	.5	0726	3.7	1309	1.1	1919	5.1
17	0210	.1	0808	3.6	1331	1.3	1941	5.3
18	0242	-.2	0847	3.6	1356	1.6	2002	5.4
19	0314	-.4	0926	3.5	1418	1.8	2027	5.5
20	0349	-.5	1009	3.3	1439	2.0	2054	5.5
21	0426	-.5	1057	3.2	1506	2.3	2123	5.4
22	0505	-.4	1150	3.0	1531	2.5	2156	5.3
23	0555	-.3	1300	3.0	1601	2.7	2236	5.0
24	0647	-.2	1433	3.1	1657	3.0	2326	4.7
25	0744	-.1	1532	3.3	1848	3.1	----	---
26	0035	4.4	0847	0.0	1614	3.6	2059	2.9
27	0207	4.0	0940	.1	1642	4.1	2223	2.2
28	0336	3.9	1031	.3	1714	4.6	2330	1.4
29	0459	3.8	1116	.5	1745	5.2	----	---
30	0023	.6	0608	3.8	1156	.8	1817	5.7
31	0114	-.3	0713	3.8	1238	1.1	1854	6.1

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

TABLE 13

SAN NICOLAS ISLAND TIDES
MAY 1985
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
1	0034	.9	0638	4.2	1243	-.1	1917	4.8
2	0120	.1	0731	4.2	1319	.1	1947	5.2
3	0205	.4	0824	4.2	1353	.4	2021	5.5
4	0253	-1.1	0920	4.0	1429	.8	2056	5.8
5	0340	-1.3	1013	3.7	1507	1.1	2133	5.8
6	0432	-1.3	1114	3.3	1546	1.6	2214	5.6
7	0527	-1.1	1221	3.1	1628	2.0	2258	5.3
8	0630	-.9	1347	2.9	1720	2.4	2354	4.8
9	0739	-.5	1527	3.0	1844	2.6	----	---
10	0101	4.2	0853	-.3	1639	3.3	2048	2.6
11	0229	3.9	1000	-.1	1734	3.5	2233	2.3
12	0359	3.6	1054	.1	1806	3.8	2339	1.8
13	0514	3.5	1139	.3	1835	4.0	----	---
14	0029	1.3	0613	3.5	1214	.5	1856	4.3
15	0104	.9	0702	3.4	1243	.7	1917	4.5
16	0140	.4	0744	3.4	1308	1.0	1937	4.7
17	0209	.1	0826	3.3	1330	1.2	1959	4.8
18	0241	-.2	0905	3.3	1355	1.5	2020	4.9
19	0313	-.4	0944	3.2	1417	1.7	2045	5.0
20	0348	-.4	1027	3.0	1438	1.8	2112	5.0
21	0425	-.4	1115	2.9	1505	2.1	2141	4.9
22	0504	-.4	1208	2.7	1530	2.3	2214	4.8
23	0554	-.3	1318	2.7	1600	2.5	2254	4.6
24	0646	-.2	1451	2.8	1656	2.7	2344	4.3
25	0743	-.1	1550	3.0	1847	2.8	----	---
26	0053	4.0	0846	0.0	1632	3.3	2058	2.6
27	0225	3.7	0939	.1	1700	3.8	2222	2.0
28	0354	3.6	1030	.3	1732	4.2	2329	1.3
29	0517	3.5	1115	.4	1803	4.8	----	---
30	0022	.5	0626	3.5	1155	.7	1835	5.2
31	0113	-.3	0731	3.5	1237	1.0	1912	5.6

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

TABLE 14

POINT MUGU TIDES
JUNE 1985
34 DEG 06 MIN N. 119 DEG 06 MIN W. (SEWAGE PIER)

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0201	-1.0	0809	3.3	1314	1.9	1931	4.5
2	0250	-1.4	0907	3.5	1401	1.6	2013	4.8
3	0338	-1.6	1003	3.7	1443	1.4	2054	5.0
4	0427	-1.5	1102	3.6	1529	2.2	2139	6.3
5	0520	-1.3	1203	3.4	1617	2.4	2225	5.9
6	0611	-1.0	1309	3.0	1719	2.7	2317	5.3
7	0706	-.6	1416	2.6	1825	2.9	----	---
8	0013	4.7	0802	-.2	1515	3.8	2011	4.8
9	0125	4.1	0856	.2	1607	4.0	2149	2.5
10	0244	3.6	0946	.6	1645	4.3	2306	2.0
11	0410	3.4	1031	1.0	1718	4.6	0002	1.4*
12	0524	3.3	1109	1.2	1745	4.8	----	---
13	0044	1.0	0628	3.3	1143	1.6	1812	5.1
14	0122	.5	0721	3.3	1216	1.8	1837	5.3
15	0158	.1	0808	3.3	1246	2.0	1903	5.5
16	0230	-.3	0851	3.3	1318	2.2	1934	5.7
17	0305	-.5	0932	3.4	1352	2.3	2003	5.8
18	0340	-.7	1015	3.4	1420	2.4	2038	5.9
19	0419	-.7	1057	3.4	1456	2.5	2114	5.8
20	0457	-.7	1142	3.4	1538	2.6	2152	5.7
21	0538	-.6	1228	3.5	1628	2.7	2234	5.4
22	0620	-.5	1320	3.6	1729	2.8	2323	5.0
23	0706	-.2	1409	3.8	1856	2.8	----	---
24	0026	4.5	0753	.1	1454	4.1	2034	2.4
25	0143	3.9	0842	.5	1536	4.6	2202	1.9
26	0318	3.6	0934	1.0	1621	5.1	2316	1.1
27	0450	3.4	1023	1.3	1701	5.6	----	---
28	0018	.2	0614	3.4	1116	1.6	1745	6.0
29	0110	-.5	0724	3.5	1204	1.9	1829	6.4
30	0201	-1.1	0824	3.6	1254	2.0	1915	6.6

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

TABLE 15

SAN NICOLAS ISLAND TIDES
JUNE 1985
33 DEG 16 MIN N. 119 DEG 30 MIN W. (CENTRAL PART NE END)

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0200	-.9	0827	3.5	1313	1.4	1949	6.1
2	0249	-1.3	0925	3.5	1400	1.5	2031	6.1
3	0337	-1.5	1021	3.4	1442	1.5	2112	6.0
4	0426	-1.4	1120	3.3	1527	2.0	2157	5.8
5	0519	-1.2	1221	3.3	1616	2.2	2243	5.4
6	0610	-.9	1327	3.3	1718	2.5	2335	4.8
7	0705	-.5	1434	3.3	1834	2.6	----	---
8	0031	4.3	0801	-.2	1533	3.5	2010	2.6
9	0143	3.8	0855	.2	1625	3.7	2148	2.3
10	0302	3.3	0945	.5	1703	4.0	2305	1.8
11	0428	3.1	1030	.9	1736	4.2	0001	1.3*
12	0542	3.0	1108	1.1	1803	4.4	----	---
13	0043	.9	0646	3.0	1142	1.5	1870	4.7
14	0121	.4	0739	3.0	1215	1.7	1855	4.8
15	0157	.1	0826	3.0	1245	1.8	1921	5.0
16	0229	-.3	0909	3.0	1317	2.0	1952	5.2
17	0304	-.4	0950	3.1	1351	2.1	2021	5.3
18	0339	-.6	1033	3.1	1419	2.2	2056	5.4
19	0418	-.6	1115	3.1	1455	2.3	2132	5.3
20	0456	-.6	1200	3.1	1537	2.4	2210	5.2
21	0537	-.5	1246	3.2	1627	2.5	2252	4.9
22	0619	-.4	1338	3.3	1728	2.6	2341	4.6
23	0705	-.2	1427	3.5	1855	2.6	----	---
24	0044	4.1	0752	.1	1512	3.8	2053	2.2
25	0201	3.6	0841	.4	1554	4.2	2211	1.7
26	0336	3.3	0933	.9	1639	4.7	2315	1.0
27	0508	3.1	1022	1.2	1719	5.1	----	---
28	0017	.2	0632	3.1	1115	1.5	1803	5.5
29	0109	-.4	0742	3.2	1203	1.8	1847	5.9
30	0200	-1.0	0842	3.3	1253	1.8	1933	6.1

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

TABLE 16

POINT MUGU TIDES
JULY 1985
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
1	0248	-1.3	0916	3.7	1345	2.1	2000	6.7
2	0333	-1.4	1004	3.7	1432	2.2	2043	6.6
3	0417	-1.3	1049	3.8	1523	2.3	2128	6.3
4	0501	-1.2	1136	3.8	1609	2.4	2211	6.0
5	0542	-.8	1221	3.8	1705	2.5	2257	5.4
6	0625	-.3	1310	3.9	1805	2.6	2344	4.8
7	0704	.2	1359	4.0	1918	2.6	----	---
8	0036	4.1	0744	.7	1444	4.2	2046	2.4
9	0145	3.6	0829	1.2	1526	4.3	2216	2.1
10	0314	3.1	0911	1.6	1608	4.6	2328	1.5
11	0501	2.9	0956	2.0	1647	4.8	----	---
12	0021	1.1	0625	3.0	1045	2.3	1724	5.1
13	0107	.6	0729	3.1	1135	2.5	1802	5.3
14	0142	.1	0814	3.3	1217	2.6	1838	5.6
15	0217	-.2	0851	3.5	1301	2.5	1914	5.9
16	0253	-.5	0924	3.6	1340	2.5	1952	6.0
17	0326	-.7	0956	3.6	1418	2.4	2027	6.1
18	0359	-.9	1028	3.7	1501	2.4	2108	6.1
19	0435	-.8	1103	3.8	1545	2.3	2147	6.0
20	0510	-.7	1142	4.0	1636	2.3	2230	5.7
21	0547	-.4	1219	4.2	1736	2.2	2318	5.1
22	0624	.1	1301	4.4	1845	2.1	----	---
23	0017	4.4	0704	.6	1346	4.7	2012	1.8
24	0133	3.7	0750	1.2	1437	5.0	2144	1.3
25	0319	3.2	0842	1.7	1533	5.4	2309	.8
26	0514	3.1	0944	2.2	1630	5.7	----	---
27	0015	.1	0644	3.3	1055	2.4	1729	6.0
28	0111	-.5	0743	3.6	1202	2.5	1820	6.3
29	0157	-.9	0828	3.7	1258	2.4	1909	6.5
30	0241	-1.1	0910	3.9	1347	2.3	1954	6.5
31	0318	-1.2	0946	4.0	1433	2.1	2037	6.4

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

TABLE 17

SAN NICOLAS ISLAND TIDES
JULY 1985
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
1	0247	-1.2	0934	3.4	1344	1.9	2018	6.2
2	0332	-1.3	1022	3.4	1431	2.0	2101	6.1
3	0416	-1.2	1107	3.5	1522	2.1	2146	5.8
4	0500	-1.1	1154	3.5	1608	2.2	2229	5.5
5	0541	-.7	1239	3.5	1704	2.3	2315	4.9
6	0624	-.3	1328	3.6	1804	2.4	0002	4.4*
7	0703	.2	1417	3.7	1917	2.4	----	---
8	0054	3.8	0743	.6	1502	3.9	2045	2.2
9	0203	3.3	0828	1.1	1544	4.0	2215	1.9
10	0332	2.8	0910	1.5	1626	4.2	2327	1.4
11	0519	2.6	0955	1.8	1705	4.4	----	---
12	0020	1.0	0643	2.7	1044	2.1	1742	4.7
13	0106	.5	0747	2.8	1134	2.3	1820	4.8
14	0141	.1	0832	3.0	1216	2.4	1856	5.1
15	0216	-.2	0909	3.2	1300	2.3	1932	5.4
16	0252	-.4	0942	3.3	1339	2.3	2010	5.5
17	0325	-.6	1014	3.3	1417	2.2	2045	5.6
18	0358	-.8	1046	3.4	1500	2.2	2126	5.6
19	0434	-.7	1121	3.5	1544	2.1	2205	5.5
20	0509	-.6	1200	3.7	1635	2.1	2248	5.2
21	0546	-.4	1237	3.9	1735	2.0	2336	4.7
22	0623	.1	1319	4.0	1844	1.9	----	---
23	0035	4.0	0703	.5	1404	4.3	2011	1.7
24	0151	3.4	0749	1.1	1455	4.6	2143	1.2
25	0337	2.9	0841	1.6	1551	4.9	2308	.7
26	0532	2.8	0943	2.0	1648	5.2	----	---
27	0014	.1	0702	3.0	1054	2.2	1747	5.5
28	0110	-.4	0801	3.3	1201	2.3	1838	5.8
29	0156	-.8	0846	3.4	1257	2.2	1927	6.0
30	0240	-1.0	0928	3.6	1346	2.1	2012	6.0
31	0317	-1.1	1004	3.7	1432	1.9	2055	5.9

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

TABLE 18

POINT MUGU TIDES
AUGUST 1985
34 DEG 06 MIN N 119 DEG 06 MIN W - CENTRAL PART

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0356	-1.6	1018	4.1	1516	2.0	2136	5.5
2	0430	-.7	1053	4.1	1558	2.0	2154	5.4
3	0504	-.3	1123	4.2	1644	2.0	2233	5.2
4	0534	.2	1157	4.3	1730	2.1	2312	4.7
5	0602	.7	1232	4.3	1827	2.1	2357	4.0
6	0630	1.2	1309	4.3	1934	2.1	----	---
7	0053	3.5	0659	1.8	1349	4.4	2111	2.0
8	0231	2.4	0727	2.3	1442	4.4	2250	1.6
9	0515	2.6	0823	2.7	1546	4.6	2356	1.2
10	0658	3.1	0952	2.9	1642	4.9	----	---
11	0044	.7	0739	3.3	1116	3.0	1735	5.2
12	0123	.2	0805	3.6	1211	2.8	1818	5.6
13	0158	-.2	0830	3.7	1256	2.6	1900	5.9
14	0227	-.5	0852	3.9	1336	2.3	1939	6.1
15	0259	-.7	0917	4.1	1415	2.0	2018	6.3
16	0329	-.6	0945	4.3	1457	1.8	2057	6.3
17	0401	-.7	1014	4.6	1543	1.5	2139	6.0
18	0433	-.4	1046	4.8	1629	1.3	2224	5.6
19	0505	.1	1121	5.0	1726	1.2	2313	4.9
20	0541	.7	1203	5.2	1832	1.2	----	---
21	0016	4.1	0618	1.3	1248	5.2	1953	1.2
22	0144	3.4	0700	2.0	1345	5.3	2131	.9
23	0357	3.1	0759	2.6	1455	5.4	2302	.4
24	0557	3.3	0939	2.9	1613	5.5	----	---
25	0011	-.1	0702	3.6	1112	2.9	1723	5.3
26	0103	-.5	0745	3.9	1217	2.6	1818	5.0
27	0145	-.7	0813	4.1	1310	2.3	1907	6.1
28	0221	-.7	0842	4.3	1351	2.0	1949	6.1
29	0253	-.6	0910	4.5	1430	1.7	2029	6.0
30	0325	-.4	0936	4.6	1506	1.5	2103	5.9
31	0351	-.1	1000	4.7	1543	1.4	2138	5.5

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

TABLE 19

SAN NICOLAS ISLAND TIDES
AUGUST 1985
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
1	0355	-.9	1036	3.8	1515	1.6	2134	5.7
2	0429	-.6	1111	3.9	1557	1.3	2212	5.4
3	0503	-.3	1141	3.9	1643	1.8	2251	4.8
4	0533	.2	1215	4.0	1729	1.9	2330	4.3
5	0601	.6	1250	4.0	1826	1.9	0015	3.7*
6	0629	1.1	1327	4.0	1933	1.9	----	---
7	0111	3.2	0658	1.7	1407	4.0	2110	1.8
8	0249	2.6	0726	2.1	1500	4.0	2249	1.5
9	0533	2.6	0822	2.5	1604	4.2	2355	1.1
10	0716	2.8	0951	2.6	1700	4.5	----	---
11	0043	.6	0757	3.0	1115	2.7	1753	4.8
12	0122	.2	0823	3.3	1210	2.6	1836	5.1
13	0157	-.2	0848	3.4	1255	2.4	1918	5.4
14	0226	-.4	0910	3.6	1335	2.1	1957	5.6
15	0258	-.6	0935	3.8	1414	1.8	2036	5.8
16	0328	-.7	1003	4.0	1456	1.7	2115	5.8
17	0400	-.6	1032	4.2	1542	1.4	2157	5.5
18	0432	-.4	1104	4.4	1628	1.2	2242	5.1
19	0504	.1	1139	4.6	1725	1.1	2331	4.5
20	0540	.6	1221	4.8	1831	1.1	----	---
21	0034	3.8	0617	1.2	1306	4.8	1952	1.1
22	0202	3.1	0659	1.8	1403	4.8	2130	.8
23	0415	2.8	0758	2.4	1513	4.9	2301	.4
24	0615	3.0	0938	2.6	1631	5.0	----	---
25	0010	-.1	0720	3.3	1111	2.6	1741	5.3
26	0102	-.4	0803	3.6	1216	2.4	1836	5.5
27	0144	-.6	0831	3.8	1309	2.1	1925	5.6
28	0220	-.6	0900	4.0	1350	1.8	2007	5.6
29	0252	-.5	0928	4.1	1429	1.6	2046	5.5
30	0324	-.4	0954	4.2	1505	1.4	2121	5.4
31	0350	-.1	1018	4.3	1542	1.7	2156	5.0

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

TABLE 20

POINT MUGU TIDES
SEPTEMBER 1985
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
1	0416	.3	1022	4.7	1619	1.4	2211	5.0
2	0438	.8	1049	4.8	1657	1.4	2249	4.4
3	0502	1.3	1112	4.7	1742	1.5	2326	3.8
4	0518	1.8	1141	4.6	1835	1.6	----	---
5	0025	3.3	0532	2.3	1213	4.5	1958	1.7
6	0218	2.8	0530	2.7	1304	4.4	2154	1.5
7	1426	4.4	2320	1.2	----	---	----	---
8	1600	4.6	0009	.7	----	---	----	---
9	0721	3.6	1114	3.2	1708	4.9	----	---
10	0049	.3	0731	3.8	1204	2.8	1756	5.4
11	0121	-.1	0751	4.1	1247	2.3	1842	5.8
12	0152	-.4	0806	4.4	1326	1.8	1920	6.0
13	0221	-.5	0831	4.7	1407	1.3	2002	6.1
14	0250	-.4	0856	5.1	1446	.9	2045	6.0
15	0322	-.2	0928	5.4	1533	.6	2131	5.7
16	0351	.3	0956	5.7	1620	.3	2220	5.1
17	0425	.8	1032	5.8	1715	.3	2317	4.4
18	0457	1.4	1110	5.8	1818	.4	----	---
19	0027	3.6	0532	2.1	1200	5.6	1941	.5
20	0215	3.3	0614	2.7	1304	5.3	2117	.4
21	0446	3.4	0748	3.2	1430	5.1	2246	.2
22	0604	3.7	1008	3.2	1602	5.2	2353	-.1
23	0646	4.1	1137	2.8	1717	5.4	----	---
24	0039	-.3	0715	4.4	1230	2.3	1813	5.5
25	0118	-.3	0744	4.6	1312	1.8	1859	5.6
26	0150	-.2	0806	4.8	1348	1.4	1940	5.6
27	0219	0.0	0828	5.0	1423	1.2	2014	5.4
28	0244	.3	0849	5.1	1455	1.0	2048	5.1
29	0306	.6	0908	5.2	1528	.8	2123	4.8
30	0326	1.1	0929	5.2	1559	.7	2156	4.4

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

TABLE 21

SAN NICOLAS ISLAND TIDES
SEPTEMBER 1985
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
1	0415	.3	1040	4.3	1618	1.3	2229	4.6
2	0437	.7	1107	4.4	1656	1.3	2307	4.0
3	0501	1.2	1130	4.3	1741	1.4	2344	3.5
4	0517	1.7	1159	4.2	1834	1.5	----	---
5	0043	3.0	0531	2.1	1231	4.1	1957	1.6
6	0236	2.6	0529	2.5	1322	4.0	2153	1.4
7	1444	4.0	2319	1.1	----	---	----	---
8	1618	4.2	0008	.6	----	---	----	---
9	0739	3.3	1113	2.9	1726	4.5	----	---
10	0048	.3	0749	3.5	1203	2.6	1814	4.9
11	0120	-.1	0809	3.8	1246	2.1	1900	5.3
12	0151	-.4	0824	4.0	1325	1.7	1938	5.5
13	0220	-.4	0849	4.3	1406	1.2	2020	5.6
14	0249	-.4	0914	4.7	1445	.8	2103	5.5
15	0321	-.2	0946	4.9	1532	.5	2149	5.2
16	0350	.3	1014	5.2	1619	.3	2238	4.7
17	0424	.7	1050	5.3	1714	.3	2335	4.0
18	0456	1.3	1128	5.3	1817	.4	----	---
19	0045	3.3	0531	1.9	1218	5.1	1940	.4
20	0233	3.0	0613	2.5	1322	4.8	2116	.4
21	0504	3.1	0747	2.9	1448	4.7	2245	.2
22	0622	3.4	1007	2.9	1620	4.8	2352	-.1
23	0704	3.8	1136	2.6	1735	4.9	----	---
24	0038	-.3	0733	4.0	1229	2.1	1831	5.0
25	0117	-.3	0802	4.2	1311	1.7	1917	5.1
26	0149	-.2	0824	4.4	1347	1.3	1958	5.1
27	0218	0.0	0846	4.6	1422	1.1	2032	4.9
28	0243	.3	0907	4.7	1454	.9	2106	4.7
29	0305	.5	0926	4.8	1527	.7	2141	4.4
30	0325	1.0	0947	4.8	1558	.6	2214	4.0

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

TABLE 22

POINT MUGU TIDES
OCTOBER 1985
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
1	0345	1.4	0948	5.2	1635	.8	2233	3.9
2	0403	1.8	1010	5.1	1714	.9	2315	3.5
3	0418	2.2	1035	5.0	1803	1.1	----	---
4	0019	3.1	0420	2.6	1102	4.8	1912	1.2
5	1142	4.5	2055	1.2	----	---	----	---
6	1302	4.3	2224	1.0	----	---	----	---
7	0657	3.6	0929	3.6	1502	4.3	2322	.6
8	0638	3.8	1108	3.2	1628	4.6	0001	.3*
9	0646	4.1	1153	2.6	1727	5.0	----	---
10	0035	0.0	0702	4.5	1233	1.9	1817	5.3
11	0107	-.1	0723	4.9	1313	1.2	1905	5.5
12	0136	-.1	0745	5.4	1354	.6	1950	5.5
13	0208	.1	0814	5.3	1440	-.1	2039	5.4
14	0240	.5	0843	6.1	1523	-.5	2127	5.0
15	0314	1.0	0918	6.3	1614	-.7	2220	4.5
16	0346	1.4	0954	6.3	1707	-.6	2324	3.9
17	0421	2.0	1036	6.1	1811	-.4	----	---
18	0048	3.5	0503	2.6	1126	5.8	1928	-.1
19	0250	3.4	0600	3.1	1232	5.3	2055	0.0
20	0439	3.6	0813	3.4	1404	4.9	2215	0.0
21	0536	4.0	1023	3.1	1546	4.7	2316	0.0
22	0614	4.4	1137	2.5	1702	4.8	0004	0.0*
23	0640	4.7	1226	1.9	1759	4.8	----	---
24	0041	.2	0705	5.0	1305	1.4	1846	4.8
25	0110	.4	0727	5.2	1340	1.0	1926	4.7
26	0135	.7	0745	5.4	1412	.7	2004	4.5
27	0200	1.0	0804	5.5	1444	.4	2039	4.3
28	0219	1.3	0824	5.6	1512	.2	2115	4.1
29	0240	1.6	0844	5.6	1544	.1	2151	3.8
30	0259	1.9	0906	5.6	1620	.2	2233	3.6
31	0317	2.3	0928	5.5	1658	.3	2323	3.3

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

TABLE 23

SAN NICOLAS ISLAND TIDES
OCTOBER 1985
33 DEG 16 MIN N. 119 DEG 30 MIN W - CENTRAL PART OF COAST

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0344	1.3	1006	4.8	1634	.7	2251	3.6
2	0402	1.7	1028	4.7	1713	.8	2333	3.2
3	0417	2.0	1053	4.6	1802	1.0	----	---
4	0037	2.8	0419	2.4	1120	4.4	1911	1.1
5	1200	4.1	2054	1.1	----	---	----	---
6	1320	4.0	2223	.9	----	---	----	---
7	0715	3.3	0928	3.3	1520	4.0	2321	.5
8	0656	3.5	1107	2.9	1646	4.2	0000	.3*
9	0704	3.8	1152	2.4	1745	4.6	----	---
10	0034	0.0	0720	4.1	1232	1.8	1835	4.8
11	0106	-.1	0741	4.5	1312	1.1	1923	5.0
12	0135	-.1	0803	4.9	1353	.5	2008	5.0
13	0207	.1	0832	5.4	1439	-.1	2057	4.9
14	0239	.4	0901	5.6	1522	-.4	2145	4.6
15	0313	.9	0936	5.8	1613	-.6	2238	4.1
16	0345	1.3	1012	5.9	1706	-.5	2342	3.6
17	0420	1.8	1054	5.6	1810	-.4	----	---
18	0106	3.2	0502	2.4	1144	5.3	1927	-.1
19	0308	3.1	0559	2.8	1250	4.8	2054	0.0
20	0457	3.3	0812	3.1	1422	4.5	2214	0.0
21	0554	3.7	1022	2.8	1604	4.3	2315	0.0
22	0632	4.0	1136	2.3	1720	4.4	0003	0.0*
23	0658	4.3	1225	1.8	1817	4.4	----	---
24	0040	.2	0723	4.6	1304	1.3	1904	4.4
25	0109	.4	0745	4.8	1339	.9	1944	4.3
26	0134	.6	0803	4.9	1411	.6	2022	4.1
27	0159	.9	0822	5.0	1443	.4	2057	4.0
28	0218	1.2	0842	5.1	1511	.2	2133	3.8
29	0239	1.5	0902	5.1	1543	.1	2209	3.5
30	0258	1.8	0924	5.1	1619	.2	2251	3.3
31	0316	2.1	0946	5.0	1657	.3	2341	3.0

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

TABLE 24

POINT MUGU TIDES
NOVEMBER 1985
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
1	0332	2.6	0955	5.3	1744	.5	----	---
2	0040	3.0	0337	2.8	1026	5.0	1845	.7
3	1105	4.7	2002	.7	----	---	----	---
4	1213	4.4	2115	.7	----	---	----	---
5	0537	3.6	0859	3.6	1406	4.2	2215	.5
6	0536	4.0	1037	3.0	1542	4.2	2303	.4
7	0551	4.4	1133	2.3	1655	4.4	2340	.4
8	0612	4.9	1219	1.4	1756	4.6	----	---
9	0017	.4	0634	5.5	1302	.6	1849	4.7
10	0051	.6	0703	6.0	1346	-.2	1945	4.7
11	0126	.9	0735	6.4	1429	-.9	2038	4.5
12	0203	1.2	0808	6.7	1517	-1.2	2131	4.3
13	0238	1.5	0849	6.8	1606	-1.3	2228	4.0
14	0317	2.0	0930	6.7	1702	-1.2	2334	3.7
15	0359	2.4	1014	6.3	1800	-1.0	----	---
16	0052	3.6	0451	2.8	1109	5.9	1906	-.6
17	0225	3.6	0608	3.1	1211	5.2	2017	-.2
18	0348	3.8	0807	3.2	1335	4.6	2127	.1
19	0443	4.2	1003	2.9	1510	4.2	2226	.3
20	0522	4.5	1119	2.3	1630	4.0	2314	.5
21	0553	4.8	1213	1.6	1737	4.0	2352	.8
22	0622	5.1	1252	1.2	1830	3.9	----	---
23	0024	1.1	0644	5.3	1328	.7	1920	3.8
24	0050	1.3	0705	5.5	1400	.3	1958	3.8
25	0114	1.6	0727	5.7	1432	0.0	2040	3.7
26	0140	1.9	0749	5.8	1504	-.2	2116	3.6
27	0205	2.1	0814	5.8	1536	-.3	2158	3.5
28	0226	2.3	0839	5.8	1611	-.3	2242	3.4
29	0252	2.5	0908	5.7	1651	-.2	2334	3.3
30	0317	2.7	0940	5.5	1734	-.1	----	---

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

TABLE 25

SAN NICOLAS ISLAND TIDES
NOVEMBER 1985
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
1	0331	2.4	1013	4.8	1743	.4	----	---
2	0058	2.7	0336	2.6	1044	4.6	1844	.6
3	1123	4.3	2001	.6	----	---	----	---
4	1231	4.0	2114	.6	----	---	----	---
5	0555	3.3	0858	3.3	1424	3.9	2214	.4
6	0554	3.7	1036	2.7	1600	3.9	2302	.4
7	0609	4.0	1132	2.1	1713	4.0	2339	.4
8	0630	4.5	1218	1.3	1814	4.2	----	---
9	0016	.4	0652	5.0	1301	.5	1907	4.3
10	0050	.5	0721	5.5	1345	-.2	2003	4.3
11	0125	.8	0753	5.9	1428	-.8	2056	4.1
12	0202	1.1	0826	6.2	1516	-1.1	2149	4.0
13	0237	1.4	0907	6.2	1605	-1.2	2246	3.7
14	0316	1.8	0948	6.2	1701	-1.1	2352	3.4
15	0358	2.2	1032	5.8	1759	-.9	----	---
16	0110	3.3	0450	2.6	1127	5.4	1905	-.5
17	0243	3.3	0607	2.8	1229	4.8	2016	-.2
18	0406	3.5	0806	2.9	1353	4.2	2126	.1
19	0501	3.9	1002	2.6	1528	3.9	2225	.3
20	0540	4.1	1118	2.1	1648	3.7	2313	.4
21	0611	4.4	1212	1.5	1755	3.7	2351	.7
22	0640	4.7	1251	1.1	1848	3.6	----	---
23	0023	1.0	0702	4.8	1327	.6	1938	3.5
24	0049	1.2	0723	5.0	1359	.3	2016	3.5
25	0113	1.5	0745	5.2	1431	0.0	2058	3.4
26	0139	1.8	0807	5.3	1503	-.2	2134	3.3
27	0204	1.9	0832	5.3	1535	-.3	2216	3.2
28	0225	2.1	0857	5.3	1610	-.3	2300	3.1
29	0251	2.3	0926	5.2	1650	-.2	2352	3.0
30	0316	2.5	0958	5.0	1733	-.1	----	---

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

TABLE 26

POINT MUGU TIDES
DECEMBER 1985
34 DEG 06 MIN N 119 DEG 06 MIN W - NAVAL PIER

DATE	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT	TIME PST	HGT FT
1	0033	3.2	0345	2.9	1015	5.2	1611	0.0
2	0153	3.2	0427	3.1	1057	5.0	1910	.2
3	0309	3.5	0547	3.3	1157	4.5	2013	.3
4	0354	3.7	0816	3.2	1320	4.1	2106	.5
5	0419	4.1	0959	2.7	1456	3.8	2157	.7
6	0450	4.6	1108	1.9	1629	3.7	2243	.9
7	0520	5.2	1204	1.0	1743	3.7	2328	1.1
8	0553	5.8	1252	0.0	1849	3.8	0010	1.3*
9	0629	6.2	1340	-.8	1949	3.9	----	---
10	0052	1.5	0708	6.7	1427	-1.3	2045	3.9
11	0134	1.7	0748	6.9	1515	-1.6	2137	3.9
12	0220	2.0	0832	6.9	1604	-1.6	2232	3.9
13	0305	2.2	0916	6.8	1653	-1.5	2329	3.7
14	0354	2.4	1005	6.3	1744	-1.2	---	---
15	0027	3.7	0448	2.6	1054	5.9	1835	-.8
16	0136	3.7	0602	2.8	1149	5.2	1930	-.3
17	0238	3.9	0729	2.8	1252	4.4	2026	.2
18	0333	4.1	0917	2.6	1414	3.8	2119	.7
19	0423	4.4	1045	2.1	1547	3.4	2208	1.2
20	0500	4.7	1151	1.5	1714	3.3	2253	1.4
21	0532	4.9	1241	1.0	1825	3.2	2335	1.8
22	0601	5.2	1316	.5	1923	3.3	0010	2.0*
23	0628	5.4	1355	.1	2008	3.4	----	---
24	0042	2.2	0656	5.6	1427	-.3	2048	3.4
25	0114	2.3	0725	5.8	1454	-.5	2126	3.5
26	0146	2.3	0757	5.9	1530	-.6	2201	3.5
27	0218	2.4	0829	5.9	1606	-.7	2237	3.5
28	0247	2.4	0901	5.9	1641	-.7	2316	3.5
29	0326	2.5	0936	5.8	1715	-.6	2358	3.5
30	0409	2.6	1012	5.5	1752	-.4	----	---
31	0040	3.6	0501	2.7	1054	5.1	1832	-.1

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

TABLE 27

SAN NICOLAS ISLAND TIDES
DECEMBER 1985
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
1	0051	2.9	0344	2.6	1034	4.8	1820	0.0
2	0211	2.9	0426	2.8	1115	4.6	1915	.2
3	0327	3.2	0546	3.0	1215	4.1	2012	.3
4	0412	3.4	0815	2.9	1338	3.8	2105	.4
5	0437	3.8	0958	2.5	1514	3.5	2156	.6
6	0508	4.2	1107	1.7	1647	3.4	2242	.8
7	0538	4.8	1203	.9	1801	3.4	2327	1.0
8	0611	5.3	1251	0.0	1907	3.5	0009	1.2*
9	0647	5.7	1339	-.7	2007	3.6	----	---
10	0051	1.4	0726	6.2	1426	-1.2	2103	3.6
11	0133	1.6	0806	6.3	1514	-1.5	2155	3.6
12	0219	1.8	0850	6.3	1603	-1.5	2250	3.5
13	0304	2.0	0934	6.2	1652	-1.4	2346	3.4
14	0353	2.2	1023	5.8	1743	-1.1	----	---
15	0045	3.4	0447	2.4	1112	5.4	1834	-.7
16	0154	3.4	0601	2.6	1207	4.8	1929	-.3
17	0256	3.6	0728	2.6	1310	4.0	2025	.2
18	0351	3.8	0916	2.4	1432	3.5	2118	.6
19	0441	4.0	1044	1.9	1605	3.1	2207	1.1
20	0518	4.3	1150	1.4	1732	3.0	2252	1.3
21	0550	4.5	1240	.9	1843	2.9	2334	1.7
22	0619	4.8	1315	.4	1941	3.0	0009	1.8*
23	0646	4.9	1354	.1	2026	3.1	----	---
24	0041	2.0	0714	5.1	1426	-.3	2106	3.1
25	0113	2.1	0743	5.3	1458	-.4	2144	3.2
26	0145	2.1	0815	5.4	1534	-.5	2219	3.2
27	0217	2.2	0847	5.4	1605	-.6	2255	3.2
28	0246	2.2	0919	5.4	1640	-.6	2334	3.2
29	0325	2.3	0954	5.3	1714	-.5	0016	3.2*
30	0408	2.4	1030	5.0	1751	-.4	----	---
31	0058	3.3	0500	2.5	1112	4.7	1831	-.1

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

Table 28. Moonrise and Moonset, Barking Sands, Hawaii, 1985.

Date	January		February		March		April		May		June		Date
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	
1	1408	0230	1452	0357	1333	0241	1522	0401	1613	0359	1814	0436	1
2	1445	0322	1549	0456	1431	0338	1626	0445	1716	0438	1923	0525	2
3	1527	0417	1650	0553	1534	0433	1730	0527	1822	0519	2031	0621	3
4	1614	0514	1755	0648	1639	0524	1834	0607	1929	0602	2134	0721	4
5	1707	0613	1901	0738	1744	0612	1939	0648	2038	0649	2230	0824	5
6	1806	0712	2005	0823	1849	0656	2046	0730	2146	0741	2318	0927	6
7	1909	0808	2108	0905	1953	0737	2153	0814	2251	0839	.....	1027	7
8	2013	0859	2210	0944	2056	0817	2300	0903	2350	0940	0000	1124	8
9	2116	0946	2311	1023	2200	0857	.....	0957	.....	1042	0037	1217	9
10	2218	1029	...	1102	2305	0939	0005	1054	0041	1142	0110	1308	10
11	2318	1108	0012	1144	.....	1024	0105	1154	0125	1239	0141	1357	11
12	.....	1146	0115	1229	0010	1113	0158	1253	0203	1333	0211	1446	12
13	0017	1224	0217	1318	0113	1206	0245	1351	0238	1424	0242	1535	13
14	0117	1303	0319	1411	0214	1303	0326	1446	0309	1514	0314	1626	14
15	0218	1345	0418	1508	0310	1401	0403	1538	0339	1602	0349	1719	15
16	0320	1431	0513	1606	0401	1459	0436	1628	0410	1651	0428	1814	16
17	0423	1522	0602	1705	0445	1556	0507	1717	0441	1741	0512	1911	17
18	0526	1617	0646	1801	0525	1650	0537	1806	0514	1833	0601	2006	18
19	0625	1716	0724	1855	0600	1742	0607	1855	0550	1926	0656	2100	19
20	0719	1816	0759	1947	0633	1832	0639	1945	0630	2021	0754	2150	20
21	0807	1914	0831	2036	0704	1921	0713	2037	0716	2117	0854	2236	21
22	0849	2010	0902	2125	0734	2009	0750	2131	0806	2212	0955	2318	22
23	0926	2103	0933	2214	0805	2059	0832	2226	0902	2304	1054	2356	23
24	1000	2154	1004	2304	0837	2150	0918	2322	1000	2352	1153	.....	24
25	1032	2243	1037	2355	0912	2242	1010	...	1100	.....	1252	0033	25
26	1103	2332	1114	.....	0951	2336	1107	0016	1200	0037	1351	0110	26
27	1133	.....	1154	0049	1034	.....	1206	0107	1300	0118	1453	0148	27
28	1205	0021	1241	0144	1123	0032	1307	0155	1359	0156	1557	0229	28
29	1240	0112	.....	.....	1217	0128	1409	0239	1500	0234	1703	0315	29
30	1319	0205	...	...	1316	0222	1511	0320	1602	0312	1811	0406	30
31	1402	0300		.....	1418	0313	.....	.....	1707	0352	.....	.....	31

Date	July		August		September		October		November		December		Date
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	
1	1916	0503	2027	0657	2039	0823	2016	0847	2101	1014	2141	1044	1
2	2015	0605	2104	0755	2110	0913	2052	0939	2153	1108	2239	1129	2
3	2108	0709	2138	0849	2142	1003	2132	1032	2249	1159	2336	1210	3
4	2153	0812	2209	0941	2217	1053	2217	1126	2347	1247	.....	1248	4
5	2233	0911	2240	1031	2254	1146	2307	1220	.....	1331	0034	1325	5
6	2308	1007	2311	1120	2337	1239	.....	1314	0046	1412	0131	1401	6
7	2340	1059	2344	1210	.....	1334	0001	1405	0146	1451	0230	1438	7
8	.....	1150	.....	1302	0024	1429	0059	1453	0245	1528	0332	1517	8
9	0011	1239	0020	1355	0117	1523	0200	1537	0346	1606	0437	1602	9
10	0041	1328	0100	1450	0215	1614	0301	1618	0448	1646	0545	1653	10
11	0113	1419	0144	1546	0315	1702	0403	1658	0553	1729	0656	1751	11
12	0147	1511	0235	1641	0418	1746	0504	1736	0702	1817	0806	1855	12
13	0224	1605	0331	1735	0520	1827	0607	1815	0813	1912	0910	2002	13
14	0306	1701	0431	1825	0623	1906	0712	1857	0923	2013	1007	2108	14
15	0354	1757	0533	1911	0725	1944	0818	1942	1029	2117	1056	2210	15
16	0447	1853	0636	1953	0827	2024	0927	2033	1128	2222	1137	2308	16
17	0545	1945	0738	2033	0931	2106	1036	2129	1219	2324	1213		17
18	0645	2033	0838	2111	1036	2151	1142	2229	1303	...	1246	0002	18
19	0747	2117	0939	2148	1143	2242	1243	2332	1340	0023	1317	0054	19
20	0848	2157	1040	2227	1248	2338	1337		1414	0117	1348	0144	20
21	0948	2234	1142	2309	1351		1423	0033	1446	0209	1419	0233	21
22	1047	2311	1246	2355	1448	0038	1504	0133	1516	0259	1452	0323	22
23	1146	2348	1350	...	1539	0139	1539	0229	1546	0349	1528	0415	23
24	1246	...	1455	0047	1623	0239	1612	0322	1618	0438	1609	0508	24
25	1348	0028	1556	0143	1702	0338	1643	0413	1652	0529	1654	0603	25
26	1452	0111	1651	0244	1737	0433	1713	0503	1730	0621	1744	0657	26
27	1558	0158	1741	0345	1809	0526	1744	0552	1811	0715	1838	0751	27
28	1702	0252	1824	0446	1840	0617	1816	0642	1858	0809	1936	0841	28
29	1803	0351	1902	0544	1911	0707	1851	0733	1949	0903	2034	0928	29
30	1858	0453	1936	0640	1942	0757	1930	0826	2044	0955	2132	1010	30
31	1946	0556	2009	0732			2013	0920			2229	1049	31

TABLE 29

PORT ALLEN TIDES
JANUARY 1995
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	0028	1.4	0749	6	1052	.8	1756	0.0
2	0104	1.6	0851	5	1158	.6	1830	0.0
3	0142	1.8	0940	.3	1254	.5	1904	-.1
4	0215	1.9	1019	.2	1342	.5	1941	-.1
5	0252	2.0	1057	.2	1426	.5	2020	-.2
6	0328	2.0	1133	.2	1508	.5	2059	-.2
7	0404	2.1	1211	.1	1551	.5	2141	-.2
8	0441	2.1	1243	.1	1643	.5	2223	-.1
9	0520	2.0	1322	.1	1741	.6	2312	.1
10	0558	1.9	1354	0.0	1845	.7	----	---
11	0007	.2	0637	1.7	1432	0.0	2004	.9
12	0121	.4	0719	1.4	1511	0.0	2129	1.0
13	0303	.6	0807	1.2	1552	-.1	2242	1.3
14	0515	.6	0903	.9	1635	-.1	----	---
15	2345	1.5	0722	.6	1015	.7	1721	-.1
16	0039	1.7	0841	.4	1138	.5	1807	-.1
17	0126	1.9	0937	.2	1251	.5	1853	-.2
18	0211	2.0	1022	.2	1347	.4	1942	-.2
19	0251	2.0	1057	.1	1438	.4	2027	-.2
20	0331	2.0	1129	.1	1521	.5	2105	-.1
21	0405	2.0	1201	.1	1601	.5	2147	-.1
22	0438	2.0	1230	.1	1642	.6	2224	0.0
23	0510	1.8	1258	.2	1725	.7	2301	.2
24	0539	1.6	1323	.2	1818	.8	2347	.2
25	0607	1.4	1351	.2	1913	.9	----	---
26	0040	.4	0634	1.3	1419	.2	2019	.9
27	0152	.6	0706	1.1	1448	.2	2131	1.0
28	0343	.6	0738	.9	1523	.1	2244	1.2
29	0621	.6	0823	.7	1607	.1	----	---
30	2343	1.4	0811	.5	0956	.6	1659	.1
31	0031	1.5	0856	.4	1133	.5	1748	0.0

* -- TIDE OCCURS ON NEXT DATE.

TABLE 30

PORT ALLEN TIDES
FEBRUARY 1985
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	0113	1.7	0930	.2	1244	.4	1838	0.0
2	0153	1.9	1000	.2	1334	.5	1923	-.1
3	0230	2.0	1028	.1	1420	.5	2011	-.2
4	0308	2.0	1057	.1	1504	.6	2058	-.2
5	0343	2.0	1125	0.0	1548	.7	2143	-.2
6	0419	2.0	1154	0.0	1635	.8	2231	-.1
7	0455	1.9	1222	0.0	1727	.9	2323	.1
8	0530	1.6	1255	-.1	1826	1.0	----	---
9	0024	.2	0607	1.4	1327	-.1	1928	1.1
10	0138	.5	0642	1.1	1404	-.1	2044	1.3
11	0327	.6	0721	.9	1446	0.0	2203	1.4
12	0601	.5	0820	.6	1538	0.0	2316	1.6
13	0804	.3	1006	.4	1679	0.0	----	---
14	0020	1.7	0853	.2	1156	.4	1745	0.0
15	0110	1.9	0928	.2	1305	.4	1844	0.0
16	0155	1.9	1000	.1	1358	.5	1939	-.1
17	0235	2.0	1025	.1	1435	.6	2025	-.1
18	0309	1.9	1050	.1	1514	.7	2107	0.0
19	0339	1.8	1112	.1	1546	.8	2146	0.0
20	0411	1.7	1132	.1	1621	.9	2224	.1
21	0436	1.5	1152	.1	1700	.9	2303	.2
22	0501	1.4	1213	.1	1740	1.0	2348	.3
23	0523	1.3	1232	.1	1824	1.1	----	---
24	0037	.4	0548	1.0	1256	.1	1912	1.1
25	0148	.5	0613	.9	1334	.2	2018	1.2
26	0336	.6	0635	.7	1357	.2	2131	1.3
27	1446	.2	2247	1.4	----	---	----	---
28	1600	.2	----	---	----	---	----	---

* -- TIDE OCCURS ON NEXT DATE.

TABLE 31

PORT ALLEN TIDES
MARCH 1985
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	2348	1.5	0834	.2	1136	.4	1712	.1
2	0038	1.7	0852	.2	1241	.5	1819	0.0
3	0123	1.8	0917	.1	1327	.6	1915	0.0
4	0201	1.9	0943	.1	1409	.7	2009	-.1
5	0240	1.9	1007	0.0	1452	.9	2058	-.1
6	0317	1.9	1033	-.1	1534	1.0	2150	-.1
7	0352	1.7	1100	-.1	1619	1.2	2243	0.0
8	0425	1.5	1128	-.1	1708	1.3	2339	.2
9	0503	1.3	1157	-.1	1800	1.4	----	---
10	0045	.2	0538	1.0	1228	-.1	1859	1.4
11	0206	.4	0614	.8	1303	-.1	2005	1.5
12	0406	.5	0659	.6	1345	0.0	2124	1.5
13	0626	.3	0818	.4	1444	.1	2242	1.6
14	0742	.2	1051	.3	1607	.2	----	---
15	2351	1.7	0820	.2	1220	.4	1736	.2
16	0042	1.7	0849	.1	1313	.6	1843	.1
17	0128	1.7	0914	.1	1351	.7	1936	.1
18	0206	1.7	0935	.1	1427	.9	2024	.1
19	0241	1.6	0956	.1	1457	.9	2106	.1
20	0307	1.5	1014	.1	1529	1.0	2147	.1
21	0332	1.4	1030	.1	1601	1.2	2227	.2
22	0357	1.3	1048	.1	1633	1.3	2309	.2
23	0422	1.1	1107	.1	1705	1.3	2355	.3
24	0447	.9	1125	.1	1745	1.4	----	---
25	0048	.4	0509	.8	1147	.1	1827	1.4
26	0159	.4	0534	.7	1211	.1	1925	1.4
27	0347	.4	0606	.5	1242	.2	2031	1.4
28	1335	.2	2148	1.4	----	---	----	---
29	0706	.2	1003	.3	1501	.2	2255	1.5
30	0729	.2	1138	.4	1640	.2	----	---
31	2353	1.6	0800	.1	1230	.6	1803	.2

* -- TIDE OCCUPS ON NEXT DATE.

TABLE 32

PORT ALLEN TIDES
APRIL 1985
21 DEG 54 MIN N. 159 DEG 37 MIN W - HANAPEPE BAY

DATE	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT	TIME HST	HGT FT
1	0042	1.7	0825	0.0	1319	.3	1907	.1
2	0124	1.7	0846	0.0	1358	1.0	2005	0.0
3	0203	1.6	0912	-.1	1439	1.2	2103	0.0
4	0241	1.5	0939	-.2	1521	1.4	2158	0.0
5	0320	1.4	1005	-.2	1603	1.6	2257	.1
6	0359	1.1	1034	-.2	1649	1.7	2357	.2
7	0435	.9	1102	-.2	1739	1.6	----	---
8	0108	.2	0516	.7	1135	-.1	1834	1.3
9	0234	.2	0558	.5	1210	0.0	1935	1.7
10	0421	.2	0707	.3	1252	.1	2047	1.6
11	0604	.2	0915	.3	1358	.2	2158	1.6
12	0654	.2	1116	.4	1534	.2	2308	1.5
13	0728	.1	1218	.5	1721	.3	----	---
14	0001	1.5	0753	.1	1301	.3	1835	.2
15	0045	1.4	0816	.1	1339	.3	1932	.2
16	0121	1.4	0836	0.0	1408	1.1	2022	.2
17	0153	1.3	0856	0.0	1439	1.2	2110	.2
18	0225	1.2	0913	0.0	1512	1.4	2152	.2
19	0253	1.0	0931	0.0	1537	1.4	2236	.2
20	0318	.8	0948	0.0	1609	1.5	2321	.2
21	0347	.8	1005	0.0	1644	1.6	----	---
22	0011	.2	0412	.7	1028	0.0	1718	1.6
23	0109	.3	0444	.6	1051	0.0	1800	1.6
24	0219	.3	0519	.4	1118	.1	1850	1.6
25	0352	.2	0618	.3	1153	.1	1949	1.6
26	0504	.2	0804	.3	1252	.2	2056	1.5
27	0556	.2	1010	.4	1425	.3	2201	1.5
28	0627	.1	1126	.6	1618	.3	2250	1.5
29	0657	0.0	1217	.8	1748	.3	----	---
30	2353	1.4	0723	-.1	1300	1.0	1903	.2

* -- TIDE OCCURS ON NEXT DATE.

TABLE 33

PORT ALLEN TIDES
MAY 1985
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	0039	1.4	0749	-.2	1342	1.3	2011	.2
2	0124	1.3	0819	-.2	1424	1.5	2114	.2
3	0207	1.1	0848	-.2	1506	1.8	2214	.1
4	0251	.9	0915	-.2	1548	1.9	2315	.1
5	0333	.8	0949	-.2	1634	2.0	----	---
6	0018	.2	0415	.6	1021	-.2	1721	2.0
7	0127	.2	0501	.4	1053	-.1	1811	2.0
8	0246	.2	0603	.3	1131	0.0	1907	1.8
9	0401	.2	0728	.3	1217	.1	2008	1.7
10	0506	.1	0926	.3	1322	.2	2109	1.5
11	0549	.1	1100	.5	1509	.4	2208	1.4
12	0621	.1	1200	.7	1655	.5	2301	1.4
13	0649	0.0	1242	.9	1818	.5	----	---
14	2349	1.2	0712	0.0	1314	1.1	1926	.4
15	0028	1.1	0734	0.0	1347	1.3	2027	.4
16	0103	.9	0755	-.1	1416	1.4	2117	.3
17	0139	.9	0815	-.1	1446	1.6	2206	.3
18	0214	.8	0836	-.1	1518	1.7	2251	.2
19	0243	.7	0858	-.1	1550	1.8	2337	.2
20	0318	.5	0920	-.1	1625	1.8	----	---
21	0029	.2	0353	.5	0948	-.1	1702	1.8
22	0121	.2	0433	.4	1017	0.0	1742	1.8
23	0217	.2	0523	.3	1052	0.0	1827	1.8
24	0316	.2	0637	.3	1134	.1	1918	1.7
25	0405	.2	0818	.3	1240	.2	2011	1.6
26	0447	.1	0957	.5	1409	.4	2105	1.5
27	0519	0.0	1103	.8	1603	.5	2204	1.4
28	0551	-.1	1159	1.0	1745	.5	2300	1.3
29	0625	-.2	1245	1.4	1912	.4	----	---
30	2353	1.1	0657	-.2	1327	1.6	2026	.3
31	0046	.9	0731	-.2	1409	1.9	2132	.2

* -- TIDE OCCURS ON NEXT DATE.

TABLE 34

PORT ALLEN TIDES
JUNE 1985
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	0137	.8	0803	-.2	1452	2.0	2335	.2
2	0225	.6	0835	-.2	1536	2.1	2333	.1
3	0314	.5	0911	-.2	1621	2.1	----	---
4	0029	.1	0403	.4	0950	-.2	1707	2.1
5	0128	.1	0459	.3	1030	-.1	1752	2.0
6	0224	.1	0558	.3	1112	0.0	1839	1.9
7	0317	.1	0717	.4	1201	.2	1924	1.7
8	0400	.1	0848	.5	1301	.3	2013	1.5
9	0437	.1	1015	.7	1433	.5	2102	1.4
10	0508	.1	1117	.9	1619	.6	2148	1.2
11	0537	.1	1203	1.1	1801	.6	2236	1.0
12	0605	0.0	1245	1.3	1926	.6	----	---
13	2325	.9	0631	0.0	1319	1.4	2033	.5
14	0014	.8	0657	0.0	1355	1.6	2129	.4
15	0059	.7	0725	-.1	1427	1.8	2218	.3
16	0142	.6	0754	-.1	1459	1.9	2303	.2
17	0221	.5	0822	-.1	1534	2.0	2344	.2
18	0303	.4	0854	-.1	1609	2.0	----	---
19	0024	.2	0345	.4	0930	-.1	1647	2.0
20	0106	.2	0433	.4	1005	0.0	1723	2.0
21	0146	.2	0527	.4	1047	.1	1805	1.9
22	0223	.1	0637	.5	1139	.2	1847	1.8
23	0303	.1	0756	.6	1241	.3	1931	1.6
24	0340	0.0	0919	.8	1411	.5	2016	1.4
25	0416	0.0	1031	1.0	1604	.6	2112	1.2
26	0452	-.1	1130	1.3	1758	.6	2209	1.0
27	0531	-.2	1225	1.6	1936	.5	2313	.8
28	0609	-.2	1311	1.8	2052	.4	----	---
29	0015	.7	0651	-.2	1357	2.0	2154	.2
30	0118	.5	0731	-.2	1442	2.1	2246	.2

* -- TIDE OCCURS ON NEXT DATE.

TABLE 35

PORT ALLEN TIDES
JULY 1985
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	0214	.5	0813	-.2	1524	2.2	2335	.2
2	0306	.4	0855	-.2	1607	2.2	----	---
3	0018	.1	0359	.4	0936	-.1	1648	2.1
4	0059	.1	0449	.5	1019	0.0	1727	2.0
5	0138	.2	0541	.5	1104	.1	1803	1.9
6	0213	.2	0642	.6	1149	.2	1842	1.7
7	0248	.2	0752	.7	1248	.4	1917	1.4
8	0317	.2	0909	.9	1402	.6	1952	1.3
9	0349	.2	1018	1.0	1548	.7	2035	1.1
10	0422	.1	1116	1.2	1753	.7	2123	.9
11	0455	.1	1206	1.4	1936	.6	2222	.8
12	0532	.1	1248	1.6	2045	.5	----	---
13	2332	.7	0609	.1	1330	1.7	2134	.4
14	0030	.6	0646	0.0	1405	1.9	2216	.3
15	0126	.5	0726	0.0	1440	2.0	2248	.2
16	0211	.5	0805	0.0	1516	2.0	2320	.2
17	0255	.5	0846	-.1	1551	2.0	2352	.2
18	0338	.6	0925	0.0	1626	2.0	----	---
19	0023	.2	0427	.6	1007	0.0	1702	2.0
20	0053	.2	0516	.7	1055	.2	1737	1.9
21	0126	.1	0617	.8	1149	.2	1813	1.7
22	0159	.1	0727	.9	1253	.5	1848	1.5
23	0234	.1	0840	1.1	1423	.6	1931	1.3
24	0313	0.0	0955	1.4	1625	.7	2022	1.0
25	0353	0.0	1105	1.5	1836	.6	2128	.8
26	0442	0.0	1204	1.8	2011	.5	2251	.6
27	0532	0.0	1256	2.0	2113	.3	----	---
28	0017	.5	0627	-.1	1345	2.1	2159	.2
29	0123	.5	0718	-.1	1428	2.2	2234	.2
30	0216	.6	0804	-.1	1510	2.2	2311	.2
31	0303	-.6	0850	0.0	1548	2.1	2341	.2

* -- TIDE OCCURS ON NEXT DATE.

TABLE 36

PORT ALLEN TIDES
AUGUST 1985
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	0745	.7	0934	0.0	1624	2.0	----	---
2	0010	.2	0429	.8	1016	1.9	1656	1.9
3	0037	.2	0515	.9	1059	1.8	1725	1.8
4	0103	.2	0601	.9	1144	1.7	1753	1.5
5	0128	.2	0657	1.0	1236	1.5	1822	1.4
6	0154	.2	0756	1.1	1345	1.3	1853	1.2
7	0224	.2	0904	1.2	1531	1.1	1919	1.0
8	0259	.2	1017	1.4	1758	.7	2000	.9
9	0344	.2	1119	1.5	1951	.6	2136	.7
10	0434	.2	1212	1.6	2045	.5	2319	.6
11	0528	.2	1257	1.8	2111	.4	----	---
12	0030	.6	0621	.2	1336	2.0	2140	.3
13	0121	.6	0710	.1	1415	2.0	2208	.2
14	0203	.7	0755	.1	1451	2.1	2236	.2
15	0247	.8	0840	0.0	1524	2.1	2302	.2
16	0326	.9	0926	.1	1558	2.0	2327	.2
17	0414	1.0	1015	.1	1633	2.0	2355	.2
18	0500	1.1	1104	.2	1706	1.7	----	---
19	0024	.1	0556	1.2	1203	.4	1742	1.5
20	0053	.1	0655	1.4	1315	.6	1816	1.3
21	0130	.1	0803	1.4	1457	.6	1858	1.0
22	0209	.1	0920	1.6	1707	.6	1951	.8
23	0300	.2	1036	1.8	1913	.5	2127	.6
24	0401	.2	1141	1.9	2016	.4	----	---
25	2324	.6	0511	.2	1239	2.0	2056	.3
26	0041	.6	0619	.2	1327	2.0	2130	.3
27	0133	.7	0716	.2	1409	2.0	2158	.2
28	0218	.8	0805	.1	1448	2.0	2223	.2
29	0254	.9	0850	.2	1519	2.0	2248	.2
30	0333	1.0	0933	.2	1551	1.9	2310	.2
31	0405	1.1	1015	.2	1618	1.7	2329	.2

* -- TIDE OCCURS ON NEXT DATE.

TABLE 37

PORT ALLEN TIDES
SEPTEMBER 1985
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	0443	1.2	1057	.3	1643	1.5	2349	.2
2	0522	1.3	1141	.5	1710	1.4	----	---
3	0010	.2	0607	1.4	1234	.6	1735	1.2
4	0032	.3	0658	1.4	1345	.6	1800	1.0
5	0100	.3	0755	1.4	1531	.7	1822	.9
6	0133	.3	0908	1.4	----	---	----	---
7	0222	.4	1023	1.5	1932	.5	2141	.6
8	0333	.4	1125	1.7	2004	.5	----	---
9	2332	.6	0453	.3	1217	1.8	2029	.4
10	0031	.7	0559	.3	1302	2.0	2053	.3
11	0113	.9	0657	.2	1340	2.0	2116	.2
12	0152	.9	0750	.2	1416	2.0	2140	.2
13	0231	1.1	0842	.2	1452	2.0	2205	.2
14	0314	1.3	0931	.2	1526	1.8	2228	.1
15	0356	1.4	1023	.2	1601	1.6	2256	.1
16	0441	1.5	1119	.3	1636	1.4	2323	.1
17	0530	1.7	1223	.4	1712	1.2	2355	.1
18	0626	1.8	1339	.6	1750	.9	----	---
19	0031	.2	0732	1.8	1529	.6	1836	.8
20	0110	.2	0844	1.8	1746	.5	2002	.6
21	0207	.2	1003	1.9	1901	.4	2223	.6
22	0333	.3	1115	1.9	1944	.3	----	---
23	2354	.7	0503	.3	1212	1.9	2019	.2
24	0052	.8	0619	.3	1258	1.9	2044	.2
25	0131	.9	0718	.3	1340	1.9	2109	.2
26	0207	1.1	0808	.3	1415	1.8	2131	.2
27	0242	1.2	0853	.3	1447	1.7	2149	.2
28	0314	1.4	0937	.3	1512	1.5	2206	.2
29	0346	1.4	1019	.4	1537	1.4	2225	.2
30	0418	1.5	1103	.4	1603	1.2	2243	.2

* -- TIDE OCCURS ON NEXT DATE.

TABLE 38

PORT ALLEN TIDES
OCTOBER 1985
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	0450	1.6	1149	.2	1624	1.1	2301	.2
2	0528	1.6	1245	.6	1656	.9	2319	.2
3	0610	1.6	1354	.6	1721	.8	2344	.3
4	0703	1.6	1540	.6	1754	.7	----	---
5	0016	.3	0810	1.6	1746	.5	1912	.6
6	0101	.4	0921	1.6	1843	.5	2215	.6
7	0234	.5	1031	1.7	1908	.4	----	---
8	2335	.7	0420	.5	1127	1.8	1933	.3
9	0023	.9	0543	.4	1215	1.8	1955	.2
10	0102	1.0	0649	.3	1257	1.8	2020	.2
11	0138	1.2	0748	.3	1339	1.7	2045	.1
12	0216	1.4	0843	.2	1415	1.6	2109	0.0
13	0257	1.6	0939	.2	1453	1.4	2134	0.0
14	0339	1.9	1036	.2	1529	1.3	2203	0.0
15	0422	2.0	1136	.3	1607	1.0	2233	0.0
16	0511	2.0	1245	.4	1646	.9	2305	0.0
17	0603	2.0	1407	.4	1735	.7	2339	.1
18	0703	2.0	1553	.4	1842	.5	----	---
19	0021	.2	0812	1.9	1720	.3	2047	.5
20	0125	.3	0924	1.9	1814	.3	2253	.6
21	0302	.5	1032	1.8	1859	.2	----	---
22	2359	.8	0451	.5	1130	1.7	1928	.2
23	0044	.9	0613	.5	1219	1.6	1952	.2
24	0119	1.1	0716	.5	1257	1.5	2013	.2
25	0155	1.3	0811	.4	1333	1.4	2032	.2
26	0223	1.4	0859	.4	1405	1.3	2050	.2
27	0255	1.6	0945	.4	1430	1.2	2108	.1
28	0327	1.7	1027	.4	1502	1.0	2126	.1
29	0355	1.8	1115	.4	1527	.9	2144	.2
30	0427	1.8	1204	.4	1555	.8	2206	.2
31	0502	1.8	1300	.5	1627	.7	2226	.2

* -- TIDE OCCURS ON NEXT DATE

TABLE 39

PORT ALLEN TIDES
NOVEMBER 1985
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	0541	1.6	1409	.5	1702	.6	2253	.2
2	0629	1.8	1532	.4	1755	.5	2326	.3
3	0726	1.7	1651	.4	1954	.5	----	---
4	0012	.4	0829	1.7	1733	.3	2204	.6
5	0145	.5	0931	1.7	1802	.2	2316	.8
6	0341	.6	1030	1.6	1830	.2	----	---
7	0002	.9	0524	.6	1123	1.5	1859	.1
8	0043	1.2	0643	.5	1211	1.4	1924	0.0
9	0122	1.4	0749	.4	1254	1.4	1950	-.1
10	0201	1.7	0853	.3	1339	1.2	2017	-.1
11	0243	2.0	0953	.2	1421	1.0	2049	-.2
12	0325	2.1	1055	.2	1503	.9	2121	-.2
13	0410	2.2	1157	.2	1545	.7	2154	-.1
14	0456	2.2	1303	.2	1635	.6	2229	-.1
15	0545	2.1	1415	.2	1733	.5	2308	.1
16	0630	2.0	1528	.2	1853	.4	2350	.2
17	0737	2.0	1631	.2	2051	.5	----	---
18	0053	.3	0837	1.8	1721	.2	2234	.6
19	0232	.5	0938	1.6	1756	.2	----	---
20	2340	.9	0425	.6	1031	1.4	1825	.2
21	0026	1.0	0601	.6	1123	1.4	1851	.1
22	0101	1.3	0715	.6	1209	1.2	1915	.1
23	0136	1.4	0819	.5	1245	1.0	1936	.1
24	0208	1.6	0911	.5	1322	.9	1958	0.0
25	0236	1.8	0959	.4	1357	.9	2019	0.0
26	0305	1.9	1045	.4	1429	.8	2042	0.0
27	0337	1.9	1131	.3	1505	.7	2106	0.0
28	0409	2.0	1213	.3	1537	.6	2135	.1
29	0446	2.0	1305	.3	1615	.5	2200	.1
30	0523	1.9	1354	.3	1705	.4	2232	.2

* -- TIDE OCCURS ON NEXT DATE.

TABLE 40

PORT ALLEN TIDES
DECEMBER 1985
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	0605	1.9	1449	.2	1806	.4	2311	.2
2	0651	1.8	1538	.2	1941	.5	----	---
3	0003	.3	0738	1.7	1617	.2	2121	.6
4	0122	.5	0833	1.6	1652	.1	2240	.9
5	0319	.6	0926	1.4	1724	.1	----	---
6	2333	1.1	0513	.6	1023	1.3	1756	0.0
7	0025	1.4	0649	.6	1119	1.1	1828	-.1
8	0107	1.7	0806	.4	1214	.9	1904	-.2
9	0146	2.0	0915	.3	1308	.8	1936	-.2
10	0230	2.1	1015	.2	1359	.7	2015	-.2
11	0313	2.2	1110	.2	1448	.6	2053	-.2
12	0358	2.3	1205	.2	1538	.5	2129	-.2
13	0443	2.3	1258	.2	1632	.4	2211	-.1
14	0528	2.1	1350	.2	1729	.4	2256	0.0
15	0614	2.0	1441	.2	1843	.4	2341	.2
16	0659	1.9	1528	.2	2009	.5	----	---
17	0040	.3	0745	1.6	1609	.2	2145	.7
18	0203	.6	0835	1.4	1644	.1	2254	.9
19	0353	.6	0924	1.2	1714	.1	----	---
20	2350	1.1	0548	.6	1010	1.0	1745	.1
21	0032	1.4	0725	.6	1105	.9	1815	0.0
22	0110	1.5	0834	.5	1154	.8	1844	0.0
23	0145	1.7	0929	.4	1246	.7	1913	0.0
24	0217	1.8	1013	.3	1335	.6	1944	0.0
25	0249	1.9	1050	.2	1417	.5	2016	-.1
26	0323	2.0	1129	.2	1456	.5	2048	-.1
27	0356	2.0	1204	.2	1535	.5	2117	-.1
28	0430	2.0	1243	.2	1614	.5	2155	0.0
29	0505	2.0	1315	.2	1703	.5	2221	.1
30	0541	1.9	1353	.2	1803	.5	2316	.2
31	0617	1.8	1425	.1	1913	.6	----	---

* -- TIDE OCCURS ON NEXT 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

Duration of rise or fall, see footnote	Time from the nearest high water or low water															
h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h 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	
4 20	0 09	0 17	0 26	0 35	0 43	0 52	1 01	1 09	1 18	1 27	1 35	1 44	1 53	2 01	2 10	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
10 20	0 22	0 43	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	
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	

Range of tide, see footnote	Correction to height															
Ft	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 2	0 2	0 2	0 2	
1.0	0 0	0 0	0 0	0 0	0 1	0 1	0.1	0.2	0.2	0.2	0 3	0 3	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 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	
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	
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	
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	
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	
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 5	1 8	2 0	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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	

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.

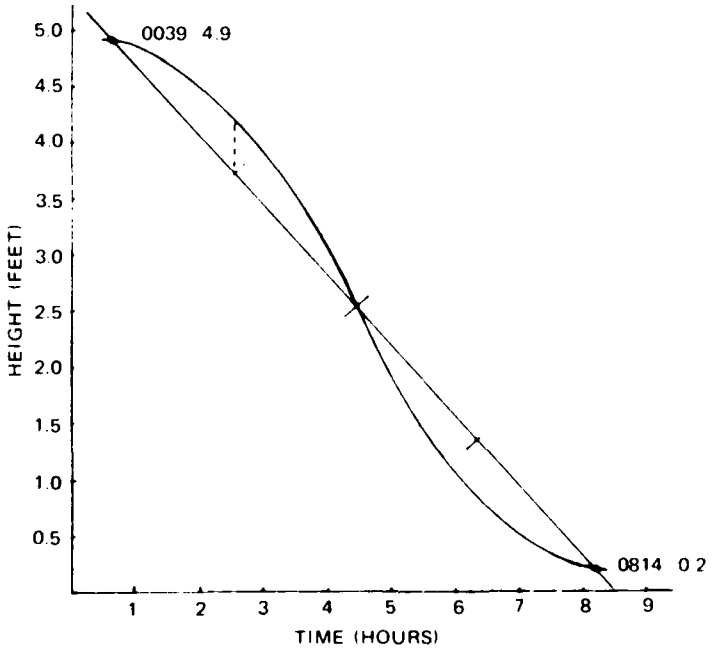

Figure A-1. Tidal Curve for Solution of the Problem.

APPENDIX B

EQUINOXES, SOLSTICES, AND LUNAR PHASES DURING 1985

The dates and times for Vernal and Autumnal Equinoxes and Summer and Winter Solstices during 1985 are listed in the table B-1. The 1985 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, 1985, Point Mugu and San Nicolas Island.

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

Vernal Equinox	20 March, 0814 PST	Beginning of Spring, day and night of equal length
Summer Solstice	21 June, 0244 PST	Beginning of Summer, greatest duration of daylight
Autumnal Equinox	22 September, 1807 PST	Beginning of Autumn, day and night of equal length
Winter Solstice	21 December, 1408 PST	Beginning of Winter, greatest duration of darkness

Table B-2. Lunar Phases, 1985, Point Mugu and San Nicolas Island.

NOTE: All times are Pacific Standard Time; add 1 hour when Daylight Saving 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
Full Moon	06	1816	05	0719	06	1813	05	0332
Last Quarter	13	1527	11	2357	13	0934	11	2041
New Moon	20	1828	19	1043	21	0359	19	2222
First Quarter	28	1929	27	1541	29	0811	27	2025
Phase	**May**		**June**		**July**		**August**	
	Date	Time	Date	Time	Date	Time	Date	Time
Full Moon	04	1153	02	1950	02	0408	...	.....
Last Quarter	11	0934	10	0019	09	1649	08	1029
New Moon	19	1341	18	0358	17	1556	16	0406
First Quarter	27	0456	25	1053	24	1539	22	2036
Full Moon	...	.....	...	.....	31	1341	30	0127
Phase	**September**		**October**		**November**		**December**	
	Date	Time	Date	Time	Date	Time	Date	Time
Last Quarter	07	0416	06	2104	05	1207	05	0101
New Moon	14	1120	13	2033	12	0620	11	1654
First Quarter	21	0303	20	1213	19	0104	18	1758
Full Moon	28	1608	28	0938	27	0442	26	2330

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: 58 min.		**Average twilight Civil: 26 min. Nautical: 55 min.**		**Average twilight Civil: 25 min. Nautical: 54 min.**		**Average twilight Civil: 26 min. Nautical: 57 min.**		**Average twilight Civil: 28 min. Nautical: 61 min.**		**Average twilight Civil: 29 min. Nautical: 65 min.**	

Date	January		February		March		April		May		June		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	24
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	1656	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: 63 min.		**Average twilight Civil: 26 min. Nautical: 58 min.**		**Average twilight Civil: 25 min. Nautical: 55 min.**		**Average twilight Civil: 25 min. Nautical: 54 min.**		**Average twilight Civil: 27 min. Nautical: 57 min.**		**Average twilight Civil: 28 min. Nautical: 59 min.**	

Retain for use in future years. These data valid through 2020.

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: 51 min.		**Average twilight Civil: 23 min. Nautical: 49 min.**		**Average twilight Civil: 22 min. Nautical: 48 min.**		**Average twilight Civil: 23 min. Nautical: 50 min.**		**Average twilight Civil: 24 min. Nautical: 53 min.**		**Average twilight Civil: 25 min. Nautical: 55 min.**		

Date	January		February		March		April		May		June		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: 54 min.		**Average twilight Civil: 23 min. Nautical: 50 min.**		**Average twilight Civil: 22 min. Nautical: 48 min.**		**Average twilight Civil: 23 min. Nautical: 49 min.**		**Average twilight Civil: 24 min. Nautical: 51 min.**		**Average twilight Civil: 24 min. Nautical: 52 min.**		

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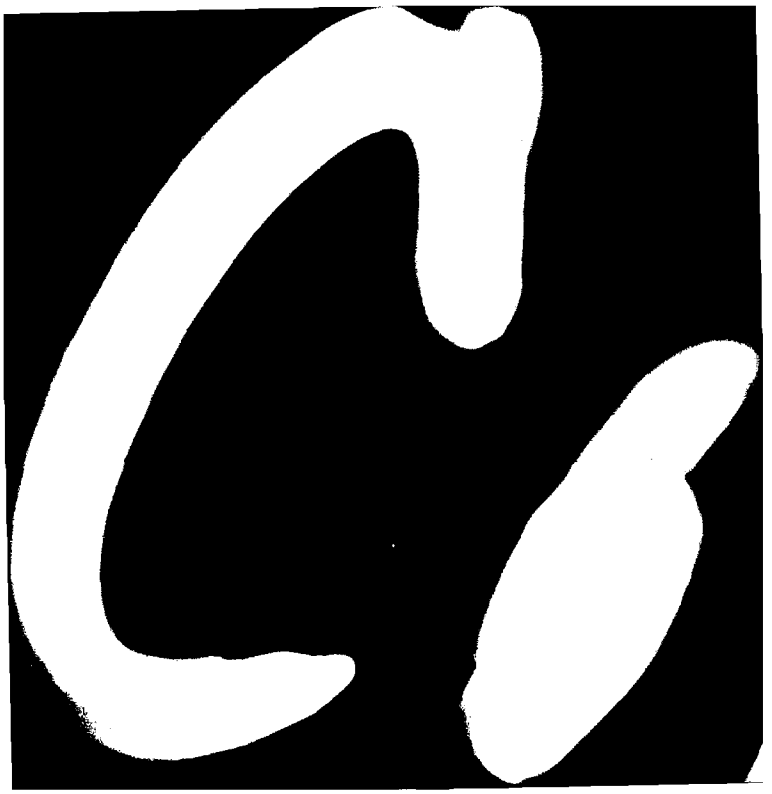

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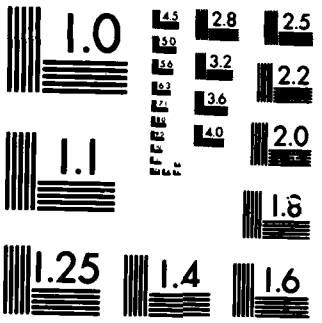

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PACIFIC MISSILE TEST CENTER
POINT MUGU, CALIFORNIA 93042

4250
Ser 0134/B013
21 JAN 1985

AD-A149733

From: Commander, Pacific Missile Test Center

Subj: "TIDAL AND LUNAR DATA FOR POINT MUGU, SAN NICOLAS ISLAND, AND THE BARKING SANDS AREA DURING 1985," TECHNICAL PUBLICATION TP000029, BY RICH DIXON, DATED 31 DECEMBER 1984

1. The subject Technical Publication contains errata in Appendix C. Please correct pages C-2 and C-3 in the publication as follows: Replace the column headings of the lower half of tables C-1 and C-2 which now are erroneously printed January through June inclusive with July through December respectively. After this replacement, the tables will correctly show the sunrise and sunset times for the entire calendar year.

2. The times shown within the tables are not affected by this change.

G. E. HUNT
By direction

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