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Surface Water Temperatures, Salinities and Densities At Shore Stations, United States West Coast 1994

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### UNIVERSITY OF CALIFORNIA, SAN DIEGO SCRIPPS INSTITUTION OF OCEANOGRAPHY LA JOLLA, CALIFORNIA 92093

# SURFACE WATER TEMPERATURES, SALINITIES AND DENSITIES AT SHORE STATIONS

United States West Coast

1994

Including five-meter temperatures, salinities, and densities at Scripps Pier

P.W. Walker, C.L. Fey and D.M. Newton

SIO Reference 95-30 October 1995

Sponsored by:

Marine Life Research Group Scripps Institution of Oceanography

and

The National Oceanic & Atmospheric Administration

Approved for distrib

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#### INTRODUCTION

This report presents temperature and salinity data observed during 1994 at shoreline stations along the Ul States West Coast from La Jolla, California to the Strait of Juan de Fuca, Washington (see map, page 10). The consist of daily temperature and salinity values when available, with means, ranges and standard deviations base these observations. Densities have been calculated from the daily temperature and salinity measurements with the International Equation of State for seawater algorithms (UNESCO, 1981)<sup>1</sup> and are listed in the same format at temperature and salinity data. The data are also shown in plots, along with a harmonic mean curve calculated from the available historical data at each location, so that one may quickly visualize how the 1994 data differ from the 1 of past observations.

Daily temperature values from tide gauge stations located at Neah Bay, Washington and Crescent City Santa Monica, California are sent to Scripps Institution of Oceanography by the National Oceanic and Atmosp Administration/National Ocean Survey (NOAA/NOS) annually (manual data collection at Port San Luis Harbor discontinued in early August, 1993). Temperature readings for these three NOAA/NOS stations, Morro Bay, Dume and Balboa, California are recorded to 1°F. Southeast Farallon Island, Santa Barbara and La Jolla re temperature to the nearest 0.1°C from calibrated immersion thermometers supplied by Scripps. Charleston, Trin Bodega Bay, Santa Cruz, Pacific Grove, Granite Canyon, and Santa Catalina Island record temperatures to the ne 0.1°C from standard thermometers, electronic digital thermometers or thermistors, and San Clemente to the ne 0.1°F from an electronic digital thermometer. Fahrenheit readings are converted to the nearest 0.1°C. Rep temperatures are published with little attempt to screen or eliminate observer errors; occasional suspect extreme v may be noted with a "U" after the temperature to indicate that the value is believed to be uncertain.

Salinities from Trinidad Beach, Southeast Farallon Island, Granite Canyon, Balboa, San Clemente, and La are obtained from analyses of sea water samples collected in special salinity bottles supplied by Scripps. Sea samples are forwarded to Scripps at the end of each month for salinity determination by inductive salinometer. Be Bay reports salinities measured by a conductivity meter. Salinities are listed to hundredths of a part per thou Values of maximum salinities may possibly be in error due to evaporation or contamination of the sample in the be Reported salinities exceeding 34% may represent recently upwelled water, or they may be due to faulty sam techniques or to loosely sealed sample bottles. Salinities less than 30% are due to local precipitation or fresh runoff. All salinities higher than 34.5% have been omitted. A few unusual salinities are noted with a "U" after salinity to indicate that the salinity is believed to be uncertain.

Densities are calculated for each day that has both a temperature and a salinity measurement. To omit repedigits, the densities are listed in sigma-t units where sigma-t = (density - 1.0) x 1000. For example, for a dens 1.02451 g/cm<sup>3</sup>, sigma-t = 24.51. Because of the high sensitivity of salinometer derived salinities, the computed der are considered to be more accurate than densities derived from field hydrometer measurements. The densities have been reduced to a standard temperature (such as 15°C); they have been calculated from the observed values so reflect the actual conditions. Whenever either the temperature or salinity have been flagged as questionable, a "U also appear after the sigma-t value.

<sup>&</sup>lt;sup>1</sup>UNESCO, 1981. Background papers and supporting data on the International Equation of State UNESCO Technical Papers in Marine Science, No. 37.

A few statistics for the data are presented below each month's column of daily observations: one-third month means, monthly means, maximum and minimum values, range, and standard deviation. For those stations with observations for every month of the year, the annual minimum, mean, and maximum are also given. This annual mean has been derived by calculating the mean of the 12 monthly means and differs very slightly from an annual mean calculated by using the individual days of the year. Data flagged with a "U" are not included in any of these computations, nor are they listed as the extremes for the month or year. The 1994 monthly and annual coastal sea-surface temperature means are summarized on page 8. In order to see how these means differ from "normal", the anomalies from the station's long-term monthly means have been calculated and are shown on the facing page. Listed below each station in this tabulation are the years used in determining the long-term mean for that location. The year's daily observations are shown on a parameter-versus-time plot. Data flagged with a "U" are not plotted. For convenience, the temperature plot shows a Celsius scale on the left side and a Fahrenheit scale on the right side. A least squares regression harmonic curve fit to all of the available daily historical data is also shown on each plot. The curves are composed of annual and semiannual harmonic components following the procedures described by Lynn (1967)<sup>2</sup> in his study of annual cycles in the California Current.

This research is made possible through the cooperation of many groups and individuals who collect samples, process data, and provide financial support. Various agencies and individuals volunteer to make daily observations which are sent to the Marine Life Research Group of Scripps Institution of Oceanography for the preparation of this data report and to update computer records of the historical shore stations database. These agencies are: National Oceanic and Atmospheric Administration/National Ocean Survey, University of California at San Diego, University of California at Davis, Humboldt State University, Stanford University, University of Oregon, Santa Catalina Island Conservancy in conjunction with the University of Southern California, California Department of Fish and Game, Point Reyes Bird Observatory, Los Angeles County, the cities of Santa Cruz, Santa Barbara, San Clemente, and Newport Beach, California, and the Pacific Gas and Electric Company. Prior to 1994, financial support for data processing was provided by the State of California through Scripps Institution of Oceanography (1916-1949), then through the Marine Life Research Group of Scripps Institution of Oceanography (1949-1993). Starting in 1989, partial support was provided by both the State of California through the Marine Life Research Group and the National Oceanic and Atmospheric Administration through the National Ocean Survey (1989-1993). More recently, support for data processing has been provided by the Joint Institute for Marine Observations (JIMO), a cooperative agreement between Scripps Institution of Oceanography and the National Oceanic and Atmospheric Administration (1993-1995).

Data from active shore stations can presently be accessed via anonymous FTP at NEMO.UCSD.EDU (132.239.114.238), and located in the directory /pub/shore. The README file contains a brief description of the Shore Stations Program and the data files available for the active stations. Historical files for the inactive stations containing both the data recorded daily and the monthly means, will be added at a later date.

A report of the Regents of the University of California, San Diego, persuant to National Oceanic and Atmospheric Administration Award No. NA37GPO518.

<sup>&</sup>lt;sup>2</sup>Lynn, R.J., 1967. Seasonal variation of temperature and salinity at 10 meters in the California Current. Calif. Coop. Oceanic Fish. Invest. Rep., XI:157-186.

#### STATION DESCRIPTIONS

The paragraphs that follow provide information about the active stations listed in geographical order as they occur from south to north. Many of the agencies and participants who provide data for the Shore Stations Program are volunteers interested in the sea at their doorstep. It is to these people we owe the success of this long-range program, and we thank them for their help.

La Jolla, California 1916-94 (Surface) 1925-94 (Bottom) 32°52.0′N, 117°15.5′W

Scripps Institution of Oceanography, University of California, San Diego

Personnel from Scripps Stephen Birch Aquarium-Museum take daily temperature and salinity samples from the end of the Scripps pier at the sea surface and a depth of about 5 meters. The proximity of Scripps pier to the deep waters at the head of La Jolla submarine canyon results in data quite representative of oceanic conditions.

Historically, this data collection took place each morning between the hours of 0900-1200. However on September 27, 1994, the sampling time was changed to the afternoon between 1400-1630. Morning measurements were resumed again on February 23, 1995.

San Clemente, California 1955, 1965-94 33°25′N, 117°37′W

City of San Clemente

Personnel of the Department of Marine Safety take daily temperatures and salinity samples from the San Clemente pier, and return the salinity samples to Scripps monthly. This station, which was established to take over monitoring from the old Dana Point station (1955-70), is so similar that the long record for this area is still preserved.

Santa Catalina Island, California 1991-94

33°26.8′N, 118°29.2′W

Santa Catalina Island Conservancy and Wrigley Marine Science Center, University of Southern California

The Catalina Conservancy Divers is a support group of the Santa Catalina Island Conservancy, a private, non-profit conservation organization dedicated to the preservation of the natural heritage of Santa Catalina Island. Personnel of this group in conjunction with the Wrigley Marine Science Center maintain a Ryan thermograph in Isthmus Cove, just outside the mouth of Fisherman Cove, on the northeast side of the island. The data presented here are the daily means of these subsurface (4 M) temperatures recorded every 30 minutes.

Historically, temperature readings at Santa Catalina Island were measured manually in the surface waters at Isthmus Cove (1955-56, 1970-85) and Avalon Bay (1955-56, 1963-67). These measurements are therefore NOT comparable to the thermister data recorded at its current depth and location at the mouth of Fisherman Cove (1991-94).

Balboa, California 1925-94 33°36'N, 117°54'W

City of Newport Beach

City lifeguards take daily temperature and salinity samples from the deeper waters surrounding the Newport Pier, which is located about two miles from the mouth of the Santa Ana River. Analysis of these salinity samples indicates that they reflect oceanic conditions except during winter storms when the salinity is strongly affected by runoff from the river.

Santa Monica, California 1955-94

This tide-gauge station is located at the end of Santa Monica pier near the harbormaster's office. Although located behind the breakwater, there is sufficient water flow to be representative of the nearshore waters.

Point Dume, California 1957-94 34°01.1'N, 118°49.5'W

Los Angeles County

To reduce the effects of solar warming on the waters near the beach, water temperatures are taken in the surf early each morning by the Los Angeles County Lifeguards at Zuma Beach County Park. Temperatures at this site west of Point Dume, are therefore thought to be representative of the nearshore waters.

Santa Barbara, California 1955-94 34°24.2'N, 119°41.6'W

City of Santa Barbara

Each morning, Santa Barbara Harbor Patrol personnel record the surface water temperature from their boat dock at the west end of the harbor. The harbor enjoys good tidal circulation and the sample is taken before the sun can exert a warming effect, so these temperatures should be representative of the coastal waters.

Morro Bay, California 1962-94 35°22.3′N, 120°51.2′W

Pacific Gas & Electric Co.

As a part of daily operations, PG&E Morro Bay power plant personnel record the temperature of the cooling water for their generators. The plant's water intake structure, which is located near the entrance at the northern end of the bay, draws waters from 6.3 M below mean sea level. Historically, the data sent to Scripps reflected the 0800 temperature. However, around 1987, plant personnel began combining the 0200, 1000 and 1800 hour readings into an average daily temperature.

Encompassing approximately 2300 acres, Morro Bay consists primarily of intertidal mud flats traversed by a navigable channel 4 to 7.5 M deep which runs from the entrance in southern Estero Bay to White Point. Due to the shallow nature of the bay, reported temperatures may be affected by the warmer back bay waters drawn into the intake during outgoing tides.

Granite Canyon, California 1971-94 36°25.9′N, 121°55′W

Marine Pollution Studies Laboratory California Department of Fish and Game

Personnel of the Marine Pollution Studies Laboratory take daily temperature and salinity samples off the rocks near the water intake for the laboratory, and return the salinity samples to Scripps once a month for analysis. This sampling site, approximately 5 miles south of the old Point Lobos South location (1956-1979), is considered to be a good representative of the spring-summer upwelling that is typical of the central California coast.

Pacific Grove, California 1919-39, 41-75, 77-94 36°37.3'N, 121°54.2'W

Hopkins Marine Station, Stanford University

Hopkins Marine Station personnel take daily temperature measurements from a beach on the north side of Point Cabrillo just north of their main laboratory buildings. Exposed to the northwest swell as it sweeps past Point Pinos, this location is representative of coastal conditions on the south side of Monterey Bay.

Santa Cruz, California 1955-71, 80-94 36°57.5′N, 122°01.0′W

City of Santa Cruz

Each morning at the Santa Cruz Municipal Wharf, temperatures are read on a buoy-gauge thermistor unit installed and maintained in a protective pipe on a pier piling 5.2 M below average tide.

The Farallon Islands, seven rocky islands comprising the Farallon Islands National Wildlife Refuge, are the breeding grounds for more than one-quarter of all California seabirds and home to populations of seals and sea lions. The largest seabird colony south of Alaska, this critical habitat provides protection for 12 different species, numbering more than 200,000 individuals. As a small part of their ongoing scientific studies, research personnel stationed on Southeast Farallon take daily temperature and salinity samples and return the salinity samples to Scripps once a month for analysis. Because of their location 26 miles west of the Golden Gate Bridge, where they catch the full force of winter storms and the strong summer northwesters, data collection can be interrupted from time to time. The sampling site at the boat landing on the southeast side of the island is steep and rocky, so measurements are representative of the oceanic waters around the islands.

Bodega Bay, California 1957-94 38°19.0'N, 123°04.3'W

Bodega Marine Laboratory, University of California, Davis

In the latter part of 1989, the Marine Biological Laboratory located at Horseshoe Cove switched from manual sampling to an automated meteorological and oceanographic monitoring system. Installed at the same site, this system records temperature and salinity at the aquarium's water system intake located in a deep rocky channel on the northern headland of the cove. The manual and automated data sets overlapped in 1990 with good agreement, so the manual collections of samples subsequently ceased in 1991. The temperature and salinity values presented are, for the most part, the 0815 data point, and since the water is deep and the headland steep and rocky, these values are representative of the coastal water.

Trinidad Beach, California 1975-94 41°03.6'N, 124°08.9'W

Telonicher Marine Laboratory, Humboldt State University

and Trinidad Bay, California

41°03.3'N, 124°08.8'W

Humboldt State University operates a marine laboratory on the rocky headland between the ocean and Trinidad Bay. Bay temperatures are taken from the fishing pier on the lee or southeast side of the headland. Ocean temperatures and salinity samples are taken from the beach on the northwest side, and returned to Scripps once a month for analysis. Except during periods of heavy runoff, salinity values from the coast and the bay are so similar that salinity samples are collected from the beach only.

Crescent City, California

41°44.7′N, 124°11.8′W

NOAA/NOS

This tide gauge station is located on the end of the Coast Guard Pier in Crescent City harbor. Temperatures at this site inside the harbor and the water on the beach outside the small entrance formed by two breakwaters, are nearly the same.

Charleston, Oregon 1966-94 43°20.7'N, 124°19.3'W

Oregon Institute of Marine Biology, University of Oregon

Coos Bay, the second largest bay on the Oregon coast, encompasses over 12,000 acres which are divided almost evenly between tidelands and submerged lands. The OIMB pier is located less than a mile from the mouth of the bay, which is protected by jetties to both the north and the south. The bay itself is comprised of eleven tidal inlets, including the South Slough National Estuarine Research Reserve, a significant source of freshwater runoff, less than a mile above the pier. Because of this, personnel collect daily temperatures at high tide in order to minimize the effects of the estuarine environment.

Neah Bay, Washington 1955-94 48°22.1'N, 124°37.0'W

NOAA/NOS

This tide gauge station is located near Cape Flattery at the entrance to the Strait of Juan de Fuca.

# 1994 COASTAL SEA-SURFACE TEMPERATURE MONTHLY AND YEARLY MEANS

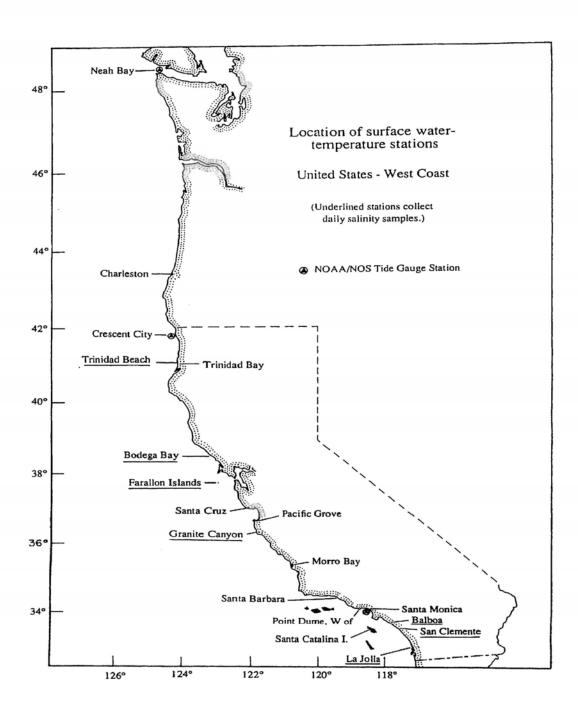
Location	Jan	Feb	Mar	Apr	May	Jun	Jui	Aug	Sep	Oct	Nov	Dec	Year
La Jolla	15.43	14.93	16.06	16.76	17.32	19.83	21.49	22.25	21.19	19.67	16.10	14.92	18.00
San Clemente	15.23	14.63	15.97	16.01	16.88	19.27	20.22	22.15	20.69	18.44	15.55	14.75	17.48
Balboa	15.05	15.06	15.86	16.05	16.64	19.01	19.06	21.37	20.07	18.38	14.94	13.72	17.10
Santa Monica	15.21	14.76	16.00	15.79	17.06	20.25	19.19	22.29	21.25	18.71	15.10	14.42	17.50
Point Dume	14.72	14.23	14.95	14.30	14.55	17.26	17.07	20.52	18.97	18.08	14.80	14.38	16.15
Santa Barbara	14.48	14.00	15.73	14.88	15.45	18.21	16.81	20.33	19.10	17.44	14.84	13.49	16.23
Мотто Вау	11.48	10.65	10.69	10.68	9.93	12.64	12.03	12.45	11.93	13.72	12.68	12.08	11.75
Granite Canyon	13.20	13.05	11.95	10.01	10.19	9.83	11.71	11.84	13.12	13.55	12.14	12.20	11.90
Pacific Grove	12.28	12.32	14.14	13.90	13.70	13.71	13.29	13.19	13.55	13.93	11.57	11.23	13.07
Santa Cruz	12.81	12.65	13.06	12.83	12.90	13.60	14.44	15.48	15.01	14.51	12.29	11.79	13.45
Farallon Islands	12.88	12.80	13.22	11.71	11.22	11.43	11.65	12.89	13.43	13.48	11.83	11.65	12.35
Bodega Bay	12.05	12.19	12.34	10.66	10.43	10.27	12.37	11.77	12.82	13.39	11.16	10.74	11.68
Trinidad Beach	12.41	11.72	12.74	12.19	12.75	13.65			13.55	12.42	10.89	10.80	
Crescent City	11.54	10.80	11.95	12.12	12.55	13.14	14.70	15.42	15.64	13.20		9.90	
Charleston	11.09	10.42	10.89	11.46	12.53	12.86	11.47	13.85	12.70	11.52	11.02	9.72	11.63
Neah Bay	9.56	8.34	9.54	10.74	12.02	13.22	12.67	13.25	12.42	10.84	9.50	8.49	10.88

1994 COASTAL SEA-SURFACE TEMPERATURE MONTHLY AND YEARLY ANOMALIES

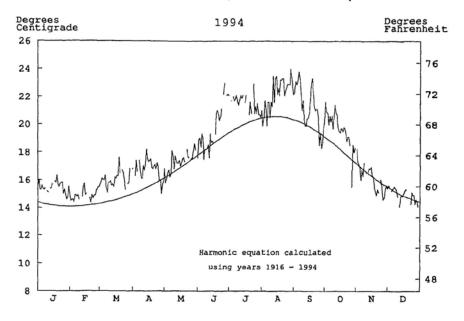
Location	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
La Jolia 1916-94	1.30	0.84	1.48	1.19	0.30	1.37	1.52	1.45	1.71	1.54	-0.24	0.01	1.03
San Clemente* 1955-94	1.25	0.41	1.42	0.43	0.20	1.18	0.77	2.12	1.33	0.08	-0.83	0.15	0.73
Balboa 1925-94	0.92	0.96	1.46	0.93	0.43	1.40	0.40	2.07	1.46	0.47	-1.38	-1.25	0.65
Santa Monica 1946-94	1.17	0.53	1.44	0.58	0.76	2.27	-0.33	2.01	1.60	0:44	-1.07	-0.24	0.73
Point Dume 1957-94	0.67	0.35	0.98	-0.03	-0.27	1.00	-0.50	1.92	0.78	0.55	-1.30	-0.29	0.31
Santa Barbara 1955-94	0.95	0.19	1.59	0.21	0.02	1.29	-0.79	1.97	0.73	-0.20	-0.94	-0.59	0.37
Morro Bay 1962-94	-0.84	-1.70	-1.50	-1.49	-2.71	-0.91	-2.20	-2.29	-2.50	-0.49	-0.82	-0.58	-1.50
Granite Canyon 1971-94	0.71	0.84	0.52	-0.47	-0.17	-1.02	0.04	-0.77	0.21	0.41	-0.73	-0.44	(-0.12)
Pacific Grove 1919-94	0.37	0.21	1.78	1.36	0.92	0.23	-0.64	-0.97	-0.80	0.04	-1.40	-1.12	0.02
Santa Cruz 1955-71, 80-94	0.88	0.44	0.63	0.35	-0.11	-0.31	-0.45	0.01	-0.29	-0.06	-0.89	-0.46	-0.07
Farallon Islands 1925-43, 55-94	1.01	0.91	1.48	0.38	-0.07	-0.24	-0.58	-0.12	-0.21	-0.09	-1.07	-0.59	0.11
Bodega Bay 1957-94	0.95	0.86	1.28	0.27	0.23	-0.57	0.83	-0.45	0.11	0.63	-1.17	-0.78	0.21
Trinidad Beach 1975-94	1.54	0.86	1.14	1.11	1.59	2.04			0.97	0.09	-0.86	-0.32	
Crescent City 1933-94	1.49	0.35	1.03	0.88	0.56	0.08	0.52	0.38	1.48	0.37		-0.48	
Charleston 1966-94	1.25	0.43	0.36	0.54	0.89	0.51	-1.03	1.52	0.28	-0.02	-0.34	-0.60	(0.38)
Neah Bay 1935-94	2.15	0.79	1.22	1.30	1.22	1.52	0.74	1.36	0.87	0.16	-0.01	0.41	1.02

<sup>\*</sup> Recent data combined with older nearby records for historical means.

( )Historical mean of less than 30 years.

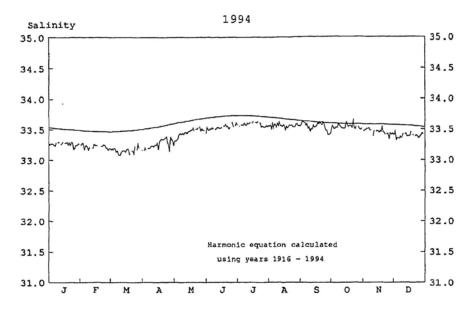


SIO (Surface) La Jolla, CA



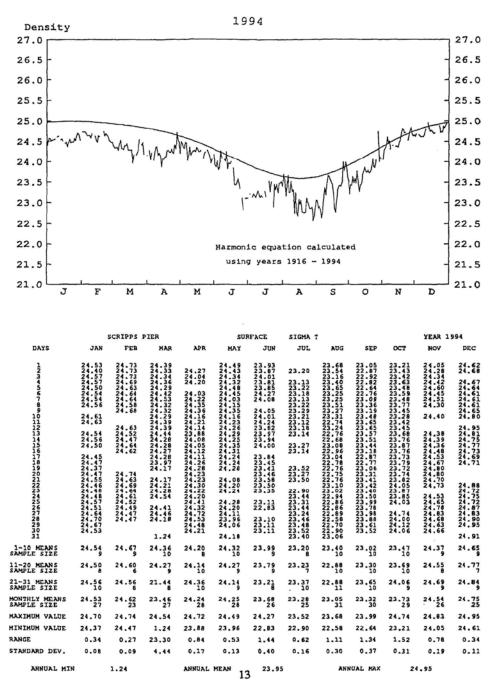
	s	CRIPPS P	IER		SUR			YEAR 19	94			
DAYS	JAN	FEB	MAR	APR	MAY	JUN	JUL	DUA	SEP	OCT	NOV	DEC
1234567890122345678901	15.03 16.03 15.36 15.36 15.43 15.4 15.7 15.7 15.7 15.7 15.7 15.8 15.7 15.7 15.8 15.7 15.7 15.8 16.8 16.8 16.8 16.8 16.8 16.8 16.8 16	14.5 14.6 14.4 14.9 114.9 114.9 114.9 114.9 115.5 114.9 114.	8.100.935.1889.67.52.133.65 75.03 76.88 8.100.935.135.55.55.56.66.67.6 6.66.5 75.03 76.8 8.100.935.135.66.66.67.6 6.66.67.6 6.66.67.6 6.66.67.6 6.66.67.6 6.66.67.6 6.66.67.6 6.66.67.6 6.66.67.6 6.66.67.6 6.66.67.6 6.66.67.6 6.66.67.6 6.66.67.6 6.66.67.6 6.66.67.6 6.66.67.6 6.66.67.6 6.66.6 6.66.6 6.66.6 6.66.6 6.66.6 6.66.6	346 4611071253459801820000798 6766 7666567777777667776655556	15.8 166.7.2 166.7.2 116.7.2 116.7.2 117.2 177.2 177.2 177.2 177.6 177.6 177.6 177.6 166.6 176.6	18.9.04 119.04 119.15 119.17 119.17 118.06 119.18 1	21.7 22.0,7 221.7 221.7 221.4 222.1 221.4 221.8	9.57 201.57 211.9.65 221.56 221.56 221.23 221.23 222.23 222.23 222.23 222.23 222.23 222.23 222.23 222.23 222.23 222.23 222.23 222.23 222.23 222.23 222.23 223.23 233.23 23	31928320749945880344011553378222222222112222221122222222222222222	6980626784878547758738115 52222222222222221211111111111111111	23180732 5 58893282931 0567364 8777666667 6 666666632455 655444555 451414111 111111 1111111 1111111	155 5.2345448 1 1898023 3.19936441 144444 1 4 3
1-10 MEANS SAMPLE SIZE	15.44	14.69	15.83	16.69	16.80	18.58	21.77	20.97	22.39	20.66	16.90	15.33
11-20 MEANS SAMPLE SIZE	15.66	15.00	16.20	17.24 10	17.31	19.42	21.73	22.85	21.34	19.86	16.12	14.87
21-31 MEANS SAMPLE SIZE	15.25	15.13	16.20	16.35 10	17.90	21.69	21.10	22.87	19.85 10	18.34	15.28	14.54
MONTHLY MEANS SAMPLE SIZE	15.43	14.93	16.06	16.76	17.32	19.83 26	21.49	22.25	21.19	19.67	16.10	14.92 25
MAXIMUM VALUE	16.3	15.7	17.6	18.2	18.6	23.0	22.9	24.0	23.8	21.6	18.2	15.6
MINIMUM VALUE	14.6	14.4	15.1	15.0	15.8	17.5	20.5	19.9	18.3	15.5	14.6	14.1
RANGE	1.7	1.3	2.5	3.2	2.8	5.5	2.4	4.1	5.5	6.1	3.6	1.5
STANDARD DEV.	0,39	0.37	0.53	0.68	0.68	1.59	0.61	1.10	1.53	1.22	0.90	0.46
ANNUAL MIN	14	1.1		ANNUAL N	EAN 11	18.00		ANN	DAL MAX	24	.0	

## SIO (Surface) La Jolla, CA

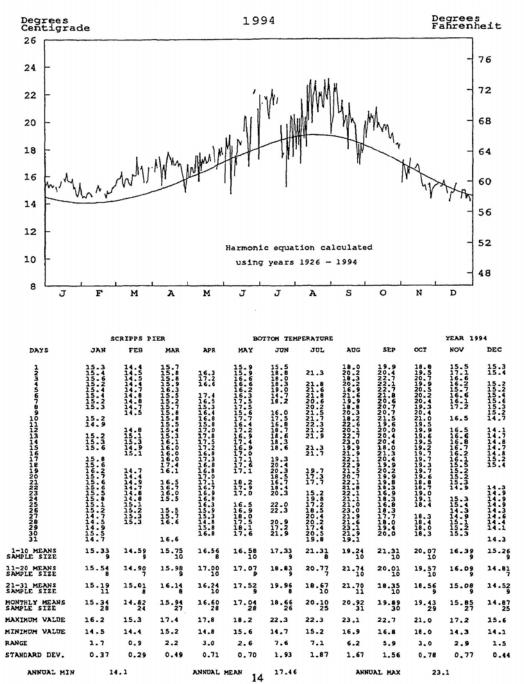


		SCRIPPS	PIER		SU	RFACE SA	LINITY		YEAR 1	994		
DAYS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
123456789012345678901 2311111111122222222233	33.27.55 33.27.	33.25 33.27 33.27 33.123 33.123 33.222 33.123 33.224 324 324 324 324 324 324 324 324 324	33.177 34.177 34	33.1.1 93.3.2.4.8 0 3.3.2.4.1 93.3.2.4 1.3.2.2.3.3.3.3.3.3.3.3.3.3.3.3.3.3.3.3.	33.3.351.351.351.351.351.351.351.351.351	33.449 333.44510 333.4510 333.5531 333.5533 333.	33.55 33.57 33.56 33.56 33.55 33.55 33.60 33.60 33.60 33.60 33.55 33.60 33.60 33.55 35 35 35 35 35 35 35 35 35 35 35 35 3	33.577 331.6018 331.5018 331.5018 331.5018 331.5018 331.5018 331.5018 331.5018 331.5018 331.5018 331.5018 331.5018 331.5018 331.5018 331.5018 331.5018 331.5018 331.5018	333.661069114610734668297293284811244412233333333333333333333333333	33.5561 33.551 3	33,48 331,551 331,551 333,552 333,48 333,47 333,46 333,47 333,46 333,47 333,47 333,47 333,43 333,44 333,43 333,	33.472 33.472 33.335 33
1-10 MEANS SAMPLE SIZE	33.26		33.14			33.51	33.57 8	33.56	33.57	33.54	33.48	33.38
11-20 MEANS SAMPLE SIZE	33.28	33.24	33.14	33.28	33.48	33.54	33.60	33.55 10	33.56	33.55	33.47	33.41
21-31 MEANS SAMPLE SIZE	33.25	33.21	33.18	33.30	33.49	33.56	33.56	33.56	33.49	33.53	33.41	33.40
MONTHLY MEANS SAMPLE SIZE	33.26	33.22	33.15	33.26	33.45	33.53	33.58	33.56	33.54	33.54	33.45	33.39
MAXIMUM VALUE	33.29	33.28	33.27	33.38	33,54	33,61	33.62	33.62	33.63	33.66	33.54	33,47
MINIMUM VALUE	33.18	33.16	33.08	33.14	33,31	33,48	33.53	33.49	33.41	33.49	33.34	33.32
RANGE	0.11	0.12	0.19	0.24	0,23	0.13	0.09	0.13	0.22	0.17	0.20	0.15
STANDARD DEV.	0.03	0.04	0.04	0.07	0.06	0.03	0.03	0.03	0.07	0.04	0.04	0.04
ANNUAL MIN		33,08		ANNUAL	MEAN 1	2 33.4	1	AN	RUAL MAX	3	3.66	

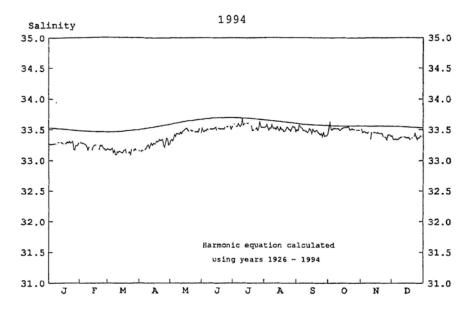
### SIO (Surface) La Jolla, CA



SIO (Bottom) La Jolla, CA

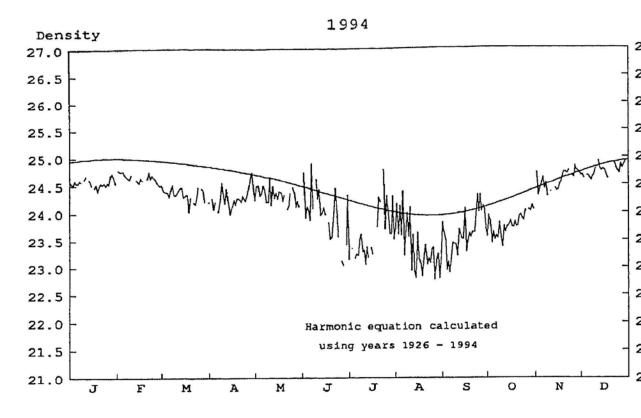


## SIO (Bottom) La Jolla, CA



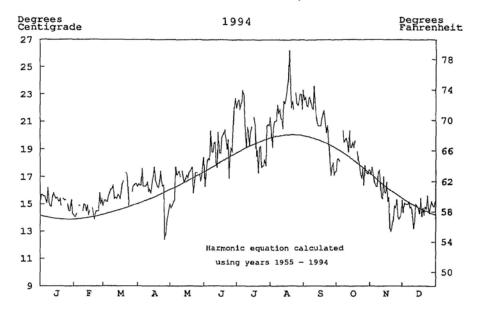
		SCRIPPS	PIER		В	IAS MOTTO	LINITY				YEAR 1	994
DAYS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
123456789111231456789221232456789331	33.276 33.226 33.226 33.226 33.227 33	23.28 33.28 33.27	33.18 33.187 33.180 33.180 33.110 33.	33.1.1 8 1224.5 9 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	33,3316284332443323333333333333333333333333333	33.476 33.449 34.449 34	33.55 35 35 35 35 35 35 35 35 35 35 35 35 3	33.55993233 33.55993233 33.55993233 33.5599323 33.55993 35.55993 35.55993 35.55993 35.55993 35.55993 35.55993 35.55993 3	33.4.5.63.2893.33.4.5.63.23.3.3.3.3.3.3.3.3.3.3.3.3.3.3.3.3.3	\$315971721721739917300 99999 33151747517575745555 99999 331517475757575757575757575757575757575757	33.51 23.457 23.475 23.444 23.45	33.40 33.354 33.354 33.354 33.355 33.355 33.355 33.356 33.377 33.38 33.377 33.3
1-10 MEANS SAMPLE SIZE	33.27	33.25	33.15	33.19	33.38	33.50		33.54	33.51	33.53	33.45	33.36
11-20 MEANS SAMPLE SIZE	33.28	33.22	33.14	33.28	33.48	33.51	33.57	33.51	33.48	33.52	33.45	33.37
21-31 MEANS SAMPLE SIZE	33.25	33.20	33.15	33.30	33.47	33.53	33.53	33.52	33.42	33.50	33.39	33.39
MONTHLY MEANS SAMPLE SIZE	33.27	33.22	33.15	33.26	33.44	33.51	33.56	33.52	33.47	33.52	33.43	33.37
MAXIMUM VALUE	33.31	33.29	33.20	33.36	33,52	33.55	33.69	33.59	33.58	33.63	33.51	33.44
MINIMUM VALUE	33.17	33.16	33.09	33.15	33.31	33.46	33.48	33.46	33.38	33.49	33.33	33.33
RANGE	0.14	0.13	0.11	0.21	0.21	0.09	0,21	0.13	0.20	0.14	0.18	0.11
STANDARD DEV.	0.03	0.04	0.03	0.06	0.06	0.03	0.05	0.03	0.05	0.03	0.04	0.03
ANNUAL MIN		33.09		ANNUAL	MEAN 1:	5 33.35	•	ANI	NUAL MAX	3:	3.69	

# SIO (Bottom) La Jolla, CA



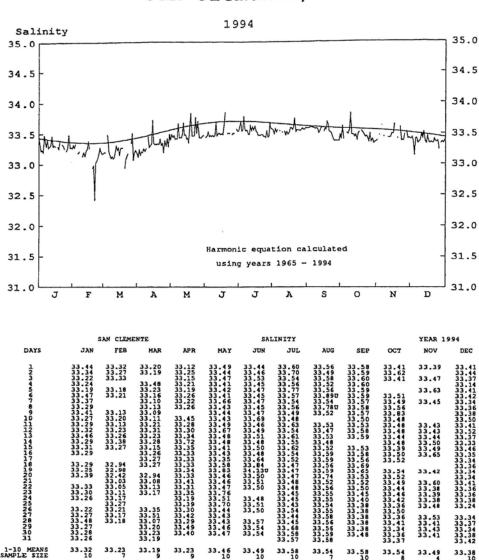
	1	SCRIPPS I	PIER		вс	MOTTO	SIGMA T		YEAR 199		
DAYS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
123456789012345678901 1112345678901 22222222233	74994407 18 181 62094259528254 4444444 44 44 4444444444444444444444	24.58 24.555 24.660 24.63 24.63 24.69 24.69 24.69 24.69 24.55 24.55 24.55 24.55 24.55 24.55	24.19 24.16 24.28 24.46 24.45 24.42 24.20	24 .26 24 .26 24 .26 24 .53 24 .53 24 .27 24 .27 27 .47 27 .47	#915930934766597612 735 56011 44444444444444444444444444444444444	24.90 24.004 24.004 24.86 24.80 24.80 24.80 24.80 24.80 24.80 24.80 24.80 24.80 24.80 24.80 24.80 28.8	23.34 23.17 23.51 23.51 23.51 23.628 23.31 23.37 2	1612981600693340157733583401424343434434434343443434343434343434343	50401554 33.791015534 33.791015534 33.79101553 33.79101553 33.79101553 33.79101554 33.7910	9844407331374436532345532323333333333333333333333333	2244.452 24.452
1-10 MEANS SAMPLE SIZE	24.56	24.71	24.38	24.23	24.37		23.33		23.27 10	23.62 10	24.47
11-20 MEANS SAMPLE SIZE	24.53	24.62	24.32	24.20	24.33	23.92	23.46	23.15	23.60	23.75 10	24.54
21-31 MEANS SAMPLE SIZE		24.58							23.97	23.98	24.72
MONTHLY MEANS SAMPLE SIZE	24.56	24.64 24	24.34	24.27	24.31	23.95 26	23.62 25	23.38	23.61	23.78	24.58
MAXIMUM VALUE	24.72		24.52	24.74	24.63	24.89	24.78	24.38	24.32	24.12	24.83
MINIMUM VALUE	24.40	24.50	24.02	23.97	24.07	23.03	23.05	22.78	22.91	23.37	24.29
RANGE	0.33	0.29	0.49	0.76	0.56	1.85	1.73	1.60	1.41	0.75	0.55
STANDARD DEV.	0.07	0.08	0.11	0.18	0.14	0.48	0.45	0.44	0.37	0.19	0.16
ANNUAL MIN		22.78		ANNUAL	MEAN 1	6 24.1	5	ANI	XAM JAUN	24	1.92

# San Clemente, CA



	s	AN CLEME	NTE			TEM	PERATURE			YEAR 19	94	
DAYS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
123456789012345678901 111111111222222222222233	27766631222985864532249 433 05553321155445555 5 5 445523 2 1555332	14.13 14.99 14.50	3322681114454764957 3279 934553 5555555666655555566 7764 5666666 1111111111111111111111111111111	5446333746918517863264834499266 666776666655607766866676682723445	14.9237.124 14.5537.124 15.577.127.77.7 17.77.7 17.66.9.1934 11.67.78.3 11.67.78.3 11.67.8.4	117.8.13.2.18.8.4.5.0.7.2.7.7.8.0.11.4.8.1.18.1.18.1.18.1.18.1.18.1.1	22.46.93.43.07.16.53.3.6 22.21.23.3.07.16.53.3.6 22.22.23.3.07.16.53.3.6 22.22.23.3.07.16.53.3.6 22.22.33.07.16.6 22.22.33.07.16.6 22.22.33.07.16.6 22.22.33.07.16.6 22.22.33.07.16.6 22.22.33.07.16.6 22.22.33.07.16.6 22.22.33.07.16.6 22.22.33.07.16.6 22.22.33.07.16.6 22.22.33.07.16.6 22.22.33.07.16.6 22.22.33.07.16.6 22.22.33.07.16.6 22.22.33.07.16.6 22.22.33.07.16.6 22.22.33.07.16.6 22.23.07.16.6 22.23.07.07.16.6 22.23.07.16	20.4 190.0 190.0 2011.12.6 2011.2 2012.2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	22222222222222222222222222222222222222	231 255848311516 82029648312601199.6 8202964831177777	27.26533355554098625206997319143 777666667766557556533333445445 11116666776655755653133344545	4100027862709873417286683929822
1-10 MEANS SAMPLE SIZE	15.45	14.54	15.64	16.47	16.28	18.52	21.83	21.01	22.51	19.15	16.91	14.70
11-20 MEANS SAMPLE SIZE	15.34 10	14.49	16.00	16.57	17.17	19.34	19.70	22.87	21.22	19.17	15.31	14.58 10
21-31 MEANS SAMPLE SIZE	14.87	14.86	16.30	14.99	17.12	19.96 10	19.19	22.58	18.34	17.34	14.42	14.94
MONTHLY MEANS SAMPLE SIZE	15.23	14.63	15.97	16.01	16.88	19.27	20.22	22.15	20.69	18.44	15,55	14.75
MAXIMUM VALUE.	16.2	15.8	17.3	17.7	18.4	22.7	23.3	26.2	23.6	20.3	17.7	15.6
MINIMUM VALUE	24.2	13.9	14.9	12.4	14.7	16.3	17.3	19.1	17.1	16.4	13.0	13.2
RANGE	2.0	1.9	2.4	5.3	3.7	6.4	6.0	7.1	6.5	3.9	4.7	2.4
STANDARD DEV.	0.46	0.44	0.63	1,26	0.89	1.46	1.75	1.34	1.96	1.08	1.35	0.49
ANNUAL MIN	12	.4		ANNUAL P	EAN 17	17.48		ANNU	JAL MAX	26	.2	

#### San Clemente, CA



33.46

33.52

33.51

33.50

0.48

0.11

ANNUAL MEAN 18

33.54

0.09

33.41

33.36

0.60

0.12

33.21

0.57

0.12

0.96

0.19

0.08

MONTHLY MEANS SAMPLE SIZE MAXIMUM VALUE

MINIMUM VALUE

STANDARD DEV.

ANNUAL MIN

33.54

33.56

33.54

33.50

0.34

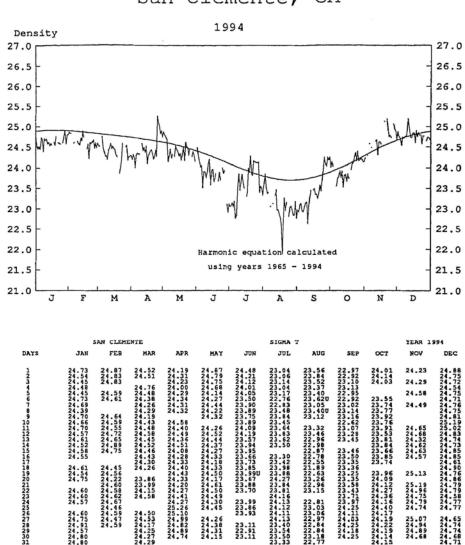
33.58

33.38

ANNUAL MAX

33.52

#### San Clemente, CA



23.18

23.34

22.62

1.63

24.54

0.65

23.85

23.56

24.48

22.91

0.35

19

25.26

0.30

MAXIMUM VALUE

MINIMUM VALUE

STANDARD DEV.

ANNOAL MIN

RANGE

24.91

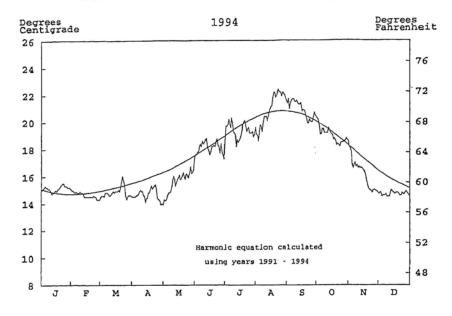
24.39

0.12

24.22

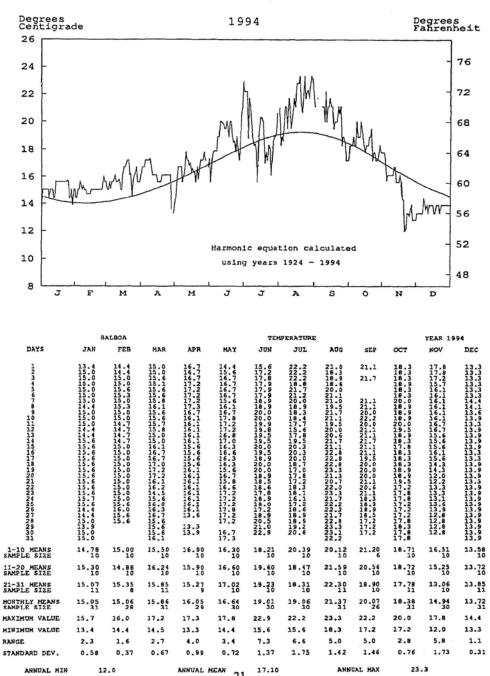
0.15

## Santa Catalina Island, CA

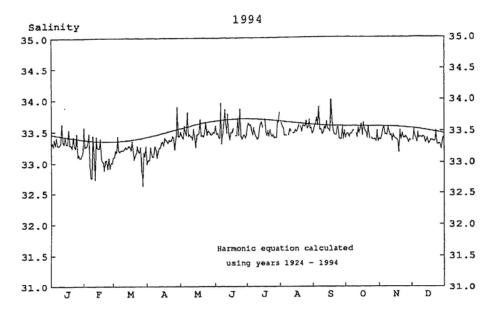


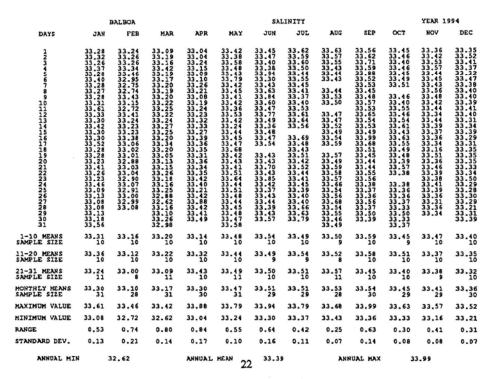
	s	ANTA CAT	ALINA I.			TEM	PERATURE			YEAR 19	94	
DAYS	JAN	FEB	MAR	APR	MAY	JUN	JUL	λUG	SEP	OCT	NOV	DEC
1 2 3 4 5 6 7 8 9 9 1 1 1 1 2 1 2 1 3 1 4 5 7 1 1 1 2 1 2 1 2 1 2 2 2 2 2 2 2 2 2 2	1012322110978899991123345553332221	15.0 15.0 14.8 14.8 14.8 14.8 14.8 114.8 114.5 1	14.588876678989993607463566635144.88876678989993607463566665	14.5 14.5 14.6 14.6 14.7 15.9 14.8 114.8 114.8 114.8 115.1 115.1 115.1 115.0 114.3 1	11111111111111111111111111111111111111	177.088.296822326832712188.82883271888.828832778888827777777888888888888888	77829630321275792801773562223916	19.06 198.38 199.73 199.73 119	21.1.4677555643348998539921004754	12711155722264210786343255566876 00997119997199971199971199971199971199971199971199971199971199971199971199971999711999711999711999711999711999711999711999711999711999711999719997119997119997119997119997119997119997119997119997119997119997119997119997119997119997119997119997119997119997997	2189680786766654285200980000911166667666654285200980000998000099800009980000998000099800009980000998000099800009980000998000000	7888-56-66-77-09-87-144-66-87-78-98-7144-66-77-89-87-144-66-77-89-87-144-66-87-744-66-87-87-87-87-87-87-87-87-87-87-87-87-87-
1-10 MEANS SAMPLE SIZE	15.13	14.67	14.65	14.71	14.90	18.11	19.77	19.55	21.51	19.50	17.15	14.63
11-20 MEANS SAMPLE SIZE	14.94	14.55	14.91	14.71	15.83	18.19	19.12	21.22	20.96	18.99	16.21	14.77
21-31 MEANS SAMPLE SIZE	15.30	14.41	14.95	14.56	16.30	18.14	19.33	22.06	20.21	18.52	14.93	14.71
MONTHLY MEANS SAMPLE SIZE	15.13	14.63	14.84	14.66	15.70	18.15	19.40	20.98	20,89	18.99	16.10	14.70 31
MAXIMUM VALUE	15.5	15.0	16.0	15.4	17.3	18.8	20.3	22.4	21.7	20.3	18.2	15.0
MINIMUM VALUE	14.7	14.3	14.3	13.9	14.2	17.3	18.2	18.6	19.9	18.2	14.8	14.5
RANGE	0.8	0.7	1.7	1.5	3.1	1.5	2.1	3.8	1.8	2.1	3.4	0.5
STANDARD DEV.	0.20	0.22	0.39	0.41	0.74	0.41	0.51	1.19	0.61	0.53	1.03	0.13
ANNUAL MIN	1	3.9		ANNUAL I	MEAN 20	17.01		ANN	JAL HAX	22	.4	

#### Balboa, CA

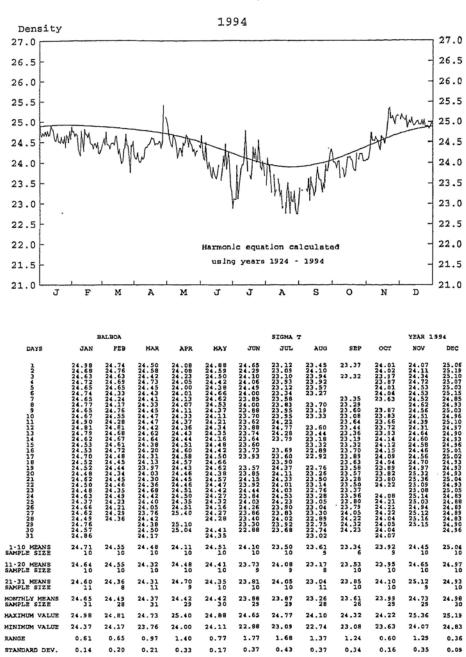


Balboa, CA





#### Balboa, CA



ANNUAL MEAN 23

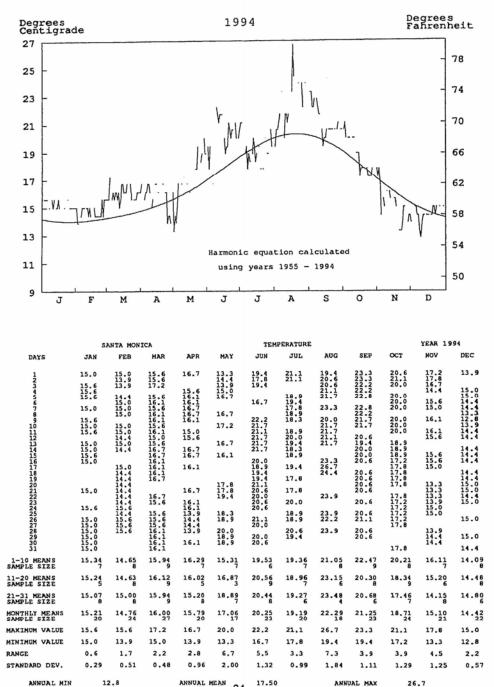
ANNUAL MAX

25.40

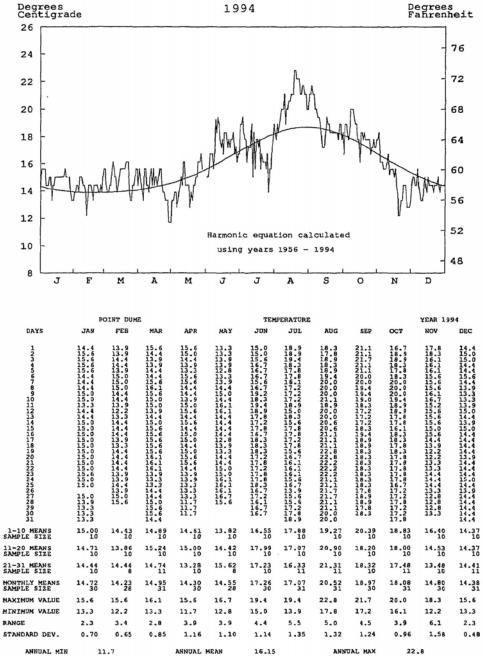
ANNUAL MIN

22.74

#### Santa Monica, CA

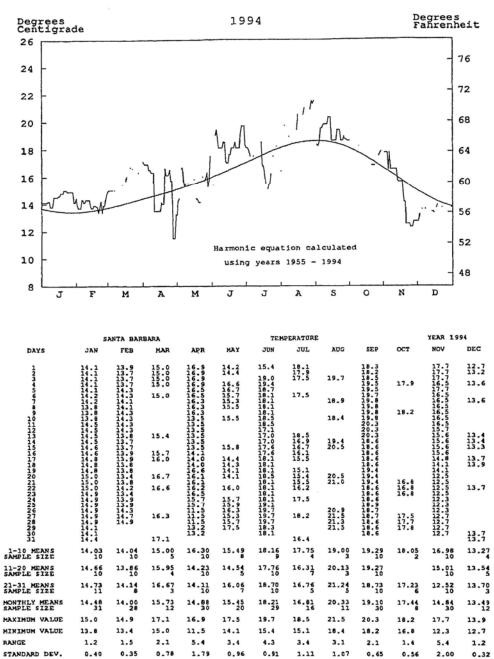


#### Point Dume, CA



25

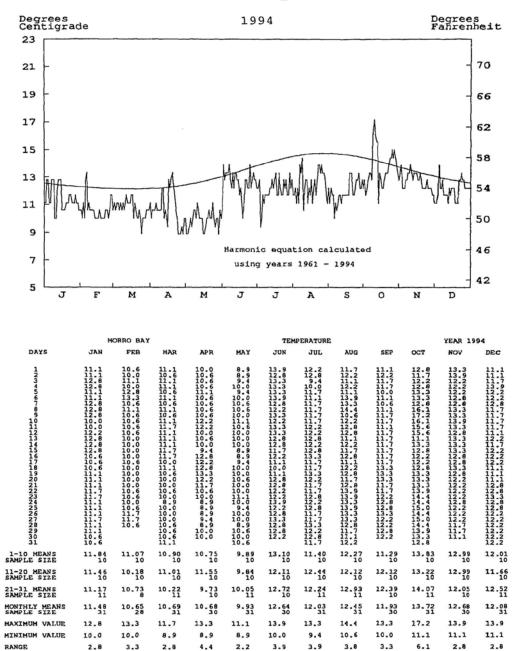
### Santa Barbara, CA



ANNUAL HEAN 26

ANNUAL MIN

### Morro Bay, CA



STANDARD DEV.

ANNUAL MIN

0.91

0.84

0.62

1.25

ANNUAL MEAN 27

0,63

0.87

11.75

0.85

1.02

0.81

ANNUAL MAX

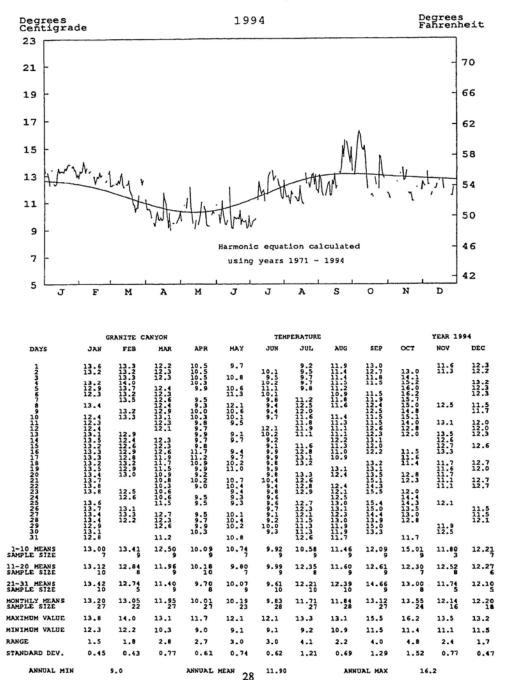
1.41

17.2

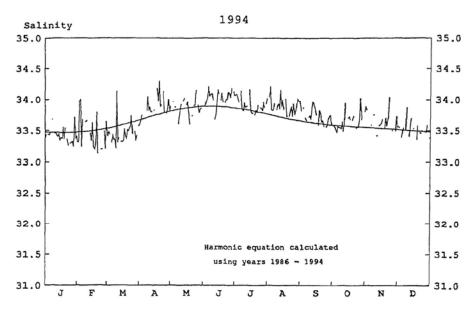
0.67

0.69

Granite Canyon, CA

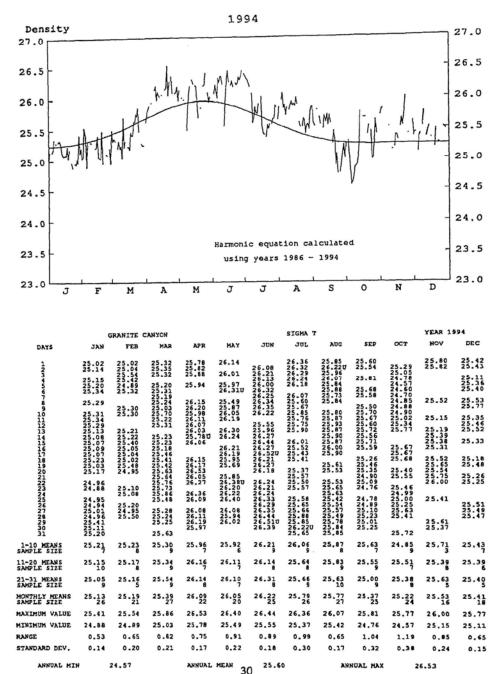


# Granite Canyon, CA

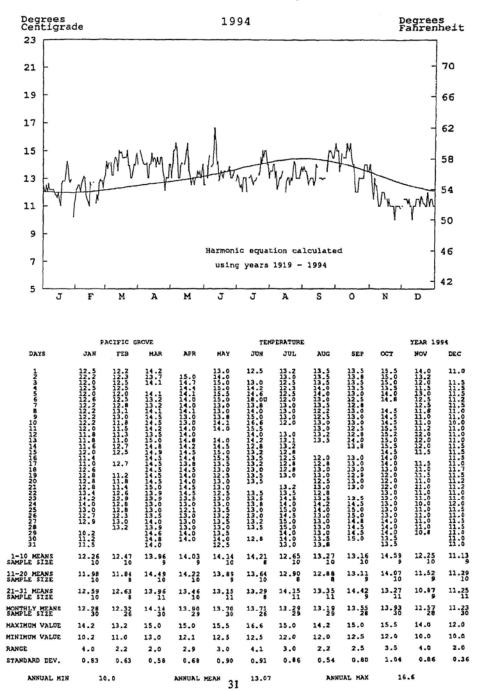


		GRANITE	CANYON			SAI	YTINI				YEAR 1	94
DAYS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1234567	33.38 33.43	33.31	33.41	33.61	33.89	33.90	34.07	34.02 34.380	33.98	33.58	33.89	33.57
3	33.44	33.97	33.44	33.74	33.97	33.94	34.09	34.05	33.87	33.56		33.40
5	33.44 33.43 33.47	33.24	33.31	33.68	33.88	34.03	33.97	33.84		33.47		33.49
		33.67	33.35			34.21	34.14	33.63 33.84 33.94	33.71	33.57	33.59	33.54
8 9	33,68	33.64	33.36	33.82	33.61	34.09	33.85	33.94		33.55	33.75	33.52
10	33.45	33.66	34 . 13	33.82	33.86	34.10	33.95	33.64	33.72	33.64		
112	33.46		33.31	33.88	33,92	33.69	33.88	33.91	33.69	33.49	33.42	33.41
13	33.40	33.45		33.80 33.43U	33.98	33.77	33.90	33.86	33.96	33.94	33.58	33.69
10 11 12 13 14 15 16 17	33.34	33.62	33.32 33.32 33.33	33.82		33.96 34.16 34.10	34.16	33.90	33.87		33.62	33.53
17	33.39	33.24	33.52		33.92 33.96	34 4211	33.82	34.00	33.76	33.70	33.68	
18	33.55	33.28	33.41 33.37 33.51	34.17	33.76	34.00	33.78	34.01	33.59	33.68	33.55	33.36
20	33.53	33.14	33.51	34.29		33.97	33.76	33.73	33.78	33.67	33.58 33.71	
22	33.36		33.49	33.92	33.74 34.360	33.96	33.80	33.74	33.64		34.03	33.46
190 201 222 24 225 227 227 228	33.26	33.20	33.56 33.73 33.45	34-13	33.91	34.00	33.91	33.82	33.57	33.54		
25	33.29	33.48	33.45	34:13	34.15	34.12	33.87	33.89 33.74 33.93	33.56	33.55	33.50	33.49
27	33.32	33.21	33.46	33.78	33.91	34.04	33.83	33 76	33.56 33.59 33.70	34.02		33.47
28 29	33.32 33.25 33.71 33.37	33,64	33.34	33.86	33.79	34.18 34.43U	33.96	33.83	33.74 33.75 33.60	33.68	33.49	33,58
29 30 31	33.37		33.57	33.81	33.85	34.13	34.36U 33.94	34.01	33.60	33.81	33.55	33.38
1-10 MEANS SAMPLE SIZE	33.47	33.60	33.46	33.77	33.83	34.04	34.00	33.95	33.79	33.55	33.77	33.56
11-20 MEANS SAMPLE SIZE	33.43	33.38	33.39	33.96	33.88	33.97	33.87	33.93	33.81	33.66	33.59	33.52
21-31 MEANS SAMPLE SIZE	33.36	33.35	33.51	33.90	33.89	34.06	33.88	33,86	33.65	33.69	33.67	33.47
MONTHLY MEANS SAMPLE SIZE	33.42	33.46	33.45	33.88	33.87	34.02	33.92	33.91	33.74	33.64	33.66	33.52
MAXIMUM VALUE	33.71	34.00	34.13	34.29	34.15	34.21	34.16	34.21	33.98	34.02	34.03	33.87
MINIMUM VALUE	33.25		33.22	33.61	33,61	33.69	33.76	33.73	33.56	33.47	33.42	33.36
		33.14										
RANGE	0.46	0.86	0.91	0.68	0.54	0.52	0.40	0.48	0.42	0.55	0.61	0.51
STANDARD DEV.	0.11	0.26	0.17	0.17	0.13	0.12	0.11	0.12	0.12	0.13	0.15	0.12
ANNUAL MIN	:	33.14		ANNUAL	MEAN 29	33.71		ANN	WAL HAX	34	1.29	

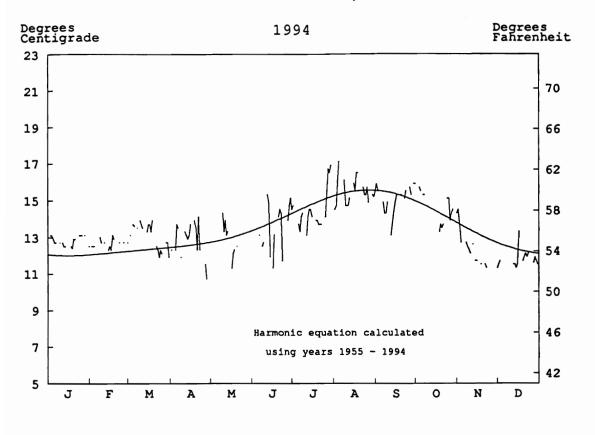
## Granite Canyon, CA



### Pacific Grove, CA

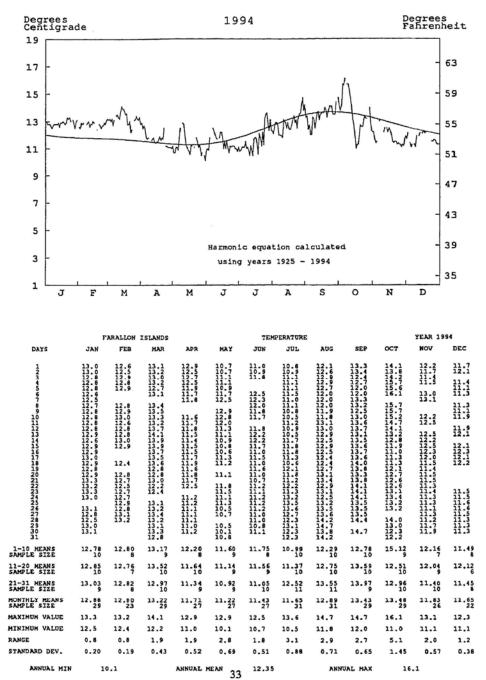


# Santa Cruz, CA

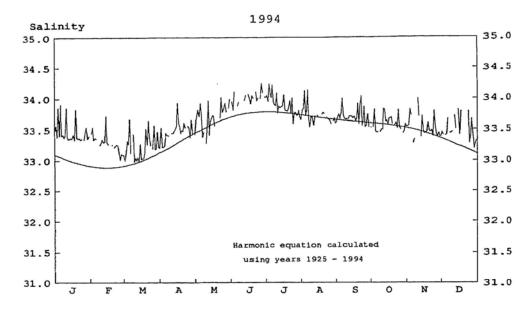


	s	ANTA CRU	z			TEM	PERATURE			YEAR 19	94	
DAYS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1 2 3 4 5 6 7	13.1 13.1 12.9 12.7 12.7	12.5 12.5 12.5	13.1 13.7 13.6	12.3 12.3 13.7			14.7	14.5 14.7 16.1 17.1	15.9 15.5	15.7 15.5	14.5 13.7 12.7	11:5
8 9	12.7	13.0	13.5 13.9 13.7	13.5	14.3 13.3	13.1 12.5 12.7	13.3 14.1 14.3	16.1 14.7 14.7	14.9 14.3 14.3 14.9	15.3 15.3	12.7 12.5 12.3 12.1	
11 12 13 14 15 16	12.7 12.5 12.5	12.7 12.3 12.5 12.3	13.3 13.7 13.7	13.3 13.1 12.9 13.1 13.7	13.9 13.1 13.3	15.3 14.9 11.9	13.1 14.1 14.5 14.5 14.5	14.7 15.1 15.9 15.5	13.1 13.7 14.3 14.9 15.3		12.6 11.7 11.7	11.5 11.3 11.5 13.3
17 18 19 20 21 22	12.5 12.4 12.9 12.9	12.3 13.1 12.9	13.3 13.9 12.5 12.3 11.9	13.9 13.5 12.3 14.1 12.3	12.1	14.1 14.5 14.3 11.7	13.9 13.7 13.7 13.7	16.5 16.5	15.3 15.3 15.1 15.5	13.3 13.7 13.5 13.7	11.5 11.3	11.7 11.9 12.1 11.9
10 11 12 13 14 15 16 17 18 19 20 21 22 24 24 25 26 27 28 29	13.1 13.1 13.1	12.7	12.7 12.7 12.7 11.9	11.5 10.7		13.9 14.7 15.1 14.5	14.1 15.3 16.7 16.5 16.9	15.3 15.7 14.9	15.7 15.3 15.9 15.9	15.1 15.1 13.9 14.3 14.5	11.3	11.6 11.9 11.7 11.5
31 1-10 MEANS SAMPLE SIZE	12.5 12.87	12.64	13.58	12.74	13.80	12.77	14.02	15.41	14.97	15.45	12.93	11.60
11-20 MEANS SAMPLE SIZE	12.58	12.63	13.57	13.23	12.64	13.43	13.98	15.70 6	14.56	13.50	11.88	11.81
21-31 MEANS SAMPLE SIZE	12.97	12.70	12.30	12.15		14.10	15.27	15.36	15.57	14.41	11.37	11.83
MONTHLY MEANS SAMPLE SIZE	12.81	12.65 14	13.06	12.83 17	12.90	13.60 16	14.44 20	15.48 21	15.01 19	14.51 14	12.29 14	11.79 16
MAXIMUM VALUE	13.1	13.1	13.9	14.1	14.3	15.3	16.9	17.1	15.9	15.7	14.5	13.3
MINIMUM VALUE	12.4	12.3	11.9	10.7	11.3	11.3	13.1	14.5	13.1	13.3	11.3	11.3
RANGE	0.7	0.8	2.0	3.4	3.0	4.0	3.8	2.6	2.8	2.4	3.2	2.0
STANDARD DEV.	0.26	0.24	0.70	0.93	0.94	1.29	1.09	0.70	0.77	0.81	0.93	0.46
ANNUAL MIN	10	0.7		ANNUAL !	MEAN 32	13.45		ANN	AL MAX	17.	.1	

#### Farallon Islands, CA

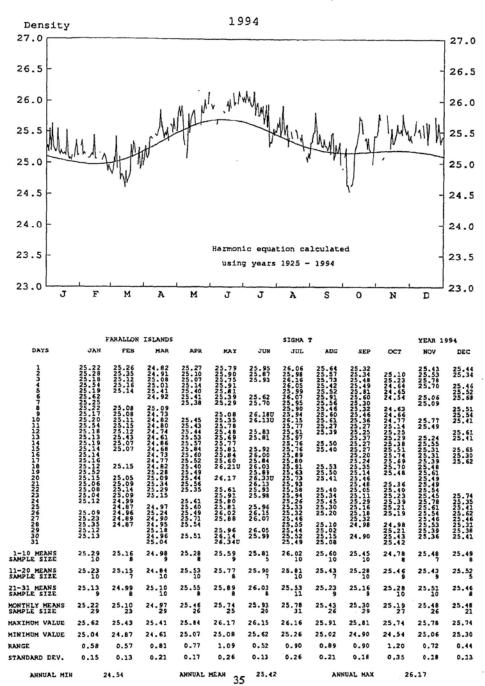


## Farallon Islands, CA



	1	FARALLON	ISLANDS			SAI	INITY				YEAR 19	994
DAYS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
123456789	33.49 33.56 33.85 33.40 33.41 33.41 33.41 33.85 33.34	33.44 33.53 33.33 33.36 33.35	33.00 33.13 33.31 33.26 33.66 33.12	33.52 33.21 33.22 33.25 33.44 33.41 33.40	33.66 33.81 33.71 33.74 33.38 33.45	33.94 33.81 34.10 33.88 33.93	34.04 33.95 34.23 34.09 34.01 34.21	33.80 33.84 34.12 33.72 33.80 34.13	33.69 33.74 33.67 33.76 33.79 33.72	33.54 33.82 33.47 33.45 33.46	33.55 33.56 33.82 33.73 33.28 33.34	33.45 33.41 33.40 33.41 33.66
8901123455678890123455678	33.3.15.58 33.3.3.3.3.3.3.3.3.3.3.3.3.3.3.3.3.3.3	33.25 33.34 33.29 33.30 33.71 33.26 33.25 33.21 33.25 33.21 33.25 33.21	33, 42 32, 98 33, 04 33, 05 32, 98 33, 26 33, 03 33, 03 33, 51 33, 51 33, 51 33, 54 33, 26	33.44 33.47 33.51 33.55 33.92 33.60 33.44 33.49 33.47 33.60 33.53	33.28 33.60 33.96 33.41 33.63 33.68 33.72 33.56 34.32 34.24 33.69 34.01	34.43U 34.34U 33.97 34.04 34.06 34.00 33.91 34.04 34.43U 34.10 34.20 34.20	33.90 888 888 333.85 868 333.86 868 868 868 868 868 868 868 868 868	33.54 33.70 33.69 33.57 33.71 33.72 33.69 33.74 33.77 33.75	33.66 33.67 33.71 33.71 33.71 33.68 33.67 33.67 33.67 33.59 33.87 33.59	33.46 33.50 33.83 33.63 33.63 33.65 33.67 33.69 33.59 33.57 33.69	33.99 33.771 33.47 33.47 33.45 33.45 33.46 33.47 33.47 33.47	33.44 33.46 33.71 33.51 33.61 33.78
245 67 228 229 31	33.35 33.45 33.53 33.35 33.35	33.01 33.10 33.09 33.08	33.19 33.56 33.18 33.19 33.46 33.22 33.20	33.55 33.53 33.37 33.65 33.44	33.77 33.83 33.92 33.78 33.84 33.98 34.390	34.00 34.24 34.09 34.02 34.01	33.59 33.76 33.77 33.72 33.73 33.80 33.70 33.66	33.66 33.64 33.59 33.64 33.68 33.60 33.62	33.86 33.54 33.56 33.74 33.54	33.81 33.53 33.50 33.44 33.47 33.58 33.54	33.57 33.43 33.38 33.44 33.38 33.39	33.28 33.39 33.66 33.43 33.19 33.27 33.32
1-10 MEANS SAMPLE SIZE	33,52	33,36	33.21	33.36	33.62	33.93	34.03	33.80	33.72	33.52	33.61	33.46
11-20 MEANS SAMPLE SIZE	33.46	33.33	33.13	33.54	33.74	34.00	33.85	33.71	33.72	33.68	33.52	33.64
21-31 MEANS SAMPLE SIZE	33.38	33.14 8	33.33	33.51	33.05	34.05	33.77	33.64	33.67	33.56	33.47	33.42
MONTHLY MEANS SAMPLE SIZE	33.45	33.27	33.22	33.48	33.73	34.01	33.88	33.72	33.70	33.59	33.53 26	33.49
MAXIMUM VALUE	33.90	33.71	33.66	33.92	34.24	34.24	34.23	34.13	34.03	33.83	33.99	33.81
MINIMUM VALUE	33.33	33.01	32,98	33.21	33.28	33.81	33.59	33.54	33.53	33.44	33.28	33.19
RANGE	0.57	0.70	0.68	0.71	0.96	0.43	0.64	0.59	0.50	0.39	0.71	0.62
STANDARD DEV.	0.17	0.15	0.20	0.14	0.22	0.09	0.15	0.14	0.13	0.12	0.17	0.18
ANNUAL MIN	1 3	32.98		ANNUAL	MEAN 34	33.59		AN	NUAL MAX	34	1.24	

#### Farallon Islands, CA



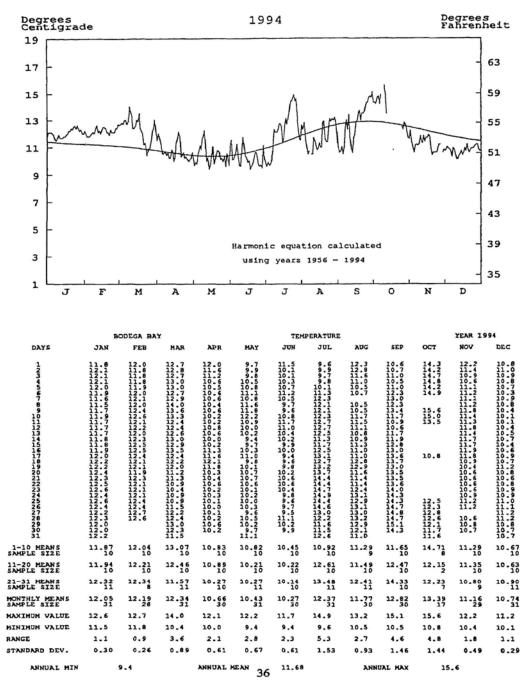
25.42

ANNUAL MAX

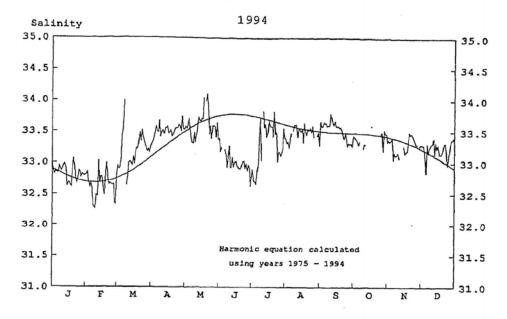
ANNUAL MIN

24.54

#### Bodega Bay, CA

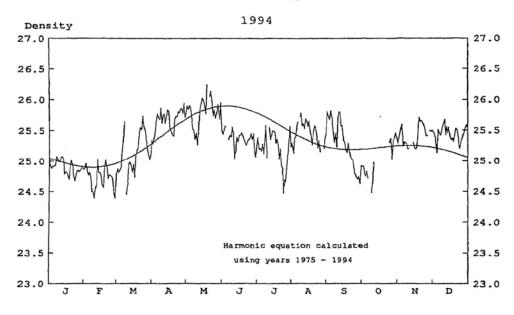


# Bodega Bay, CA



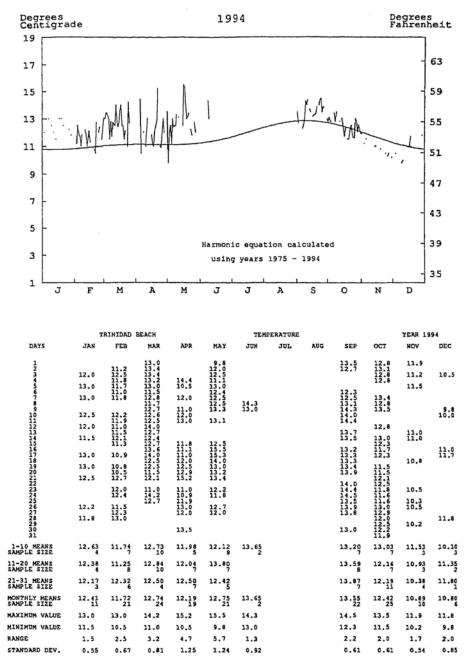
	BODEGA BAY					67.	LINITY				YEAR 1	004
DAYS	JAN	FEB	MAR	APR	MAY	אטע	JUL	AUG	SEP			
	UAII	FLB	nan	AFA	na:	JUN	JOL	AUG	SEP	OCT	NOV	DEC
1234567	32.97 32.88 32.87 32.87 32.85 32.85 32.95	32.85 32.70 32.61 32.69 32.57	32.95 32.90 32.92 33.06 33.43 33.55 34.00	33.31 33.35 33.41 33.50 33.58 33.52 33.49	33.58 33.61 33.71 33.56 33.41	33.39 33.18 33.24	32.89 32.70 32.66 32.87 32.94	33.40 33.31 33.34 33.24 33.33 33.47	33.66 33.59 33.65 33.63 33.64	33.41 33.40 33.37 33.35 33.29 33.34	33.34 33.36 33.39 33.05 33.16 33.11	33.28 33.27 33.16 32.84 33.30 33.15
10 11 12 13	32.87 32.91 32.96 32.98 32.92 32.63	32.30 32.27 32.49 32.47 33.03 32.70 32.78	32.65 32.77 32.99 33.02 32.99	33.68 33.42 33.50 33.52 33.46 33.56 33.56	33.31 33.46 33.34 33.45 33.56 33.73	32.93 33.11 33.26 32.93 32.93 33.08	33.41 33.71 33.04 33.82 33.57 33.62	33.52 33.60 33.61 33.61 33.42 33.55	33.60 33.60 33.79 33.72 33.64 33.61	33.23 33.30 33.29	33.16	33.26 33.29 33.31 33.38 33.13 33.32
10 112 113 114 115 117 120 122 223 245 257	322.64 322.64 322.69 322.89 322.97 322.68	32.77 32.549 32.899 32.668 32.668	32.96 33.09 33.123 33.224 33.33 33.34 33.35	33.58 33.48 33.48 33.42 33.45 33.55 33.55	33.68 33.67 33.71 34.04 34.00 34.10 33.84 33.46	32.94 33.03 32.96 32.93 32.91 32.91 32.96	33.42 33.50 33.67 33.58 33.58 33.42 33.46 33.46	33.54 33.50 33.54 33.64 33.51 33.45 33.54	33.59 33.59 33.55 33.55 33.55 33.47	33.59	33.26 33.15 33.18 33.19 33.49 33.45 33.45 33.43	33.23 33.28 33.14 33.13 33.13 33.23 33.30 33.31 33.31
245 226 227 28 29 30 31	32.88 32.85 32.85 32.77 32.82 32.81 32.79 32.81	32.65 32.66 32.36 32.34 32.81	33.41 33.26 33.22 33.18 33.22 33.16 33.26	33.56 33.61 33.59 33.51 33.74 33.54 33.53	33.59 33.59 33.59 33.59 33.41 33.64	32.91 32.98 32.88 32.96 32.93 32.63 32.77	33.02 33.17 33.17 33.11 33.15 33.23 33.55 33.40	33.56 33.50 33.59 33.42 33.48 33.48	33.37 33.32 33.32 33.31 33.27 33.43	33.49 33.19 33.52 33.47 33.46 33.33	33.35 33.29 33.29 33.26 33.28 33.29	33.96 33.05 33.18 33.29 33.37 33.37 33.34 33.34
1-10 MEANS SAMPLE SIZE	32.89	32.56	33.14	33.48	33-49	33.18	32.99	33.42	33.63	33.34	33.21	33.21
11-20 MEANS SAMPLE SIZE	32.81	32.74	33.10	33.50	33.73	32.96	33.58	33.51	33.60	33.44	33.29	33.21
21-31 MEANS SAMPLE SIZE	32-81	32.60	33.31	33.57	33.60	32.91	33.32	33.48	33.35	33.42	33,34	33.25
MONTHLY MEANS SAMPLE SIZE	32.83	32.64	33.19	33.52	33.60	33.01	33.31 30	33.47	33.53	33.38	33.28	33.22
MAXIMUM VALUE	33.06	33.03	34.00	33.74	34.10	33.39	33.82	33.64	33.79	33.59	33.49	33.40
MINIMUM VALUE	32.62	32.27	32.65	33.31	33.31	32.63	32.66	33.24	33.27	33.19	33.05	32.84
RANGE	0.44	0.76	1.35	0.43	0.79	0.76	2.16	0.40	0.52	0.40	0.44	0.56
STANDARD DEV.	0.11	0.20	0.27	0.09	0.20	0.16	0.34	0.11	0.14	0.11	0.13	0.13
ANNUAL MIN	3	2.27		ANNUAL	HEAN 37	33.25		ANN	UAL MAX	34	.10	

# Bodega Bay, CA

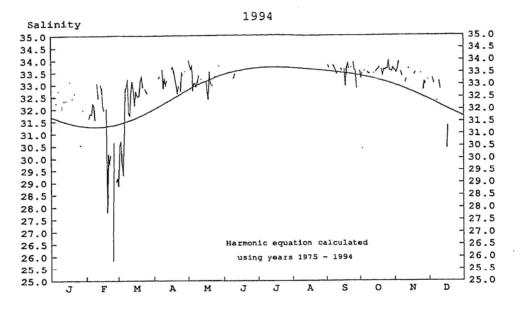


	SIGMA T							YEAR 1994				
DAYS	JAN	FEB	MAR	APR	MAY	אטע	JUL	AUG	SEP	OCT	NOV	DEC
1 2 3 4 5 6 7 8 9 9 1 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1	52.882147.69968392449916839244449916839244449916839244449916839244449916839244449916839244449916839244449916839244449916839244449916839244449916839244449916839244449916839244449916839244449916839244449916839244444991683924444991683924444449916839244444991683924444444444499168392444444444444444444444444444444444444	96471099647 	24.88 24.88 24.88 25.364 24.61 24.61 24.91 24.91 24.91 24.91 24.91	23508699755555555555555555555555555555555555	940692055569332696 88986555569332696 889865555555555555555555555555555555	255.556 3529 255.556 255.334 255.3466 2255.342 2	255.216 2255.227 2255.555 2255.555 2255.555 2255.555 2255.449 2255.449 2255.449	2525371 253711 25371 253	87681160 87681160 874853109978 87555555555555555555555555555555555	24.90 24.91 24.78 24.78 24.71 24.82 24.71 24.66 24.97	25125529 255529 255529 25529 25529 25529 25529 25529 25529 25529 25529 25529 25529 25529	255.313 255.31
10 112 113 115 117 120 122 223 245 227 229 231	24.791 24.791 24.767 24.767 24.884 24.889 24.889 24.885	24.775 24.775 24.775 24.775 24.775 24.776 24.776 24.776	25.18 25.45 25.54 25.55 25.56 25.53 25.10 25.10 25.10	25.42 25.40 25.72 25.72 25.77 25.77 25.77 25.77 25.77 25.77 25.77	26.05 26.13 25.5.82 25.760 25.768 25.768 25.5.94 25.5.94	25.40 255.29 255.29 255.34 255.34 255.44 255.44 255.25	25.35 25.25 25.19 24.97 24.47 24.69 25.29 25.52 25.52	25.38 25.26 25.57 25.57 25.32 25.31 25.32 25.33 25.34	25.14 25.15 25.06 25.03 25.01 24.88 24.74 24.74 24.74 24.73 24.73 24.91	25.336 255.338 255.45 255.45	25.48 25.64 25.66 25.65 25.51 25.41 25.41 25.49 25.50	25.37 25.43 25.52 25.52 25.34 25.26 25.34 25.47 25.47 25.54 25.58 25.58
1-10 MEANS SAMPLE SIZE	24.97	24.69	24.96	25.62	25.63	25.46	25.25 9	25.49	25.59	24.75		25.44
11-20 MEANS SAMPLE SIZE	24.90	24.80	25.02	25.63	25.92	25.32	25.37 10	25.52	25.41	25.34	25.39	25.45
21-31 MEANS SAMPLE SIZE	24.83	24.66	25.35	25.79	25.81	25.29	24.99	25.36	24.85	25.32	25.52	25.43 11
MONTHLY MEANS SAMPLE SIZE	24.90	24.72	25.12	25.68	25.76	25.35 28	25.19 30	25.46 28	25.28 30	25.05	25.41 26	25.44
MAXIMUM VALUE	25.08	25.02	25.73	25,93	26.24	25.56	25.57	25.77	25.81	25.71	25.71	25.67
MINIMUM VALUE	24.67	24.39	24.45	25.28	25.26	25.04	24.47	25.12	24.62	24.4B	25.20	25.13
RANGE	0.40	0.63	1.27	0.66	0.97	0.52	1.10	0.65	1.20	1.24	0.51	0.54
STANDARD DEV.	0.11	0.18	0.32	0.16	0.23	0.13	0.28	0.18	0.38	0.34	0.16	0.12
ANNUAL MIN	:	24.39		ANNUAL	MEAN 3	8 25.2	8	ANI	NOAL MAX	2	6.24	

#### Trinidad Beach, CA

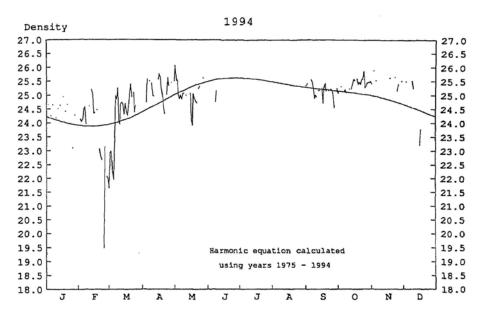


#### Trinidad Beach, CA



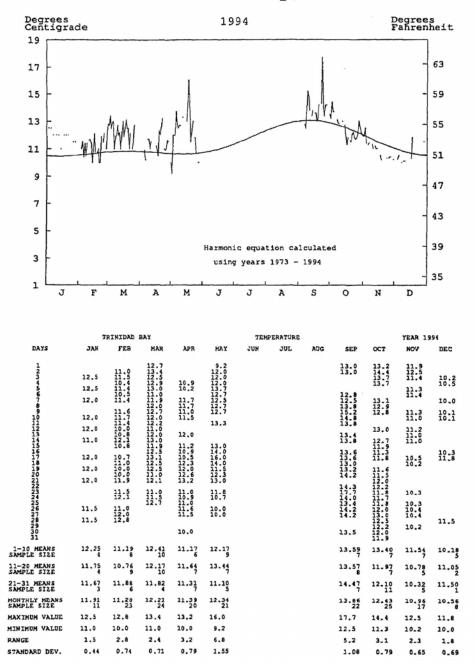
		TRINIDAD	BEACH		SAL	INITY	YEAR 1994					
DAYS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1234567	32.51 32.24 32.74 32.02 32.32	31.63 31.82 31.79 32.23 32.16 31.57 33.03 32.47	30.52 30.67 29.73 30.99 32.95 33.20 31.73 32.66	33.25 33.32 33.59 32.85 33.26 32.93 33.15	33.80 33.62 33.77 33.03 33.04 32.89 33.14 33.36	33.25 33.42			33.77 33.67 33.67 33.57 33.42 33.49 33.50	33.25 33.45 33.56 33.50 33.43 33.46	33.48 33.59 33.91 33.51 33.35 33.21 33.64	33.24 33.03 32.33 33.12 32.82
8 1011234 1156 1178 1290 12223 2245 2278 2290	32.35 33.12 32.44 32.63	32.13 31.97 32.00 27.81 30.15 29.75 30.10 25.84 30.62	32.15 32.71 32.55 32.55 33.13 33.33 32.89 32.87 32.63	33.63 33.75 33.56 32.97 32.63 32.97 32.74 33.36	33.15 32.69 32.41 33.05 32.97 32.94 33.32				33.63 33.57 33.60 32.93 33.64 33.65 33.65	33.51 33.63 33.70 33.61 33.61 33.60 33.65 33.67	33.40 33.48 33.45	30.42 31.30
25 26 27 28 29 30 31	30.53 31.96	29.04 29.16 28.86	32,63	33.36 33.53 33.97	33.75				33.89 33.59 33.56 32.85	33.58 33.58 33.52 33.68 33.61 33.58	33.12 33.02 33.19	
1-10 MEANS SAMPLE SIZE	32.38	32.09	31.37	33.20	33.27	33.33			33.62	33.44	33.45	32.91
11-20 MEANS SAMPLE SIZE	32.56	31.20	32.74	33.28	33.00				33.55	33.55	33.51	30.86
21-31 MEANS SAMPLE SIZE	31.71	28.94	32.76	33.34	33.33				33.52	33.64	33.11	
MONTHLY MEANS SAMPLE SIZE	32.26	30.91	32.17	33.27	33.19	33.33			33.56	33.56	33.35	32.32
MAXIMUM VALUE	33.12	33.03	33.33	33.97	33.80	33.42			33.89	33.97	33.91	33.24
MINIMUM VALUE	30.53	25.84	29.30	32.63	32.41	33.25			32.85	33.25	32.79	30.42
RANGE	2.59	7.19	4.03	1.34	1.39	0.17			1.04	0.72	1.12	2.82
STANDARD DEV.	0.66	1.87	1.12	0.36	0.38	0.12			0.25	0.14	0.28	1.07

## Trinidad Beach, CA

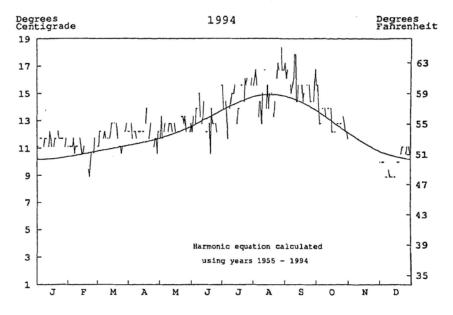


	TRINIDAD BEACH						SIGMA T		YEAR 1994			
DAYS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
123456	24.66	24.12 24.03 24.13 24.49 24.57	22.93 22.96 22.24 21.94 23.29 24.96	24.75 25.56	26.05 25.52 25.54 25.00 24.87 24.99				25.34 25.42	25.08 25.17 25.32	25.43 25.89 25.53	25.49
7 9 10 11	24.64 24.18 24.51	23.96 24.59 25.20 25.01	24.84 25.25 24.00 23.94 24.68 24.73	25.49 25.42 24.98 24.96	24.86 25.05 25.06 24.99	24.77 25.17			25.46 25.27 24.90 25.02 24.94	25.15 25.22 25.10 25.23		25.52 25.25
134 155 166 177 188 199	24.62 24.94 24.41	24.34 24.36 24.46 23.04 22.78	24.66 24.30 24.68 24.38 24.26 24.59 25.04 25.39	25.56 25.75 25.65 25.25 24.92 24.58	25.06 24.08 23.91 25.04 24.88 24.78				25.19 25.19 25.27 24.73 25.28 25.43 25.17	25.24 25.45 25.58 25.52 25.60 25.41 25.49	25.63	23:21 23:77
1234567890123456789012232222222222222222222222222222222222	23.08	22.66 19.49 23.12 22.05 22.00 21.64	24.93 25.08 24.38 24.62	25.02 25.62 25.33 25.45	24.72 25.25 25.31 25.62				25.17 25.22 25.20 25.10 24.57	25.49 25.418 25.66 25.89 25.47 25.47	25.66 25.18 25.40 25.51	
30 31 1-10 MEANS SAMPLE SIZE	21.43	24.27	23.64	25.49 25.24	25.21	24.97			25.28	25.17	25.61	25.4Z
11-20 MEANS SAMPLE SIZE	24.62	24.17	24.67 10	25.24	24.68				25.15	25.43	25.63	23.49
21-31 MEANS SAMPLE SIZE	24.00	21.83	24.75	25.21	25.22				25.09	25.49 11	25.43	
MONTHLY MEANS SAMPLE SIZE	24.38	23.50	24.25	25.23	25.03	24.97			25.18	25.40	25.53	24.65
MAXIMUM VALUE	24.94	25.20	25.39	25.75	26.05	25.17			25.57	25.86	25.89	25.52
MINIMUM VALUE	23.08	19.49	21.94	24.33	23.91	24.77			1.00	25.08	25.18	23.21
RANGE STANDARD DEV.	0.49	1.41	0.93	0.41	0.48	0.40			0.24	0.19	0.21	1.08

#### Trinidad Bay, CA

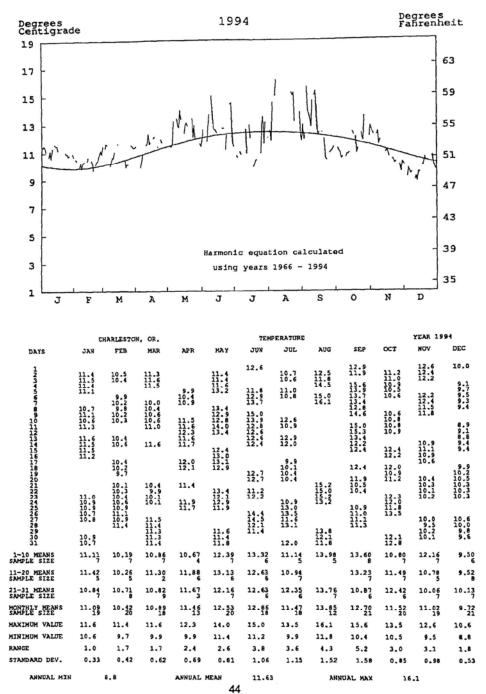


## Crescent City, CA



	CRESCENT CITY						TEMPERATURE						
DAYS	JAN	FEB	MAR	APR	HAY	JUN	JUL	AUG	SEP	OCT	NOA	DEC	
1 2 3 4 5 6 7 8 9 11123 14 5 6 7 8 9 1223 14 5 6 7 8 9 22 22 22 22 22 22 22 22 22 22 22 22 2	11.1.77 11	11.1 11.1 11.1 11.1 11.1 11.1 11.1 11.	11.1 12.2 12.2 11.7 11.7 11.7 11.7 12.8 12.8 12.8 12.8 12.8 12.8 12.8 12.8	12.2 12.8 11.7 12.2 11.7 12.2 12.2 12.2 12.2 12.2	11.7 13.37 11.7 12.2 12.8 12.2 12.8 12.8 12.2 12.8 12.2 12.2	12.2 13.3 123.9 13.9 153.0 153.0 123.1 14.4 122.2 120.5 123.1 122.8 122.8 122.8 123.	15.6 13.9 14.4 11.7 114.4 115.0 115.6 12.8 113.9 113.9 115.6 14.4 115.6 116.1	15.6 16.7 15.6 13.4 14.8 15.6 13.6 13.6 13.6 15.0 16.7 17.7 16.7 17.7 18.6 19.7 19.7 19.7 19.7 19.7 19.7 19.7 19.7	17.2.17 166.7 . 6.06.18 15.5.6.18 15.5.6.18 15.5.6.18 15.6.6.6.6.18 15.6.6.6.7	15.669 122.88 13.99 13.33 13.99 122.2 12.88 13.99 122.2 12.88 13.88 13.99 122.2 12.88 13.88 13.89 122.2 12.88 13.88 13.88 13.99		10.0 10.0 10.0 8.9 9.4 8.9 8.9 8.9 8.9 10.0 10.0 10.6 11.1 11.1	
1-10 MEANS SAMPLE SIZE	11.47	11.11	11.83	12.14	12.39	13.49	14.03 B	14.88	16.26	13.98		9.44	
11-20 MEANS SAMPLE SIZE	11.51	10.50	12.40	12.46	12.42	12.78	14.67	15.02	15.31	13.05		9.37	
21-31 MEANS SAMPLE SIZE	11.62	10.80	11.66	11.76	12.84	13.24	15.65	16.23	15.24	12.60		10.89	
MONTHLY MEANS SAMPLE SIZE	11.54	10.80	11.95	12.12	12.55	13.14	14.70	15.42	15.64	13.20		9.90	
MAXIMUM VALUE	12.2	11.7	12.8	13.9	13.3	15.6	16.1	18.3	17.8	15.6		11.1	
MINIMUM VALUE	11.1	8.9	10.6	10.6	11.7	10.6	11.7	12.8	14.4	11.7		8.9	
RANGE	1.1	2.8	2.2	3.3	1.6	5.0	4.4	5.5	3.4	3.9		2.2	
STANDARD DEV.	0.35	0.70	0.66	0.67	0.50	1.11	1.16	1.42	1.08	1,02		0.85	

#### Charleston, OR



#### Neah Bay, WA

