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SURFACE WATER TEMPERATURES

AT SHORE STATIONS

United States West Coast

1969

Including surface salinities from

several stations and five-meter

temperatures and salinities at

Scripps Pier

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Approved for distribution:

W. A. Nierenberg

W. A. Nierenberg, Director

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INTRODUCTION

This report presents temperature and salinity data observed during 1969 at shoreline stations along the west coast of North America from the Strait of Juan de Fuca, Washington, to La Jolla, California. Also included are data from shore stations reporting to Oregon State University. The data consist of monthly means, ranges and standard deviations based on daily observations. Daily temperature and salinity values from which the means were derived are reproduced by computer for limited distribution and are available, upon request, for the cost of reproduction.

Various agencies and volunteers have participated in the collection of these data. The agencies are: Hopkins Marine Station, U. S. Coast and Geodetic Survey, U. S. Coast Guard, the California State Park System, Mendocino County, Oregon State University, Pacific Gas and Electric Company and Scripps Institution of Oceanography of the University of California, San Diego. We are also indebted to all volunteer observers and to staff members of Scripps who have tabulated the data and compiled the statistics.

Temperature readings and water samples are obtained from surf and sandy beaches, off rocky cliffs and ledges, over the sides of lightships and off piers, depending upon the station location. Temperatures have been listed as reported with no attempt to screen or eliminate observers' errors. Thermometer accuracies are assumed to be equivalent to the reading accuracies noted below.

All stations, excluding the U. S. Coast and Geodetic Survey and those reporting to Oregon State University, are maintained in cooperation with Scripps Institution of Oceanography. At these cooperative stations, temperatures are taken by obtaining a sample of water in a container, then measuring the temperature of the sample by immersion of a high-grade mercury thermometer supplied and calibrated by Scripps. At Scripps Pier, Balboa (April through December) and San Clemente, temperature readings are listed to 0.01°C. Blunts Reef (September through December 4), Avila, Santa Monica and Shelter Cove, temperatures were reported to 1.0°F; Ventura Marina to 0.5°F and Bodega Bay to 0.1°F. The Fahrenheit temperatures were converted and listed to the nearest 0.1°C. At all other stations, and at Balboa (January through March) and Blunts Reef (January through August), temperatures were reported to 0.1°C.

Salinities for Scripps Pier, Balboa, Blunts Reef, S. E. Farallon Island, Pacific Grove, San Clemente and Ventura Marina are obtained from sea-water samples in special salinity bottles supplied by Scripps. Water samples are forwarded to Scripps once a month for determination by salinometer. Salinities are listed in hundredths of a part per thousand. Values of maximum salinities may possibly be in error, due to evaporation or contamination of the samples in the bottles. At Balboa, the area from Santa Ana River to the Newport Pier was quarantined from January 30 to May 31, 1969, due to a broken main sewer caused by heavy flood conditions. Some questionable values have been omitted for these months.

Each month, the U. S. Coast and Geodetic Survey sends to Scripps Institution daily temperature and density values from four tide stations, located at Neah Bay, Washington, and Avila, Crescent City and Santa Monica, California. Temperature readings for Avila and Santa Monica are listed to 1.0°F; for Neah Bay and Crescent City, to 0.5°F. These Fahrenheit readings have been converted and are listed to the nearest 0.1°C. The density values are obtained by hydrometer and are converted at Scripps to salinity values listed in tenths of a part per thousand. Reported salinities exceeding 34‰ may be due to faulty sampling techniques. Salinities less than 30‰ are due to local precipitation or fresh water runoff. Neither are representative of offshore oceanic waters.

Temperature data from stations reporting to Oregon State University were taken with calibrated thermometers contained in plastic-lined, brass, protecting enclosures. The thermometers were calibrated against a standard and read to the nearest 0.1°C. The observations are considered accurate to approximately ±0.2°C.

Most salinity data from Oregon State University were determined by hydrometer readings and tables. Hydrometers were calibrated against an inductive salinometer which has an accuracy of about ±0.003‰. The accuracy of salinity determined by a corrected hydrometer is believed to be ±0.2‰. At Newport Marine Science Center, salinities were run on an inductive salinometer. Salinities reported in excess of 34.4‰ are doubtful values and possibly are due to salt residue accumulating on the measuring equipment. At Depoe Bay, samples are taken from an aquarium intake pipe. The ocean side of this pipe is located in a tidal pool which apparently has high evaporation. It is isolated from the ocean more than one-half the tidal cycle.

SURFACE-TEMPERATURE STATIONS IN GEOGRAPHICAL ORDER

Station Name	Position	Location	Page
Washington			
Neah Bay	48°22.0'N, 124°37.0'W	USCGS Tide Gauge Station Strait of Juan de Fuca	10
Umatilla Lightship	48°10.0'N, 124°50.0'W	Off Cape Flattery	10
Oregon			
Columbia River Lightship	46°11.2'N, 124°11.0'W	Mouth of Columbia River	11
Seaside Aquarium	45°59.7'N, 123°55.6'W	At pump outlet into Aquarium settling tank from surf inlet pipe	11, 12
Depoe Bay Aquarium	44°49.4'N, 124°04.0'W	At pump outlet into Aquarium settling tank from surf inlet pipe	12
Newport Marine Science Center	44°37.2'N, 124°01.5'W	At pump outlet into Laboratory from bottom of Yaquina Bay	13
Charleston	43°21.0'N, 124°19.0'W	From surface of bay	13
Port Orford	42°44.6'N, 124°30.6'W	Off east side of Port Orford River	14
California			
Crescent City	41°44.6'N, 124°11.7'W	USCGS Tide Gauge Station Crescent City	14
Blunts Reef Lightship	40°26.0'N, 124°30.0'W	Off Cape Mendocino	15
Shelter Cove	40°01.4'N, 124°03.9'W	Mendocino County	15
Mendocino	39°18.2'N, 123°48.2'W	Russian Gulch State Park near Mendocino	15
Fort Ross	38°30.7'N, 123°14.5'W	Fort Ross Historical Monument Sonoma County	16
Bodega Bay	38°19.0'N, 123°04.2'W	University of California Marine Laboratory	16
Farallon Island, S. E.	37°42.0'N, 123°00.0'W	SE Farallon Island Light Station off San Francisco	16
Santa Cruz	36°57.8'N, 122°00.0'W	Twin Lakes Beach State Park	17
Pacific Grove	36°37.2'N, 121°54.2'W	Hopkins Marine Station Pacific Grove	17
Point Lobos: north side	36°31.3'N, 121°56.3'W	Point Lobos Reserve State Park Whalers Cove	17
Point Lobos: south side	36°30.8'N, 121°56.6'W	Point Lobos Reserve State Park Carmel	18
Piedras Blancas Lighthouse	35°40.0'N, 121°16.9'W	U. S. Coast Guard	18
Morro Bay	35°22.2'N, 120°51.3'W	Pacific Gas and Electric Plant	18

Station Name	Position	Location	Page
California (cont.)			
Avila	35°10.0'N, 120°44.0'W	USCGS Tide Gauge Station Port San Luis Obispo	19
Santa Barbara	34°24.3'N, 119°41.5'W	Harbor Department Santa Barbara	19
Ventura Marina	34°14.7'N, 119°15.8'W	Ventura County Small Boat Harbor	20
Point Dume: west of	34°01.4'N, 118°50.0'W	Zuma Beach County Park near Malibu	20
Santa Monica	34°00.0'N, 118°30.0'W	USCGS Tide Gauge Station Santa Monica	21
Balboa	33°36.0'N, 117°54.0'W	Newport Beach Pier Newport Beach	21
Dana Point: east of	33°27.7'N, 117°41.1'W	Doheny Beach State Park Dana Point	22
San Clemente	33°25.0'N, 117°37.0'W	San Clemente Beach State Park	22
Oceanside	33°11.6'N, 117°23.1'W	Oceanside Pier Oceanside	22
La Jolla: Scripps Pier, surface	32°52.0'N, 117°15.3'W	Scripps Institution of Oceanography La Jolla	23
La Jolla: Scripps Pier, bottom	32°52.0'N, 117°15.3'W	Scripps Institution of Oceanography La Jolla	23

ALPHABETICAL LIST OF SURFACE-TEMPERATURE STATIONS

Station Name	Type of Data Collected		Agency	Page
	1968			
Avila	TS[1]	d[2]	USCGS	19
Balboa	TS	d	SIO	21
Blunts Reef Lightship	TS	d	USCG	15
Bodega Bay	T[3]	d	UCML	16
Charleston	TS	d	OSU	13
Columbia River Lightship	TS	d	USCG	11
Crescent City	TS	d	USCGS	14
Dana Point: east of	T	d	CSP	22
Depoe Bay Aquarium	TS	d	OSU	12
Farallon Island, S. E.	TS	d	USCG	16
Fort Ross	T	d	CSP	16
La Jolla: Scripps Pier, surface	TS	d	SIO	23
La Jolla: Scripps Pier, bottom	TS	d	SIO	23
Mendocino	T	d	CSP	15
Morro Bay	T	d	PG and E	18
Neah Bay	TS	d	USCGS	10
Newport Marine Science Center	TS	d	OSU	13
Oceanside	T	d	SIO	22
Pacific Grove	TS	d	HMS	17
Piedras Blancas Lighthouse	T	d	USCG	18
Point Dume: west of	T	d	SIO	20
Point Lobos: north side	T	d	CSP	17

[1] S: Surface salinities

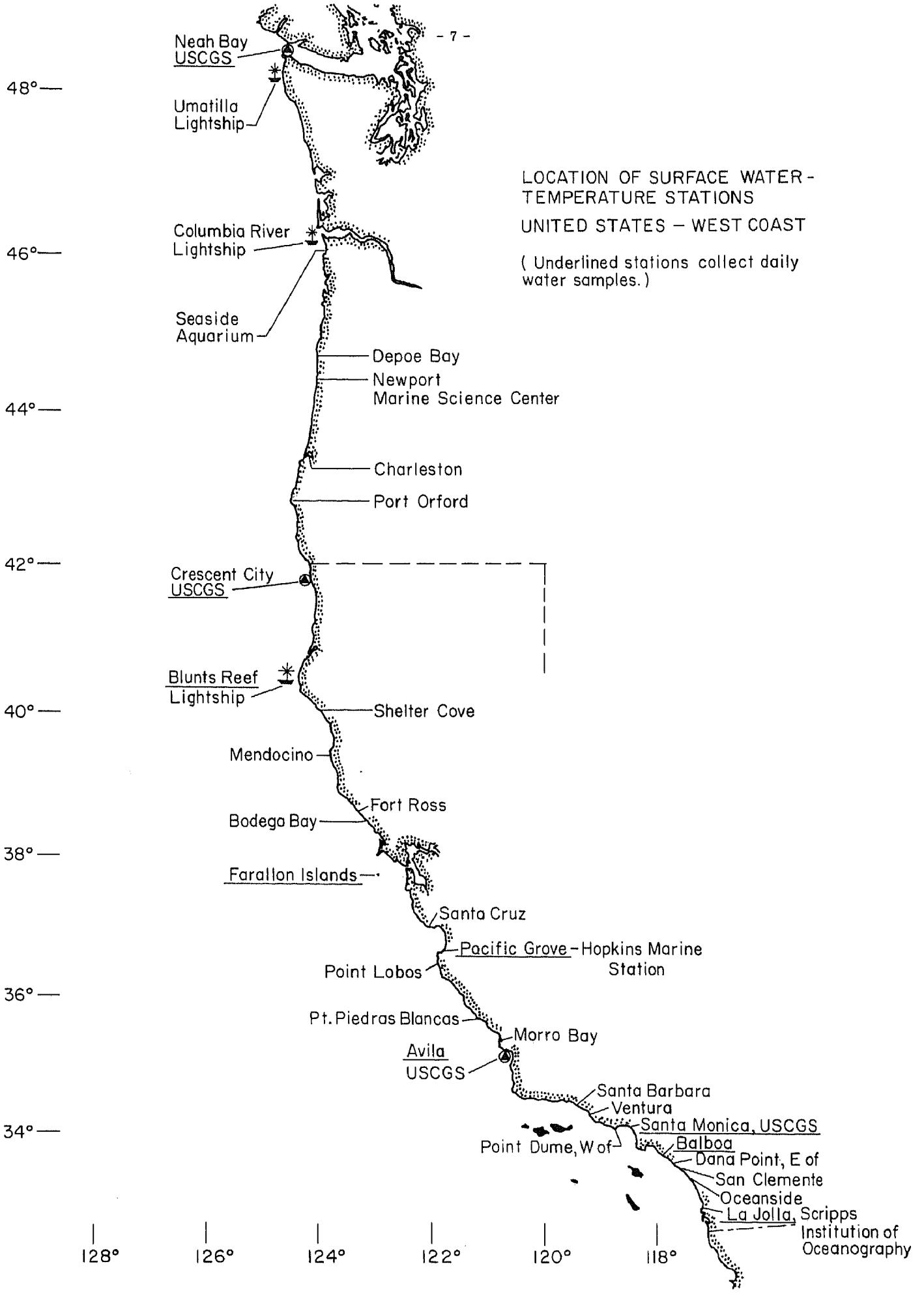
[2] d: Values taken daily

[3] T: Surface temperatures

[4] i: Values taken at irregular intervals

Station Name	Type of Data Collected		Agency	Page
	1968			
Point Lobos: south side	T	d	CSP	18
Port Orford	TS	d	OSU	14
San Clemente	TS	d	SIO	22
Santa Barbara	T	d	SIO	19
Santa Cruz	T	d	CSP	17
Santa Monica	TS	d	USCGS	21
Seaside Aquarium	TS	d	OSU	11, 12
Shelter Cove	T	i[4/]	MC	15
Umatilla Lightship	TS	d	USCG	10
Ventura Marina	TS	d	SIO	20

SIO: University of California, Scripps Institution of Oceanography, La Jolla, California
MC: Mendocino County
CSP: California State Park System
OSU: Oregon State University, Corvallis, Oregon
HMS: Hopkins Marine Station, Pacific Grove, California
USCG: United States Coast Guard
UCML: University of California Marine Laboratory
USCGS: United States Coast and Geodetic Survey
PG and E: Pacific Gas and Electric Company


LOCATION OF SURFACE WATER-TEMPERATURE STATIONS
UNITED STATES – WEST COAST
(Underlined stations collect daily water samples.)
Neah Bay USCGS
Umatilla Lightship
Columbia River Lightship
Seaside Aquarium
Depoe Bay
Newport Marine Science Center
Charleston
Port Orford
Crescent City USCGS
Blunts Reef Lightship
Shelter Cove
Mendocino
Fort Ross
Bodega Bay
Farallon Islands
Santa Cruz
Pacific Grove - Hopkins Marine Station
Point Lobos
Pt. Piedras Blancas
Morro Bay
Avila USCGS
Santa Barbara
Ventura
Santa Monica, USCGS
Point Dume, W of
Balboa
Dana Point, E of
San Clemente
Oceanside
La Jolla, Scripps Institution of Oceanography
48°
46°
44°
42°
40°
38°
36°
34°
128°
126°
124°
122°
120°
118°

SHORELINE SURFACE WATER-TEMPERATURE DATA

For the daily stations, the data presented show the monthly means, ranges, and standard deviations. A code designates the number of observations from which the averages were computed. This code is as follows:

No Designation	25 or more observations in a month, or 23 or more in February.
S Scattered	*Minimum of 5 observations per month with at least one in any 7-day period. Exception is Shelter Cove, where data are difficult to obtain and are shown even though only 1 to 3 observations per month.
A-B-C	Minimum of 6 or more observations in any group during a 10-day period. These periods are: A, 1 to 10; B, 11 to 20; C, 21 to 30 or 31.

Means, maxima, minima, ranges and standard deviations are included for those months marked "S" but the values are listed in parentheses.

For values designated "A," "B," "C," or any combination of these letters, means, maxima and minima are listed in parentheses. Ranges and standard deviations are omitted.

Standard deviations included in this report were computed from the following formula:

$$\text{Standard Deviation} = \sqrt{\frac{\Sigma\ (x - \bar{x})^2}{N-1}}$$

* Santa Cruz values have been included in this report, even though there were fewer observations than the minimum in some months and none in others, to provide some continuity in the records. In 1970, the station is being reactivated by the Santa Cruz Aquaticks Scuba Diving Club.

T AND S DATA NEAH BAY

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	5.07	5.99	7.73	9.23	11.16	12.31	11.86	11.52	10.78	10.90	9.80	8.34	9.56		
Max.		6.9	6.9	9.4	10.3	13.9	14.4	13.9	13.4	12.2	12.0	11.1	8.9		14.4	
Min.	T	2.2	4.7	6.6	7.8	9.2	10.8	8.9	10.3	9.2	9.7	8.0	7.8			2.2
Range		4.7	2.2	2.8	2.5	4.7	3.6	5.0	3.1	3.0	2.3	3.1	1.1			
Std. Dev.		1.25	0.61	0.62	0.55	1.25	1.03	1.14	0.87	0.88	0.69	0.93	0.33			
No. Obs.		31	28	31	30	30	31	29	30	29	31	29	28			
Mean	1969	29.65	29.53	30.11	29.00	30.97	31.19	31.90	32.23	31.72	30.88	30.83	30.86	30.74		
Max.		31.1	31.2	31.8	30.6	32.4	31.9	32.7	32.8	33.2	31.8	31.9	32.1		33.2	
Min.	S	22.4	27.4	29.0	27.7	25.6	29.4	29.5	31.8	29.7	29.1	29.5	29.9			22.4
Range		8.7	3.8	2.8	2.9	6.8	2.5	3.2	1.0	3.5	2.7	2.4	2.2			
Std. Dev.		1.71	1.00	0.87	0.67	1.70	0.62	0.62	0.31	1.01	0.52	0.69	0.78			
No. Obs.		31	28	31	30	29	30	29	30	29	31	29	28			

T AND S DATA UMATILLA LIGHTSHIP

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	6.86	7.11	8.16	9.77	10.81	13.61	11.88	(12.41)	11.69	13.24	11.38	10.00	(10.58)		
Max.		9.0	7.8	9.0	11.1	14.0	15.2	13.9	(13.9)	14.0	14.1	12.7	10.5		(15.2)	
Min.	T	5.2	6.0	7.5	8.3	9.2	11.4	10.0	(11.0)	10.6	12.0	9.5	9.0			(5.2)
Range		3.8	1.8	1.5	2.8	4.8	3.8	3.9	(2.9)	3.4	2.1	3.2	1.5			
Std. Dev.		1.10	0.48	0.46	0.66	1.35	0.93	1.04	(0.79)	0.99	0.63	0.86	0.46			
No. Obs.		31	28	31	30	31	29	28	24S	30	31	30	31			
Mean	1969				(29.07)	(30.74)	30.94							-		
Max.					(30.6)	(32.3)	33.0								(33.0)	
Min.	S				(28.4)	(24.2)	26.3									(24.2)
Range					-	(8.1)	6.7									
Std. Dev.					-	(1.86)	1.96									
No. Obs.					13C	23S	29									

T AND S DATA COLUMBIA RIVER LIGHTSHIP

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	6.87	7.80	8.49	(10.26)	11.72	14.99	15.79	15.00	13.86	13.35	(11.67)	11.01	(11.73)		
Max.		11.6	9.1	10.2	(12.0)	14.2	16.7	16.8	16.6	15.4	15.2	(13.5)	12.2		(16.8)	
Min.	T	3.4	5.5	7.2	(9.4)	9.6	10.8	13.8	12.6	11.1	10.5	(10.4)	8.5			(3.4)
Range		8.2	3.6	3.0	(2.6)	4.6	5.9	3.0	4.0	4.3	4.7	(3.1)	3.7			
Std. Dev.		2.00	1.12	0.90	(0.74)	0.88	1.34	0.68	1.05	1.36	1.49	(0.86)	0.92			
No. Obs.		25	26	30	23S	31	28	31	28	26	31	20S	26			
Mean	1969		(27.84)	25.94			23.61	23.81	28.00	(29.48)	(27.99)	(27.72)	(29.90)	-		
Max.			(31.8)	31.9			32.4	26.1	34.0	(33.8)	(30.8)	(30.4)	(33.2)		(34.0)	
Min.	S		(23.0)	15.7			13.2	17.3	22.2	(23.7)	(24.1)	(21.6)	(18.7)			(13.2)
Range			-	16.2			19.2	8.8	11.8	(10.1)	-	(8.8)	(14.5)			
Std. Dev.			-	5.36			4.84	2.45	4.03	(2.75)	-	(2.23)	(3.69)			
No. Obs.			10C	28			29	26	27	24S	7A	19S	23S			

T AND S DATA SEASIDE AQUARIUM

	YEAR	JAN.*	FEB.	MAR.	APR.	MAY	JUN.	JUL.*	AUG.*	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.*	MIN.*
Mean	1968	(8.71)	(8.43)	(10.89)		(12.38)	(14.40)	(14.91)	(14.38)					-		
Max.		(11.0)	(8.9)	(11.3)		(13.1)	(15.9)	(17.2)	(16.2)						(17.2)	
Min.	T	(7.6)	(7.8)	(10.4)		(11.0)	(13.7)	(12.1)	(10.9)							(7.6)
Range		(3.4)	-	(0.9)		(2.1)	(2.2)	(5.1)	(5.3)							
Std. Dev.		(0.93)	-	(0.27)		(0.86)	(0.89)	(1.57)	(1.33)							
No. Obs.		23S	9A	17S		8S	5S	15S	12S							
Mean	1968	(27.66)	(28.84)	(27.95)		(28.69)	(26.94)	(28.74)						-		
Max.		(29.0)	(29.6)	(28.3)		(30.3)	(28.6)	(30.5)							(30.5)	
Min.	S	(26.1)	(28.2)	(27.5)		(27.7)	(25.6)	(25.4)								(25.4)
Range		(2.9)	-	(0.8)		(2.6)	(3.0)	(5.1)								
Std. Dev.		(0.74)	-	(0.24)		(0.78)	(1.13)	(1.58)								
No. Obs.		23S	9A	17S		8S	5S	15S								

* Corrected values.

T AND S DATA SEASIDE AQUARIUM (cont.)

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969			(9.01)	(10.72)	(12.61)	15.86	14.38	15.28	(13.66)	(13.61)	(12.51)	(10.93)	-		
Max.				(10.1)	(11.7)	(15.0)	18.1	17.6	17.5	(16.2)	(14.4)	(13.6)	(11.3)		(18.1)	
Min.	T			(8.0)	(9.9)	(11.2)	13.3	11.7	12.9	(9.8)	(12.4)	(11.7)	(10.5)			(8.0)
Range				(2.1)	(1.8)	(3.8)	4.8	5.9	4.6	(6.4)	(2.0)	(1.9)	(0.8)			
Std. Dev.				(0.64)	(0.51)	(1.07)	1.11	1.84	1.01	(1.96)	(0.78)	(0.58)	(0.28)			
No. Obs.				17S	23S	21S	25	30	25	17S	8S	7S	8S			
Mean	1969			(28.36)	(30.26)	(29.46)	24.28	30.02	31.12	(32.08)	(31.05)	(30.91)	(31.46)	-		
Max.				(31.2)	(31.4)	(32.1)	31.3	33.7	32.9	(33.3)	(31.7)	(32.1)	(32.2)		(33.7)	
Min.	S			(19.5)	(27.2)	(24.1)	18.3	22.6	28.9	(30.6)	(29.0)	(30.0)	(30.9)			(18.3)
Range				(11.7)	(4.2)	(8.0)	13.0	11.1	4.0	(2.7)	(2.7)	(2.1)	(1.3)			
Std. Dev.				(3.50)	(1.00)	(2.04)	3.96	3.15	1.12	(0.78)	(0.90)	(0.67)	(0.54)			
No. Obs.				17S	23S	21S	25	30	25	17S	8S	7S	8S			

T AND S DATA DEPOE BAY

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	(7.25)	(7.58)	(7.94)	(9.50)	(10.80)						(7.51)	(7.37)	-		
Max.		(8.2)	(8.2)	(8.4)	(10.6)	(11.4)						(8.4)	(8.4)		(11.4)	
Min.	T	(6.8)	(6.8)	(7.0)	(8.4)	(10.2)						(6.6)	(5.8)			(5.8)
Range		(1.4)	(1.4)	(1.4)	(2.2)	(1.2)						(1.8)	(2.6)			
Std. Dev.		(0.38)	(0.37)	(0.41)	(0.76)	(0.33)						(0.53)	(0.84)			
No. Obs.		20S	20S	21S	20S	20S						16S	16S			
Mean	1969	(32.05)	(31.90)	(31.84)	(31.10)	(31.48)						(31.48)	(31.57)	-		
Max.		(33.1)	(32.7)	(33.5)	(32.7)	(32.4)						(32.4)	(33.2)		(33.5)	
Min.	S	(31.3)	(31.3)	(30.6)	(30.1)	(30.4)						(30.5)	(29.6)			(29.6)
Range		(1.8)	(1.4)	(2.9)	(2.6)	(2.0)						(1.9)	(3.6)			
Std. Dev.		(0.58)	(0.41)	(0.72)	(0.69)	(0.55)						(0.56)	(1.09)			
No. Obs.		20S	20S	21S	20S	20S						16S	16S			

T AND S DATA NEWPORT MARINE SCIENCE CENTER

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	(8.62)	(9.27)	(9.83)	(11.35)	(11.98)	14.09	(12.26)	(13.10)	(12.24)	(12.35)	(11.51)	(10.30)	(11.41)		
Max.		(10.1)	(11.5)	(10.4)	(12.4)	(13.6)	16.0	(15.7)	(15.8)	(14.8)	(14.6)	(13.0)	(10.7)		(16.0)	
Min.	T	(7.0)	(7.9)	(9.1)	(10.8)	(9.8)	11.4	(9.1)	(9.9)	(9.7)	(10.8)	(9.8)	(9.8)			(7.0)
Range		(3.1)	(3.6)	(1.3)	(1.6)	(3.8)	4.6	(6.6)	(5.9)	(5.1)	(3.8)	(3.2)	(0.9)			
Std. Dev.		(1.07)	(1.02)	(0.45)	(0.47)	(0.91)	1.33	(2.29)	(1.79)	(1.34)	(1.03)	(0.92)	(0.29)			
No. Obs.		15S	13S	17S	15S	19S	25	20S	21S	18S	21S	15S	11S			
Mean	1969	(29.25)	(29.14)	(30.69)	(30.64)	(30.34)	30.24	(31.44)	(33.23)	(32.70)	(31.95)	(31.36)	(31.05)	(31.00)		
Max.		(31.42)	(31.85)	(32.33)	(31.45)	(33.49)	32.49	(33.75)	(33.77)	(33.60)	(32.91)	(32.41)	(32.43)		(33.77)	
Min.	S	(25.75)	(25.70)	(25.90)	(29.02)	(26.45)	25.76	(25.14)	(32.39)	(31.55)	(31.26)	(29.95)	(28.09)			(25.14)
Range		(5.67)	(6.15)	(6.43)	(2.43)	(7.04)	6.73	(8.61)	(1.38)	(2.05)	(1.65)	(2.46)	(4.34)			
Std. Dev.		(1.93)	(1.87)	(1.61)	(0.63)	(1.89)	1.91	(2.33)	(0.36)	(0.71)	(0.36)	(0.79)	(1.36)			
No. Obs.		15S	13S	16S	15S	19S	25	20S	21S	18S	21S	15S	11S			

T AND S DATA CHARLESTON

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	(9.15)	(8.92)	(9.96)	(11.37)	(11.48)	(13.13)	(12.56)	(11.88)	(11.65)	(11.87)	(10.69)	(10.23)	(11.07)		
Max.		(10.9)	(9.9)	(11.6)	(12.2)	(14.1)	(16.2)	(14.6)	(14.4)	(13.5)	(13.3)	(12.1)	(11.4)		(16.2)	
Min.	T	(7.4)	(8.2)	(8.9)	(10.4)	(10.0)	(10.9)	(9.7).	(9.6)	(9.3)	(10.1)	(9.2)	(9.2)			(7.4)
Range		(3.5)	(1.7)	(2.7)	(1.8)	(4.1)	(5.3)	(4.9)	(4.8)	(4.2)	(3.2)	(2.9)	(2.2)			
Std. Dev.		(0.90)	(0.48)	(0.84)	(0.60)	(1.04)	(1.30)	(1.24)	(1.37)	(1.4)	(0.85)	(0.78)	(0.72)			
No. Obs.		21S	12S	14S	16S	21S	18S	21S	18S	16S	23S	17S	21S			
Mean	1969	(29.66)	(29.75)	(30.30)	(30.12)	(30.57)	(30.23)	(31.48)	(32.64)	(32.52)	(31.61)	(31.31)	(28.40)	(30.72)		
Max.		(31.3)	(30.9)	(31.6)	(31.5)	(33.2)	(32.5)	(33.2)	(33.3)	(33.3)	(32.9)	(32.2)	(32.2)		(33.3)	
Min.	S	(25.4)	(26.9)	(25.3)	(27.2)	(27.0)	(26.9)	(29.4)	(31.5)	(31.5)	(29.5)	(28.3)	(11.6)			(11.6)
Range		(5.9)	(4.0)	(6.3)	(4.3)	(6.2)	(5.6)	(3.8)	(1.8)	(1.8)	(3.4)	(3.9)	(20.6)			
Std. Dev.		(1.53)	(1.29)	(1.74)	(1.40)	(1.77)	(1.66)	(1.15)	(0.54)	(0.51)	(0.84)	(0.92)	(6.49)			
No. Obs.		21S	12S	14S	16S	21S	18S	21S	18S	15S	23S	17S	21S			

T AND S DATA PORT ORFORD

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	10.05	(10.26)	(10.53)	(10.19)	(10.17)		(9.36)	(8.87)					-		
Max.		10.9	(10.5)	(11.8)	(10.6)	(11.2)		(11.8)	(9.6)						(11.8)	
Min.	T	9.0	(10.0)	(10.0)	(10.1)	(9.2)		(6.8)	(7.9)							(6.8)
Range		1.9	(0.5)	(1.8)	(0.5)	(2.0)		(5.0)	-							
Std. Dev.		0.52	(0.14)	(0.64)	(0.14)	(0.64)		(1.25)	-							
No. Obs.		27	19S	23S	15S	16S		18S	9A							
Mean	1969	31.62	(32.23)	(32.23)	(31.03)	(33.11)		(33.60)	(33.47)					-		
Max.		32.7	(32.3)	(32.7)	(31.6)	(33.6)		(34.0)	(33.9)						(34.0)	
Min.	S	29.3	(32.1)	(31.6)	(30.9)	(32.3)		(33.3)	(33.1)							(29.3)
Range		3.4	(0.2)	(1.1)	(0.7)	(1.3)		(0.7)	-							
Std. Dev.		0.86	(0.09)	(0.24)	(0.20)	(0.32)		(0.22)	-							
No. Obs.		27	19S	23S	15S	16S		18S	9A							

T AND S DATA CRESCENT CITY

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	(8.57)	(8.91)	(10.39)	(11.43)	(11.91)	(13.16)			(13.02)	(11.94)	(11.76)	(11.14)	-		
Max.		(10.3)	(10.3)	(12.0)	(12.2)	(14.4)	(15.3)			(15.0)	(12.5)	(12.8)	(12.5)		(15.3)	
Min.	T	(7.0)	(7.8)	(9.2)	(10.8)	(9.4)	(11.6)			(9.7)	(10.8)	(10.3)	(10.0)			(7.0)
Range		(3.3)	(2.5)	(2.8)	(1.4)	(5.0)	(3.7)			(5.3)	(1.7)	(2.5)	(2.5)			
Std. Dev.		(0.88)	(0.89)	(0.82)	(0.47)	(1.62)	(1.20)			(1.32)	(0.51)	(0.89)	(0.76)			
No. Obs.		12S	11S	13S	12S	10S	11S			14S	14S	13S	11S			
Mean	1969	(25.36)	(27.91)	(30.18)	(29.66)	(28.81)	(30.41)			(32.61)	(32.74)	(32.08)	(29.07)	-		
Max.		(28.0)	(32.4)	(32.8)	(32.3)	(34.0)	(33.3)			(33.6)	(33.6)	(32.8)	(32.5)		(34.0)	
Min.	S	(21.0)	(24.2)	(22.0)	(24.2)	(23.4)	(28.0)			(31.0)	(31.5)	(29.7)	(23.5)			(21.0)
Range		(7.0)	(8.2)	(10.8)	(8.1)	(10.6)	(5.3)			(2.6)	(2.1)	(3.1)	(9.0)			
Std. Dev.		(2.30)	(2.32)	(2.66)	(2.37)	(3.33)	(1.77)			(0.78)	(0.66)	(0.98)	(3.26)			
No. Obs.		12S	11S	13S	12S	10S	11S			14S	14S	13S	11S			

T AND S DATA BLUNTS REEF LIGHTSHIP

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	10.99		10.74			12.34	11.24		(10.71)	11.33	10.46	12.53	-		
Max.		11.5		13.0			14.0	12.5		(11.1)	12.8	11.1	13.2		(14.0)	
Min.	T	10.1		10.0			10.6	10.0		(10.6)	10.6	10.0	10.0			(10.0)
Range		1.4		3.0			3.4	2.5		-	2.2	1.1	3.2			
Std. Dev.		0.31		0.73			0.94	0.65		-	0.58	0.36	0.95			
No. Obs.		30		31			27	29		14BC	30	27	28			
Mean	1969			32.62			33.07	33.89		(33.69)	33.37	33.57	33.00	-		
Max.				33.37			33.46	34.59		(34.02)	34.41	34.08	33.76		(34.59)	
Min.	S			31.56			32.69	33.39		(33.31)	32.62	33.34	32.09			(31.56)
Range				1.81			0.77	1.20		-	1.79	0.74	1.67			
Std. Dev.				0.42			0.22	0.25		-	0.40	0.16	0.48			
No. Obs.				29			28	28		14BC	30	26	28			

T DATA SHELTER COVE

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	(10.13)	(10.60	(10.80)	(10.85)	(10.55)	(10.00)	(12.23)		(13.50)	(13.30)			-		
Max.		(11.1)	-	(14.4)	(11.1)	(11.1)	-	(12.80)		(14.4)	-				(14.4)	
Min.	T	(9.4)	-	(9.4)	(10.6)	(10.0)	-	(11.67)		(12.8)	-					(9.4)
Range		(1.7)	-	(5.0)	(0.5)	(1.1)	-	(1.13)		(1.6)	-					
Std. Dev.		(0.71)	-	(2.42)	(0.35)	(0.78)	-	(0.80)		(0.82)	-					
No. Obs.		4S	(1)	4S	2S	2S	(1)	2S		3S	(1)					

T DATA MENDOCINO

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	(10.03)	(9.94)	(9.15)	10.47	(10.51)	(11.70)	(10.71)	10.86	(11.75)	(11.79)	12.02	(12.10)	(10.92)		
Max.		(11.3)	(11.2)	(11.1)	11.6	(13.1)	(13.9)	(12.4)	11.7	(12.8)	(12.8)	13.6	(14.0)		(14.0)	
Min.	T	(8.5)	(8.8)	(7.8)	9.0	(8.8)	(10.0)	(9.7)	10.0	(10.0)	(10.0)	10.9	(7.8)			(7.8)
Range		(2.8)	(2.4)	(3.3)	2.6	(4.3)	(3.9)	(2.7)	1.7	(2.8)	(2.8)	2.7	(6.2)			
Std. Dev.		(0.74)	(0.73)	(0.88)	0.61	(1.25)	(0.91)	(0.84)	0.55	(0.78)	(0.85)	0.86	(1.49)			
No. Obs.		22S	22S	24S	25	16S	18S	22S	27	22S	23S	25	21S			

T DATA FORT ROSS

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	10.51	10.95	10.34	10.28	9.97	10.35	(10.85)	(10.55)		(11.45)	13.03	(13.00)	-		
Max.		11.7	11.7	12.2	12.2	11.1	11.7	(13.9)	(12.9)		(13.5)	14.0	(13.5)		(14.0)	
Min.	T	9.4	10.0	8.9	9.2	8.1	8.3	(7.8)	(9.3)		(9.8)	12.2	(12.5)			(7.8)
Range		2.3	1.7	3.3	3.0	3.0	3.4	(6.1)	(3.6)		(3.7)	1.8	(1.0)			
Std. Dev.		0.60	0.51	1.04	0.93	0.59	0.92	(2.11)	(1.06)		(1.07)	0.47	(0.22)			
No. Obs.		30	27	31	30	31	29	23S	24S		17S	30	24S			

T DATA BODEGA BAY

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	(11.03)	(11.18)	(11.39)	(11.21)	(11.16)	(12.47)	(12.39)	(11.95)	(13.44)	(12.52)	(13.19)	(13.29)	(12.10)		
Max.		(11.6)	(11.6)	(14.6)	(13.4)	(13.5)	(14.4)	(15.4)	(14.1)	(15.2)	(13.9)	(13.8)	(14.1)		(15.4)	
Min.	T	(10.6)	(10.5)	(9.7)	(9.8)	(9.3)	(10.6)	(10.1)	(10.7)	(12.0)	(10.7)	(12.1)	(12.5)			(9.3)
Range		(1.0)	(1.1)	(4.9)	(3.6)	(4.2)	(3.8)	(5.3)	(3.4)	(3.2)	(3.2)	(1.7)	(1.6)			
Std. Dev.		(0.28)	(0.33)	(1.29)	(1.22)	(1.22)	(1.22)	(1.57)	(0.99)	(1.06)	(1.02)	(0.58)	(0.49)			
No. Obs.		21S	19S	22S	20S	19S	19S	19S	18S	16S	21S	18S	15S			

T AND S DATA FARALLON ISLAND, S. E.

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	11.92	12.04	12.29	12.26	12.61	12.70	12.70	(13.31)		14.89	14.84	14.74	-		
Max.		12.8	12.8	13.1	13.6	15.7	14.2	15.0	(15.0)		16.9	16.1	16.6		(16.9)	
Min.	T	10.8	11.0	11.1	10.9	10.5	11.0	10.4	(11.5)		12.7	13.8	13.8			(10.4)
Range		2.0	1.8	2.0	2.7	5.2	3.2	4.6	-		4.2	2.3	2.8			
Std. Dev.		0.51	0.48	0.46	0.90	1.52	0.85	1.24	-		0.84	0.59	0.61			
No. Obs.		31	28	31	30	31	30	31	23AB		31	30	31			
Mean	1969	(32.28)	31.21	32.59	33.07	33.74	33.66	33.88	(33.93)		33.60	33.57	33.12	-		
Max.		(33.60)	32.82	33.53	33.83	34.09	34.50	34.79	(34.65)		33.80	33.88	33.59		(34.79)	
Min.	S	(29.09)	25.49	30.86	31.08	33.48	33.10	33.52	(33.60)		33.25	33.34	29.15			(25.49)
Range		(4.51)	7.33	2.67	2.75	0.61	1.40	1.27	-		0.55	0.54	4.44			
Std. Dev.		(1.21)	1.70	0.70	0.73	0.16	0.40	0.27	-		0.12	0.12	0.83			
No. Obs.		23S	28	31	30	30	30	30	23AB		31	30	27			

T DATA SANTA CRUZ

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	(11.07)	(12.35)	(11.25)	(12.20)	(13.86)								-		
Max.		(12.8)	(12.9)	(11.6)	-	(15.0)									(15.0)	
Min.	T	(9.9)	(11.8)	(10.9)	-	(12.7)										(9.9)
Range		(2.9)	(1.1)	(0.7)	-	(2.3)										
Std. Dev.		(0.72)	(0.78)	(0.49)	-	(0.90)										
No. Obs.		15S	2S	2S	(1)	5S										

T AND S DATA PACIFIC GROVE

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	11.78	11.92	12.34	12.95	12.95	14.58	13.57	13.43	14.04	13.65	13.86	14.09	13.27		
Max.		12.7	12.4	13.7	13.8	15.1	15.6	15.8	15.2	15.4	14.4	15.2	14.9		15.8	
Min.	T	10.7	11.4	11.2	11.9	11.4	13.3	11.5	11.9	12.2	12.4	12.8	12.4			10.7
Range		2.0	1.0	2.5	1.9	3.7	2.3	4.3	3.3	3.2	2.0	2.4	2.5			
Std. Dev.		0.47	0.23	0.70	0.53	1.00	0.58	1.27	0.83	0.76	0.66	0.58	0.62			
No. Obs.		31	28	31	30	31	30	31	31	30	31	30	31			
Mean	1969	33.09	32.81	32.80	33.26	33.73	33.64	33.72	33.84	33.70	33.65	33.60	33.46	33.44		
Max.		33.56	33.28	33.33	33.63	33.90	33.85	34.14	33.98	33.97	33.83	33.74	33.68		34.14	
Min.	S	31.90	32.22	31.21	32.80	33.58	33.42	33.41	33.50	33.55	33.52	33.48	33.19			31.21
Range		1.66	1.06	2.12	0.83	0.32	0.43	0.73	0.48	0.42	0.31	0.26	0.49			
Std. Dev.		0.43	0.24	0.46	0.25	0.08	0.10	0.15	0.10	0.12	0.09	0.06	0.09			
No. Obs.		31	28	29	30	31	30	31	30	30	31	30	31			

T DATA POINT LOBOS: north side

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	11.87	11.72	11.24	11.38	11.56	13.16	12.94	12.38	(13.64)	13.20	13.97	13.56	(12.55)		
Max.		13.0	12.2	13.9	12.6	12.5	14.9	15.3	13.8	(15.3)	14.4	15.2	14.8		(15.3)	
Min.	T	10.8	11.4	9.6	10.4	10.2	11.3	11.3	11.6	(12.1)	11.9	13.0	9.8			(9.6)
Range		2.2	0.8	4.3	2.2	2.3	3.6	4.0	2.2	(3.2)	2.5	2.2	5.0			
Std. Dev.		0.49	0.22	1.22	0.70	0.72	1.16	1.08	0.56	(0.92)	0.69	0.59	1.54			
No. Obs.		31	28	31	30	30	29	31	31	21S	31	30	26			

T DATA POINT LOBOS: south side

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	11.90	11.77	10.95	10.86	10.67	12.33	12.24	11.50	(12.84)	12.70	13.84	13.52	(12.09)		
Max.		12.8	12.2	12.4	12.1	11.4	14.1	13.9	12.9	(14.0)	14.2	15.3	14.6		(15.3)	
Min.	T	10.4	11.4	9.4	9.8	9.4	10.3	10.8	10.7	(11.7)	10.8	12.9	9.6			(9.4)
Range		2.4	0.8	3.0	2.3	2.0	3.8	3.1	2.2	(2.3)	3.4	2.4	5.0			
Std. Dev.		0.67	0.22	0.95	0.72	0.55	1.34	0.85	0.67	(0.72)	0.92	0.59	1.46			
No. Obs.		31	27	31	29	30	29	31	31	21S	31	30	26			

T DATA PIEDRAS BLANCAS LIGHTHOUSE

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	(10.13)	(10.10)	(10.10)	(10.07)	(10.06)	(10.10)	(10.16)	(10.15)					-		
Max.		(10.3)	(10.2)	(10.2)	(10.2)	(10.2)	(10.2)	(10.2)	(10.2)						(10.3)	
Min.	T	(10.0)	(10.0)	(10.0)	(10.0)	(10.0)	(10.0)	(10.1)	(10.1)							(10.0)
Range		(0.3)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)							
Std. Dev.		(0.10)	(0.10)	(0.08)	(0.07)	(0.06)	(0.07)	(0.05)	(0.05)							
No. Obs.		20S	20S	21S	22S	22S	21S	18S	21S							

T DATA MORRO BAY

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	12.24	11.61	(10.90)	11.66	12.20	13.81	13.71	13.48	13.75	13.39	14.11	13.37	(12.85)		
Max.		13.3	12.2	(12.2)	13.3	13.8	16.1	16.1	16.1	15.0	14.4	15.6	14.4		(16.1)	
Min.	T	10.6	10.6	(10.0)	10.0	10.0	11.1	12.2	12.2	12.8	11.7	13.3	11.1			(10.0)
Range		2.7	1.6	(2.2)	3.3	3.8	5.0	3.9	3.9	2.2	2.7	2.3	3.3			
Std. Dev.		0.69	0.54	(0.68)	0.96	0.99	1.29	1.10	0.97	0.54	0.64	0.52	0.93			
No. Obs.		31	28	24S	30	31	30	31	31	30	29	30	31			

T AND S DATA AVILA

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	13.90	13.55	13.24	13.24	14.78	15.24	16.28	17.64	16.99	16.13	15.34	(14.53)	(15.07)		
Max.		15.0	14.4	16.1	17.2	18.4	17.8	18.4	18.9	18.4	17.8	16.6	(15.0)		(18.9)	
Min.	T	12.8	12.8	11.6	11.1	12.2	12.8	13.9	16.1	16.1	15.0	15.0	(13.9)			(11.1)
Range		2.2	1.6	4.5	6.1	6.2	5.0	4.5	2.8	2.3	2.8	1.6	(1.1)			
Std. Dev.		0.57	0.46	1.35	1.28	1.42	0.94	1.06	0.65	0.77	0.60	0.45	(0.34)			
No. Obs.		29	26	31	27	31	29	29	30	28	28	25	24S			
Mean	1969	31.34	30.48	32.77	33.34	33.74	33.93	34.01	33.95	33.98	34.05	33.55	(33.27)	(33.20)		
Max.		34.0	33.3	34.2	34.1	34.4	34.9	34.9	34.6	34.5	34.6	34.2	(33.7)		(34.9)	
Min.	S	20.6	23.3	28.1	32.4	32.4	33.3	33.2	33.4	33.4	33.4	32.7	(32.9)			(20.6)
Range		13.4	10.0	6.1	1.7	2.0	1.6	1.7	1.2	1.1	1.2	1.5	(0.8)			
Std. Dev.		3.53	2.90	1.19	0.48	0.49	0.34	0.32	0.26	0.27	0.35	0.32	(0.21)			
No. Obs.		28	26	31	27	31	29	27	30	28	28	25	24S			

T DATA SANTA BARBARA

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	13.37	12.97	13.36	14.62	15.04	16.99	17.03	18.06	17.21	17.31	15.59	15.66	15.60		
Max.		14.6	13.9	15.4	16.2	17.5	19.2	18.7	19.6	18.5	19.4	16.7	18.5		19.6	
Min.	T	12.2	11.2	12.0	12.4	13.3	15.5	15.6	17.0	15.9	15.3	14.6	12.8			11.2
Range		2.4	2.7	3.4	3.8	4.2	3.7	3.1	2.6	2.6	4.1	2.1	5.7			
Std. Dev.		0.58	0.62	0.94	0.99	1.04	0.87	0.95	0.64	0.75	1.48	0.50	1.27			
No. Obs.		29	28	31	30	31	30	31	30	30	31	30	31			

T AND S DATA VENTURA MARINA

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	13.26	12.60	13.07	15.20	15.69	17.50	18.11	19.41	17.89	17.09	15.63	14.65	15.84		
Max.		14.7	13.4	15.6	16.6	17.5	18.0	20.0	21.1	19.7	18.9	17.2	15.8		21.1	
Min.	T	11.1	11.4	10.6	13.4	13.9	16.6	16.4	17.2	15.6	15.3	14.4	11.6			10.6
Range		3.6	2.0	5.0	3.2	3.6	1.4	3.6	3.9	4.1	3.6	2.8	4.2			
Std. Dev.		0.87	0.60	1.21	0.89	0.91	0.32	1.04	1.03	1.01	1.02	0.80	1.06			
No. Obs.		31	27	31	30	31	30	31	31	30	31	30	31			
Mean	1969	28.30	28.71	31.03	32.44	33.07	33.24	33.23	33.27	33.09	33.19	32.63	33.40	32.13		
Max.		33.63	31.76	32.73	33.16	33.28	33.94	33.68	33.44	33.43	33.46	33.41	33.97		33.97	
Min.	S	15.26	17.24	26.32	30.79	32.80	32.84	32.42	33.11	32.64	32.77	25.48	33.19			15.26
Range		18.37	14.52	6.41	2.37	0.48	1.10	1.26	0.33	0.79	0.69	7.93	0.78			
Std. Dev.		6.53	3.62	1.68	0.69	0.12	0.24	0.22	0.09	0.19	0.18	1.61	0.14			
No. Obs.		29	26	31	30	31	30	31	31	29	31	30	31			

T DATA POINT DUME: west of

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	14.05	13.40	13.24	14.36	14.92	16.14	17.41	17.77	16.76	16.74	16.68	15.53	15.58		
Max.		15.8	14.6	15.3	16.2	17.1	18.4	19.9	20.4	18.9	17.9	17.8	16.4		20.4	
Min.	T	12.6	12.7	11.5	12.9	12.9	14.8	14.7	15.4	15.1	15.0	15.7	12.2			11.5
Range		3.2	1.9	3.8	3.3	4.2	3.6	5.2	5.0	3.8	2.9	2.1	4.2			
Std. Dev.		0.87	0.48	1.10	0.86	0.98	0.92	1.37	1.16	1.01	0.81	0.44	1.11			
No. Obs.		31	28	31	29	31	30	31	31	30	31	30	31			

T AND S DATA SANTA MONICA

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	14.43	13.92	13.87	14.93	16.18	17.31	19.39	19.49	17.83	17.92	16.64	15.57	16.46		
Max.		15.0	15.0	15.6	16.6	18.4	18.9	21.1	21.1	19.4	19.4	17.8	16.6		21.1	
Min.	T	13.4	13.4	12.2	12.8	13.9	15.6	17.2	17.2	15.6	15.6	15.6	11.6			11.6
Range		1.6	1.6	3.4	3.8	4.5	3.3	3.9	3.9	3.8	3.8	2.2	5.0			
Std. Dev.		0.44	0.38	0.79	1.02	1.13	0.88	0.92	1.14	1.10	1.20	0.62	1.41			
No. Obs.		31	28	31	30	31	30	31	31	30	31	30	31			
Mean	1969	(33.35)	33.88	33.90	34.23	34.51	(34.58)	34.26	34.04	34.29	(34.39)	(34.09)	33.87	(34.12)		
Max.		(34.2)	34.7	34.6	34.6	34.9	(34.9)	34.7	34.7	34.7	(34.7)	(34.6)	34.2		(34.9)	
Min.	S	(30.8)	33.0	33.2	33.4	34.1	(34.0)	33.4	33.2	33.6	(34.0)	(33.3)	33.2			(30.8)
Range		-	1.7	1.4	1.2	0.8	(0.9)	1.3	1.5	1.1	(0.7)	(1.3)	1.0			
Std. Dev.		-	0.38	0.37	0.35	0.20	(0.23)	0.30	0.40	0.29	(0.24)	(0.32)	0.22			
No. Obs.		22BC	28	31	29	29	23S	27	30	29	22S	23S	30			

T AND S DATA BALBOA

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	14.39	14.05	13.47	15.13	16.09	17.30	18.59	18.84	17.16	17.91	16.44	15.67	16.25		
Max.		15.0	14.8	15.0	17.00	18.90	20.60	20.50	22.00	19.50	19.80	17.50	17.00		22.00	
Min.	T	13.2	13.3	12.2	12.80	13.75	15.00	15.90	14.20	14.90	15.95	15.70	12.00			12.00
Range		1.8	1.5	2.8	4.20	5.15	5.60	4.60	7.80	4.60	3.85	1.80	5.00			
Std. Dev.		0.55	0.30	0.87	0.91	1.30	1.03	1.13	2.44	1.35	1.42	0.46	1.45			
No. Obs.		31	28	31	30	31	30	31	31	30	31	29	31			
Mean	1969	32.96	32.47	32.63	(33.22)	33.49	33.64	33.69	33.65	33.50	33.54	33.41	33.49	(33.31)		
Max.		33.59	33.58	34.17	(33.56)	33.65	33.80	34.46	34.40	33.60	33.76	33.56	33.64		(34.46)	
Min.	S	28.96	30.20	28.03	(32.60)	32.99	33.47	33.45	33.48	33.35	33.40	33.17	33.39			(28.03)
Range		4.63	3.38	6.14	(0.96)	0.66	0.33	1.01	0.92	0.25	0.36	0.39	0.25			
Std. Dev.		1.19	0.90	1.68	(0.25)	0.13	0.07	0.23	0.19	0.06	0.10	0.08	0.07			
No. Obs.		30	24	30	24S	29	29	30	30	28	31	27	31			

T DATA DANA POINT: east of

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	14.55	14.12	14.43	15.95	16.68	17.77	18.68	19.77	18.58	18.40	16.78	15.10	16.74		
Max.		15.5	15.6	16.1	17.5	18.0	18.9	20.8	24.0	20.0	20.6	17.8	17.0		24.0	
Min.	T	13.4	11.8	13.3	14.6	15.0	15.5	15.0	14.4	16.7	16.2	15.0	9.4			9.4
Range		2.1	3.8	2.8	2.9	3.0	3.4	5.8	9.6	3.3	4.4	2.8	7.6			
Std. Dev.		0.63	0.82	0.78	0.77	0.77	0.81	1.36	2.52	1.03	1.46	0.74	2.10			
No. Obs.		28	25	26	27	30	28	31	31	28	30	25	27			

T AND S DATA SAN CLEMENTE

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	14.53	14.62	14.09	15.65	16.67	17.68	18.28	20.19	18.71	17.98	16.69	15.28	16.70		
Max.		15.61	15.28	16.50	16.67	17.78	18.61	20.83	22.72	20.56	19.94	17.94	16.89		22.72	
Min.	T	13.33	13.22	12.78	14.44	15.56	16.07	15.72	15.83	16.67	15.44	15.56	10.56			10.56
Range		2.28	2.06	3.72	2.23	2.22	2.54	5.11	6.89	3.89	4.50	2.38	6.33			
Std. Dev.		0.76	0.59	0.95	0.51	0.47	0.61	1.03	1.94	0.98	1.57	0.50	1.83			
No. Obs.		31	27	31	29	30	29	30	31	30	31	30	31			
Mean	1969	33.12	32.78	33.19	33.44	33.57	33.69	33.74	33.81	(33.66)	33.57	33.49	33.59	(33.47)		
Max.		34.26	33.88	33.51	33.68	33.72	33.90	34.53	34.25	(34.45)	33.77	33.64	33.94		(34.53)	
Min.	S	28.42	22.82	29.04	33.32	33.44	33.57	33.52	33.51	(33.46)	33.05	33.18	33.42			(22.82)
Range		5.84	11.06	4.47	0.36	0.28	0.33	1.01	0.74	-	0.72	0.46	0.52			
Std. Dev.		1.33	2.07	0.78	0.08	0.06	0.07	0.22	0.22	-	0.15	0.10	0.13			
No. Obs.		31	26	31	30	31	27	28	31	23BC	31	27	30			

T DATA OCEANSIDE

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	14.42	14.32	14.22	15.18	16.40	17.63	19.14	20.47	18.37	17.85	16.98	15.40	16.70		
Max.		15.5	15.1	15.6	16.4	17.9	18.9	21.1	22.8	20.3	20.2	17.8	17.7		22.8	
Min.	T	13.3	13.3	13.1	12.8	15.5	15.5	16.7	15.9	14.8	15.9	16.0	11.4			11.4
Range		2.2	1.8	2.5	3.6	2.4	3.4	4.4	6.9	5.5	4.3	1.8	6.3			
Std. Dev.		0.70	0.43	0.68	0.87	0.53	0.88	1.29	1.56	1.42	1.05	0.45	1.65			
No. Obs.		31	28	31	30	30	30	31	31	30	31	30	31			

T AND S DATA LA JOLLA: end of Scripps Pier, surface

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	14.49	14.13	13.98	14.90	16.44	18.10	18.94	20.27	18.26	18.03	16.62	15.54	16.64		
Max.		15.40	14.52	15.60	16.59	18.39	18.91	21.00	22.70	20.65	19.90	17.56	17.15		22.70	
Min.	T	13.60	13.51	12.50	12.80	15.15	16.88	14.90	18.49	15.75	16.71	15.88	10.60			10.60
Range		1.80	1.01	3.10	3.79	3.24	2.03	6.10	4.21	4.90	3.19	1.68	6.55			
Std. Dev.		0.45	0.30	0.81	1.17	0.73	0.52	1.47	1.00	1.37	0.87	0.40	1.86			
No. Obs.		31	28	31	30	31	30	31	31	30	31	30	31			
Mean	1969	33.57	(33.46)	33.44	33.60	33.74	33.81	33.74	33.75	33.62	33.60	33.53	33.61	(33.62)		
Max.		34.06	(33.56)	33.91	33.93	33.87	34.06	33.98	33.86	33.85	33.78	33.75	33.91		(34.06)	
Min.	S	33.37	(33.30)	33.09	33.51	33.64	33.64	33.59	33.62	33.48	33.39	33.43	33.48			(33.09)
Range		0.69	-	0.82	0.42	0.23	0.42	0.39	0.24	0.37	0.39	0.32	0.43			
Std. Dev.		0.13	-	0.18	0.10	0.06	0.09	0.10	0.06	0.08	0.08	0.08	0.09			
No. Obs.		31	13C*	30	30	31	30	31	31	30	31	30	31			

T AND S DATA LA JOLLA: end of Scripps Pier, 5-meter bottom

	YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN	MAX.	MIN.
Mean	1969	14.56	14.11	13.94	14.74	15.92	17.89	18.00	18.88	17.19	17.74	16.69	15.69	16.28		
Max.		15.45	14.60	15.60	16.60	17.96	19.08	20.42	20.95	20.32	19.85	17.70	17.30		20.95	
Min.	T	13.70	13.15	12.30	12.80	13.80	15.21	14.46	16.20	14.95	15.45	15.99	10.60			10.60
Range		1.75	1.45	3.30	3.80	4.16	3.87	5.96	4.75	5.37	4.40	1.71	6.70			
Std. Dev.		0.44	0.31	0.79	1.19	1.01	0.92	1.61	1.49	1.39	1.14	0.41	1.91			
No. Obs.		31	28	31	30	31	30	31	31	30	31	30	31			
Mean	1969	33.64	(33.47)	33.50	33.69	33.82	33.81	33.72	33.74	33.65	33.63	33.59	33.65	(33.66)		
Max.		34.31	(33.64)	33.86	33.93	34.05	33.99	33.89	33.98	33.99	33.96	33.97	34.06		(34.31)	
Min.	S	33.36	(33.34)	33.32	33.53	33.62	33.72	33.52	33.59	33.49	33.44	33.44	33.52			(33.32)
Range		0.95	-	0.54	0.40	0.43	0.27	0.37	0.39	0.50	0.52	0.53	0.54			
Std. Dev.		0.17	-	0.13	0.10	0.09	0.06	0.09	0.09	0.10	0.12	0.10	0.10			
No. Obs.		31	13C*	30	29	29	30	31	31	30	31	30	31			

* 1 case of samples lost.