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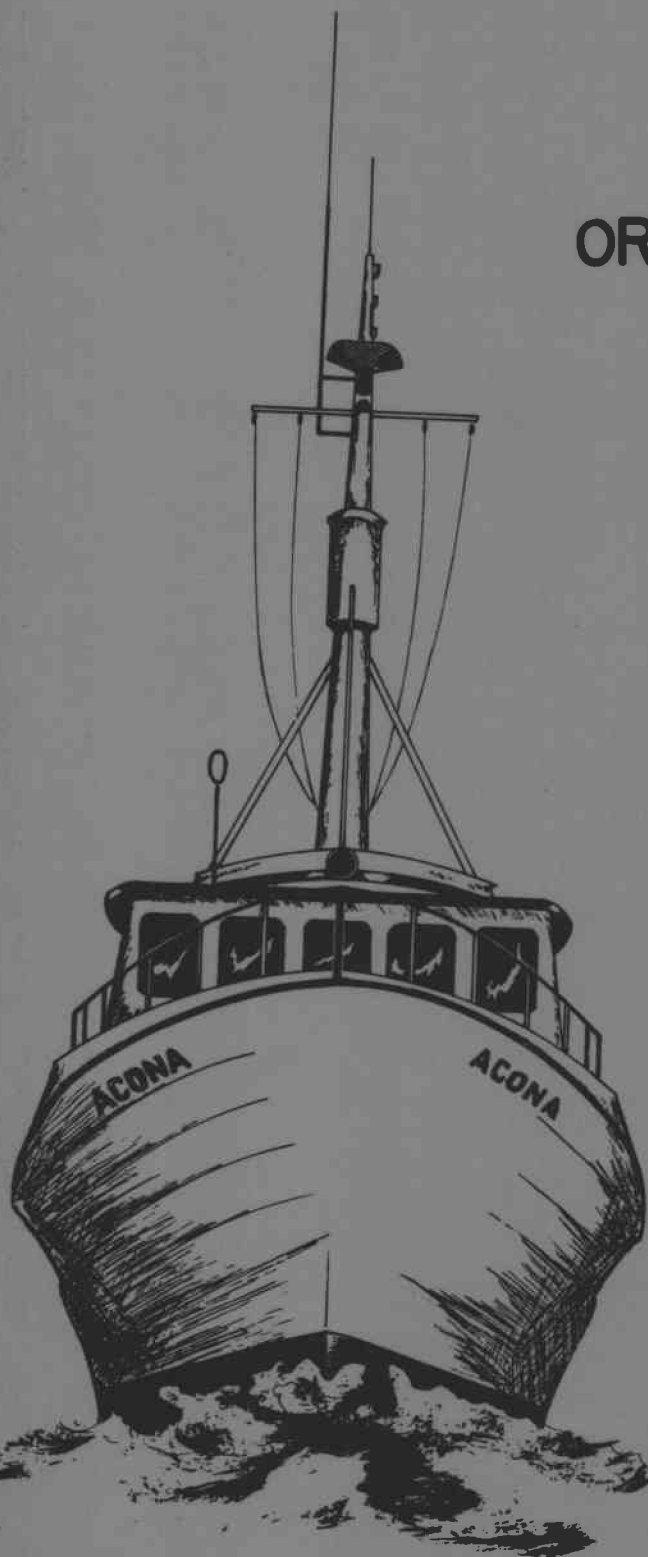
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Surface Temperature and Salinity Observations at Shore Stations on the Oregon Coast for 1962

by
Robert Still, Bruce Wyatt
and
Norman Kujala

Office of Naval Research
Contract Nonr 1286(10)
Project NR 083-102

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Date Report No. 11

Reference 63-27

October 1963

DEPARTMENT OF OCEANOGRAPHY

SCHOOL OF SCIENCE

OREGON STATE UNIVERSITY

Corvallis, Oregon

SURFACE TEMPERATURE AND SALINITY
OBSERVATIONS AT SHORE STATIONS
ON THE OREGON COAST FOR 1962

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Robert Still, Bruce Wyatt

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Edited by Elizabeth Strong

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Wayne V. Burt
Chairman

INTRODUCTION

The Department of Oceanography, Oregon State University, has initiated a program for obtaining weekly samples of surface temperature and salinity off the Oregon coast. Observations for 1960 and 1961 are included in two Data Reports: No. 6 (Kujala and Wyatt, 1961) and No. 8 (Oliphant, Wyatt and Kujala, 1962). Data in this report were collected during 1962.

Locations of sampling sites are shown in Figure 1. Station names and locations, and name of observer at each station, are listed in Table I. The assistance of these interested observers has contributed greatly to the success of the shore station sampling program.

PROCEDURE

Where possible, sampling sites were selected at points exposed to open ocean effects. Temperature values were read to the nearest 0.1°C , but are considered accurate to $\pm 0.2^{\circ}\text{C}$. A calibrated thermometer contained in a brass, plastic-lined, protecting bucket was used.

Water samples collected for later salinity analysis were stored in air-tight glass-stoppered citrate bottles. Samples were titrated at Oregon State University by the method described by Strickland and Parsons (1960). Seaside Aquarium and Crescent City, California, salinity values were calculated from hydrometer readings and tables (Zerbe and Taylor, 1953). Salinity values determined by titration are believed to be accurate to $\pm 0.04\%$; the accuracy of values obtained from hydrometer readings is not known, but is probably $\pm 0.5\%$.

Table II lists chronologically all observations taken at each coast station. A summary of the monthly maximum, minimum, mean, range, and number of observations for each station is given in Table III.

DISCUSSION

Analyses of 1961 data (Denner, 1963) indicated the coastal waters are divided into three more or less well-marked regimes. Data from a sample station for each of these regimes is plotted in Figure 2.

The northern portion of the coast (Columbia River Lightship to Otter Rock) showed strong influence of the Columbia River. Summer samples were higher in temperature and lower in salinity than the coastal average. Data from Seaside are selected to illustrate the characteristics for this area. The central portion of the coast (Yachats to Humbug Mountain) was the region most influenced by upwelling. Low temperature and high salinity in summer were most marked at Humbug Mountain; data from this station are plotted. The most southerly stations (Brookings and Crescent City) were warmer than the other stations and the salinities were average or low; Brookings data are shown. Further details will be submitted for publication soon (Pattullo and Denner, in prep.).

REFERENCES

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- Kujala, Norman, and Bruce Wyatt, 1961. Surface Temperatures and Salinity Observations at Shore Stations on the Oregon Coast, Data Report No. 6, Department of Oceanography, Oregon State University, Ref. 61-4.
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- Pattullo, June, and Warren Denner. Processes Affecting Sea Water Characteristics Along the Oregon Coast. In preparation.
- Strickland and Parsons, 1960. A Manual of Seawater Analysis. Fish. Res. Bd. Canada Bull. No. 125, pp. 11-17.
- Zerbe, W. B., and C. B. Taylor, 1953. Sea Water Temperature and Density Reduction Tables, U. S. Dept. Comm., Coast and Geod. Surv. Spec. Publ. No. 298, 21 pp.

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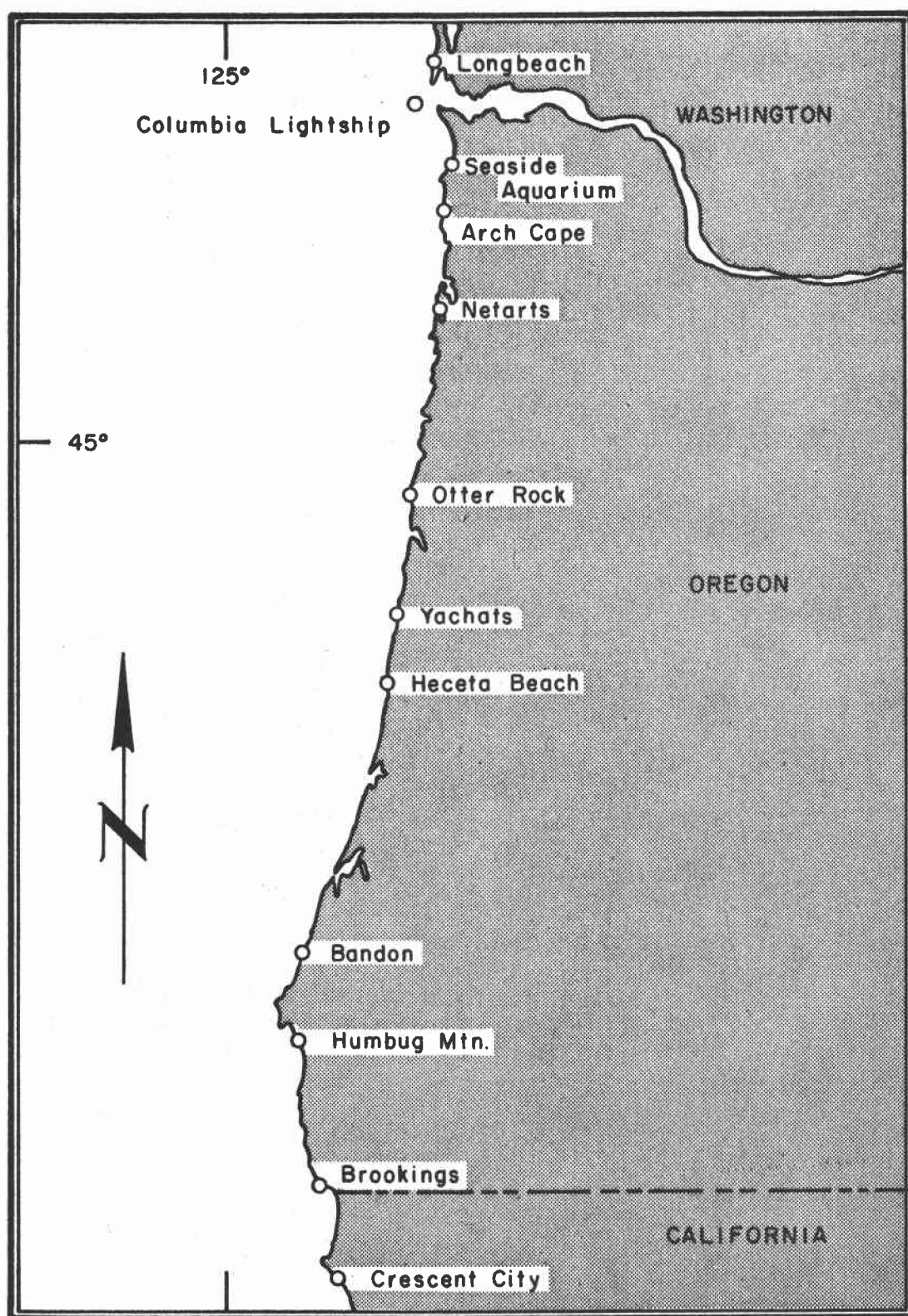


Figure 1. Location of Shore Stations

TABLE I. LIST OF SHORE STATIONS

Long Beach, Washington 46°23.0'N 124°04.0'W	In the surf on a sand beach, 10th Street approach	Mr. Bert Klawe
Columbia River Lightship 46°11.2'N 124°11.0'W	Five miles southwest of the Columbia River south jetty	U. S. Coast Guard
Seaside Aquarium 45°59.7'N 123°55.6'W	At pump outlet into aquarium settling tank which is filled during the highest tide each day from a surf inlet pipe	Mr. Lawrence Smith
Arch Cape 45°48.0'N 123°58.0'W	In the surf on a sand beach	Mrs. Berkeley Snow Mr. John Markham
Netarts 45°26.1'N 123°58.0'W	Boat ramp at the entrance of Netarts Bay	Mrs. Clair Peterson
Otter Rock 44°44.6'N 124°58.0'W	Off the rocks	Mr. Robert Troxel
Yachats 44°44.6'N 124°04.0'W	Off the rocks	Mr. Eugene Hanson
Heceta Beach 44°03.0'N 124°04.0'W	Sand beach 1.8 miles north of the Suislaw River	Mr. Hod Johnson
Bandon 43°07.0'N 124°25.5'W	Off the rocks at Bandon Wayside	Miss Lura Morgan Mr. George Anthony
Humbug Mountain 42°04.1'N 124°24.0'W	Off the rocks 4 miles south of Humbug Mountain	Mr. E. V. Nelson
Brookings 42°04.1'N 124°18.8'W	Off the rocks at Harris Beach State Park	Mr. Morton W. Phillips
Crescent City, California 41°44.6'N 124°11.7'W	Off the end of the Crescent City municipal wharf	Mr. Darold Richcreek

TABLE II. TEMPERATURE AND SALINITY OBSERVATIONS

LONG BEACH, WASHINGTON

Date 1962	Time PST	T °C	S ‰	Date 1962	Time PST	T °C	S ‰	Date 1962	Time PST	T °C	S ‰
July 22	1631	15.2		Aug. 1	1346	15.8		Aug. 9	1848	15.7	
24	1813	13.4	30.70	2	1420	15.2		18	1418	17.8	
25	1910	15.7		3	1458	15.0		19	1513	18.0	
26	0801	14.3		4	1430	15.0		20	1552	17.7	
27	0938	15.0		5	1540	14.8		21	1646		28.23
30	1230	15.0		7	1704	14.7	27.23	Sept. 4	1525	14.9	22.05
31	1307	16.1	18.85	8	1715	16.8					

COLUMBIA RIVER LIGHTSHIP

Oct. 3	1539	13.3		Nov. 2	1543	12.7		Dec. 4	0700	10.7	
4	1617	13.0		3	1634	12.8		5	0757	10.0	
5	1704	12.7		4	1738	12.0		6	0852	11.9	
6	1806	13.4		5	1857	11.8		7	0945	11.3	
7	1924	12.7		6	0833	11.9		8	1035	11.2	
8	2042	12.6		7	0929	11.6		9	1123	10.8	
9	2152	12.6		8	1019	11.7		10	1209	10.7	
10	2255	13.3		9	1106	11.6		11	1254	10.8	
13	1303	12.6		10	1150	11.8		12	1338	11.0	
14	1344	13.3		11	1233	12.0		13	1421	10.9	
15	1425	13.5		12	1316	11.9		14	1504	11.0	
16	1508	13.4		13	1358	12.0		15	1550	10.8	
17	1554	13.3		14	1441	12.0		16	1639	11.0	
18	1643	12.8		15	1526	12.1		17	0559	11.2	
19	1740	13.3		16	1614	12.2		18	0648	10.9	
20	1847	13.1		17	1707	12.0		19	0737	11.3	
21	1959	13.5		18	1809	11.8		20	0825	11.1	
22	0919	13.8		19	0738	11.9		21	0912	10.9	
23	1009	12.3		20	0832	12.0		22	0957	10.0	
24	1053	12.3		21	0921	11.9		23	1038	9.4	
25	1130	12.0		22	1004	11.7		24	1119	8.4	
26	1204	12.2		23	1045	12.1		25	1157	8.5	
27	1236	12.0		24	1122	12.0		26	1233	8.4	
28	1304	12.5		28	1330	10.5		27	1310	9.2	
29	1332	12.3		30	1442	10.1		28	1350	9.6	
30	1359	12.3		Dec. 2	1619	10.8		30	1520	10.2	
31	1429	12.2		3	1723	10.6		31	1613	10.6	
Nov. 1	1503	12.4									

SEASIDE AQUARIUM

Jan. 1	0635	9.0	30.8	Jan. 29	0630	8.3	29.8	Feb. 26	1700	8.1	29.8
2	0700	9.3	30.7	30	0630	8.2	30.6	27	0630	8.1	30.6
3	0745	9.6	30.8	31	0630	8.4	30.8	28	0630	7.5	27.7
4	0800	9.2	31.1	Feb. 1	0700	8.6	31.6	Mar. 1	0645	6.5	25.8
5	0855	9.2	30.8	2	0755	8.5	31.5	2	0730	6.2	24.4
6	0955	9.5	30.8	3	0735	8.6	30.8	3	0845	6.3	25.9
7	1100	10.1	31.1	4	1100	8.7	30.2	4	0900	7.3	27.2
8	1130	9.8	30.6	5	1030	8.3	30.3	5	1000	8.3	29.1
9	1210	9.6	31.1	6	1110	8.7	30.4	6	1030	8.7	30.8
10	1305	9.3	31.4	7	1125	8.8	30.6	7	1100	8.4	29.1
11	1420	8.9	31.4	8	1300	9.8	31.6	8	1145	8.1	29.0
12	1520	8.7	31.1	9	1405	9.5	31.5	9	1305	8.7	31.6
13	0630	8.4	31.0	10	1535	9.7	32.1	10	1345	8.4	31.1
14	0630	8.0	30.7	11	0630	9.7	31.8	11	1530	8.6	29.9
15	0635	8.1	29.8	12	0630	9.6	31.5	12	1630	8.7	27.8
16	0710	8.4	30.1	13	0630	9.3	31.6	13	0630	8.8	29.4
17	0740	8.2	29.8	14	0645	9.5	31.9	14	0625	8.6	29.9
18	0830	8.1	30.3	15	0710	9.5	32.0	15	0630	9.0	26.7
19	0925	6.9	30.6	16	0810	9.8	32.3	16	0715	9.1	26.0
20	0950	7.0	31.9	17	0830	9.3	31.5	17	0855	8.6	27.3
21	1115	7.4	31.9	18	1030	9.6	31.4	18	0945	8.7	29.8
22	1130	7.4	32.4	19	1030	9.6	31.4	19	1015	8.6	28.1
23	1155	7.2	31.9	20	1035	9.4	31.6	20	1100	8.7	25.6
24	1300	7.5	28.2	21	1130	9.1	32.4	21	1100	8.4	28.0
25	1330	7.9	29.1	22	1215	8.6	31.8	22	1145	8.7	29.9
26	1410	8.3	28.5	23	1315	9.3	32.4	23	1200	9.0	27.7
27	1530	8.4	28.8	24	1345	8.5	31.8	24	1245	9.0	29.4
28	0615	8.7	28.4	25	1500	8.4	31.8	25	1400	9.4	28.1

SEASIDE AQUARIUM

Date 1962	Time PST	T °C	S ‰	Date 1962	Time PST	T °C	S ‰	Date 1962	Time PST	T °C	S ‰
Mar. 26	1515	9.3	28.6	June 2	1100	13.3	23.9	Aug. 9	0655	13.9	
27	1600	9.1	27.8	3	1300	13.3	26.0	10	1945	15.9	
28	1730	9.9	29.5	4	1430	13.6	26.1	11	2045	15.1	
29	0630	8.7	31.1	5	1600	13.8	22.7	12	0930	15.4	
30	0615	9.2	31.0	6	1640	15.0	26.4	13	1100	15.7	
31	0625	9.5	30.2	7	0405	13.0	28.2	14	1200	15.1	
April 1	0730	9.8	31.1	8	0400	11.9	30.7	15	1230	15.3	
2	0820	9.6	29.5	9	0430	10.4	33.2	16	1415	15.7	
3	0925	9.4	30.6	10	0600	9.8	33.5	17	1320	16.6	
4	1100	10.0	26.1	11	0805	10.4	33.2	18	1525	17.1	
5	1115	10.0	25.0	12	0840	10.2	33.7	19	1500	17.3	
6	1220	10.5	27.1	13	0930	10.3	33.2	20	1530	17.5	
7	1305	10.4	26.5	14	1015	11.3	33.3	21		13.0	
8	1415	10.4	28.1	15	2230	13.2	28.6	22		13.4	
9	1500	10.7	23.4	16	1230	12.9	30.4	23		12.6	
10	1645	10.6	25.0	17	1300	13.6	31.2	24		11.7	
11	1730	12.0	25.6	18	1300	13.0	31.9	25		13.2	
12	0600	10.2	29.5	19	1415	14.0	31.6	26		13.1	
13	0645	10.7	29.4	20	0220	13.1	32.4	27		13.6	
14	0730	11.2	28.5	21	0255	11.8	33.5	29		13.3	32.8
15	0830	11.2	20.9	22	0305	12.9	33.2	30		13.6	33.7
16	0930	11.2	23.3	23	0405	11.9	33.5	Sept. 1		14.0	32.7
17	1030	12.2	21.4	24	0445	11.9	33.6	2		14.0	33.5
18	1115	12.3	23.0	25	0600	12.1	33.8	3		13.7	33.2
19	1130	12.6	23.3	26	0715	11.9	31.4	4		14.0	33.7
20	1215	11.8	23.7	27	0845	13.6	29.4	5		13.5	32.8
21	1300	12.2	23.3	28	1000	14.2	29.4	6		14.1	33.2
22	1400	12.5	24.8	29	1135	12.4	31.8	7		13.9	33.1
23	1430	13.2	23.9	30	1215	13.3	31.4	8		13.2	33.1
24	1515	12.4	28.1	July 1	1300	14.2	30.7	9		13.3	32.8
25	1600	12.4	27.8	2	1330	14.4	31.6	10		13.2	32.3
26	1615	12.3	28.1	3	1330	13.6	33.7	11		13.1	31.6
27	1645	11.5	28.8	4	1650	12.5	32.8	12		13.0	32.1
28	0830	11.0	28.4	5	1515	13.4	31.5	13		12.7	32.9
29	0900	11.1	28.8	6	1600	15.4	28.5	14		13.0	31.9
30	0915	11.2	28.8	7	0310	13.8	29.1	15		13.1	32.5
May 1	0930	11.4	29.8	8	0440	13.4	30.2	16		13.1	33.3
2	1025	11.5	28.4	9	1800	14.9	30.6	17		13.4	32.8
3	1105	11.5	29.0	10	1830	13.0	32.7	18		13.2	32.8
4	1145	11.7	27.5	11	1845	13.1	32.7	19		13.5	31.4
5	1330	12.6	29.4	12	2020	11.8	32.7	20		13.3	30.2
6	1415	11.5	30.6	13	2050	11.7	34.0	Dec. 1		10.6	
7	1515	12.0	30.7	14	2110	11.0	34.0	2		11.1	
8	1520	12.7	31.4	15	1145	11.5		3		10.3	
9	1630	12.0	31.5	16	1300	12.3		4		10.3	
10	0615	11.3	30.7	17	1320	13.1		5		10.0	
11	0615	11.5	29.8	18	1355	13.1		6		10.3	
12	0630	11.8	29.0	19	1430	14.5		7		10.6	
13	0750	12.0	27.6	20	0130	13.1		8		10.8	
14	0915	12.0	27.3	21	0225	13.4		10		11.1	
15	0930	10.8	32.0	22	0330	13.3		11		10.8	
16	1035	11.2	32.0	23	0500	12.4		12		10.8	
17	1135	11.9	28.8	24	0620	11.0		13		11.1	
18	1215	11.0	31.9	25	0745	10.5		14		11.1	
19	1305	11.6	31.6	26	0900	11.2		15		11.6	
20	1300	11.7	29.3	27	0945	12.0		16		11.6	
21	1300	12.8	29.0	28	1045	12.4		20		10.6	
22	1530	12.9	25.6	29	1215	11.9		21		10.6	
23	1600	12.7	26.7	30	1245	11.8		22		10.0	
24	1715	13.1	24.7	31	1315	12.4		23		10.0	
25	0600	11.8	28.5	Aug. 1	1315	12.5		24		8.9	
26	0600	11.9	28.0	2	1500	13.6		25		8.9	
27	0630	12.1	28.6	3	1530	14.2		26		8.9	
28	0730	12.3	25.2	4	1630	14.2		27		8.4	
29	0900	12.4	27.2	5	1700	13.7		28		8.9	
30	1015	12.7	27.7	6	1615	14.0		29		9.5	
31	1100	13.6	25.9	7	0505	13.4		30		10.0	
June 1	1100	14.6	22.6	8	0605	13.7		31		10.0	

ARCH CAPE

Date 1962	Time PST	T °C	S ‰	Date 1962	Time PST	T °C	S ‰	Date 1962	Time PST	T °C	S ‰
Jan. 1	0855	8.40		June 11	1935	10.6		Sept. 12	1105	11.6	
7	1300	9.10	29.22	12	0825	9.2		13	1155	12.3	
13	1630	7.70	30.64	13	0900	9.6		14	1515	14.0	
20	1138	6.80	32.07	14	0945	11.3		15	1300	14.5	31.52
27	1700	8.1	26.42	16	1130	12.1	31.11	16	1350	13.4	
Feb. 5	1200	8.3	29.91	23	1650	12.1	33.34	17	1450	12.1	
10	1630	9.3	30.13	30	1130	12.0	32.35	18	1550	12.5	
17	1645	8.8	30.19	July 8	1720	12.1	32.15	19	1650	13.0	
24	1500	8.7	31.81	14	1040	10.1	32.76	20	0510	12.5	
Mar. 3	0905	6.3	27.80	21	1700	10.1	33.06	30	1430	13.1	32.19
11	1550	8.8	31.56	28	1230	14.0	32.32	Oct. 6	1700	13.1	
17	1040	8.7		Aug. 11	0900	13.1	32.15	27	1130	13.1	31.72
18	1030	8.5	31.53	18	1515	16.0	31.8	Nov. 3	1500	13.0	29.93
19	1145	8.8		20	1540	17.0		17	1400	11.1	31.25
20	1325	8.5		26	1055	10.7		Dec. 8	1400	11.6	30.33
21	1650	7.8		27	1150	11.6		16	1550	11.3	31.14
22	1315	8.0		28	1225	12.7		17	1620	11.2	
23	1430	8.2		29	1145	13.1		18	1720	10.9	
24	1425	8.5	29.28	30	1340	12.8		19	0715	11.0	
Apr. 1	1100	9.1	30.70	31	1300	11.5		20	0755	10.8	
8	1630	9.9	26.44	Sept. 1	1410	10.3	33.43	21	0720	10.8	
14	0920	11.0	25.32	2	1410	10.8		22	0830	10.2	
21	1330	12.5	25.52	3	1425	11.4		23	0920	10.2	30.65
28	1700	10.1	26.71	4	1505	12.65		24	1000	9.8	
May 5	1330	13.1	29.85	5	1555	14.1		25	1130	9.7	
12	1100	11.1	29.90	6	1600	13.7		26	1155	9.8	
20	1300	10.1	30.11	7	1650	13.8		28	1205	8.8	
27	1530	12.0	29.33	8	0700	10.7	31.71	29	1330	9.6	30.43
June 2	1630	13.1	27.30	9	0805	9.9		30	1410	10.2	
9	1700	11.1	32.13	10	0915	9.6		31	1510	10.4	
10	1835	11.4		11	1015	11.1					

NETARTS

Jan. 2	0900	9.1		Apr. 24	1630	11.7	28.72	Aug. 21	1500	20.3	30.95
10	1600	7.8	29.40	30	1000	11.5		28	1230	11.3	32.00
15	0830	7.6	29.87	May 7	1600	12.0	28.32	Sept. 3	1630	11.6	32.89
22	1330	6.3	30.30	16	1130	12.2	28.21	18	1500	12.4	32.12
30	0800		31.00	25	1830	15.0	28.33	24	1015	12.1	32.37
Feb. 5	1315	8.4		June 11	0800	11.4	30.22	Oct. 5	1415	15.2	31.37
14	0900	8.6		21	1635	13.4	32.35	23	0810	11.7	28.36
19	1330	10.1	30.85	26	1105	13.4	31.32	Nov. 7	0900	12.0	
26	1745	8.2	30.59	July 2	1330	15.4	31.00	14	0830	11.7	
Mar. 6	1330	7.8	30.67	9	0745	13.4		20	0945	12.4	30.57
14	0730	7.4	30.67	17	1415	15.9	31.92	26	1330	11.8	30.23
19	1200	9.1	30.35	23	1750	12.9	32.90	Dec. 5	0845	10.5	30.30
25	1600	9.7	27.73	31	1300	14.9	30.84	22	1115	10.1	30.14
Apr. 7	1500	10.2	27.74	Aug. 7	1800	14.2	30.13	27	1300	9.4	31.27
16	1100	12.2	27.86	13	1150	17.1	31.04				

OTTER ROCK

Jan. 7	1130	9.7	29.87	May 12	1900	13.5	25.70	Sept. 16	1330	12.4	32.92
13	1600	9.4	24.85	20	1300	10.4	32.33	23	0830	12.0	33.00
20	1200	6.2	30.35	26	1900	11.4	31.90	30	1230	14.2	32.45
26	1530	8.8	32.23	June 3	1300	13.5	30.49	Oct. 6	1630	13.5	
Feb. 4	1100	9.1	32.10	10	1900	12.4	28.91	14	1300	13.4	
10	1600	9.4	31.50	17	1200	11.8	30.37	21	1730	14.7	
18	1100	9.7	30.29	25	1830	10.4	33.62	28	1200	13.5	
24	1530	9.1	31.05	July 1	1200	13.6	32.80	Nov. 5	0800	13.0	32.11
Mar. 3	0930	8.2	31.63	8	1700	13.2	32.01	10	1130	12.4	31.25
10	1530	8.8	28.93	15	1730	14.0	33.63	18	1630	12.9	31.85
18	1000	9.0	31.60	22	1630	12.5	33.43	25	1200	11.6	27.44
24	1430	9.2	29.54	29	1200	12.4	33.80	Dec. 2	1630	10.0	30.45
Apr. 1	0930	9.7	31.50	Aug. 5	1500	12.4	32.69	9	1000	11.1	30.85
7	1430	11.2	29.66	12	0945	15.3	32.68	16	1500	11.5	30.10
15	0930	10.4	31.91	19	1500	19.5	32.24	22	0900	10.3	30.53
22	1430	13.2	29.63	26	1000	11.0	33.66	29	1300	10.1	31.57
28	1900	13.3	28.06	Sept. 2	1400	11.3	32.60				
May 6	1400	11.2	29.02	9	0830	9.7	33.21				

YACHATS

Date 1962	Time PST	T °C	S ‰
Jan. 3	1630	9.9	29.20
10	1545	9.7	30.90
17	1630	8.9	31.38
24	1600	8.8	32.32

Date 1962	Time PST	T °C	S ‰
Feb. 11	0950	9.4	
18	1645	10.3	
25	1115	9.7	

Date 1962	Time PST	T °C	S ‰
Mar. 4	1000	8.5	
26	1745	9.6	
Apr. 2	1630	10.2	

HECETA BEACH

July 13	0900	10.2	33.45
23	1555	11.1	33.35
29	1040	10.9	33.15
Aug. 5	1100	12.6	33.19
7	1700	13.8	
12	0830	14.6	32.17
16	1500	17.2	
17	0800	16.7	
18	1115	18.0	32.12

Aug. 23	1800	10.3	
25	1300	10.3	
Sept. 4	1600	10.1	33.50
9	1710	11.2	33.39
16	1800	10.3	32.78
23	1600	10.1	33.04
30	0900	13.3	32.42
Oct. 7	1630	13.1	31.78

Oct. 14	1030	13.2	31.59
28	0930	12.1	32.42
Nov. 4	0900	12.7	32.38
19	1545	12.2	31.75
26	0900	12.3	30.46
Dec. 8	1215	12.5	30.46
16	1605	11.8	30.84
31	1405	9.8	31.46

BANDON

Jan. 4	1100	9.8	31.82
11	1545	9.2	33.13
18	1130	8.0	32.72
25	1440	9.5	33.21
Feb. 1	0840	8.4	32.95
8	1230	9.4	
15	1015	9.3	27.95
22	1330	9.8	30.49
Mar. 1	0715	7.4	32.17
8	1345	10.4	32.03
15	0715	9.2	31.74
22	1403	9.9	32.12
29	0615	9.1	31.90
Apr. 5	1310	12.7	31.20
12	0600	7.8	33.38
19	1310	12.9	31.97
26	1710	11.7	30.05
May 3	1340	13.6	31.35

May 10	1815	11.1	32.26
17	1115	10.1	33.41
24	1615	12.5	32.78
31	1030	10.7	33.49
June 8	1730	9.0	33.84
14	1000	9.1	33.86
21	1615	11.2	33.76
28	0915	12.1	33.72
July 5	1235	10.6	33.76
12	0815	8.5	33.83
19	1430	11.1	33.87
26	0820	8.6	33.97
Aug. 2	1110	10.4	33.63
9	0645	12.1	33.02
16	1340	15.2	32.60
23	0640	9.4	33.70
30	1120	9.7	33.83

Sept. 6	1610	9.7	33.77
13	1120	11.0	33.57
20	0700	11.3	33.42
27	1250	12.1	33.39
Oct. 4	1600	13.6	32.91
11	1310	12.4	29.47
18	1530	12.7	32.84
25	1110	11.3	32.65
Nov. 1	1310	11.5	33.17
8	0915	12.2	31.95
15	1330	12.0	31.18
22	0915	12.1	32.58
29	1140	11.0	31.61
Dec. 6	0830	11.3	30.64
13	1120	11.9	31.07
20	0740	11.0	31.36
27	1205	9.4	32.98

HUMBUG MOUNTAIN

Jan. 1	1345	9.5	31.73
7	1645	9.7	32.21
20	1705	7.5	32.12
27	1520	8.7	31.71
Feb. 3	1455	9.7	32.38
15	1720	9.8	30.14
22	1750	10.0	30.62
Mar. 4	1550	9.3	31.74
11	1740	9.6	31.83
18	1810	10.1	30.84
27	1750	9.9	30.08
Apr. 4	1805	9.9	33.04
11	1620	10.7	33.32

Apr. 23	1340	10.1	33.14
May 7	1640	11.0	32.73
14	1855	10.1	32.38
21	1800	9.2	33.58
30	1930	8.5	33.63
June 10	1745	9.0	33.74
18	1850	9.4	33.29
24	1820	10.5	33.62
July 1	1920	10.5	33.16
7	1835	10.4	33.70
15	1855	9.7	33.50
23	1800	10.7	33.84
31	1900	11.3	33.85

Aug. 9	1830	14.8	33.12
26	1820	11.4	33.84
Sept. 3	1825	10.7	33.93
9	1745	11.2	33.77
19	1820	12.7	33.17
30	1815	12.4	33.18
Oct. 25	1705	11.5	32.12
Nov. 5	1445	12.1	32.51
18	1710	12.2	31.44
24	1610	11.5	32.33
Dec. 8	1650	11.3	29.98
14	1530	11.8	30.98
22	1615	11.3	31.44
29	1050	9.8	32.35

BROOKINGS

Jan. 3	1115	9.6	31.36
6	0815	9.4	31.94
13	1530	9.4	32.90
20	1300	8.0	32.74
27	1530	8.7	31.08
Feb. 3	1130	9.5	32.32
10	1415	9.8	29.62
20	1645	10.2	30.89
26	1530	8.5	32.35
Mar. 3	0930	8.4	29.03
12	1530	9.8	31.67
19	1545	9.6	32.30
24	1400	9.3	30.70
31	1530	10.2	30.60
Apr. 7	1445	11.3	32.36
15	1715	9.8	33.27

Apr. 24	1630	10.8	32.63
May 6	1530	10.8	31.16
13	1930	10.4	31.74
26	1530	11.4	33.33
June 5	1645	10.8	33.30
9	1600	10.6	33.35
20	1630	11.9	33.42
July 17	1645	8.8	34.05
22	1700	12.8	33.62
30	1745	13.1	33.68
Aug. 7	1700	13.5	32.72
14	1730	13.5	33.07
20	1645	13.6	33.57
31	1645	13.0	33.58
Sept. 6	1730	13.0	33.29
11	1700	12.2	33.59

Sept 17	1700	15.5	33.03
24	1715	13.4	33.27
Oct. 4	1730	13.5	32.78
10	1715	12.0	30.70
15	1645	12.0	31.91
23	1730	11.8	32.18
31	1730	11.5	32.28
Nov. 5	1745	12.2	32.26
14	1645	13.0	30.95
22	1030	11.8	31.46
26	1630	11.8	31.42
Dec. 3	1700	11.2	27.10
15	1000	11.8	31.18
22	1500	11.6	30.81
31	1630	10.4	31.04

CRESCENT CITY, CALIFORNIA

Date 1962	Time PST	T °C	S %	Date 1962	Time PST	T °C	S %	Date 1962	Time PST	T °C	S %
Jan. 2	0925	9.2	28.0	May 2	0920	11.7	27.6	Sept. 1	1400	13.1	32.9
4	1050	9.5	31.1	4	1330	12.8	29.4	3	0920	13.1	32.5
6	1000	9.7	32.3	6	1140	10.9	31.8	5	1840	13.4	32.5
7	1210	10.0	32.7	7	1620	12.5	31.1	8	1335	14.7	32.4
9	1245	9.7	33.6	9	1535	12.8	27.5	11	1545	14.7	31.9
11	1525	9.7	31.4	11	1520	13.9	31.5	13	1425	14.5	32.1
13	1420	9.7	32.8	12	1620	12.5	31.9	15	1325	14.2	32.8
15	1510	9.2	31.9	15	0900	9.2	34.0	17	1135	15.0	32.8
17	1105	8.6	32.8	18	1720	10.6	34.1	18	1445	15.3	32.5
18	1205	8.4	31.4	19	1345	10.0	34.1	20	1740	16.1	32.4
22	1330	8.1	33.2	20	1105	8.9	34.1	22	1550	15.3	32.7
23	1440	7.2	30.2	21	1705	11.1	33.7	24	1730	14.2	32.5
24	1235	7.8	32.3	23	1820	12.5	31.4	25	1600	14.5	32.5
26	1400	8.6	32.9	25	1500	10.6	34.2	27	1650	15.0	32.3
27	1230	8.6	30.6	27	1430	10.9	34.1	29	1620	14.5	32.1
28	1450	8.6	31.6	28	0710	10.0	33.1	30	1600	14.7	32.7
29	1600	10.0	31.5	31	1145	11.1	33.8	Oct. 1	1425	13.6	32.5
Feb. 1	0840	9.2	32.5	June 2	1225	12.5	33.8	4	1435	13.4	32.8
2	0825	9.5	31.9	3	1815	10.6	34.1	7	1325	13.4	33.1
3	0930	9.5	32.3	5	1230	9.7	34.4	8	1255	12.2	32.1
5	1415	9.5	32.1	6	1450	10.6		10	1230	12.2	25.5
6	1600	9.5	29.3	7	1425	10.3	33.5	13	1150	12.2	29.0
8	1530	10.00	26.8	8	1445	11.4	33.6	14	1630	12.5	25.6
10	0955	9.5	23.0	10	1400	13.4	31.6	17	1415	12.8	32.1
12	0850	10.0	24.7	11	1920	13.4	31.9	18	1340	12.2	31.2
14	0900	10.0	28.1	14	1510	10.3	34.4	21	1105	12.2	29.9
16	1010	9.5	27.7	15	1355	10.9	33.7	23	1440	12.5	29.9
18	1230	10.0	27.6	17	1505	12.8	33.3	25	1235	13.4	27.1
20	0920	9.9	31.8	18	1410	13.4	31.8	27	1430	13.9	27.8
22	1305	10.0	29.8	20	1310	12.8	33.5	29	1350	12.5	34.0
24	1305	9.7	30.7	21	1520	14.2	31.5	Nov. 2	1500	12.5	31.2
26	1415	9.7	33.6	22	1350	13.9	32.0	3	1455	12.8	32.0
28	1300	7.7	27.3	24	1535	13.4	32.7	4	0945	12.5	32.0
Mar. 1	1005	7.5	26.4	26	1350	13.6	32.3	8	1345	12.2	31.4
3	0945	8.1	28.8	28	1350	11.7	33.3	10	0940	12.5	30.4
5	1030	9.2	28.9	30	1055	12.2	31.8	11	1145	12.5	29.8
6	1130	10.3	29.4	July 3	0915	11.7	31.8	16	1050	12.2	30.1
8	1515	10.6	30.4	6	1150	10.9	33.5	17	1640	12.2	30.3
11	1520	9.5	29.1	7	1530	11.7	32.1	18	0930	12.0	31.4
13	1440	11.1	28.2	8	1325	12.8	33.2	20	1300	12.5	30.3
15	1200	10.3	28.4	9	1310	13.6	31.5	23	1310	12.0	31.5
18	1030	10.3	31.8	10	1455	13.6	31.1	24	0950	11.4	31.9
20	1440	10.6	31.8	12	1245	13.6	31.1	26	1420	12.0	28.8
21	1550	9.2	32.4	15	0835	9.2	30.4	27	1030	11.7	29.5
23	1325	9.5	28.9	16	1345	10.0	34.2	28	1315	12.0	30.2
25	1255	9.5	24.7	18	1220	9.7	34.4	30	1520	11.1	29.3
26	1520	11.4	22.5	19	1200	11.1	34.4	Dec. 2	1545	11.1	25.9
28	1445	12.5	29.0	21	1130	13.9	32.1	3	1515	11.1	23.7
30	1530	12.5	23.8	23	1355	13.9	32.3	6	1425	11.7	25.1
Apr. 1	1735	10.3	31.5	25	1510	13.9	32.8	7	0915	11.1	28.0
4	1030	10.6	31.5	28	1250	13.9	32.5	8	1505	12.2	27.5
5	1230	11.9	30.7	30	1035	13.4	32.5	9	1110	11.1	27.6
7	1640	11.9	31.2	31	1055	13.4	32.7	10	1240	10.9	28.1
8	1305	11.1	31.6	Aug. 2	0835	13.4	32.3	11	1325	10.9	27.6
10	1425	11.1	33.2	4	1030	14.7	33.5	13	1245	11.1	27.5
12	0645	10.0	30.2	7	1530	15.0	29.8	16	1330	11.7	28.6
13	1540	14.2	30.3	8	1320	14.5	31.6	17	1310	11.7	29.0
14	1105	11.4	27.6	9	1345	15.3	31.1	18	1240	11.4	30.4
16	1555	12.8	30.7	11	1640	14.2	33.6	19	1520	11.1	29.3
17	1505	12.5	31.9	13	1420	16.4	31.4	21	1425	11.1	29.3
20	1555	12.0	31.9	15	1020	14.7	31.2	22	0955	10.8	30.7
21	1455	11.4	33.3	17	1155	10.5	32.7	25	1045	9.2	30.8
22	1310	10.6	31.8	20	1250	15.6	32.8	27	1310	8.9	30.1
23	1440	10.3	33.3	21	1450	16.1	32.0	30	0955	8.6	28.6
25	1625	11.1	32.1	22	1440	13.4	33.8	31	1150	8.6	30.2
28	0845	10.3	30.4	25	1025	13.1	32.7				
30	1515	12.8	28.6	27	1415	16.4	32.1				
May 1	0750	10.9	30.1	29	1505	13.6	32.7				

TABLE III. MONTHLY MEAN TEMPERATURE AND SALINITY

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
<u>LONG BEACH, WASHINGTON</u>													
TEMPERATURE °C													
Mean							15.0	16.0	14.9				15.3
Max.							16.1	18.0	14.9				
Min.							13.4	14.7	14.9				
Range							2.7	3.3	0.0				
No. of Obs.							7	11	1				
SALINITY ‰													
Mean							24.77	27.73	22.05				24.84
Max.							30.70	28.23	22.05				
Min.							18.85	27.23	22.05				
Range							11.85	1.00	0.00				
No. of Obs.							2	2	1				
<u>COLUMBIA RIVER LIGHTSHIP</u>													
TEMPERATURE °C													
Mean										12.8	11.9	10.5	11.7
Max										13.8	12.8	11.9	
Min.										12.0	10.0	8.4	
Range										1.8	2.8	3.5	
No. of Obs.										27	26	29	
SALINITY ‰													
No Observations													
<u>SEASIDE AQUARIUM</u>													
TEMPERATURE °C													
Mean	8.4	9.0	8.0	11.2	11.9	12.6	12.8	13.9	13.5			8.9	11.0
Max.	10.1	9.8	9.9	12.6	13.6	15.0	15.4	17.5	14.1			11.6	
Min.	7.0	8.3	6.2	9.4	10.8	10.8	10.5	12.5	12.7			8.4	
Range	3.1	1.5	3.7	3.2	2.8	4.2	4.9	5.0	1.4			3.2	
No. of Obs.	31	28	31	30	31	30	31	30	20			31	
SALINITY ‰													
Mean	30.5	31.3	27.6	26.4	28.8	30.5	31.8	33.2	32.9				31.0
Max	32.4	32.2	31.6	31.1	32.0	33.8	34.0	33.7	33.7				
Min.	28.2	30.2	25.6	23.0	24.7	22.6	28.5	32.8	30.2				
Range	4.2	2.0	6.0	8.1	8.3	11.2	5.5	0.9	3.4				
No. of Obs	31	28	31	30	31	30	14	2	20				
<u>ARCH CAPE</u>													
TEMPERATURE °C													
Mean	8.0	8.8	7.4	10.5	11.6	11.3	11.8	13.8	12.2	13.1	12.0	10.4	10.9
Max.	9.1	9.3	8.8	12.5	13.1	13.1	14.0	17.0	14.6	13.1	13.0	11.5	
Min.	6.8	8.3	6.3	9.2	10.1	9.3	10.0	10.7	9.6	13.1	11.1	9.7	
Range	2.3	1.0	2.5	3.3	3.0	3.8	4.0	6.3	5.0	0	1.9	1.8	
No. of Obs.	5	4	11	5	5	10	4	9	21	2	2	16	
SALINITY ‰													
Mean	29.59	30.51	30.04	26.92	29.97	31.25	32.57	31.97	32.21	31.72	30.59	30.84	30.68
Max.	32.07	31.81	31.56	30.70	30.11	33.34	33.06	32.15	33.43	31.72	31.25	30.65	
Min.	26.42	29.91	27.80	25.32	29.33	27.30	32.15	31.80	31.52	31.72	29.93	30.14	
Range	5.65	1.90	3.76	5.38	0.78	6.04	0.91	0.35	1.91	0.00	1.32	0.51	
No. of Obs.	4	4	4	5	4	5	4	2	4	1	2	4	

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
<u>NETARTS</u>													
TEMPERATURE °C													
Mean	7.9	9.0	8.8	11.5	13.1	12.8	14.4	15.8	12.1	13.5	12.0	10.2	11.8
Max.	9.1	10.1	9.7	12.2	15.0	13.4	15.9	20.3	12.4	15.2	12.4	10.5	
Min.	6.3	8.0	7.4	10.2	12.0	11.4	13.4	11.3	11.6	11.8	11.7	9.4	
Range	2.8	2.1	2.3	2.0	3.0	2.0	2.5	9.0	0.8	3.4	0.7	1.1	
No. of Obs.	5	4	4	4	3	3	5	4	3	2	4	3	

SALINITY ‰													
Mean	30.16	30.72	29.85	28.11	28.29	31.26	31.66	30.53	32.46	29.86	30.40	30.57	30.32
Max.	31.00	30.85	30.67	28.72	28.33	32.35	32.90	32.00	32.89	31.37	30.57	31.27	
Min.	29.40	30.59	27.73	27.74	28.21	30.22	30.84	30.13	32.12	28.36	30.23	30.14	
Range	1.60	0.26	2.94	0.98	0.12	2.13	2.06	1.87	0.77	3.01	0.34	1.13	
No. of Obs.	4	2	4	3	3	3	4	4	3	2	2	3	

OTTER ROCK

TEMPERATURE °C													
Mean	8.5	9.3	8.8	11.6	11.8	12.0	13.1	14.6	11.9	13.8	12.5	10.6	11.6
Max.	9.7	9.7	9.3	13.3	13.5	13.5	14.0	19.5	14.2	14.7	13.0	11.5	
Min.	6.2	9.1	8.3	9.7	10.4	10.4	12.4	11.0	9.7	13.4	11.6	10.0	
Range	3.5	0.6	1.0	3.6	3.1	3.1	1.6	8.5	4.5	1.3	1.4	1.5	
No. of Obs.	4	4	4	5	4	4	5	4	5	4	4	5	

SALINITY ‰													
Mean	29.32	31.24	30.42	30.15	29.76	30.85	33.13	32.82	32.84		30.64	30.70	31.08
Max.	32.23	32.10	31.63	31.91	32.33	33.62	33.80	33.66	33.21		32.11	31.57	
Min.	24.85	30.29	28.93	28.06	29.02	28.91	32.00	32.24	32.45		27.44	30.10	
Range	7.38	1.81	2.70	3.85	3.31	4.71	0.80	1.42	0.76		4.67	1.47	
No. of Obs.	4	4	4	5	4	4	5	4	5		4	5	

YACHATS

TEMPERATURE °C													
Mean	9.3	9.8	9.0	10.2									9.6
Max.	9.9	10.3	9.6	10.2									
Min.	8.7	9.4	8.5	10.2									
Range	1.2	0.9	1.1	0.0									
No. of Obs.	4	3	2	1									

SALINITY ‰													
Mean	30.95												30.95
Max.	32.32												
Min.	29.20												
Range	3.12												
No. of Obs.	4												

HECETA BEACH

TEMPERATURE °C													
Mean							10.7	14.3	11.0	12.6	12.4	11.2	12.0
Max.							11.1	18.0	13.3	13.2	12.7	12.5	
Min.							10.2	10.3	10.1	12.1	12.2	9.8	
Range							0.9	7.3	3.2	1.1	0.5	2.7	
No. of Obs.							3	8	5	3	3	3	

SALINITY ‰													
Mean							33.32	32.49	33.02	31.93	31.53	30.92	32.20
Max.							33.45	33.19	33.50	32.42	32.38	31.46	
Min.							33.15	32.12	32.42	31.60	30.46	30.46	
Range							0.30	1.07	1.08	0.82	1.92	1.00	
No. of Obs.							3	3	5	3	3	3	

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
<u>BANDON</u>													
TEMPERATURE °C													
Mean	9.1	9.2	9.2	11.3	11.6	10.4	9.7	11.4	11.0	12.5	11.8	10.9	9.2
Max.	9.8	9.8	10.4	12.9	13.6	12.1	11.1	15.2	12.1	13.6	12.2	11.9	
Min.	8.0	8.4	7.5	7.8	10.1	9.0	8.5	9.4	9.7	11.3	11.0	9.4	
Range	1.8	1.4	2.9	5.1	3.5	3.1	2.6	5.8	2.4	2.3	1.2	2.5	
No. of Obs.	4	4	5	4	5	4	4	5	4	4	5	4	

SALINITY ‰													
Mean	32.72	30.45	31.99	31.65	32.66	33.79	33.86	33.35	33.53	31.97	32.09	31.51	32.46
Max.	33.21	32.95	32.17	33.38	33.49	33.86	33.97	33.83	33.77	32.91	33.17	32.98	
Min.	31.82	27.95	31.74	30.05	31.35	33.72	33.76	32.60	33.39	29.47	31.18	30.64	
Range	1.39	5.00	1.43	3.33	2.14	0.14	0.21	1.23	0.38	3.44	1.99	2.34	
No. of Obs.	4	4	5	4	5	4	4	5	4	4	5	4	

HUMBUG MOUNTAIN

TEMPERATURE °C													
Mean	8.8	9.8	9.7	10.2	9.7	9.6	10.5	13.2	11.8	11.5	11.9	11.0	10.6
Max.	9.7	10.0	10.1	10.7	11.0	10.5	11.3	14.9	12.7	11.5	12.2	11.8	
Min.	7.5	9.6	9.3	9.9	8.5	9.0	9.7	11.5	10.7	11.5	11.5	9.8	
Range	2.2	0.4	0.8	0.8	2.5	1.5	1.6	3.4	2.0	0.0	0.7	2.0	
No. of Obs.	4	3	4	3	4	3	5	2	4	1	3	4	

SALINITY ‰													
Mean	31.95	31.04	31.15	33.13	33.08	33.55	33.61	33.50	33.51	32.12	32.09	31.19	32.49
Max.	32.21	32.38	31.83	33.32	33.63	33.74	33.85	33.84	33.93	32.12	32.51	32.35	
Min.	31.71	30.14	30.08	30.04	32.38	33.29	33.16	33.17	33.17	32.12	31.44	29.98	
Range	0.50	2.24	1.75	3.28	1.25	0.45	0.69	0.67	0.76	0.0	1.07	2.37	
No. of Obs.	4	3	4	3	4	3	5	2	4	1	3	4	

BROOKINGS

TEMPERATURE °C													
Mean	9.0	9.5	9.7	10.6	10.9	11.1	11.6	13.4	13.5	12.1	12.2	11.2	11.2
Max.	9.6	10.2	10.2	11.3	11.4	11.9	13.1	13.6	15.5	13.5	13.0	11.8	
Min.	8.0	8.5	8.4	9.8	10.4	10.6	8.8	13.0	12.2	11.5	11.8	10.4	
Range	1.6	1.7	1.8	1.5	1.0	1.3	4.3	0.6	3.3	2.0	1.2	1.4	
No. of Obs.	5	4	5	3	3	3	3	4	4	5	4	4	

SALINITY ‰													
Mean	32.00	31.29	31.66	32.75	32.07	33.35	33.78	33.51	33.37	31.97	31.50	30.03	32.27
Max.	32.90	32.35	32.30	33.27	33.33	33.42	34.05	33.58	33.59	32.78	32.26	31.18	
Min.	31.08	29.62	29.03	32.36	31.16	33.30	33.62	32.72	33.03	30.70	30.95	27.10	
Range	1.82	2.73	3.27	0.91	2.17	0.12	0.43	0.86	0.56	2.08	1.31	4.08	
No. of Obs.	5	4	5	3	3	3	3	4	4	5	4		

CRESCENT CITY, CALIFORNIA

TEMPERATURE °C													
Mean	9.0	9.6	10.1	11.4	11.8	12.1	12.3	14.4	14.5	12.8	12.1	10.7	11.7
Max.	10.0	10.0	12.5	14.2	13.9	14.2	13.9	16.4	16.1	13.9	12.8	11.7	
Min.	7.2	7.8	7.5	10.0	8.9	9.7	9.2	13.3	13.1	11.7	11.1	8.6	
Range	2.8	2.2	5.0	4.2	5.0	5.5	4.7	3.1	3.0	2.2	1.7	3.1	
No. of Obs.	17	16	16	18	18	19	17	15	16	14	16	19	

SALINITY ‰													
Mean	31.8	29.3	28.4	31.2	32.1	33.0	30.7	32.2	32.5	30.2	30.7	28.3	30.8
Max.	33.6	33.6	32.4	33.3	34.2	34.4	34.4	33.8	32.9	34.0	32.0	30.8	
Min.	28.0	23.0	22.5	28.6	27.5	31.6	31.1	29.8	31.9	25.5	28.8	23.7	
Range	5.6	10.6	9.9	4.7	6.7	2.8	3.3	4.0	1.0	8.5	3.2	7.1	
No. of Obs.	17	16	16	18	18	18	17	15	16	14	16	19	

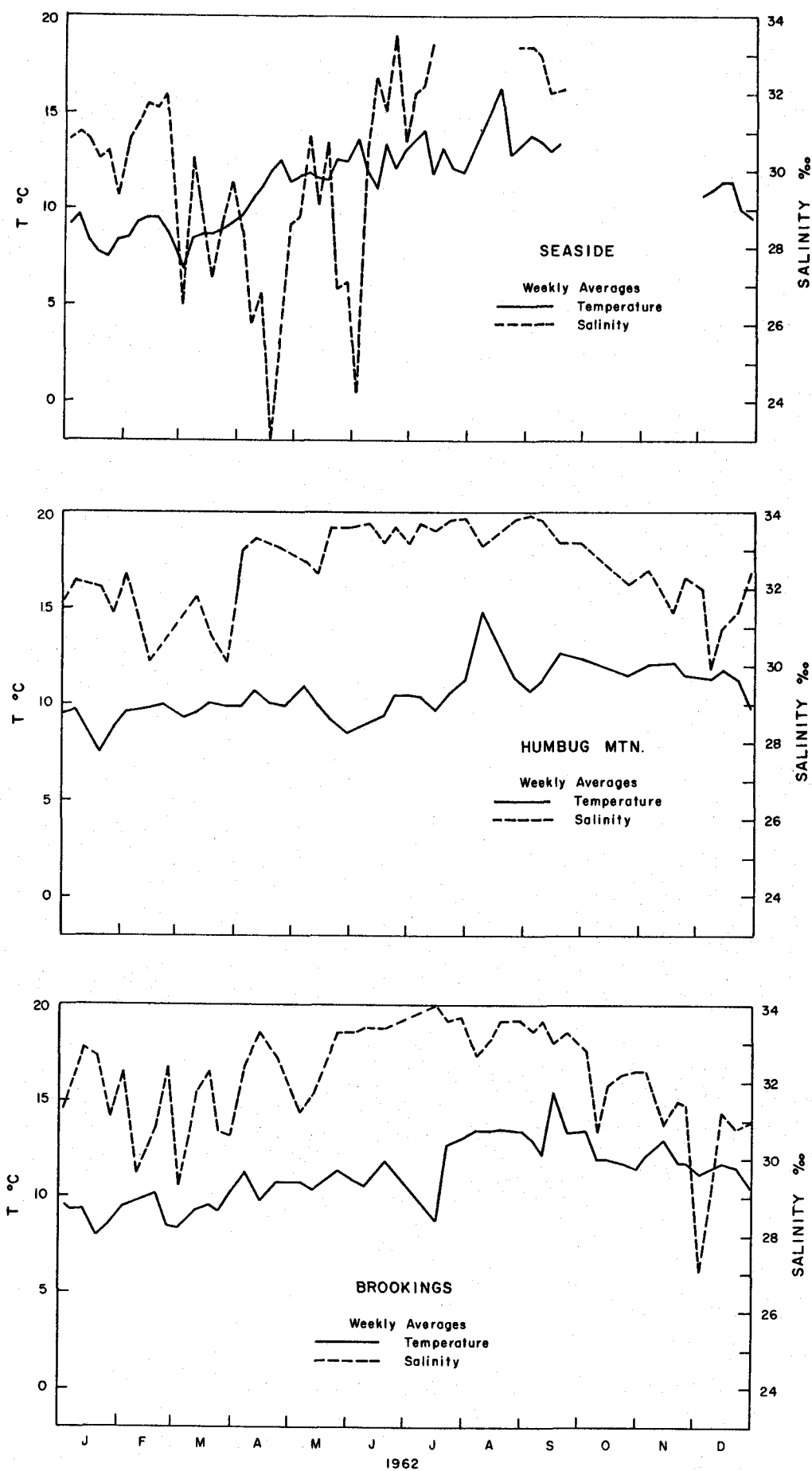


Figure 2. Weekly Temperature and Salinity, Three Stations.

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