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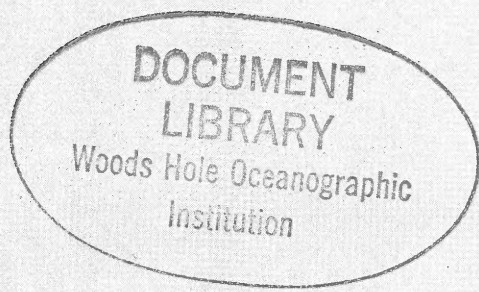
U.S. DEPARTMENT OF COMMERCE / Environmental Science Services Administration
Coast & Geodetic Survey

~~C+GS 31-3~~



SURFACE WATER TEMPERATURE AND DENSITY

PACIFIC COAST NORTH AND SOUTH AMERICA & PACIFIC OCEAN ISLANDS



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U.S. DEPARTMENT OF COMMERCE
Alexander B. Trowbridge, Secretary

ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
Robert M. White, Administrator

COAST AND GEODETIC SURVEY
James C. Tison, Jr., Director

C & GS PUBLICATION 31-3

SURFACE WATER TEMPERATURE AND DENSITY

PACIFIC COAST

NORTH AND SOUTH AMERICA &
PACIFIC OCEAN ISLANDS

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INTRODUCTION

The summaries of sea water temperatures and densities presented in this publication are based on observations made at locations along the Pacific coast of North and South America and Pacific Ocean islands through the year 1964. The sea water temperatures and densities were observed primarily at tide stations which, in the United States and possessions, were maintained by the Coast and Geodetic Survey, often with the cooperation of other organizations. The data for six places on the California coast, namely La Jolla, Balboa, Port Hueneme, Pacific Grove, Southeast Farallon Island and Blunts Reef Lightship were supplied by the Scripps Institution of Oceanography. The data for places in Chile were supplied by the Departamento de Navegación e Hidrografía, República de Chile. Other observations in Latin America were obtained through cooperation with the Inter American Geodetic Survey. Data for the Philippine Islands were supplied by the Bureau of Coast and Geodetic Survey of the Republic of the Philippines. For places in other countries the Coast and Geodetic Survey derived the data from observations made by organizations in the particular country.

Table 1 presents monthly means and annual means and extremes of the surface water temperatures and densities for each year of observation after 1959. Earlier observations, with the exception of certain nineteenth century data, are combined in five-year groups. For each station at which the series of observations covered two or more years, the following monthly values are presented: the mean of the monthly means, the maximum observed, the mean of the monthly maxima, the mean of the monthly minima and the minimum observed.

When an asterisk appears in either extreme temperature column in Table 1, it indicates that the extreme may have been exceeded if observations had been available for all months in which the maximum or minimum normally occurs. If observations are not available for any month in which the yearly maximum or minimum may have occurred, the extreme has been omitted. For densities, the yearly extremes are from the months of the year for which means are given. If they are from an incomplete year, they are followed by an asterisk.

The temperature data given in degrees Celsius are based on thermometer readings made in a sample of water drawn by bucket from a foot or two below the surface. They can be converted to degrees Fahrenheit by means of Table 2.

The density of any substance is defined as the mass per unit volume. The density of sea water, as observed, depends not only upon the amount of soluble matter held in solution but also upon the temperature of the water at the time the reading was made. It is necessary, therefore, to reduce the observed densities to some standard temperature in order that they may be comparable. In this publication the observed densities have been reduced to a standard temperature of 15°C (59°F). The density of pure water at a temperature of 15°C is taken as 0.9991. The density values obtained by using a hydrometer were reduced to the standard temperature by using the tables given in C&GS Special Publication No. 298.

Densities in Table 1 are expressed in terms of the Greek letter sigma with a subscript that refers to temperature and is called a sigma-t (σ_t) value. Thus: $\sigma_{15} = (\rho_{15} - 1)1000$ where ρ_{15} is the density of sea water at 15°C (59°F) referred to pure water at 4°C (39.2°F) as unity. For example: If sea water has a density at 15°C of 1.0268, $\sigma_{15} = 26.8$. The actual density of the water may vary from a little less than unity for fresh water at a temperature other than 4°C to approximately 1.0410 for the heaviest sea water.

The salinity of sea water, denoted by the symbol ‰, is defined as the number of grams of salts contained in 1000 grams of sea water.

INTRODUCTION

Table 3 gives the salinity corresponding to different values of density at the standard temperature of 15°C.

The observations are usually made once each weekday at whatever time the observer attends the gage. At some stations situated within or near the entrance of an estuary, the temperature or density varies with the stage of tide or with the direction of the tidal current. It may be assumed that in the course of a month or more the distribution of observations is fairly uniform over all phases of the tide.

The mean temperature and density curves are derived from the monthly means given in Table 1 and show graphically the seasonal variation for many places.

For some practical uses of density data, it is more important to know the density at the temperature apt to be encountered than at the standard temperature. The graph, Sea Water Density at Various Temperatures, provides for converting density at 59°F (15°C) to density at other temperatures.

The following Coast and Geodetic Survey publications on sea water temperatures, salinities and densities are also available:

C&GS Publication 31-1, Surface Water Temperature and Salinity, Atlantic Coast, North and South America (Second Edition) 1965, 55 cents.

C&GS Special Publication No. 298, Sea Water Temperature and Density Reduction Tables, 1953, 25 cents.

LIST OF STATIONS

Station	Lat.	Long.	Page
	° ' "	° ' "	
Aberdeen, Grays Harbor, Wash. -----	46 58N.	123 51W.	30
Acajutla, El Salvador -----	13 35N.	89 51W.	70
Acapulco, Mexico -----	16 51N.	99 55W.	72,82
Admiralty Islands (Seeadler Harbor) -----	2 02S.	147 23E.	48
Alameda, Calif. -----	37 47N.	122 18W.	22,78
Anacortes, Wash. -----	48 31N.	122 37W.	32,34
Angaur Island, Palau Islands -----	6 54N.	134 08E.	52
Antofagasta, Chile -----	23 39S.	70 25W.	60,81
Apia (observatory), Western Samoa -----	13 48S.	171 46W.	48,80
Arica, Chile -----	18 29S.	70 20W.	60,81
Astoria (Tongue Point), Ore. -----	46 13N.	123 46W.	28,78
Avila Beach, Calif. -----	35 10N.	120 44W.	18,78
Bahía Solano, Colombia -----	6 14N.	77 24W.	66
Balboa, Calif. -----	33 36N.	117 54W.	14,78
Bandon, Coquille River, Ore. -----	43 07N.	124 25W.	26
Benicia, Carquinez Strait, Calif. -----	38 03N.	122 08W.	24
Blaine, Wash. -----	49 00N.	122 46W.	34
Blunts Reef Lightship, Calif. -----	40 26N.	124 30W.	24,26,78
Bremerton, Wash. -----	47 34N.	122 38W.	32
Brighton, Nehalem River, Ore. -----	45 40N.	123 56W.	28
Buenaventura, Colombia -----	3 54N.	77 05W.	66,82
Caldera, Chile -----	27 04S.	70 50W.	60,81
Caleta Percy, Magellan Strait, Chile -----	52 54S.	70 16W.	56
Callao (La Punta), Peru -----	12 04S.	77 11W.	64,81
Callao (Naval Arsenal), Peru -----	12 03S.	77 09W.	62
Canton Island, Phoenix Islands -----	2 48S.	171 43W.	46,80
Cathlamet, Columbia River, Wash. -----	46 12N.	123 23W.	30
Cebu, Cebu Island, Philippine Islands -----	10 18N.	123 54E.	54,56,81
Chimbote, Peru -----	9 05S.	78 38W.	64,81
Christmas Island -----	1 59N.	157 29W.	46
Collinsville, Sacramento River, Calif. -----	38 04N.	121 51W.	24
Constantine Harbor, Amchitka Island, Alaska -----	51 25N.	179 17E.	42
Coos Bay entrance, Ore. -----	43 21N.	124 19W.	26
Cordova, Alaska -----	60 33N.	145 46W.	38
Corinto, Nicaragua -----	12 29N.	87 10W.	70
Corral, Chile -----	39 52S.	73 26W.	58
Crescent City, Calif. -----	41 45N.	124 12W.	26,78
Davao, Mindanao Island, Philippine Islands -----	7 05N.	125 38E.	56,81
Dumbarton Bridge, San Francisco Bay, Calif. -----	37 30N.	122 07W.	22
Dutch Harbor, Amaknak Island, Alaska -----	53 54N.	166 32W.	40,80
Easter Island, Chile -----	27 09S.	109 26W.	62
Eniwetok Atoll, Marshall Islands -----	11 22N.	162 21E.	50,80
Ensenada, Mexico -----	31 51N.	116 38W.	76,82
Everett, Wash. -----	47 59N.	122 13W.	32
Florence, Siuslaw River, Ore. -----	43 58N.	124 06W.	26
Friday Harbor, San Juan Island, Wash. -----	48 33N.	123 00W.	34,79
Funafuti Atoll, Ellice Islands -----	8 31S.	179 12E.	48
Galápagos Islands (San Cristóbal), Ecuador -----	0 54S.	89 37W.	66
Gardiner, Umpqua River, Ore. -----	43 44N.	124 07W.	26
Garibaldi, Tillamook Bay, Ore. -----	45 33N.	123 54W.	26
Guadalcanal I. (Kukum), Solomon Islands -----	9 26S.	160 00E.	48
Guam (Apra Harbor), Marianas -----	13 26N.	144 39E.	52,80
Guaymas, Mexico -----	27 55N.	110 55W.	74,82

LIST OF STATIONS

Station	Lat.	Long.	Page
	° ,	° ,	
Haines, Alaska -----	59 14N.	135 26W.	36
Harrington Point, Columbia River, Wash. -----	46 16N.	123 39W.	28
Hilo, Hawaii -----	19 44N.	155 03W.	44,46,80
Honolulu, Hawaii -----	21 18N.	157 52W.	44,80
Iquique, Chile -----	20 13S.	70 10W.	60
Johnston Atoll -----	16 45N.	169 31W.	46,80
Jolo, Jolo Island, Philippine Islands -----	6 04N.	121 00E.	56,81
Juneau, Alaska -----	58 18N.	134 25W.	36,79
Kaneohe Bay (Mokuoloe I.), Oahu I., Hawaii -----	21 26N.	157 48W.	44
Ketchikan, Alaska -----	55 20N.	131 38W.	34,79
Kodiak, Kodiak Island, Alaska -----	57 47N.	152 24W.	38
Koror, Koror Island, Palau Islands -----	7 21N.	134 29E.	52
Kwajalein Atoll, Marshall Islands -----	8 44N.	167 44E.	50,80
La Jolla, Calif. -----	32 52N.	117 15W.	12,14,78
La Libertad, Ecuador -----	2 13S.	80 55W.	64,66,82
La Paz, Mexico -----	24 10N.	110 19W.	74,76,82
La Unión, El Salvador -----	13 20N.	87 49W.	70,82
Legaspi, Luzon Island, Philippine Islands -----	13 09N.	123 45E.	54,81
Los Angeles (Outer Harbor), Calif. -----	33 43N.	118 16W.	14,16,78
Manila, Luzon Island, Philippine Islands -----	14 35N.	120 58E.	52,54,81
Manzanillo, Mexico -----	19 03N.	104 20W.	72,82
Marcus Island -----	24 18N.	153 58E.	52
Mare Island Strait, Calif. -----	38 06N.	122 16W.	24
Massacre Bay (Pyramid Cove), Attu Island, Alaska -----	52 50N.	173 12E.	42,80
Massacre Bay (Murder Point), Attu Island, Alaska -----	52 48N.	173 10E.	42
Matarani, Peru -----	17 00S.	72 07W.	62,81
Mazatlán, Mexico -----	2 11N.	106 26W.	72,74,82
Midway Islands -----	28 13N.	177 22W.	44,80
Naos Island, Canal Zone -----	8 55N.	79 32W.	68,82
Neah Bay, Wash. -----	48 22N.	124 37W.	30,79
New Hope Bridge, Mokelumne River, Calif. -----	38 14N.	121 29W.	24
Newport Bay, Calif. -----	33 36N.	117 53W.	14,78
Newport, Yaquina Bay, Ore. -----	44 38N.	124 03W.	26
Olympia, Wash. -----	47 03N.	122 54W.	32
Pacific Grove, Calif. -----	36 37N.	121 54W.	18,78
Pago Pago, American Samoa -----	14 17S.	170 41W.	48,80
Peard Bay, Alaska -----	70 48N.	158 28W.	42
Pittsburg, New York Slough, Calif. -----	38 02N.	121 53W.	24
Point Barrow (Elson Lagoon), Alaska -----	71 23N.	156 27W.	42
Point Barrow (ocean), Alaska -----	71 23N.	156 27W.	42
Point San Quentin, San Francisco Bay, Calif. -----	37 57N.	122 29W.	22
Port Angeles, Wash. -----	48 08N.	123 26W.	30
Port Hueneme, Calif. -----	34 09N.	119 12W.	16,78
Port Moller, Alaska -----	55 59N.	160 34W.	42
Port Townsend (Fort Worden), Wash. -----	48 08N.	122 46W.	30
Port Townsend (town), Wash. -----	48 07N.	122 45W.	32
Prisoners Point, San Joaquin River, Calif. -----	38 04N.	121 33W.	24
Puerto Armuelles, Panama -----	8 16N.	82 52W.	68,82
Puerto Montt, Chile -----	41 29S.	72 58W.	58,81
Puerto Peñasco, Mexico -----	31 19N.	113 35W.	74,82
Puerto Somoza, Nicaragua -----	12 11N.	86 48W.	70
Punta Arenas, Magellan Strait, Chile -----	53 09S.	70 54W.	56,58,81
Quepos, Costa Rica -----	9 24N.	84 10W.	68
Raymond, Willapa Bay, Wash. -----	46 41N.	123 45W.	30,79
Rio Vista, Sacramento River, Calif. -----	38 09N.	121 42W.	24

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Station	Lat.		Long.		Page
	°	'	°	'	
Salina Cruz, Mexico -----	16	10N.	95	12W.	72,82
San Diego, Calif. -----	32	42N.	117	14W.	12,78
San Fernando, Luzon Island, Philippine Islands -----	16	37N.	120	18E.	52
San Francisco (Port Point), Calif. -----	37	48N.	122	28W.	20,78
San Francisco (Hunters Point), Calif. -----	37	44N.	122	22W.	22
San José, Guatemala -----	13	55N.	90	50W.	70,82
San Juan, Peru -----	15	21S.	75	09W.	62
San Juan del Sur, Nicaragua -----	11	15N.	85	53W.	68
Santa Barbara, Calif. -----	34	25N.	119	41W.	16,18
Santa Monica, Calif. -----	34	00N.	118	30W.	16,78
Sausalito, Calif. -----	37	51N.	122	29W.	22
Seattle (Duwamish River), Wash. -----	47	32N.	122	19W.	32
Seattle (Elliott Bay), Wash. -----	47	36N.	122	20W.	32,79
Seward, Alaska -----	60	06N.	149	27W.	38,79
Sitka, Alaska -----	57	03N.	135	20W.	34,36,79
Skagway, Alaska -----	59	27N.	135	19W.	36,79
Skamokawa, Columbia River, Wash. -----	46	16N.	123	27W.	30
Southeast Farallon Island, Calif. -----	37	42N.	123	00W.	18,20,78
Sweeper Cove, Adak Island, Alaska -----	51	51N.	176	39W.	40,80
Tacloban, Leyte Island, Philippine Islands -----	11	15N.	125	00E.	54,81
Tacoma, Wash. -----	47	17N.	122	25W.	32
Taft, Siletz Bay, Ore. -----	44	56N.	124	01W.	26
Talara, Peru -----	4	35S.	81	17W.	64,81
Talcahuano, Chile -----	36	41S.	73	06W.	58,81
Threemile Slough, San Joaquin River, Calif. -----	38	05N.	121	41W.	24
Tokeland, Willapa Bay, Wash. -----	46	42N.	123	58W.	30,79
Topolobampo, Mexico -----	25	36N.	109	03W.	74
Truk Islands (Moen Island), Caroline Islands -----	7	27N.	151	51E.	50,52,80
Tumaco, Colombia -----	1	50N.	78	44W.	66,82
Unalaska, Unalaska Island, Alaska -----	53	53N.	166	32W.	40,80
Valparaiso, Chile -----	33	02S.	71	38W.	58,60,81
Wake Island -----	19	17N.	166	37E.	48,50,80
Waldport, Alsea Bay, Ore. -----	44	26N.	124	04W.	26
Wauna, Columbia River, Ore. -----	46	10N.	123	24W.	28
Womens Bay, Kodiak Island, Alaska -----	57	43N.	152	31W.	38,40,80
Yakutat, Alaska -----	59	33N.	139	44W.	36,38,79
Yap Island, Caroline Islands -----	9	30N.	138	08E.	52
Yerba Buena Island, San Francisco Bay, Calif. -----	37	49N.	122	22W.	22

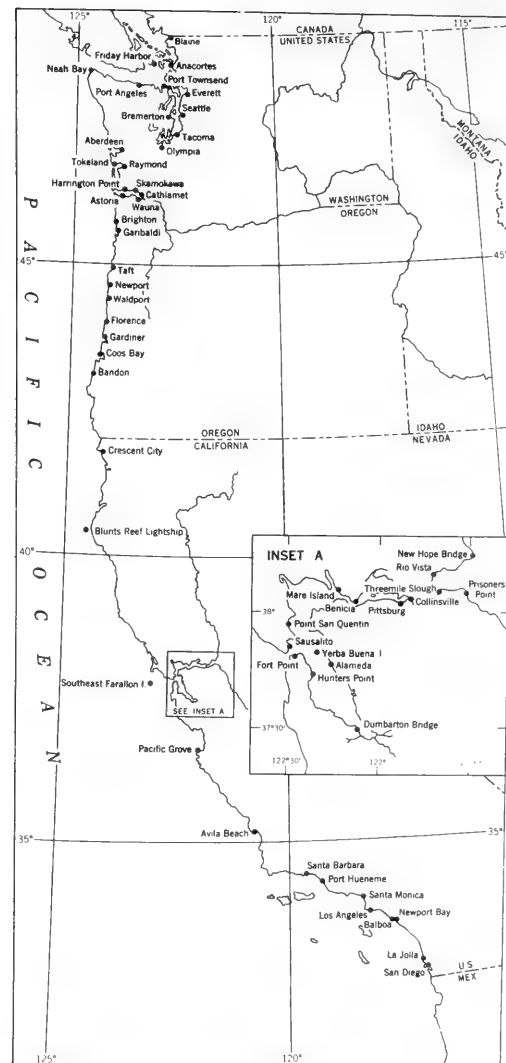
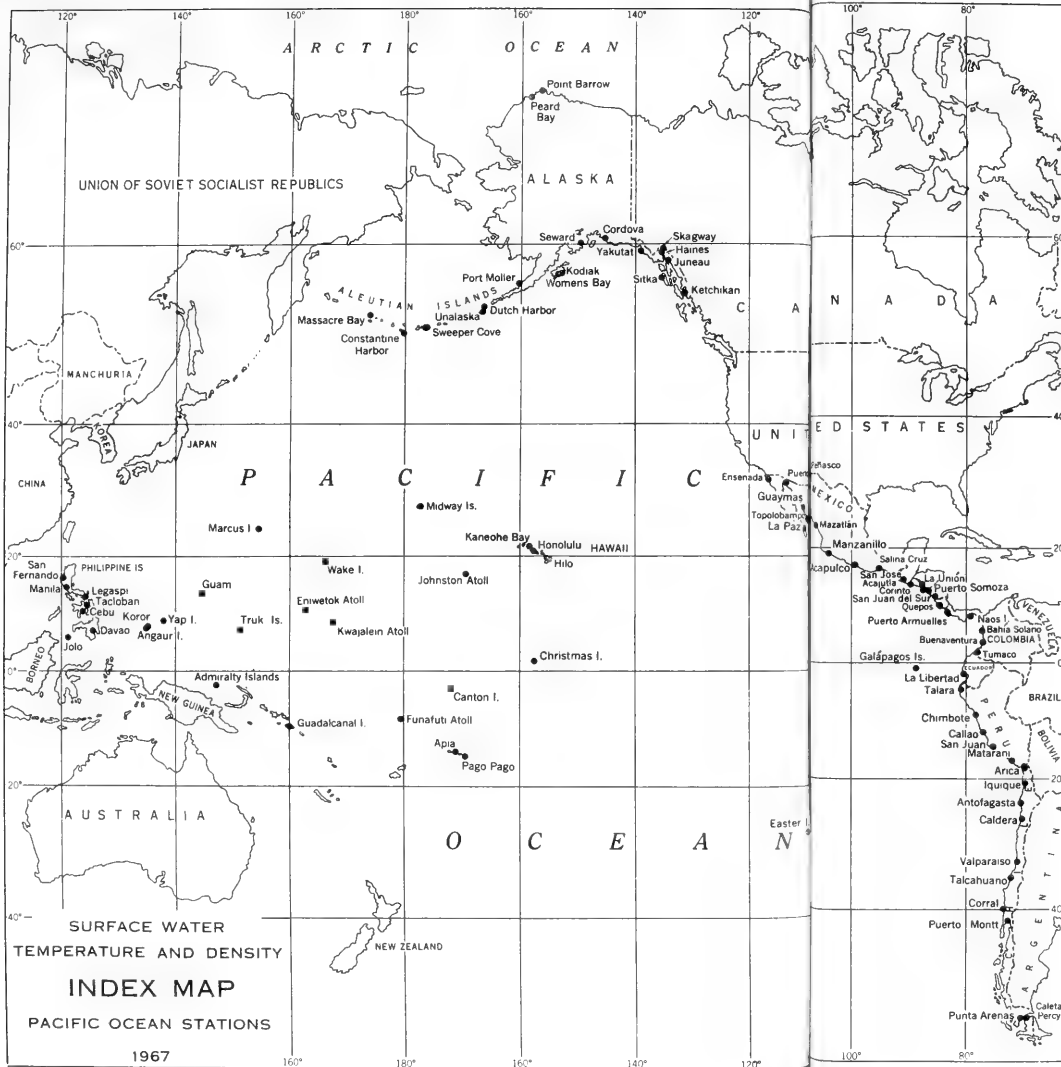


Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
SAN DIEGO,														
1854	--	--	--	--	--	--	--	--	16.3	--	--	--	20.1	--
1855	14.5	--	14.9	--	15.8	--	17.7	--	17.3	--	20.2	--	20.1	--
1856	13.8	--	14.6	--	15.7	--	17.7	--	16.8	--	18.2	--	21.4	--
1857	11.8	--	13.2	--	15.5	--	17.2	--	17.1	--	18.9	--	19.4	--
1858	12.6	--	13.7	--	14.4	--	14.9	--	16.8	--	18.6	--	20.4	--
1859	13.5	--	13.8	--	14.6	--	14.6	--	17.0	--	19.0	--	21.1	--
1860	12.7	--	13.4	--	15.6	--	16.8	--	17.1	--	17.2	--	17.6	--
1861	12.5	--	13.6	--	14.4	--	16.5	--	18.3	--	18.2	--	20.9	--
1862	14.1	--	12.5	--	14.6	--	14.6	--	16.4	--	17.8	--	20.3	--
1863	13.1	--	13.2	--	15.0	--	16.2	--	17.4	--	18.3	--	19.9	--
1864	14.2	--	14.3	--	15.8	--	16.4	--	18.7	--	21.3	--	19.3	--
1865	14.2	--	14.4	--	14.9	--	16.4	--	18.7	--	19.4	--	18.9	--
1866	12.3	--	14.7	--	14.9	--	17.0	--	17.7	--	18.7	--	20.3	--
1867	14.4	--	14.0	--	14.4	--	17.0	--	18.8	--	19.8	--	22.2	--
1868	14.7	--	14.0	--	14.3	--	16.6	--	18.0	--	17.8	--	19.2	--
1869	15.2	--	14.5	--	15.9	--	17.7	--	18.1	--	18.3	--	19.6	--
1870	14.6	--	14.2	--	14.2	--	14.7	--	15.9	--	17.3	--	20.6	--
1871	13.3	--	13.3	--	14.9	--	15.5	--	17.7	--	17.7	--	20.9	--
1872	13.2	--	--	--	--	--	15.4	--	17.5	--	19.3	--	22.2	--
1922-1925	13.4	24.6	13.7	24.6	14.6	24.7	15.2	24.8	16.9	25.0	17.8	25.1	19.6	25.3
Mean	13.6	24.6	13.9	24.6	14.9	24.7	16.1	24.8	17.4	25.0	18.5	25.1	20.1	25.3
Maximum	18	25.2	17	25.4	19	25.5	19	25.4	21	25.8	22	25.8	23	26.1
Mean Max.	14.6	25.1	14.8	25.1	16.4	25.2	17.4	25.2	18.7	25.5	19.8	25.5	21.6	25.8
Mean Min.	12.5	23.9	12.7	24.2	13.8	24.1	14.7	24.2	16.1	24.5	17.2	24.8	18.6	24.9
Minimum	11	22.8	9	23.3	12	23.6	12	23.1	13	24.0	13	24.7	16	24.8
LA JOLLA,														
1917-1919	13.4	24.9	13.3	24.9	13.8	24.8	15.2	24.9	17.1	25.1	19.1	25.1	21.2	25.1
1920-1924	13.9	24.8	13.8	24.8	14.4	24.8	14.9	24.8	16.8	25.0	18.7	25.0	20.1	25.0
1925-1929	14.2	24.8	14.1	24.8	14.8	24.8	15.4	24.8	17.3	24.9	18.9	25.0	20.3	25.0
1930-1934	13.9	24.9	14.1	24.8	15.1	24.9	16.3	24.9	17.4	25.0	18.8	25.0	20.3	25.0
1935-1939	14.2	24.8	13.6	24.7	14.1	24.7	14.9	24.8	17.3	24.9	18.4	25.0	20.6	25.0
1940-1944	14.8	24.8	14.6	24.7	15.3	24.6	15.8	24.7	17.4	24.9	18.4	24.9	18.7	24.9
1945-1949	13.3	24.9	13.3	24.9	13.7	24.9	14.9	24.9	17.2	25.0	18.8	24.9	19.6	25.0
1950-1954	13.6	24.8	13.5	24.8	13.8	24.8	15.4	24.9	16.3	24.9	17.8	25.0	20.1	25.0
1955-1959	14.6	24.9	14.3	24.9	14.8	24.8	15.7	24.8	17.0	24.9	18.6	25.0	20.3	25.0
1960	14.3	24.9	13.5	24.9	14.3	24.9	16.2	25.0	17.8	25.0	17.4	25.1	18.8	25.0
1961	14.6	24.9	14.6	24.9	14.6	24.9	15.6	25.0	16.2	25.1	17.1	25.1	20.5	25.1
1962	13.4	24.8	13.7	24.8	13.4	24.8	15.3	24.9	16.2	25.0	16.9	25.1	18.3	25.1
1963	14.0	25.0	14.8	25.0	14.5	25.0	14.6	25.0	16.4	25.1	18.3	25.1	19.4	25.1
1964	15.3	25.1	14.7	25.1	14.2	25.1	15.0	25.1	15.0	25.1	17.0	25.2	19.3	25.1
Mean	14.1	24.9	13.9	24.8	14.4	24.8	15.4	24.9	17.0	25.0	18.4	25.0	20.0	25.0
Maximum	18	25.5	19	25.2	18	25.6	20	25.3	21	25.4	23	25.4	26	25.5
Mean Max.	14.9	25.0	14.7	24.9	15.6	24.9	16.8	25.0	18.6	25.0	20.1	25.1	22.0	25.1
Mean Min.	13.3	24.7	13.1	24.6	13.3	24.6	13.7	24.8	14.8	24.9	16.1	24.9	17.2	24.9
Minimum	11	23.6	11	22.4	11	23.4	12	24.1	12	24.4	13	24.7	13	24.7
LA JOLLA,														
1927-1929	14.2	24.8	13.8	24.7	14.1	24.8	14.3	24.9	16.3	24.9	17.6	25.0	18.3	25.0
1930-1934	13.9	24.9	14.1	24.9	14.7	24.9	15.8	24.9	16.6	25.0	17.7	25.0	18.7	25.0
1935-1939	14.1	24.8	13.6	24.8	13.9	24.7	14.3	24.9	16.4	25.0	17.3	25.0	18.2	25.0
1940-1944	14.8	24.8	14.6	24.7	15.2	24.7	15.5	24.7	16.7	24.9	17.6	24.9	16.9	24.9

*Observations for the year are incomplete; extremes are for the months shown.

Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}
CALIF.															
20.3	--	17.9	--	17.3	--	16.2	--	15.5	--	--	--	22	--	14*	--
20.2	--	20.1	--	19.0	--	17.2	--	15.2	--	17.7	--	22	--	13	--
21.3	--	19.8	--	17.4	--	15.2	--	12.2	--	17.0	--	23	--	11	--
20.7	--	19.9	--	17.8	--	16.0	--	13.3	--	16.7	--	22	--	11	--
19.7	--	19.3	--	17.7	--	16.0	--	13.7	--	16.5	--	22	--	12	--
19.8	--	19.1	--	18.1	--	16.1	--	13.9	--	16.7	--	22	--	13	--
20.1	--	18.9	--	17.7	--	14.5	--	13.7	--	16.3	--	21	--	12	--
21.7	--	19.2	--	18.2	--	16.2	--	13.8	--	17.0	--	23	--	12	--
20.4	--	20.3	--	18.1	--	15.3	--	13.8	--	16.5	--	21	--	12	--
19.9	--	19.7	--	19.1	--	16.0	--	14.2	--	16.8	--	21	--	13	--
22.8	--	20.9	--	19.6	--	17.7	--	15.2	--	17.9	--	23	--	13	--
20.6	--	20.6	--	19.6	--	17.2	--	13.1	--	17.3	--	22	--	11	--
21.2	--	20.4	--	18.4	--	17.2	--	15.2	--	17.3	--	22	--	11	--
21.5	--	21.1	--	19.2	--	17.4	--	16.7	--	18.0	--	23	--	13	--
21.4	--	22.0	--	19.7	--	17.4	--	16.0	--	17.6	--	23	--	14	--
--	--	20.3	--	19.7	--	17.6	--	15.0	--	--	--	22*	--	12	--
20.9	--	20.0	--	18.4	--	16.1	--	13.6	--	16.7	--	22	--	9	--
21.7	--	19.4	--	17.8	--	15.7	--	14.6	--	16.9	--	23	--	12	--
21.9	--	--	--	--	--	--	--	--	--	--	--	23*	--	12	--
19.6	25.2	18.4	25.1	17.2	24.8	15.4	24.9	14.5	24.7	16.4	24.9	22	26.1	11	22.8
20.6	25.2	19.7	25.1	18.3	24.8	16.2	24.9	14.4	24.7	17.0	24.9				
23	26.1	23	26.1	22	25.6	21	25.7	18	25.3			23	26.1		
21.9	25.8	21.1	25.6	19.8	25.2	17.4	25.3	15.6	25.2						
19.0	24.8	18.2	24.7	16.7	24.5	15.0	24.5	13.3	24.2					9	22.8
16	24.6	14	24.5	14	24.4	13	24.4	11	23.7						
CALIF.-surface															
21.1	25.0	19.4	25.0	18.5	25.1	16.6	25.1	14.9	25.0	17.0	25.0	23	25.9	10	24.1
20.8	25.0	19.1	24.9	17.3	24.9	15.8	25.0	14.6	24.8	16.7	24.9	23	25.2	12	23.6
20.7	25.0	18.9	24.9	17.7	24.8	16.5	24.9	15.4	24.8	17.0	24.9	23	25.6	12	22.4
20.6	25.0	19.2	25.0	17.8	24.9	16.5	24.9	14.7	24.9	17.1	24.9	26	25.2	12	24.0
21.1	25.0	20.0	25.0	17.9	24.9	16.4	24.9	15.7	24.9	17.0	24.9	24	25.2	11	23.4
20.5	24.9	19.0	24.9	18.4	24.9	16.6	24.8	15.4	24.8	17.1	24.8	23	25.1	13	23.9
20.6	24.9	19.6	24.9	18.0	24.9	15.6	24.9	14.2	24.9	16.6	24.9	23	25.1	11	24.5
20.3	25.0	18.4	24.9	17.6	24.9	16.2	24.9	14.7	24.9	16.5	24.9	24	25.1	11	24.3
21.2	25.0	19.9	24.9	18.6	24.9	16.7	24.9	15.7	25.0	17.3	24.9	24	25.2	12	24.1
19.5	25.0	19.1	25.0	17.8	25.0	16.3	24.9	14.2	24.9	16.6	25.0	24	25.1	12	24.8
19.8	25.1	19.0	25.0	17.2	24.9	14.9	24.9	14.2	24.8	16.5	25.0	23	25.4	13	24.5
20.0	25.1	19.3	25.1	17.6	25.0	16.0	25.0	14.8	25.0	16.2	25.0	22	25.3	12	24.6
20.9	25.0	19.6	24.9	18.6	24.9	16.7	24.9	15.7	25.0	17.0	25.0	22	25.1	13	24.7
21.6	25.2	19.1	25.1	17.7	25.1	14.7	25.0	13.4	24.9	16.4	25.1	23	25.3	12	24.8
20.7	25.0	19.3	24.9	17.9	24.9	16.2	24.9	14.9	24.9	16.8	24.9				
26	25.4	24	25.3	22	25.9	21	25.7	18	25.8			26	25.9		
22.5	25.1	21.2	25.0	19.5	25.0	17.7	25.0	16.1	25.0						
18.3	24.9	16.8	24.8	16.2	24.8	14.8	24.8	13.9	24.7						
15	24.7	14	24.5	14	24.0	10	24.5	12	23.8					10	22.4
CALIF.-bottom															
18.8	25.0	18.3	24.9	17.3	24.9	16.4	24.9	15.2	24.9	16.2	24.9	23	25.2	11	23.2
18.6	24.9	17.7	24.9	17.0	24.9	16.2	25.0	14.6	24.9	16.3	24.9	25	25.2	11	24.6
19.0	25.0	18.3	24.9	17.1	24.9	16.2	24.9	15.6	24.9	16.2	24.9	23	25.1	11	23.5
18.8	24.9	18.0	24.9	18.0	24.9	16.6	24.8	15.4	24.8	16.5	24.8	23	25.1	12	24.0

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
LA JOLLA,														
1945-1949	13.4	24.9	13.3	24.9	13.7	24.9	14.6	24.9	16.7	25.0	18.1	25.0	18.1	25.0
1950-1954	13.6	24.8	13.4	24.8	13.6	24.9	14.9	24.9	15.7	24.9	16.9	24.9	18.6	25.0
1955-1959	14.5	24.9	14.6	24.9	14.8	24.8	15.7	24.8	16.7	24.9	17.9	24.9	18.6	24.9
1960	14.2	24.9	13.4	24.9	14.2	24.9	15.9	25.0	17.5	25.0	15.9	25.0	16.8	25.0
1961	14.6	24.9	14.4	24.9	14.3	24.9	15.0	25.0	15.7	25.1	15.9	25.1	19.6	25.1
1962	13.3	24.8	13.8	24.8	13.4	24.8	14.8	24.9	15.5	25.0	16.4	25.1	16.6	25.1
1963	13.9	25.0	14.8	25.0	14.3	25.0	14.3	25.0	15.4	25.1	18.1	25.1	18.1	25.0
1964	15.3	25.0	14.6	25.1	14.2	25.1	14.8	25.1	14.2	25.1	16.8	25.2	17.4	25.1
Mean	14.1	24.9	13.9	24.8	14.2	24.8	15.0	24.9	16.3	24.9	17.4	25.0	18.1	25.0
Maximum	17	25.2	17	25.2	18	25.2	19	25.2	21	25.5	23	25.3	25	25.3
Mean Max.	15.0	24.9	14.6	24.9	15.4	24.9	16.7	25.0	18.3	25.1	19.7	25.1	21.2	25.1
Mean Min.	13.3	24.8	13.1	24.7	12.9	24.7	13.1	24.8	13.2	24.9	14.2	24.9	14.6	24.9
Minimum	11	24.2	11	23.2	11	23.5	11	23.8	11	24.4	11	24.7	11	24.8
NEWPORT BAY,														
1955-1959	14.6	24.4	14.7	24.2	16.2	24.3	17.3	24.0	17.9	24.6	19.8	24.6	20.7	24.8
1960	14.1	24.0	13.7	24.1	15.2	24.1	17.6	24.3	18.9	24.2	19.5	24.4	18.8	24.4
1961	14.7	24.2	15.4	24.2	15.6	24.3	16.9	24.5	17.7	24.6	18.4	24.8	21.7	25.0
1962	13.3	24.9	13.6	23.8	13.4	24.7	16.4	25.2	17.8	25.3	17.8	25.4	19.9	25.8
1963	13.8	25.1	15.3	24.6	15.0	25.0	15.2	25.0	17.1	25.4	18.9	25.4	20.7	25.4
1964	14.6	24.8	14.5	24.9	14.2	25.1	15.8	24.9	15.8	25.0	17.9	25.2	19.8	25.3
Mean	14.3	24.5	14.6	24.3	15.3	24.5	16.8	24.4	17.7	24.8	19.0	24.9	20.4	25.0
Maximum	17	25.4	17	25.3	19	25.5	21	25.6	21	26.5	22	26.2	24	26.2
Mean Max.	15.2	24.9	15.6	24.9	16.7	24.9	18.4	25.0	19.5	25.2	20.9	25.4	22.7	25.4
Mean Min.	13.3	23.9	13.6	23.4	13.8	24.0	14.3	23.3	15.7	24.5	16.9	24.6	18.0	24.8
Minimum	12	22.1	12	21.9	12	21.9	12	16.1	13	23.8	15	24.2	15	24.3
BALBOA,														
1925-1929	14.2	24.8	14.2	24.7	14.3	24.8	15.1	24.9	16.6	25.0	18.1	25.0	19.2	25.0
1930-1934	14.1	24.9	14.1	24.9	14.9	24.9	15.9	25.0	16.6	25.1	17.9	25.1	19.7	25.1
1935-1939	14.3	24.8	13.7	24.7	13.9	24.8	14.7	25.0	16.6	25.0	18.1	25.0	18.7	25.1
1940-1944	15.0	24.8	14.8	24.7	15.3	24.7	15.7	24.8	17.0	24.9	17.9	25.0	17.9	24.9
1945-1949	13.4	24.8	13.3	24.8	13.6	24.8	14.9	24.9	16.6	24.9	18.4	24.9	18.9	25.0
1950-1954	13.3	24.8	13.4	24.8	13.3	24.7	14.8	24.8	14.8	24.9	16.6	24.9	18.2	25.0
1955-1959	14.4	24.9	14.0	24.8	14.8	24.8	14.8	24.7	15.8	24.9	17.7	24.9	18.9	24.9
1960	14.4	24.8	13.4	24.8	14.2	24.8	15.5	24.9	17.3	24.9	17.4	25.0	17.2	25.0
1961	14.4	24.9	14.8	24.9	14.1	24.9	14.9	24.9	15.6	25.1	16.5	25.2	19.3	25.1
1962	13.4	24.8	13.7	24.7	14.2	24.8	15.0	24.9	15.7	25.0	15.6	25.1	18.2	25.0
1963	14.0	25.0	14.9	24.9	13.9	24.9	13.5	25.0	15.6	25.0	18.0	25.1	18.8	25.1
1964	15.3	25.1	14.8	25.1	13.7	25.1	14.4	25.1	13.8	25.1	16.6	25.1	17.8	25.1
Mean	14.1	24.8	14.0	24.8	14.3	24.8	15.1	24.9	16.2	24.9	17.7	25.0	18.7	25.0
Maximum	18	26.2	17	25.8	18	25.6	19	25.4	20	25.7	22	25.5	25	26.8
Mean Max.	15.0	25.0	14.9	25.0	15.4	25.0	16.6	25.0	17.8	25.2	19.3	25.2	20.8	25.2
Mean Min.	13.1	24.7	12.9	24.5	12.9	24.6	13.2	24.7	14.1	24.8	15.6	24.9	16.1	24.9
Minimum	11	23.9	10	22.6	11	23.1	11	23.8	11	24.5	12	24.7	12	24.6
LOS ANGELES (Outer)														
1924	13.0	24.8	14.6	24.9	14.3	24.8	14.2	24.7	16.4	24.9	16.8	24.7	18.2	24.8
1925-1929	13.8	24.7	14.2	24.4	14.6	24.6	15.0	24.7	16.7	24.8	18.1	24.9	19.3	24.8
1930-1934	13.6	24.7	14.2	24.7	15.2	25.0	16.1	25.0	16.7	25.1	17.9	25.1	19.3	25.1
1935-1939	13.3	24.7	12.8	24.6	13.4	24.5	13.9	24.9	15.4	25.0	17.2	25.1	18.4	25.1
1940-1944	14.1	24.5	14.3	24.3	14.8	24.4	15.1	25.0	16.1	25.0	17.2	25.0	17.7	25.2

*Observations for the year are incomplete; extremes are for the months shown.

Temperatures and Densities
Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
CALIF.-bottom-continued															
19.2	24.9	18.2	24.9	17.7	24.9	15.6	24.9	14.2	24.9	16.1	24.9	22	25.1	11	24.6
18.8	25.0	17.4	24.9	16.8	24.9	16.0	24.9	14.6	24.9	15.9	24.9	23	25.1	11	24.4
19.4	24.9	18.8	24.9	18.1	24.9	16.6	24.9	15.6	24.9	16.8	24.9	23	25.2	11	23.8
17.1	25.0	17.2	24.9	17.1	25.0	16.2	24.9	14.2	24.9	15.8	25.0	23	25.1	12	24.7
17.2	25.0	17.9	25.0	16.3	24.9	14.6	24.9	14.2	24.8	15.8	25.0	22	25.5	12	24.8
18.7	25.1	18.2	25.0	17.0	25.0	15.8	24.9	14.7	25.0	15.7	25.0	22	25.2	11	24.7
19.9	25.0	18.5	24.9	17.9	24.9	16.6	24.9	15.7	24.9	16.5	25.0	22	25.1	12	24.8
20.8	25.2	18.6	25.2	16.7	25.0	14.6	25.0	13.4	24.9	15.9	25.1	23	25.3	12	24.8
18.9	25.0	18.1	24.9	17.3	24.9	16.1	24.9	14.9	24.9	16.2	24.9				
24	25.3	23	25.2	21	25.2	20	25.2	18	25.2			25	25.5		
21.7	25.1	20.5	25.0	19.2	25.0	17.5	25.0	16.1	25.0						
15.3	24.9	15.0	24.8	15.1	24.8	14.6	24.8	13.9	24.8					11	23.2
13	24.7	12	24.7	13	24.6	12	24.5	13	24.5						
CALIF.															
21.1	24.8	19.8	24.7	18.7	24.6	16.4	24.7	15.4	24.6	17.7	24.5	24	26.5	12	16.1
20.4	24.4	19.8	24.4	18.2	24.4	16.9	24.3	14.3	24.3	17.3	24.3	24	25.0	12	23.4
19.6	24.9	18.9	24.8	17.9	24.8	15.2	24.8	14.0	24.8	17.2	24.6	24	25.4	13	23.9
20.6	25.7	19.6	25.3	18.3	25.0	16.2	24.8	14.9	25.0	16.8	25.1	23	26.2	12	21.9
21.3	25.2	21.0	25.2	20.0	25.0	16.6	24.1	15.1	24.8	17.5	25.0	23	26.0	12	21.0
21.8	25.6	20.1	25.4	18.1	25.3	14.2	25.0	13.7	24.8	16.7	25.1	23	26.6	12	23.4
20.9	25.0	19.8	24.9	18.6	24.8	16.1	24.7	14.9	24.7	17.4	24.7				
24	26.2	24	25.8	23	26.6	20	25.6	17	25.4			24	26.6		
22.8	25.4	22.1	25.3	20.4	25.3	17.8	25.1	15.7	25.0						
18.3	24.7	17.2	24.5	16.6	24.5	14.3	24.0	14.0	24.3					12	16.1
17	23.9	14	24.1	14	24.2	12	21.0	13	23.4						
CALIF.															
19.4	24.9	18.2	24.9	17.3	24.8	16.4	24.9	15.5	24.8	16.5	24.9	22	25.6	12	22.6
19.6	25.0	18.3	24.9	17.6	25.0	16.2	24.9	14.8	24.9	16.6	25.0	25	26.8	12	23.8
19.7	25.1	18.7	25.0	18.2	25.0	16.7	25.0	16.0	25.0	16.6	25.0	23	25.9	11	23.3
19.6	24.9	18.6	24.9	18.4	24.9	16.8	24.8	15.5	24.7	16.9	24.8	23	25.4	12	23.9
19.4	25.0	18.9	25.0	17.7	24.9	15.6	24.8	14.2	24.8	16.2	24.9	23	25.1	11	24.5
18.1	25.0	16.9	25.0	16.6	24.9	15.6	24.9	14.4	24.8	15.5	24.9	23	25.1	10	24.4
19.3	24.9	18.7	24.9	18.1	24.9	16.4	24.9	15.4	24.9	16.5	24.9	23	25.7	11	23.8
18.6	25.0	18.4	24.9	17.2	24.9	16.6	24.9	14.3	24.9	16.2	24.9	22	25.2	12	24.6
17.7	25.1	17.7	25.0	16.9	24.9	15.1	24.9	14.3	24.8	15.9	25.0	22	25.5	12	24.7
18.7	25.1	18.9	25.0	17.8	24.9	16.0	25.1	15.1	25.0	16.0	25.0	22	25.5	12	24.2
19.7	25.0	19.8	24.9	19.3	24.9	16.9	24.8	15.4	25.0	16.6	25.0	22	25.5	12	24.3
20.5	25.2	18.4	25.1	17.6	25.1	14.8	24.9	14.2	24.9	16.0	25.1	23	26.2	12	24.5
19.3	25.0	18.4	24.9	17.7	24.9	16.2	24.9	15.1	24.9	16.4	24.9				
23	26.8	23	26.3	22	25.8	20	26.2	19	25.5			25	26.8		
21.3	25.1	20.4	25.1	19.1	25.1	17.7	25.1	16.1	25.0						
16.8	24.9	16.2	24.8	15.9	24.8	14.8	24.8	13.9	24.7						
14	24.7	12	24.6	13	24.5	12	24.3	12	24.5					10	22.6
Harbor), CALIF.															
18.2	24.8	16.8	24.9	15.0	24.7	13.4	24.6	12.7	24.7	15.3	24.8	20	25.4	11	24.4
19.9	24.9	18.7	24.8	17.8	24.7	16.3	24.7	15.2	24.7	16.6	24.7	23	25.8	11	19.1
19.3	25.0	18.3	25.0	17.7	25.0	16.1	25.0	13.9	24.9	16.5	25.0	24	25.7	11	20.1
19.3	25.1	18.8	25.0	17.4	24.9	15.9	25.0	15.1	24.8	15.9	24.9	22	25.7	10	18.6
19.3	25.1	18.4	25.1	18.1	25.0	16.3	25.0	14.8	24.7	16.4	24.9	22	25.9	12	16.8

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
LOS ANGELES (Outer Harbor),														
1945-1949	12.8	24.7	13.2	24.8	13.5	24.9	14.6	25.0	16.1	25.1	17.8	25.1	18.7	25.1
1950-1954	13.9	24.5	14.3	24.8	14.4	24.9	15.8	25.0	15.7	25.1	17.7	25.3	19.3	25.2
1955-1959	14.5	24.2	14.4	24.2	15.5	24.4	15.7	24.5	16.4	24.6	18.2	24.8	19.5	24.8
1960	13.9	24.2	13.4	24.4	14.9	24.5	16.5	24.5	17.6	24.6	18.3	24.7	18.4	24.7
1961	14.8	24.7	15.6	24.7	15.0	24.8	16.3	24.8	15.7	25.0	17.2	25.0	21.2	25.2
1962	13.9	24.2	14.2	24.4	13.6	24.4	15.8	24.8	16.3	24.9	16.6	24.8	18.3	24.8
1963	14.2	24.9	15.6	24.4	15.3	24.8	14.1	25.0	16.2	25.1	17.9	25.0	19.4	25.1
1964	14.9	25.1	15.1	25.3	14.1	25.2	15.0	25.3	13.9	25.4	16.5	25.4	17.6	25.2
Mean	13.8	24.6	14.1	24.5	14.5	24.7	15.2	24.9	16.1	25.0	17.7	25.0	18.8	25.0
Maximum	17	25.5	17	25.4	19	25.7	20	25.6	20	25.9	22	25.8	24	26.3
Mean Max.	14.9	25.0	15.3	25.0	15.9	25.1	16.8	25.2	17.8	25.3	19.3	25.3	20.8	25.4
Mean Min.	12.8	23.6	13.0	23.3	13.2	23.9	13.7	24.4	14.4	24.6	15.9	24.7	16.9	24.8
Minimum	10	16.9	11	17.1	11	16.8	11	20.8	12	21.3	13	24.2	14	24.4
SANTA MONICA,														
1946-1949	12.9	24.8	13.2	24.8	14.0	24.9	15.4	25.0	16.7	25.1	18.7	25.1	19.6	25.2
1950-1954	13.1	24.7	13.2	24.7	13.3	24.8	14.4	24.9	14.8	25.0	16.8	25.1	19.0	25.1
1955-1959	14.1	24.9	13.8	24.9	14.4	24.9	14.8	24.9	16.1	25.0	18.1	25.0	19.3	25.1
1960	13.7	24.9	13.2	24.8	14.1	24.8	14.8	25.0	16.3	25.3	17.7	25.2	18.1	25.0
1961	14.3	25.0	14.5	25.0	13.4	25.1	14.8	25.3	15.1	25.4	16.4	25.4	20.2	25.6
1962	13.5	24.7	13.4	24.1	12.8	24.9	14.1	24.9	15.1	25.1	15.5	25.0	18.0	25.0
1963	13.8	25.2	14.6	24.9	13.7	24.9	14.0	25.0	15.6	25.0	17.8	25.1	19.5	25.1
1964	14.4	25.1	14.5	25.1	13.4	25.1	14.2	25.1	14.1	25.1	16.3	25.1	18.2	25.1
Mean	13.6	24.8	13.6	24.8	13.8	24.9	14.7	25.0	15.7	25.1	17.5	25.1	19.2	25.1
Maximum	16	25.6	17	25.8	18	25.7	19	26.3	19	25.9	23	26.2	23	26.5
Mean Max.	14.3	25.2	14.5	25.2	15.2	25.3	16.2	25.4	17.4	25.5	19.3	25.6	21.0	25.6
Mean Min.	12.5	24.2	12.5	23.7	12.3	24.3	13.1	24.4	13.8	24.7	15.6	24.6	17.2	24.7
Minimum	11	23.0	11	20.3	11	22.8	11	23.4	12	24.3	13	24.1	14	24.3
PORT HUENEME,														
1920-1924	13.3	24.8	12.9	24.9	13.2	24.9	12.4	25.0	13.6	25.0	14.6	25.0	14.8	25.0
1925-1929	13.8	24.9	13.5	24.8	13.4	24.9	13.1	24.9	13.8	25.0	14.9	25.0	15.8	24.9
1930-1934	13.3	24.9	13.5	24.8	13.7	24.9	13.9	25.0	14.0	25.1	14.8	25.0	16.4	25.0
1935-1939	13.6	24.7	12.8	24.7	12.6	24.8	12.6	24.9	13.3	25.0	14.5	25.0	15.6	25.0
1940-1944	14.3	24.6	14.0	24.5	14.2	24.4	13.7	24.7	14.3	24.5	15.0	24.7	15.8	24.8
1945-1949	12.6	24.8	12.6	24.7	12.6	24.7	12.9	24.8	13.9	24.9	14.8	24.9	16.3	25.0
1950-1954	13.1	24.8	13.1	24.8	13.1	24.8	14.1	24.8	14.1	24.9	15.8	24.9	17.2	25.0
1955-1959	13.8	24.4	13.4	24.7	13.6	24.7	13.9	24.6	14.7	24.6	15.7	24.4	16.8	24.5
1960	12.6	24.8	12.1	24.9	13.2	25.0	13.2	25.0	13.5	25.1	15.1	25.0	14.7	25.0
1961	13.2	25.0	13.3	25.0	11.8	25.1	12.8	25.2	12.8	25.2	14.4	25.2	16.7	25.1
1962	12.3	24.9	13.0	24.2	11.9	24.9	13.5	25.1	13.7	25.2	14.6	25.1	15.7	25.2
1963	13.3	25.0	14.6	24.9	12.8	25.1	13.2	25.1	--	--	--	--	--	--
Mean	13.4	24.8	13.2	24.7	13.2	24.8	13.3	24.9	13.9	24.9	15.0	24.9	16.1	24.9
Maximum	17	25.4	17	25.6	18	25.4	18	25.6	18	25.6	20	25.6	22	25.4
Mean Max.	14.6	25.0	14.3	25.0	14.6	25.0	14.9	25.1	15.9	25.1	17.1	25.1	18.6	25.1
Mean Min.	12.1	24.2	12.0	24.3	11.7	24.4	11.9	24.6	12.1	24.7	12.9	24.5	13.9	24.7
Minimum	9	17.3	10	20.8	9	21.9	10	21.6	11	21.8	11	19.1	12	21.6
SANTA BARBARA,														
1930-1932	12.7	25.0	13.3	25.0	14.1	25.2	15.1	25.3	15.0	25.3	16.7	25.4	18.8	25.4

*Observations for the year are incomplete; extremes are for the months shown.

Temperatures and Densities

Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}
CALIF.—continued															
19.3	25.1	19.0	25.0	17.7	25.0	15.6	24.9	13.8	24.8	16.0	25.0	21	25.6	11	22.8
19.3	25.1	18.6	25.1	18.2	25.1	17.0	25.0	15.3	24.9	16.6	25.0	23	26.0	11	16.9
19.2	24.8	19.4	24.8	18.8	24.7	16.8	24.7	15.4	24.7	17.0	24.6	24	25.9	12	18.3
19.4	24.8	20.0	24.7	18.1	24.7	17.3	24.6	14.9	24.7	16.9	24.6	22	25.1	12	23.5
19.3	25.1	19.0	25.0	17.2	24.7	15.7	24.6	14.4	24.3	16.8	24.8	23	26.3	14	23.9
19.4	25.0	19.4	24.9	18.5	24.7	16.8	24.7	15.6	24.7	16.5	24.5	21	25.3	12	17.9
20.7	25.1	20.3	25.2	19.6	25.2	17.0	24.8	15.4	25.0	17.1	25.0	22	25.8	13	19.7
20.2	25.3	18.6	25.0	17.9	25.2	15.1	25.1	14.2	25.1	16.1	25.2	22	25.9	12	24.5
19.4	25.0	18.8	25.0	17.9	24.9	16.2	24.9	14.8	24.8	16.4	24.9				
23	25.8	23	25.8	22	26.0	21.1	25.7	18.3	25.9			24	26.3		
21.2	25.3	20.5	25.3	19.3	25.2	17.8	25.2	16.1	25.1						
17.8	24.7	17.3	24.7	16.7	24.6	14.9	24.5	13.6	24.2						
16	24.2	15	24.1	13	24.3	12.8	23.3	10.6	20.5					10	16.8
CALIF.															
20.0	25.0	18.9	25.0	17.1	24.9	15.2	24.9	13.8	24.8	16.3	25.0	23	27.3	11	22.7
19.1	25.0	18.3	25.0	17.0	24.9	15.6	24.8	14.2	24.7	15.7	24.9	22	26.3	11	22.8
20.0	25.0	19.3	25.0	18.0	24.9	15.9	25.1	15.0	25.0	16.6	25.0	23	26.5	10	20.9
20.1	25.1	19.7	24.9	17.3	24.9	16.3	25.0	14.2	25.2	16.3	25.0	22	27.3	12	24.1
19.3	25.4	17.9	25.5	16.7	25.2	14.8	25.0	13.9	24.8	15.9	25.2	22	26.4	12	24.1
19.1	25.0	19.3	24.8	17.7	24.9	15.8	24.8	14.8	24.8	15.8	24.8	21	26.2	12	20.3
20.2	25.0	20.7	25.0	19.0	24.9	16.2	25.0	14.8	25.0	16.7	25.0	23	25.8	12	24.1
20.7	25.2	18.8	24.9	17.2	25.0	13.9	24.7	13.8	24.8	15.8	25.0	22	25.9	11	22.8
19.7	25.0	18.9	25.0	17.4	24.9	15.6	24.9	14.4	24.9	16.2	25.0				
23	27.3	22	26.4	23	25.7	19	26.5	17	25.8			23	27.3		
21.3	25.6	20.6	25.5	18.9	25.3	17.1	25.5	15.3	25.3						
17.8	24.6	17.3	24.5	15.8	24.5	14.2	24.3	13.3	24.4						
16	24.3	16	24.0	13	23.9	11	22.8	12	22.8					11	20.3
CALIF.															
15.4	24.9	15.9	25.0	15.4	25.0	15.2	25.1	13.8	25.0	14.2	25.0	19	25.7	10	23.6
16.7	24.9	16.6	24.9	16.4	24.9	15.5	24.9	14.8	24.9	14.9	24.9	22	25.7	11	24.2
17.0	25.0	16.4	24.9	16.1	24.9	14.9	24.9	13.9	24.9	14.8	24.9	22	25.3	11	24.4
16.8	24.9	17.2	24.9	16.9	24.9	15.8	24.9	15.3	24.7	14.8	24.9	21	25.2	10	22.6
17.4	24.8	17.4	24.8	16.9	24.8	15.5	24.8	14.8	24.7	15.3	24.7	21	25.1	11	21.6
16.4	24.9	16.6	24.9	16.0	24.9	14.9	24.8	13.6	24.8	14.4	24.8	19	25.2	10	24.5
17.4	24.9	17.0	24.9	16.3	24.8	15.4	24.8	14.1	24.8	15.1	24.9	21	25.1	9	24.5
17.3	24.6	17.0	24.6	16.8	24.8	15.6	24.8	14.7	24.7	15.3	24.6	21	25.6	10	17.3
14.7	25.0	14.9	24.9	15.0	24.9	15.0	24.8	13.3	25.0	13.9	25.0	17	25.3	11	23.3
16.5	25.1	16.1	25.0	15.9	25.0	13.7	25.1	13.0	24.8	14.2	25.0	20	25.6	9	24.1
16.6	25.0	17.6	25.0	16.8	25.1	15.3	25.0	14.7	25.1	14.6	25.0	19	25.4	11	20.8
--	--	--	--	--	--	--	--	--	--	--	--	--	25.4*	11*	21.9*
16.8	24.9	16.7	24.9	16.3	24.9	15.3	24.9	14.3	24.8	14.8	24.9				
22	25.5	21	25.3	20	25.7	19	25.6	18	25.5			22	25.7		
18.8	25.0	18.8	25.0	18.0	25.0	16.7	25.1	15.6	25.0						
14.6	24.7	14.6	24.7	14.5	24.7	13.6	24.7	12.9	24.4					9	17.3
10	23.1	11	23.2	11	24.0	11	23.3	11	18.9						
CALIF.															
19.9	25.4	18.0	25.2	16.4	25.2	14.4	25.2	13.4	25.1	15.6	25.2	22	26.2	10	21.6

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
SANTA BARBARA,														
Mean	12.7	25.0	13.3	25.0	14.1	25.2	15.1	25.3	15.0	25.3	16.7	25.4	18.8	25.4
Maximum	15	25.6	17	25.8	17	25.8	18	25.9	19	26.2	19	26.0	22	25.9
Mean Max.	14.2	25.5	15.1	25.6	16.2	25.7	17.3	25.8	17.1	25.9	18.7	25.7	20.5	25.8
Mean Min.	11.4	24.4	11.5	23.2	11.5	24.7	12.9	24.9	12.4	24.9	14.6	25.1	15.8	25.0
Minimum	10	23.9	10	21.6	11	24.6	10	24.8	11	24.8	14	25.0	14	24.9
AVILA BEACH,														
1945-1949	11.6	25.0	11.6	25.0	11.4	25.1	12.0	25.2	12.4	25.3	13.8	25.3	14.8	25.3
1950-1954	11.8	24.6	11.8	24.7	11.7	24.9	12.1	25.2	12.4	25.3	13.2	25.3	15.0	25.2
1955-1959	12.4	24.9	12.1	24.6	12.2	25.1	12.3	25.1	13.1	25.1	13.9	25.2	14.9	25.5
1960	12.3	24.9	--	--	--	--	--	--	--	--	--	--	--	--
1961	12.8	24.8	12.2	24.6	--	--	--	--	--	--	13.9	25.4	15.3	25.5
1962	12.1	24.5	13.0	21.2	11.7	23.9	12.6	25.6	12.1	25.5	14.1	25.3	15.0	25.2
1963	12.5	25.0	13.6	23.2	12.2	23.7	--	--	13.6	24.7	--	--	15.7	25.4
1964	12.8	24.9	12.7	25.1	11.5	25.1	11.9	25.5	12.3	25.1	13.6	25.3	14.9	25.3
Mean	12.1	24.8	12.1	24.5	11.8	24.8	12.2	25.2	12.7	25.1	13.7	25.3	14.9	25.3
Maximum	15	25.9	15	25.7	15	26.0	17	26.0	16	26.3	18	26.2	18	26.5
Mean Max.	13.2	25.4	13.1	25.3	13.3	25.5	13.9	25.7	14.3	25.8	15.6	25.8	16.5	25.8
Mean Min.	11.1	24.1	10.9	23.3	10.5	23.3	10.5	24.7	11.2	24.7	11.9	24.9	13.1	24.9
Minimum	10	21.2	8	17.2	9	11.9	9	24.2	10	22.2	10	24.3	12	24.2
PACIFIC GROVE,														
1920-1924	10.9	24.7	11.3	24.5	11.5	24.6	11.6	24.8	11.7	25.0	12.9	25.0	13.1	24.9
1925-1929	11.4	24.8	11.8	24.7	12.1	24.7	12.3	24.7	12.2	25.0	12.4	25.1	13.1	25.1
1930-1934	11.7	24.7	12.1	24.7	12.7	24.7	12.8	24.9	13.2	24.9	13.6	25.0	13.7	25.0
1935-1939	12.1	24.6	11.7	24.4	12.1	24.4	12.2	24.8	12.8	24.9	13.7	25.0	13.9	25.0
--														
1941-1944	12.8	24.6	12.8	24.4	13.1	24.4	13.0	24.4	13.3	24.8	13.5	25.1	14.4	25.1
1945-1949	11.4	24.7	11.6	24.6	11.6	24.7	12.3	24.7	13.2	24.9	14.1	24.9	14.4	25.0
1950-1954	11.6	24.7	11.6	24.8	11.6	24.7	12.2	24.7	12.6	24.8	13.3	24.9	13.9	25.0
1955-1959	12.3	24.7	12.2	24.7	12.7	24.6	12.7	24.7	13.4	24.8	13.8	24.9	13.7	25.0
1960	12.4	24.9	12.6	24.8	12.3	24.8	12.9	24.9	12.2	24.9	14.4	24.8	14.1	24.9
1961	12.3	24.9	13.1	24.8	12.0	25.0	12.3	25.1	12.4	25.1	13.8	25.1	14.1	25.1
1962	11.3	24.9	11.8	24.7	11.8	24.5	12.2	25.0	12.5	25.2	12.5	25.2	13.0	25.2
1963	11.7	25.0	13.3	24.5	12.0	24.7	13.3	24.7	12.9	25.0	13.5	25.1	14.9	25.2
1964	12.1	25.7	11.9	25.0	11.4	25.1	11.5	25.1	12.1	25.1	13.1	25.2	13.4	25.1
Mean	11.8	24.8	11.9	24.6	12.1	24.6	12.3	24.8	12.7	24.9	13.4	25.0	13.8	25.0
Maximum	14	27.8	15	25.2	15	26.0	17	25.4	17	25.4	18	25.5	17	26.0
Mean Max.	12.6	24.9	12.7	24.9	13.0	24.9	13.6	25.0	14.2	25.1	15.0	25.2	15.2	25.2
Mean Min.	10.8	24.5	11.1	24.2	11.2	24.2	11.1	24.4	11.3	24.6	12.3	24.7	12.2	24.8
Minimum	8	23.7	8	21.2	9	20.8	9	23.1	9	22.8	10	23.7	11	24.1
SOUTHEAST FARALLON														
1926-1929	11.7	24.6	11.9	24.5	11.6	24.6	11.1	24.6	10.7	25.0	11.3	25.1	11.8	25.1
1930-1934	11.1	24.7	11.3	24.6	11.6	24.6	11.2	24.8	11.3	24.9	11.8	25.0	12.1	25.0
1935-1939	11.4	24.6	11.2	24.4	11.2	24.4	11.2	24.6	11.6	24.8	12.3	24.9	12.5	25.1
1940-1942	13.1	24.1	12.8	23.8	12.8	24.1	12.2	24.2	12.1	24.6	11.9	24.9	12.8	25.0
--														
1955	--	--	10.4	--	10.3	--	9.8	--	9.8	--	10.2	--	10.0	--
--														
1957-1959	12.1	24.5	12.3	23.8	12.1	23.5	11.6	22.8	12.1	24.3	12.8	24.5	13.0	24.7

*Observations for the year are incomplete; extremes are for the months shown.

Temperatures and Densities

Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
CALIF.-continued															
19.9	25.4	18.0	25.2	16.4	25.2	14.4	25.2	13.4	25.1	15.6	25.2				
22	25.9	22	25.7	18	25.7	18	25.8	16	25.5			22	26.2		
21.6	25.8	21.0	25.6	17.8	25.7	17.2	25.6	15.0	25.4						
17.4	25.1	15.2	24.8	15.0	24.7	11.1	24.4	12.0	23.4						
17	25.0	14	24.7	15	24.4	11	24.1	11	22.1					10	21.6
CALIF.															
15.3	25.3	15.1	25.2	14.2	25.1	13.1	25.0	12.2	25.0	13.1	25.2	19	26.6	9	23.9
15.2	25.2	15.1	25.1	13.9	25.0	13.6	24.8	12.6	24.8	13.2	25.0	18	26.8	9	23.6
15.3	25.4	15.5	25.3	15.3	25.2	13.7	25.0	13.2	25.1	13.7	25.1	18	26.5	9	20.9
--	--	14.3	24.7	--	--	--	--	--	--	--	--	16*	25.6*	12*	23.8*
15.8	25.4	--	--	14.6	25.2	12.4	24.7	12.3	24.6	--	--	18*	26.2*	8*	22.0*
15.8	25.4	15.6	25.3	14.9	25.3	13.5	25.2	13.4	25.0	13.6	24.8	18*	26.2	10	19.5
17.2	25.4	17.4	25.4	16.1	25.1	14.8	24.8	13.2	24.9	--	--	19	26.0*	10	11.9*
16.4	25.3	15.1	25.1	15.1	25.1	13.8	25.1	--	--	--	--	21	26.3*	10	23.9*
15.5	25.3	15.3	25.2	14.6	25.1	13.5	24.9	12.7	24.9	13.4	25.0				
21	26.8	19	26.1	18	26.6	17	25.8	15	25.9			21	26.8		
17.3	25.9	16.8	25.6	16.0	25.7	14.8	25.3	13.7	25.4						
14.0	24.9	14.0	24.7	13.3	24.7	12.3	24.4	11.7	24.2					8	11.9
12	24.4	12	23.8	11	24.1	11	22.5	11	22.5						
CALIF.															
12.8	25.0	13.3	24.9	12.8	24.8	11.7	24.7	11.1	24.7	12.1	24.8	17	25.4	8	22.8
13.0	25.1	13.4	25.0	12.9	25.0	12.8	24.9	12.2	24.8	12.5	24.9	17	25.4	8	23.5
14.0	25.0	14.8	24.9	14.1	24.8	12.6	24.7	12.1	24.7	13.1	24.8	18	25.4	9	23.8
14.3	25.0	14.3	24.9	14.2	24.9	13.0	24.8	13.2	24.8	13.1	24.8	18	25.4	9	21.2
14.1	25.0	14.7	24.9	13.8	24.9	13.6	24.8	12.9	24.8	13.5	24.8	17	25.2	10	22.0
14.3	25.0	14.2	24.9	13.7	24.8	12.6	24.8	11.9	24.7	12.9	24.8	17	25.1	9	24.4
13.9	24.9	14.4	24.9	13.4	24.9	13.2	24.8	12.6	24.8	12.9	24.8	17	25.1	9	24.3
14.3	24.9	14.8	24.9	14.7	24.9	12.9	24.9	13.1	24.8	13.4	24.8	18	25.2	10	21.5
13.5	25.1	13.4	25.0	14.2	24.9	12.7	24.9	12.5	24.9	13.1	24.9	16	25.3	11	24.1
14.7	25.1	13.9	25.1	13.6	25.0	12.3	24.8	12.0	24.8	13.0	25.0	16	25.4	11	24.5
14.3	25.1	13.3	25.2	13.6	25.0	12.8	25.0	12.1	24.9	12.6	25.0	16	25.7	9	24.1
13.8	25.2	14.7	25.1	15.6	25.1	13.6	24.8	12.1	25.1	13.4	25.0	17	27.1	11	20.8
13.7	25.2	13.8	25.5	14.0	25.1	13.4	24.8	12.2	24.6	12.7	25.1	16	27.8	10	24.1
13.8	25.0	14.2	25.0	13.7	24.9	12.8	24.8	12.3	24.8	12.9	24.8				
17	26.4	18	27.1	18	25.4	16	25.2	16	27.1			18	27.8		
15.2	25.1	15.5	25.1	15.2	25.0	13.9	25.0	13.3	25.0						
12.4	24.8	12.8	24.8	12.2	24.7	11.6	24.7	11.3	24.5						
11	23.9	11	24.3	11	24.2	9	24.0	9	22.8					8	20.8
ISLAND, CALIF.															
12.2	25.1	12.4	25.0	12.1	25.0	12.8	24.8	12.1	24.6	11.8	24.8	15	25.6	8	20.5
12.6	25.0	13.3	25.0	12.7	24.9	12.0	24.8	11.1	24.7	11.8	24.8	16	25.3	9	23.7
12.8	25.1	13.6	25.0	14.1	24.9	12.5	24.9	12.7	24.8	12.3	24.8	17	25.4	8	22.1
13.5	25.0	14.7	25.0	13.5	24.9	13.4	24.8	13.3	24.7	13.0	24.6	19	25.7	8	21.6
10.8	--	11.7	--	11.6	--	10.3	--	11.2	--	--	--	13	--	9*	--
13.4	24.6	14.2	24.7	14.9	24.8	13.9	24.8	12.7	24.8	12.9	24.3	18	25.1	9	14.3

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
	SOUTHEAST FARALLON													
1960	11.7	24.8	11.7	24.7	10.2	24.7	10.0	24.8	10.6	25.0	11.4	25.1	12.1	25.0
1961	11.0	--	11.6	--	10.8	--	10.8	--	10.3	--	11.4	--	11.8	--
1962	10.7	24.7	11.6	24.7	11.1	24.6	10.5	25.0	10.1	25.2	10.2	25.4	10.8	25.2
1963	11.1	24.5	12.3	24.4	10.2	24.9	11.6	24.3	10.9	24.8	10.5	25.3	11.7	25.2
1964	11.6	24.7	11.1	24.8	9.8	25.2	9.4	25.2	10.0	25.2	11.0	25.3	11.3	25.3
Mean	11.6	24.6	11.6	24.4	11.4	24.5	11.1	24.6	11.2	24.8	11.7	25.0	12.1	25.1
Maximum	15	25.3	14	25.4	15	25.4	15	25.4	16	25.4	18	26.0	16	25.6
Mean Max.	12.6	24.9	12.4	24.8	12.5	24.9	12.4	25.0	12.4	25.1	13.2	25.3	13.3	25.2
Mean Min.	10.7	24.0	10.7	23.5	10.1	23.7	9.8	23.6	10.1	24.3	10.3	24.7	10.8	24.8
Minimum	9	22.6	9	20.5	8	21.2	8	14.3	9	22.9	9	23.4	9	23.9
	SAN FRANCISCO													
1855	--	--	--	--	--	--	--	--	12.7	--	--	--	14.7	--
1856	9.9	--	11.7	--	12.1	--	13.7	--	12.6	--	13.3	--	13.6	--
1857	9.4	--	10.6	--	11.9	--	13.2	--	13.3	--	13.4	--	13.6	--
1858	10.2	--	11.0	--	11.5	--	11.6	--	12.3	--	13.0	--	14.3	--
1859	9.4	--	10.9	--	10.8	--	10.8	--	12.4	--	13.3	--	13.7	--
1860	10.3	--	10.8	--	11.6	--	12.7	--	12.2	--	13.1	--	14.7	--
1861	10.1	--	10.0	--	10.8	--	12.4	--	12.1	--	12.6	--	13.8	--
1862	9.9	--	10.0	--	10.8	--	12.4	--	12.1	--	12.6	--	14.9	--
1863	10.3	--	10.0	--	11.3	--	12.7	--	12.9	--	13.2	--	14.2	--
1864	10.2	--	10.7	--	11.7	--	12.2	--	13.8	--	14.7	--	14.8	--
1865	11.1	--	10.7	--	10.8	--	11.4	--	14.6	--	13.8	--	14.3	--
1866	8.9	--	10.8	--	11.9	--	13.1	--	12.7	--	13.5	--	14.3	--
1867	11.6	--	10.2	--	10.4	--	12.4	--	13.8	--	13.9	--	14.6	--
1868	9.6	--	10.8	--	11.9	--	12.8	--	13.9	--	13.1	--	15.0	--
1869	11.8	--	11.4	--	13.5	--	13.6	--	13.4	--	14.6	--	15.6	--
1870	8.9	--	10.3	--	9.9	--	12.6	--	14.1	--	15.2	--	17.9	--
1871	9.3	--	9.7	--	10.2	--	10.4	--	11.3	--	13.4	--	14.9	--
1872	11.4	--	12.0	--	12.1	--	11.4	--	12.8	--	14.8	--	15.1	--
1873	12.0	--	10.8	--	11.6	--	12.3	--	13.3	--	13.9	--	14.8	--
1874	10.7	--	10.8	--	11.2	--	12.4	--	14.3	--	14.9	--	14.2	--
1875	10.4	--	11.2	--	10.8	--	11.9	--	13.6	--	14.5	--	16.0	--
1876	11.2	--	11.6	--	12.3	--	13.0	--	14.2	--	15.3	--	15.8	--
1877	12.0	--	13.8	--	14.4	--	13.5	--	14.3	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1922-1924	9.9	21.9	10.3	21.1	11.3	20.4	12.0	20.5	13.1	20.2	14.1	20.4	15.0	22.4
1925-1929	10.2	22.3	11.3	19.9	12.2	19.8	12.7	19.0	13.1	20.2	14.0	21.3	14.8	22.8
1930-1934	10.2	21.9	11.0	21.8	12.5	21.1	12.9	21.3	13.5	21.9	14.3	22.5	14.9	23.5
1935-1939	10.6	21.4	10.4	19.6	11.4	17.9	12.2	17.6	13.2	18.5	14.6	19.6	14.7	22.2
1940-1944	11.3	19.9	11.8	17.0	12.6	16.7	12.9	17.4	13.5	19.1	13.8	20.2	15.3	22.6
1945-1949	11.1	21.0	10.8	21.5	11.6	20.8	12.5	21.0	13.2	21.3	14.6	21.7	15.4	23.4
1950-1954	10.3	19.9	10.6	18.6	11.0	19.8	12.1	20.0	12.8	20.4	13.4	21.1	14.5	22.6
1955-1959	10.3	19.9	10.6	19.1	11.3	18.5	12.5	20.9	13.4	21.4	14.4	21.5	14.3	23.0
1960	10.4	24.1	12.6	24.0	13.2	23.5	13.0	23.2	12.7	24.1	13.9	24.3	14.4	24.8
1961	9.7	23.1	11.6	22.0	10.9	22.2	12.2	23.6	11.5	23.3	12.9	24.3	14.8	24.7
1962	9.0	23.6	10.2	23.6	10.1	23.4	11.9	22.5	11.7	22.4	12.1	22.7	13.5	23.3
1963	9.9	21.6	12.8	17.3	11.6	21.4	12.7	16.9	12.7	19.2	13.9	21.2	14.9	21.1
1964	10.5	21.9	10.7	20.9	10.5	23.0	11.1	23.2	11.6	23.8	13.4	23.5	13.8	23.9
Mean	10.4	21.3	10.9	20.0	11.7	19.7	12.4	19.9	13.1	20.6	14.0	21.3	14.8	22.9
Maximum	14	25.2	14	24.8	16	25.8	17	25.4	18	25.5	20	25.5	19	25.9
Mean Max.	11.6	23.0	12.0	22.5	12.7	22.7	13.7	22.8	14.7	22.9	15.6	23.2	16.1	24.0
Mean Min.	9.3	18.6	9.9	16.3	10.6	15.7	11.6	16.4	11.6	18.1	12.4	18.9	13.2	21.5
Minimum	5	7.4	7	3.7	8	4.3	8	7.5	8	10.7	7	11.1	9	17.7

*Observations for the year are incomplete; extremes are for the months shown.

Temperatures and Densities

Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
ISLAND, CALIF. - continued															
11.9	25.1	12.6	25.1	12.8	25.0	11.7	25.0	12.1	24.9	11.6	24.9	14	25.6	8	24.2
13.2	--	12.9	--	12.3	--	11.7	--	11.8	--	11.6	--	14	--	9	--
--	--	11.8	25.1	12.8	24.8	12.6	24.7	11.6	24.8	--	--	14*	25.7*	9*	23.7*
11.7	25.1	13.8	25.2	14.4	25.1	13.2	24.7	11.8	24.7	11.9	24.9	16	26.0	9	21.9
11.9	25.1	12.2	25.0	12.3	25.0	12.8	24.6	11.8	24.5	11.3	25.0	14	25.6	9	23.7
12.6	25.0	13.3	25.0	13.2	24.9	12.6	24.8	12.2	24.7	12.0	24.8	19	26.0		
18	25.7	19	25.4	18	25.4	17	25.6	15	25.6						
13.9	25.2	14.8	25.1	14.4	25.1	13.8	25.0	13.2	25.0						
11.7	24.8	12.1	24.8	12.1	24.7	11.3	24.6	10.8	24.5						
10	23.7	11	24.5	10	24.1	9	23.1	9	24.1					8	14.3
(Fort Point), CALIF.															
16.2	--	16.1	--	15.2	--	12.9	--	10.8	--	--	--	16*	--	8*	--
14.8	--	15.2	--	14.2	--	12.3	--	9.6	--	12.8	--	17	--	9	--
14.6	--	15.5	--	15.1	--	12.4	--	11.6	--	12.9	--	16	--	8	--
15.4	--	15.3	--	14.2	--	12.9	--	9.8	--	12.6	--	16	--	9	--
13.8	--	14.4	--	14.0	--	13.0	--	10.6	--	12.3	--	16	--	8	--
14.6	--	14.5	--	14.3	--	12.2	--	10.8	--	12.6	--	16	--	10	--
13.8	--	14.5	--	14.2	--	12.6	--	11.3	--	12.4	--	15	--	9	--
14.6	--	14.8	--	13.7	--	13.0	--	11.2	--	12.5	--	16	--	9	--
14.8	--	14.8	--	13.8	--	11.4	--	10.7	--	12.5	--	16	--	9	--
15.9	--	15.6	--	14.9	--	12.8	--	10.9	--	13.2	--	17	--	10	--
15.0	--	14.9	--	14.1	--	12.8	--	9.9	--	12.8	--	16	--	9	--
14.1	--	14.9	--	14.7	--	13.0	--	12.4	--	12.9	--	16	--	8	--
15.3	--	14.5	--	14.3	--	12.7	--	11.8	--	13.0	--	17	--	9	--
14.3	--	14.3	--	14.6	--	13.1	--	12.0	--	13.0	--	16	--	9	--
14.8	--	14.8	--	13.0	--	11.7	--	9.1	--	13.1	--	17	--	7	--
16.7	--	14.3	--	14.3	--	12.4	--	9.8	--	13.0	--	20	--	8	--
15.1	--	16.2	--	15.6	--	13.2	--	11.6	--	12.6	--	17	--	8	--
15.8	--	15.9	--	15.2	--	12.5	--	11.7	--	13.4	--	17	--	11	--
16.1	--	16.3	--	15.3	--	13.3	--	11.2	--	13.4	--	18	--	10	--
14.9	--	15.3	--	15.3	--	14.2	--	12.3	--	13.4	--	17	--	9	--
16.2	--	16.5	--	15.9	--	14.8	--	12.8	--	13.7	--	19	--	10	--
15.3	--	16.3	--	15.4	--	14.8	--	12.6	--	14.0	--	18	--	10	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15.0	23.4	15.7	23.9	14.8	23.8	12.8	23.3	10.7	22.5	12.9	22.0	17	25.1	8	12.4
15.2	23.8	15.3	24.0	14.6	23.9	13.4	23.4	11.6	22.5	13.2	21.9	17	24.6	8	11.0
15.4	24.2	15.8	24.4	15.3	24.4	13.3	24.2	10.8	23.5	13.3	22.9	17	25.7	7	14.8
15.5	23.4	15.6	23.8	15.3	23.7	12.9	23.3	11.8	22.4	13.2	21.1	18	25.5	7	5.0
15.5	23.4	16.2	24.1	15.3	23.9	14.1	23.0	12.6	22.4	13.7	20.8	18	25.2	9	4.3
16.0	23.9	15.9	24.1	15.2	23.9	12.6	23.2	11.1	22.4	13.3	22.4	19	26.2	8	11.6
15.0	23.3	15.7	23.5	14.6	23.4	13.1	22.7	11.7	21.1	12.9	21.4	18	25.2	7	8.6
15.1	23.8	15.3	23.6	15.2	23.5	12.7	23.0	11.0	22.6	13.0	21.7	20	26.2	10	3.7
14.5	24.6	14.6	24.4	14.5	24.0	12.4	23.8	10.8	22.8	13.1	24.0	19	25.9	5	19.5
15.6	24.9	16.5	24.5	14.5	24.1	10.6	23.5	8.8	23.2	12.5	23.6	19	26.3	5	19.7
15.3	23.6	14.5	23.4	14.3	21.5	12.7	22.1	11.2	21.5	12.2	22.8	17	24.6	5	17.1
14.8	22.7	15.8	23.1	15.4	23.3	13.2	22.7	9.5	22.1	13.1	21.0	17	24.5	8	9.8
15.7	24.4	15.7	24.2	14.3	24.2	12.3	22.7	11.4	21.1	12.6	23.1	17	25.2	9	10.3
15.3	23.7	15.5	23.9	14.8	23.8	13.0	22.7	11.2	22.4	13.1	21.8				
20	26.3	18	26.2	19	26.2	17	25.3	16	25.3			20	26.3		
16.5	24.4	16.6	24.5	15.9	24.4	14.3	24.0	12.6	23.7						
14.1	23.0	14.5	23.4	13.7	23.1	11.8	22.2	10.0	19.9						
10	20.4	10	20.6	10	17.1	7	13.7	5	9.9					5	3.7

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
	YERBA BUENA ISLAND,													
1937	8.7	21.5	9.3	18.7	12.7	14.3	13.4	13.9	--	--	--	--	--	--
	ALAMEDA,													
1940-1944	10.7	16.4	12.1	12.9	14.6	12.1	15.7	12.9	17.8	14.8	18.9	16.8	20.1	19.1
1945-1949	9.6	19.0	11.0	18.2	13.1	17.9	16.1	17.7	17.6	17.9	19.7	19.1	20.8	20.7
1950-1954	10.2	16.4	11.7	14.7	13.1	15.6	16.1	16.0	17.9	16.6	18.9	17.8	20.4	19.8
1955-1959	10.9	16.9	11.9	16.0	14.5	15.0	16.4	16.6	18.4	18.0	20.6	18.8	20.8	20.7
1960	9.5	21.8	12.5	18.6	14.9	17.7	18.0	18.7	18.3	20.2	20.8	21.6	20.9	22.6
1961	9.9	20.6	13.2	19.0	14.3	18.4	17.6	19.0	17.3	20.5	19.7	21.9	22.3	22.6
1962	10.1	19.9	11.6	16.2	13.2	14.9	18.2	17.1	17.8	19.1	21.0	20.3	20.8	21.4
1963	9.6	18.9	13.7	14.0	13.9	16.8	15.1	14.0	17.4	14.7	19.4	17.8	19.8	17.6
1964	10.7	19.5	12.2	17.9	13.7	15.6	16.2	20.5	16.8	21.4	18.8	21.7	20.3	21.8
Mean	10.3	17.8	11.9	15.8	13.8	15.4	16.3	16.2	17.8	17.3	19.6	18.6	20.6	20.3
Maximum	13	22.7	16	21.3	18	21.5	22	21.3	22	21.8	25	23.5	25	24.8
Mean Max.	11.6	19.4	13.6	17.8	15.9	17.3	18.6	17.4	20.2	18.4	22.3	19.7	22.7	21.5
Mean Min.	9.2	15.3	10.4	13.1	11.9	13.1	14.1	14.3	15.8	15.7	17.6	17.4	18.8	18.8
Minimum	6	7.0	7	7.1	9	7.4	12	1.2	14	10.9	16	13.9	17	12.7
	SAN FRANCISCO													
1945-1946	10.7	14.4	10.4	17.0	11.4	18.7	13.7	18.8	14.7	18.4	16.4	19.8	17.7	21.6
--														
1951-1954	10.6	15.7	11.3	14.7	11.9	15.2	13.9	15.2	14.7	17.2	15.7	18.5	17.1	21.1
1955	9.5	19.2	10.3	19.5	11.8	19.7	12.7	20.7	14.6	20.2	16.1	20.7	16.4	21.9
1956	10.6	9.0	10.1	12.1	11.4	14.5	12.8	18.0	15.1	17.4	16.1	17.6	16.8	20.6
Mean	10.4	15.0	10.8	15.7	11.7	17.0	13.4	17.8	14.7	17.9	15.9	19.0	17.1	21.2
Maximum	14	21.5	13	20.8	14	20.9	16	21.2	18	20.8	19	22.0	20	23.5
Mean Max.	11.8	18.0	12.3	18.6	13.3	19.0	15.1	19.0	16.3	19.4	17.6	20.4	18.6	22.2
Mean Min.	9.4	11.1	9.8	12.2	10.3	14.7	12.0	15.7	13.1	16.1	14.5	16.9	15.8	19.6
Minimum	8	6.1	9	6.4	9	10.0	12	12.1	12	9.3	13	9.5	16	14.2
	DUMBARTON BRIDGE, SAN													
1937	6.8	23.6	9.2	19.5	12.8	14.6	14.5	11.4	17.0	14.4	19.5	16.4	21.7	18.3
--														
1952	8.8	12.8	11.4	10.3	12.1	9.8	15.8	11.2	18.2	12.7	18.9	13.7	21.4	15.2
	SAUSALITO,													
1893-1896	10.6	--	11.1	--	11.9	--	12.8	--	14.1	--	15.0	--	15.7	--
--														
1937	9.0	22.4	9.0	22.4	9.1	22.4	11.0	20.8	14.0	16.1	14.1	15.7	16.2	19.4
--														
1952	8.9	12.1	10.6	11.8	10.5	13.4	13.2	14.5	14.9	14.4	14.9	16.1	16.0	18.7
Mean	10.1	--	10.7	--	11.2	--	12.6	--	14.2	--	14.8	--	15.9	--
Maximum	13	--	13	--	15	--	16	--	18	--	19	--	20	--
Mean Max.	11.3	--	12.0	--	13.4	--	14.5	--	16.1	--	16.6	--	17.3	--
Mean Min.	8.9	--	9.7	--	10.0	--	11.2	--	11.7	--	13.3	--	14.4	--
Minimum	7	--	8	--	8	--	9	--	10	--	12	--	13	--
	POINT SAN QUENTIN,													
1937	6.7	17.4	9.0	10.2	13.2	7.8	14.9	6.9	16.7	8.4	18.2	11.3	19.1	16.7

*Observations for the year are incomplete; extremes are for the months shown.

Temperatures and Densities
Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
SAN FRANCISCO BAY, CALIF.															
18.1	22.7	17.2	23.5	--	--	--	--	--	--	--	--	19*	23.9*	7	7.9*
CALIF.															
19.9	20.9	19.7	22.1	17.6	22.4	14.2	21.6	11.6	20.2	16.1	17.7	23	23.8	8	1.2
20.4	22.1	20.1	22.8	17.6	22.2	13.7	21.3	10.8	20.5	15.9	20.0	24	25.0	6	11.8
20.0	21.2	20.0	22.0	17.7	21.7	14.4	20.2	11.4	17.8	16.0	18.3	24	23.7	7	9.1
21.3	22.1	21.3	22.6	18.5	21.6	14.6	21.0	12.0	20.3	16.8	19.1	25	25.2	9	6.9
--	--	--	--	17.3	22.4	14.4	23.3	11.4	20.7	--	--	24*	24.3*	8	14.8*
21.7	23.0	20.8	23.3	18.1	22.4	13.7	22.4	11.3	20.8	16.7	21.2	25	24.5	9	17.0
22.4	22.0	18.9	23.6	17.8	19.6	15.7	18.6	12.4	19.1	16.7	19.0	25	24.1	9	10.9
20.1	19.7	20.7	21.7	18.3	22.4	14.6	21.6	10.8	19.2	16.1	18.0	23	23.9	9	9.5
20.4	23.3	19.2	23.0	17.8	22.5	14.2	21.2	11.3	17.7	16.0	20.0	22	24.8	9	9.3
20.5	21.6	20.2	22.4	17.8	21.9	14.2	21.1	11.4	19.7	16.2	25.9				
25	25.2	24	25.0	21	24.6	18	24.3	14	23.6			25	25.2		
22.2	22.6	22.1	23.2	20.0	22.8	16.4	22.2	12.8	21.0						
18.7	20.2	18.7	21.4	15.9	20.4	12.3	19.1	10.7	16.9						
17	12.8	17	19.3	14	15.2	10	12.0	8	9.3					6	1.2
(Hunters Point), CALIF.															
17.4	22.6	17.3	22.8	17.0	22.6	14.0	21.2	11.4	18.5	14.3	19.7	20	24.0	8	11.0
17.2	22.5	17.7	22.9	16.7	22.5	14.2	21.8	11.6	19.5	14.4	18.9	19	24.1	8	6.9
16.8	22.8	17.0	23.0	16.3	22.7	13.4	22.1	11.7	18.3	13.9	20.9	18	23.4	9	6.3
17.7	21.8	18.0	22.1	16.4	21.6	--	--	--	--	--	--	18	22.6*	9*	6.1*
17.3	22.5	17.6	22.8	16.7	22.5	14.0	21.8	11.6	19.2	14.3	19.4				
19	24.0	19	24.1	18	23.7	16	23.1	13	21.9			20	24.1		
18.3	23.1	18.4	23.4	17.8	23.0	15.4	22.5	13.0	21.3						
16.3	21.7	16.7	22.3	15.3	21.8	12.7	20.7	10.3	14.7						
16	19.6	16	21.4	14	21.0	12	19.5	9	6.3					8	6.1
FRANCISCO BAY, CALIF.															
21.2	20.4	20.2	21.8	18.8	22.2	--	--	--	--	--	--	23	26.1*	4*	9.1*
21.1	17.5	20.3	19.5	18.5	20.4	14.3	20.7	10.8	19.3	16.0	15.3	23	21.1	8	7.6
CALIF.															
15.8	--	15.9	--	14.8	--	12.9	--	11.6	--	13.5	--	20	--	7	--
15.9	19.8	16.4	20.0	--	--	--	--	--	--	--	--	17	23.8*	7*	12.2*
16.1	21.2	17.0	22.3	15.4	22.2	12.8	22.0	11.5	18.3	13.5	17.2	19	24.0	7	4.9*
15.9	--	16.2	--	14.9	--	12.9	--	11.6	--	13.4	--				
19	--	18	--	19	--	17	--	14	--			20	--		
17.4	--	17.3	--	16.7	--	14.7	--	12.9	--						
14.6	--	14.6	--	13.5	--	10.8	--	10.1	--						
14	--	13	--	12	--	7	--	9	--					7	--
SAN FRANCISCO BAY, CALIF.															
19.2	20.3	19.1	20.1	17.9	19.8	16.3	19.4	--	--	--	--	22	22.0*	4*	0.4*

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
MARE ISLAND														
1937	6.7	10.8	8.7	2.8	12.4	2.3	14.2	1.2	16.6	1.7	19.2	2.9	20.2	9.2
BENICIA, CARQUINEZ														
1937	6.5	7.4	8.5	1.2	12.3	0.1	14.4	0.3	16.6	0.5	19.6	1.0	20.9	2.5
1952	7.5	0.7	9.8	-0.2	10.7	-0.5	14.5	-0.3	16.7	-0.4	18.1	-0.2	19.4	3.0
PITTSBURG, NEW YORK														
1952	7.0	-0.8	9.4	-0.8	10.7	-0.8	15.1	-0.9	17.5	-0.7	18.8	-0.5	20.5	-0.7
THREEMILE SLOUGH,														
1938-1940	8.7	-0.6	9.4	-0.6	12.2	-0.3	15.9	-0.4	18.5	-0.1	20.6	0.0	20.9	1.2
PRISONERS POINT, SAN														
1939-1940	10.5	-0.7	11.9	-0.8	14.8	-0.9	16.2	-0.6	20.4	-0.1	23.2	-0.6	--	--
COLLINSVILLE, SACRAMENTO														
1937	4.8	-0.1	7.8	-0.5	12.1	-0.3	13.8	-0.1	16.6	0.1	19.8	-0.2	21.1	0.5
RIO VISTA, SACRAMENTO														
1938-1940	8.4	-1.0	9.3	-1.0	12.1	-0.7	15.2	-0.7	17.6	-0.7	20.1	-0.8	21.1	-0.2
Mean	8.4	-1.0	9.3	-1.0	12.1	-0.7	15.2	-0.7	17.6	-0.7	20.1	-0.8	21.1	-0.2
Maximum	11	-0.7	12	-0.7	16	0.0	18	-0.2	21	-0.1	23	0.1	24	-1.5
Mean Max.	9.4	-0.8	11.4	-0.7	15.2	-0.3	17.8	-0.4	20.2	-0.4	21.7	-0.2	24.2	0.6
Mean Min.	6.7	-1.1	8.1	-1.0	9.8	-1.0	12.4	-1.0	15.0	-1.2	18.3	-1.1	18.3	-0.9
Minimum	6	-1.2	7	-1.0	9	-1.2	11	-1.1	13	-1.4	17	-1.2	18	-1.0
NEW HOPE BRIDGE,														
1938-1940	8.8	-0.7	9.4	-0.7	11.8	-0.6	14.1	-0.4	15.8	-0.4	18.7	0.2	20.9	-0.1
Mean	8.8	-0.7	9.4	-0.7	11.8	-0.6	14.1	-0.4	15.8	-0.4	18.7	0.2	20.9	-0.1
Maximum	12	-0.5	13	-0.5	15	-0.3	18	0.0	23	0.7	24	1.2	24	0.6
Mean Max.	11.1	-0.5	10.8	-0.6	15.0	-0.3	15.9	-0.2	18.9	0.2	22.1	1.0	23.3	0.3
Mean Min.	6.7	-0.8	8.1	-0.9	8.9	-0.8	12.1	-0.8	13.9	-0.7	15.9	-0.5	18.6	-1.0
Minimum	6	-0.9	7	-1.0	8	-0.9	10	-0.9	12	-0.7	15	-0.8	16	-1.5
BLUNTS REEF														
1923-1924	10.0	24.4	10.0	24.6	8.7	25.0	9.2	24.9	9.2	25.0	9.9	25.0	10.7	24.9
1925-1929	10.8	24.4	10.8	24.4	10.1	24.5	10.2	24.4	10.3	24.8	9.9	25.0	10.0	25.1
1930-1934	11.0	24.7	10.8	24.5	10.6	24.5	10.6	24.5	10.8	24.8	10.6	25.1	10.4	25.2
1935-1939	11.1	24.5	10.8	24.5	10.7	24.3	10.2	24.5	10.4	24.8	10.7	25.0	10.1	25.1
1940-1941	13.0	24.3	13.1	24.1	12.4	24.3	11.2	24.6	11.7	24.7	11.0	24.9	11.0	25.1
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1955	--	--	8.7	--	8.8	--	8.3	--	8.9	--	8.8	--	9.2	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1957-1959	11.2	24.5	10.9	24.4	10.7	24.3	10.2	24.4	10.1	24.7	10.9	24.7	10.1	24.9
1960	10.4	24.6	10.3	24.2	9.9	24.3	9.4	24.0	10.4	24.4	9.9	25.1	10.2	25.2
1961	11.1	24.8	10.9	23.8	10.9	24.2	10.2	24.8	10.9	24.4	10.6	24.6	10.1	25.0
1962	10.3	24.8	10.4	24.7	10.3	24.4	9.8	24.8	10.1	24.9	8.8	25.2	9.1	25.2
1963	10.7	24.8	11.4	24.7	10.1	24.7	11.1	23.8	11.3	24.5	9.4	25.3	10.6	25.0
1964	11.2	24.5	10.2	24.9	9.4	25.1	8.7	25.2	9.2	25.4	10.0	25.2	--	--

*Observations for the year are incomplete; extremes are for the months shown.

Temperatures and Densities
Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
STRAIT, CALIF.															
20.1	14.0	19.5	15.9	--	--	--	--	--	--	--	--	22	16.5*	5	-0.7
STRAIT, CALIF.															
20.4	8.4	20.3	12.5	18.5	10.4	--	--	--	--	--	--	25	13.5*	5	-0.5*
19.4	7.8	19.2	9.0	17.4	9.8	13.6	9.7	9.6	4.8	14.7	3.6	21	12.1	6	-1.5
SLOUGH, CALIF.															
20.9	-0.3	20.4	-0.2	18.6	-0.5	13.8	-0.5	9.1	-0.8	15.2	-0.6	22	0.7	6	-1.3
SAN JOAQUIN RIVER, CALIF.															
20.0	4.3	20.3	3.7	18.5	0.4	12.9	-0.2	10.2	-0.4	15.7	0.6	22	6.8	7	-1.0
JOAQUIN RIVER, CALIF.															
22.4	5.9	21.7	1.4	19.1	0.5	15.3	0.0	11.3	-0.3	--	--	25*	11.7	8	-1.1
RIVER, CALIF.															
21.1	3.3	19.8	5.0	18.3	2.1	14.4	0.0	11.7	-0.6	15.1	0.8	22	7.0	3	-0.8
RIVER, CALIF.															
20.7	1.2	20.9	0.8	17.8	-0.4	12.4	-0.8	9.5	-1.0	15.4	-0.4	25	4.9	6	-1.4
20.7	1.2	20.9	0.8	17.8	-0.4	12.4	-0.8	9.5	-1.0	15.4	-0.4				
25	4.9	24	3.7	21	0.5	17	-0.4	11	-0.7			25	4.9		
23.3	2.4	23.6	1.8	20.3	0.1	15.8	-0.4	10.8	-0.8						
18.6	0.1	19.2	-0.2	15.8	0.9	10.0	-1.2	8.1	-1.2						
18	-0.8	18	-1.0	16	-1.0	9	-1.2	8	-1.2					6	-1.4
MOKELUMNE RIVER, CALIF.															
21.1	-0.1	20.1	-0.6	16.7	-0.6	11.8	-0.7	9.8	-0.7	14.9	-0.4	24	1.2	6	-1.6
21.1	-0.1	20.1	-0.6	16.7	-0.6	11.8	-0.7	9.8	-0.7	14.9	-0.4				
23	0.8	23	0.6	19	0.4	15	-0.4	12	-0.5			24	1.2		
22.5	0.3	21.9	0.0	18.3	0.1	15.0	-0.5	11.7	-0.6						
19.4	-0.4	18.3	-1.3	14.6	-0.8	10.0	-0.9	8.3	-0.8						
19	-0.9	18	-1.6	14	-0.9	10	-0.9	8	-0.9					6	-1.6
LIGHTSHIP, CALIF.															
11.1	24.8	10.2	24.8	11.2	24.6	12.1	24.3	10.1	24.5	10.2	24.7	17	25.7	7	22.5
10.8	25.0	11.8	24.8	10.9	24.8	11.8	24.6	11.3	24.6	10.7	24.7	16	25.7	8	20.7
11.3	25.1	11.9	24.9	11.6	24.9	11.6	24.6	11.7	24.5	11.1	24.8	15	25.5	8	22.2
10.6	25.2	11.1	25.1	11.9	24.9	11.3	24.9	11.8	24.7	10.9	24.8	16	25.6	7	21.2
11.6	25.0	13.0	24.9	12.3	25.0	12.8	24.7	12.7	24.5	12.2	24.7	16	25.4	8	23.1
8.8	--	9.2	--	--	--	10.2	--	11.1	--	--	--	13	--	7*	--
10.7	24.9	11.3	24.8	11.8	24.7	11.9	24.7	11.4	24.6	10.9	24.6	16	25.8	8	22.8
9.8	25.1	10.0	25.0	10.8	24.8	10.9	24.8	11.4	24.5	10.3	24.7	14	25.8	9	22.5
10.8	24.8	10.6	25.1	10.7	25.2	10.7	25.1	10.6	25.1	10.7	24.7	13	25.4	8	22.5
10.6	25.1	10.8	25.0	11.7	24.8	11.8	24.8	11.5	24.7	10.4	24.9	14	25.4	7	22.6
9.9	25.2	12.2	24.9	13.8	24.9	12.5	24.5	12.2	24.8	11.3	24.8	17	26.0	8	21.2
--	--	10.4	25.1	12.0	24.6	13.1	24.1	11.5	23.9	--	--	15	25.7*	8	23.3*

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
	BLUNTS REEF LIGHTSHIP,													
Mean	11.0	24.5	10.8	24.4	10.4	24.5	10.2	24.5	10.3	24.8	10.3	25.0	10.2	25.1
Maximum	14	25.8	15	25.4	14	25.4	14	25.7	15	25.7	16	26.0	14	25.8
Mean Max.	12.1	24.9	11.8	24.9	11.6	24.9	11.4	25.0	12.0	25.1	12.2	25.2	11.9	25.3
Mean Min.	10.1	23.9	9.9	23.8	9.1	23.6	8.9	23.6	9.1	24.2	8.9	24.6	8.9	24.8
Minimum	8	21.2	8	22.5	7	21.8	8	20.7	8	23.0	7	24.1	7	24.2
	CRESCENT CITY,													
1934	10.8	19.2	11.2	22.2	12.5	21.7	12.3	23.0	13.5	22.9	12.1	24.3	13.2	23.9
1935-1939	8.8	21.1	8.7	20.3	8.9	20.0	9.7	20.6	10.4	22.8	11.2	22.6	12.5	23.7
1940-1944	10.3	20.4	10.6	20.3	10.8	21.2	11.4	21.8	11.9	22.2	12.8	22.9	14.0	23.4
1945-1947	10.1	22.1	9.9	22.1	10.1	22.5	10.4	23.1	12.2	22.5	13.2	24.0	14.2	24.2
--														
1950-1954	9.9	20.1	10.2	19.0	10.1	22.1	10.8	22.8	11.2	22.0	12.0	22.8	13.1	23.9
1955-1959	9.6	20.4	9.9	20.8	10.4	20.6	10.9	20.6	12.1	23.8	13.6	23.7	13.6	25.1
1960	9.4	23.3	10.7	21.4	10.9	19.3	12.2	19.9	--	--	12.4	22.6	14.8	23.4
1961	10.3	22.6	11.5	19.6	11.1	18.8	10.4	23.1	13.3	20.4	14.2	22.4	14.8	24.0
1962	8.9	23.5	9.6	21.6	10.1	21.0	11.4	23.1	11.2	23.7	12.1	24.5	12.2	24.3
1963	9.3	23.7	11.6	19.9	9.7	23.2	11.4	18.5	13.2	19.8	11.9	23.9	13.9	24.6
1964	9.8	21.3	9.6	23.1	9.1	23.4	--	--	--	--	--	--	--	--
Mean	9.7	21.1	10.0	20.6	10.2	21.2	10.8	21.6	11.7	22.5	12.5	23.2	13.5	24.0
Maximum	12	25.1	13	26.0	14	25.8	15	25.5	17	26.3	17	26.9	18	26.4
Mean Max.	11.0	23.4	11.2	23.2	11.6	23.7	12.2	23.8	13.4	24.5	14.7	25.2	15.3	25.3
Mean Min.	8.1	17.0	8.4	17.1	8.7	17.3	9.5	17.6	10.0	19.0	10.6	20.3	11.4	22.3
Minimum	5	9.4	7	10.2	6	10.3	7	9.6	8	9.5	9	11.8	8	16.6
	BANDON, COQUILLE													
1933-1934	9.7	4.6	10.3	8.3	12.0	10.6	--	--	--	--	--	--	--	--
	COOS BAY													
1933-1934	10.5	16.3	10.8	20.5	12.1	20.1	10.6	22.0	10.9	16.0	11.7	23.5	11.9	26.2
	GARDINER, UMPQUA													
1933-1934	8.9	-0.5	9.4	1.6	12.6	1.5	--	--	--	--	15.8	0.9	17.6	9.1
	FLORENCE, SIUSLAW													
1933-1934	9.3	2.3	10.1	9.2	12.0	6.1	--	--	--	--	--	--	--	--
	WALDPOR, ALSEA													
1933-1934	9.3	--	9.7	--	11.1	--	--	--	11.7	--	13.7	--	14.0	--
	NEWPORT, YAQUINA													
1933-1934	10.5	17.2	10.7	21.3	11.9	21.4	11.0	15.9	11.1	17.2	12.8	21.2	10.1	24.3
	TAFT, SILETZ													
1933-1934	9.2	3.4	10.3	15.1	11.1	8.7	12.3	14.3	--	--	13.3	10.4	11.2	22.1
	GARIBALDI, TILLAMOOK													
1933-1934	9.5	--	10.2	14.7	11.0	13.1	12.2	12.1	11.3	11.9	13.8	16.8	13.0	22.4

*Observations for the year are incomplete; extremes are for the months shown.

Temperatures and Densities
Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
CALIF. - continued															
10.8	25.0	11.3	24.9	11.6	24.8	11.7	24.7	11.5	24.6	10.8	24.7				
17	25.5	16	25.5	17	25.7	15	25.4	15	25.4			17	26.0		
12.7	25.2	13.3	25.2	13.6	25.1	13.3	25.0	12.9	24.9						
9.4	24.7	9.9	24.6	10.1	24.5	10.1	24.3	10.1	24.1					7	20.7
8	24.1	8	24.3	9	23.8	8	22.5	8	22.8						
CALIF.															
12.9	23.9	11.7	24.0	10.8	23.8	11.0	21.0	9.6	20.9	11.8	22.6	17	25.4	7	12.7
13.0	24.0	12.6	24.3	11.3	23.8	9.9	23.0	9.9	22.5	10.6	22.4	16	26.1	5	9.4
14.6	23.7	13.5	23.8	12.7	24.2	12.1	22.5	10.7	21.4	12.1	22.3	18	26.9	5	9.7
14.8	24.2	13.3	24.2	10.7	24.2	10.4	22.0	10.4	21.6	11.6	23.1	18	25.7	7	14.7
14.1	23.9	14.2	23.5	13.0	23.2	11.2	23.2	10.6	21.6	11.7	22.3	17	26.5	8	12.6
15.0	24.9	14.9	24.7	12.4	23.9	11.1	22.9	9.8	22.4	11.9	22.8	17	26.5	7	14.1
13.3	24.3	12.4	--	12.4	--	10.6	22.3	10.4	21.4	11.8	--	17	25.3*	8	9.6*
15.3	23.8	11.8	24.3	11.3	24.1	10.4	23.1	9.6	22.6	12.0	22.4	18	25.3	8	13.5
14.7	23.9	14.5	24.1	12.7	22.4	12.1	22.6	10.8	20.9	11.7	23.0	17	26.0	7	16.6
13.4	24.6	14.9	24.5	14.4	24.2	12.4	21.7	10.7	23.2	12.2	22.6	18	26.4	7	9.5
13.5	24.4	11.2	24.4	11.6	24.3	11.4	22.7	10.2	20.1	--	--	17*	25.4*	6*	17.1*
14.2	24.1	13.5	24.1	12.1	23.8	11.1	22.7	10.3	21.9	11.6	22.6				
18	26.5	17	26.1	16	25.6	14	25.4	14	25.5			18	26.9		
15.8	25.0	15.2	25.0	13.6	24.8	12.5	24.4	11.6	23.8						
12.3	23.0	11.7	23.0	10.8	22.2	9.5	19.7	8.7	18.4					5	9.4
9	19.2	9	19.0	8	14.4	6	9.7	7	9.7						
RIVER, ORE.															
11.5	22.9	11.9	22.8	10.6	22.7	10.1	21.6	9.5	9.6	--	--	15*	25.4*	7	-1.3*
ENTRANCE, ORE.															
12.3	26.2	10.1	25.7	10.4	--	--	--	9.9	17.5	--	--	14	27.1*	8	3.7*
RIVER, ORE.															
16.7	13.4	15.2	11.0	13.5	11.7	9.9	8.2	9.0	0.4	--	--	20	18.0*	8	-1.2*
RIVER, ORE.															
--	--	13.4	16.3	12.1	12.8	9.9	10.4	9.3	2.4	--	--	16*	23.7*	7	-0.6*
BAY, ORE.															
13.2	--	11.9	--	10.8	--	10.9	--	9.3	--	--	--	18	--	8	--
BAY, ORE.															
10.0	24.8	11.5	24.4	10.9	24.0	11.2	22.6	10.5	--	11.0	--	16	25.8*	7	-0.2*
BAY, ORE.															
12.1	21.9	12.0	21.3	11.0	17.7	9.9	14.9	9.1	3.1	--	--	18	25.2*	8	-1.1
BAY, ORE.															
13.3	22.9	13.0	17.3	11.6	12.3	10.2	11.3	--	--	--	--	17	25.3*	7*	0.1*

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
BRIGHTON, NEHALEM														
1933-1934	9.3	4.1	10.2	13.9	11.3	10.6	13.5	11.7	10.2	8.9	13.3	9.9	13.3	19.1
ASTORIA (Tongue														
1854	--	--	--	--	--	--	--	--	--	--	14.7	--	18.0	--
1855	5.7	--	6.1	--	8.1	--	10.8	--	12.8	--	16.0	--	18.8	--
1856	4.0	--	5.8	--	8.2	--	10.7	--	13.0	--	15.9	--	17.2	--
1857	3.0	--	5.6	--	8.1	--	11.4	--	13.6	--	17.2	--	19.3	--
1858	5.1	--	5.6	--	8.0	--	10.4	--	13.9	--	15.8	--	17.3	--
1859	5.0	--	4.9	--	6.3	--	9.6	--	12.6	--	15.5	--	17.7	--
1860	4.0	--	5.0	--	6.9	--	9.7	--	12.2	--	14.3	--	17.2	--
1861	4.3	--	5.7	--	7.6	--	9.7	--	11.7	--	13.7	--	17.4	--
1862	0.1	--	0.5	--	4.0	--	7.8	--	11.8	--	14.6	--	17.0	--
1863	4.6	--	3.4	--	6.4	--	9.2	--	11.9	--	14.6	--	18.4	--
1864	3.4	--	5.4	--	7.7	--	9.6	--	13.3	--	14.3	--	16.8	--
1865	3.4	--	3.2	--	2.8	--	8.3	--	12.2	--	14.3	--	17.0	--
1866	2.7	--	2.6	--	5.8	--	8.6	--	11.3	--	12.6	--	--	--
1867	4.3	--	4.4	--	4.3	--	8.6	--	12.4	--	14.3	--	16.6	--
1868	1.0	--	2.2	--	5.3	--	10.5	--	12.8	--	14.6	--	17.6	--
1869	5.6	--	5.2	--	8.2	--	10.8	--	14.8	--	17.7	--	18.3	--
1870	4.3	--	5.7	--	5.8	--	9.9	--	12.7	--	15.2	--	18.7	--
1871	4.2	--	5.3	--	6.9	--	10.0	--	11.8	--	14.7	--	17.4	--
1872	2.9	--	4.7	--	7.8	--	9.6	--	12.8	--	15.2	--	18.0	--
1873	5.4	--	4.4	--	7.1	--	9.6	--	12.4	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1875	--	--	--	--	--	--	--	--	11.7	--	14.2	--	18.3	--
1876	3.1	--	4.6	--	6.3	--	9.9	--	11.5	--	14.2	--	16.9	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1925-1929	4.3	0.4	5.1	0.0	7.9	-0.4	10.7	-0.3	13.7	-0.4	15.9	-0.3	19.2	-0.3
1930-1934	4.4	1.1	4.9	0.2	7.8	-0.3	11.1	-0.5	13.4	-0.5	15.9	-0.4	18.6	-0.4
1935-1939	4.8	0.5	4.6	0.7	7.4	-0.1	10.6	-0.4	13.8	-0.5	16.0	-0.5	19.1	-0.4
1940-1944	4.4	1.0	6.0	0.3	7.9	-0.2	11.2	-0.6	13.8	-0.8	16.1	-0.8	19.2	-0.6
1945-1949	4.2	0.7	5.2	-0.3	7.4	-0.4	10.4	-0.6	13.3	-0.7	15.8	-0.5	18.7	-0.4
1950-1954	4.9	-0.2	6.0	-0.5	7.2	-0.5	10.6	-0.6	13.5	-0.5	15.5	-0.4	18.8	-0.2
1955-1959	5.4	-0.4	5.5	-0.5	7.4	-0.8	10.7	-0.8	14.1	-0.8	15.4	-0.8	19.2	-0.6
1960	3.7	0.5	6.2	-0.7	6.9	-0.6	10.3	-1.0	13.1	-0.9	16.6	-1.1	20.1	-0.9
1961	7.0	-0.1	8.1	-1.1	8.8	-1.2	11.1	-1.0	13.7	-1.0	16.9	-0.8	20.0	-0.9
1962	5.4	-0.5	6.3	-0.4	7.2	-0.6	11.8	-1.1	12.8	-1.1	16.6	-0.9	18.6	-1.0
1963	5.0	-0.4	6.8	-0.6	8.5	-0.7	10.3	-1.0	14.3	-0.9	16.9	-0.8	18.6	-0.8
1964	7.1	-1.1	7.2	-0.9	8.2	-1.1	11.2	-0.9	13.1	-1.1	15.4	-1.1	18.4	-1.0
Mean	4.4	0.3	5.2	-0.1	7.3	-0.5	10.4	-0.6	13.2	-0.7	15.6	-0.6	18.6	-0.5
Maximum	9	10.2	11	7.6	14	4.8	16	2.9	19	0.9	21	0.4	24	0.8
Mean Max.	6.1	3.3	6.8	2.5	9.2	1.1	12.4	0.3	15.8	-0.2	17.6	-0.1	20.2	0.0
Mean Min.	2.6	-1.0	3.6	-1.1	5.6	-1.1	8.4	-1.1	11.4	-1.0	13.0	-0.9	16.7	-0.9
Minimum	-1	-1.4	0	-1.6	1	-1.4	6	-1.8	9	-1.5	11	-1.5	14	-1.4
WAUNA, COLUMBIA														
1940-1942	3.8	-1.0	5.9	-1.0	7.7	-1.0	11.2	-0.8	13.9	-0.7	16.1	-0.4	19.8	-0.6
HARRINGTON POINT,														
1940-1942	4.0	-0.9	6.2	-0.9	8.0	-0.9	11.8	-0.6	14.3	-0.4	16.7	-0.2	20.2	-0.2

*Observations for the year are incomplete; extremes are for the months shown.

Temperatures and Densities
Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}
RIVER, ORE.															
13.6	20.2	12.3	20.0	11.1	17.1	10.2	15.5	9.6	4.3	11.5	12.9	17	28.2	5	-1.5
Point), ORE.															
17.9	--	17.1	--	13.8	--	10.2	--	--	--	--	--	--	--	--	--
19.0	--	17.2	--	14.6	--	9.5	--	4.4	--	11.9	--	20	--	0	--
18.5	--	16.6	--	14.9	--	8.6	--	4.7	--	11.5	--	19	--	2	--
19.8	--	17.9	--	14.7	--	9.9	--	6.4	--	12.2	--	21	--	1	--
18.7	--	15.3	--	12.7	--	9.6	--	5.0	--	11.4	--	20	--	3	--
18.5	--	16.7	--	13.2	--	7.6	--	3.1	--	10.9	--	20	--	-1	--
19.4	--	17.0	--	13.3	--	8.6	--	5.6	--	11.1	--	21	--	3	--
18.3	--	17.3	--	12.6	--	7.7	--	5.0	--	10.9	--	19	--	1	--
18.2	--	16.6	--	12.0	--	7.7	--	4.3	--	9.6	--	20	--	-1	--
17.6	--	16.2	--	12.2	--	7.2	--	5.2	--	10.6	--	21	--	2	--
18.0	--	15.5	--	12.7	--	8.0	--	4.1	--	10.7	--	19	--	0	--
17.9	--	14.8	--	12.9	--	9.2	--	2.1	--	9.8	--	19	--	0	--
18.2	--	16.6	--	12.7	--	9.2	--	6.0	--	--	--	19*	--	-1	--
18.4	--	16.5	--	12.1	--	8.6	--	6.1	--	10.6	--	19	--	2	--
18.1	--	14.6	--	11.4	--	8.3	--	6.2	--	10.2	--	19	--	-1	--
17.5	--	15.7	--	12.7	--	9.1	--	5.9	--	11.8	--	20	--	4	--
19.6	--	16.6	--	13.4	--	8.9	--	4.7	--	11.3	--	22	--	1	--
18.1	--	16.1	--	12.8	--	8.1	--	4.4	--	10.8	--	19	--	1	--
18.1	--	16.2	--	12.9	--	6.8	--	4.6	--	10.8	--	20	--	1	--
19.2	--	17.3	--	--	--	--	--	--	--	--	--	21*	--	3*	--
19.1	--	16.6	--	14.5	--	7.8	--	6.4	--	--	--	20	--	6*	--
17.5	--	16.2	--	14.2	--	--	--	--	--	--	--	19	--	1*	--
19.6	-0.2	17.1	0.0	13.3	0.6	9.1	1.1	5.5	0.6	11.8	0.1	24	8.8	0	-1.6
19.7	-0.1	17.3	0.3	13.4	1.2	9.1	0.6	5.5	1.1	11.8	0.2	22	10.2	0	-1.8
19.8	-0.1	18.1	1.0	14.4	2.5	9.0	2.9	6.6	2.1	12.0	0.6	24	9.7	0	-1.6
19.6	-0.2	18.0	0.6	14.9	1.7	9.4	1.7	6.3	1.1	12.2	0.2	24	9.9	1	-1.8
19.2	-0.1	18.1	0.9	13.6	1.2	9.1	0.7	6.6	0.3	11.8	0.1	22	8.2	-1	-1.5
19.6	0.0	18.3	0.5	14.6	1.4	10.2	1.4	7.3	0.9	12.2	0.1	22	9.2	0	-1.4
20.2	-0.3	18.4	0.3	14.5	0.2	9.2	-0.2	6.8	-0.3	12.3	-0.4	23	5.1	0	-1.8
19.7	-0.5	17.9	0.2	15.4	0.5	10.7	-0.4	7.0	0.5	12.3	-0.4	21	4.3	2	-1.3
20.4	-0.4	17.9	-0.1	13.9	0.8	9.0	0.3	6.4	-0.6	12.8	-0.5	22	4.1	5	-1.4
20.0	-0.7	18.3	0.1	14.8	0.2	11.6	0.0	8.0	-1.0	12.6	-0.6	21	3.4	3	-1.5
19.9	-0.3	19.6	0.5	16.2	0.5	10.9	-0.4	7.4	-1.0	12.9	-0.5	21	4.4	2	-1.4
19.3	-0.7	17.5	-0.2	14.9	0.0	10.3	-0.3	6.9	-1.0	12.5	-0.8	21	2.8	4	-1.4
19.2	-0.2	17.4	0.5	13.8	1.1	9.1	0.9	6.0	0.1	11.7	-0.2				
24	5.5	22	6.3	19	9.9	14	9.7	11	9.6			24	10.2		
20.7	1.1	19.3	3.0	16.1	4.5	11.5	4.1	7.8	4.3						
18.0	-0.8	15.5	-0.7	11.4	-0.7	7.0	-0.9	4.0	-1.0						
14	-1.3	12	-1.3	8	-1.8	3	-1.8	-1	-1.6					-1	-1.8
RIVER, ORE.															
20.6	-0.5	17.7	-0.5	14.5	-0.8	9.2	-1.0	6.2	-1.0	12.2	-0.8	23	0.0	2	-1.2
COLUMBIA RIVER, WASH.															
21.1	-0.5	17.6	-0.6	15.3	-0.8	9.9	-1.0	6.7	-0.9	12.6	-0.7	23	0.5	2	-1.3

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
SKAMOKAWA, COLUMBIA														
1940-1942	3.8	-1.2	5.8	-1.2	7.9	-1.1	11.6	-1.0	13.9	-0.8	16.1	-0.9	19.8	0.8
CATHLAMET, COLUMBIA														
1940-1942	3.6	-0.9	5.8	-0.6	7.9	-0.5	11.7	-0.4	14.0	-0.5	16.3	-0.4	20.7	-0.2
TOKELAND, WILLAPA														
1935-1939	7.0	14.6	6.7	15.8	8.8	15.4	10.8	15.7	13.2	17.3	15.8	17.4	17.4	19.3
Mean	7.0	14.6	6.7	15.8	8.8	15.4	10.8	15.7	13.2	17.3	15.8	17.4	17.4	19.3
Maximum	10	23.7	11	20.9	12	21.5	18	20.1	18	22.3	19	23.4	22	23.1
Mean Max.	8.8	20.5	9.1	20.0	10.8	20.3	14.3	19.2	16.8	20.9	18.6	21.4	21.1	22.3
Mean Min.	3.8	8.4	3.8	7.4	7.2	6.3	8.5	10.5	10.7	13.8	13.2	13.7	15.1	15.5
Minimum	0	4.1	0	4.3	7	1.1	7	0.7	8	11.3	12	10.1	14	11.7
RAYMOND, WILLAPA														
1935-1939	6.2	3.0	5.7	4.3	7.9	2.8	10.9	4.3	15.0	6.0	17.3	7.0	19.8	10.1
1940-1942	7.6	5.5	9.2	4.6	10.8	5.3	13.7	5.8	16.2	5.8	18.8	9.8	21.4	13.8
Mean	6.8	4.1	7.2	4.4	9.0	3.7	11.9	4.9	15.4	5.9	17.9	8.0	20.3	11.3
Maximum	11	13.9	11	13.9	15	13.5	18	13.5	20	14.5	22	13.2	26.1	17.8
Mean Max.	8.8	9.8	9.2	10.1	11.2	9.0	14.6	9.2	18.2	10.6	20.4	11.1	23.5	15.6
Mean Min.	4.8	0.6	5.1	0.6	6.9	0.4	9.2	1.4	12.6	1.3	15.7	4.3	17.4	7.0
Minimum	2	-0.6	2	-0.6	6	-0.6	6	0.5	11	0.2	14	1.1	15	2.9
ABERDEEN, GRAYS														
1934-1935	6.0	0.1	7.3	0.7	7.0	-0.2	10.4	1.3	14.5	2.4	17.4	4.0	17.8	7.0
NEAH BAY,														
1936-1939	7.8	23.3	7.0	23.6	7.7	23.4	8.5	23.7	10.1	23.6	10.9	23.4	10.7	24.3
1940-1944	8.1	23.1	8.2	23.1	8.5	23.3	10.1	22.9	10.8	23.4	11.3	23.9	11.8	24.0
1945-1949	6.9	22.4	6.8	22.3	8.1	22.2	9.1	22.7	11.3	22.8	12.8	22.5	12.9	23.5
1950-1954	6.7	21.9	7.0	20.5	7.4	22.1	8.8	22.5	10.3	23.0	11.6	23.2	11.8	23.6
1955-1959	7.5	22.3	7.4	22.7	7.8	22.7	9.2	22.6	10.6	23.3	11.6	23.0	11.6	23.6
1960	6.8	22.8	7.8	22.1	7.4	22.6	9.3	21.6	11.2	21.8	11.3	22.7	11.8	23.9
1961	8.1	22.3	8.7	21.1	8.8	20.8	9.3	22.8	11.2	22.1	12.6	22.7	12.6	23.6
1962	6.8	22.3	7.3	22.4	7.3	23.3	9.6	22.6	10.6	22.2	11.0	23.8	11.1	24.2
1963	7.4	22.8	8.2	22.1	8.5	23.1	9.6	21.9	11.3	22.8	--	--	13.1	22.6
1964	8.1	21.8	7.8	22.4	7.7	22.8	8.7	23.4	9.6	23.8	12.1	23.4	12.1	23.2
Mean	7.4	22.5	7.4	22.4	7.9	22.7	9.2	22.8	10.7	23.1	11.7	23.2	11.8	23.7
Maximum	11	25.0	11	24.8	11	24.9	13	25.4	16	25.0	18	26.1	18	25.5
Mean Max.	8.6	23.5	8.4	23.6	9.1	23.7	10.7	23.8	12.9	24.0	14.2	24.3	14.4	24.5
Mean Min.	5.8	21.3	6.2	19.8	6.8	21.3	8.1	20.9	9.1	21.2	9.8	21.3	9.9	22.3
Minimum	2	18.9	3	9.9	3	16.6	6	11.5	8	17.8	8	15.3	8	19.1
PORT ANGELES,														
1934-1935	7.3	20.0	7.7	21.5	8.1	21.7	9.5	22.0	10.3	22.8	11.0	23.0	11.7	22.9
PORT TOWNSEND														
1935-1936	8.0	23.0	7.5	22.9	--	--	8.3	22.5	9.3	22.6	10.4	22.7	10.8	23.0

*Observations for the year are incomplete; extremes are for the months shown.

Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}
RIVER, WASH.															
19.8	-1.1	17.1	-1.1	13.9	-1.0	8.8	-1.2	6.1	-1.2	12.0	-1.0	22	0.0	1	-1.6
RIVER, WASH.															
21.3	-0.6	18.3	-0.6	15.2	-0.8	9.3	-0.8	6.4	-0.8	12.5	-0.6	24	0.2	1	-1.1
BAY, WASH.															
17.6	21.3	15.7	21.4	13.3	21.2	9.9	19.1	8.2	17.3	12.0	18.0	22	23.7	0	0.7
17.6	21.3	15.7	21.4	13.3	21.2	9.9	19.1	8.2	17.3	12.0	18.0	22	23.7	0	0.7
21	23.3	20	23.6	17	23.2	16	23.5	11	21.0			22	23.7		
20.2	22.7	18.5	23.0	15.5	22.7	11.8	21.9	10.0	20.3						
15.2	19.7	13.7	19.7	10.7	19.2	8.1	15.1	5.6	11.2						
13	18.7	13	18.9	8	18.7	5	6.5	5	5.6					0	0.7
BAY, WASH.															
19.8	15.2	18.0	15.7	14.3	14.7	8.9	8.6	7.4	5.6	12.6	8.1	26	19.6	2	-0.6
21.1	15.0	18.6	11.6	15.3	10.1	10.5	6.4	8.8	4.6	14.3	8.2	26	18.1	3	0.4
20.2	15.1	18.2	14.1	14.6	12.9	9.4	7.9	7.8	5.3	13.2	8.1				
25	18.0	23	18.4	18	18.3	15	19.6	12	18.3			26	19.6		
22.8	17.4	20.5	17.0	17.0	16.8	12.3	13.7	10.3	11.5						
18.1	12.1	15.7	10.7	10.9	7.0	6.7	2.3	5.1	0.4						
16	11.0	14	3.2	8	22	5	0.5	4	-0.5					2	-0.6
HARBOR, WASH.															
18.2	9.7	16.6	10.7	13.3	8.2	9.9	0.2	7.3	0.4	12.1	3.7	20	15.6	1	-1.1
WASH.															
10.2	24.6	9.7	24.7	10.2	24.2	9.8	23.8	9.0	23.6	9.3	23.8	17	25.5	5	17.3
11.2	24.4	11.4	24.2	11.1	23.8	10.2	23.6	8.7	23.0	10.1	23.6	17	25.9	4	16.1
12.6	23.8	11.8	23.7	10.2	23.4	8.6	22.7	7.7	22.0	9.9	22.8	18	25.5	4	10.6
12.0	23.6	12.2	23.3	11.1	23.1	9.8	22.7	8.6	22.1	9.8	22.6	16	25.3	2	9.9
11.4	23.6	11.2	23.7	10.7	23.3	8.9	22.8	8.1	22.2	9.7	23.0	16	25.4	3	18.5
11.3	24.0	10.9	24.0	10.3	23.4	9.7	22.7	8.2	22.3	9.7	22.8	14	24.8	4	19.4
11.6	23.7	10.6	24.1	9.2	23.8	7.9	23.4	7.2	22.3	9.8	22.7	15	24.6	6	19.0
12.9	22.9	11.0	23.9	12.0	23.0	10.9	22.4	9.3	21.8	10.0	22.9	17	24.6	4	11.5
12.3	23.8	12.5	23.8	13.2	22.6	11.2	22.2	8.8	22.0	--	--	16*	25.0*	4	19.1*
12.1	23.3	10.9	23.4	10.2	23.3	8.8	22.8	6.6	22.1	9.6	23.0	17	26.1	4	19.6
11.6	23.9	11.3	23.9	10.7	23.5	9.5	23.0	8.3	22.5	9.8	23.1				
17	25.5	17	25.5	14	25.9	13	25.0	11	24.9			18	26.1		
14.1	24.7	13.6	24.7	12.6	24.4	10.8	23.9	9.6	23.4						
9.8	22.7	9.3	22.6	9.1	22.1	8.1	21.2	6.7	21.0						
8	18.0	8	16.7	7	19.0	5	10.6	3	16.1					2	9.9
WASH.															
12.0	22.8	11.3	23.0	10.1	22.8	9.8	22.1	8.5	22.2	9.8	22.2	16	23.9	4	14.7
(Fort Worden), WASH.															
10.7	23.2	10.6	23.4	9.8	23.4	8.5	23.5	8.2	23.4	--	--	12	24.1*	7	21.7*

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}
	PORT TOWNSEND													
1874-1876	6.4	--	6.5	--	6.7	--	7.8	--	9.1	--	10.1	--	10.9	--
Mean	6.4	--	6.5	--	6.7	--	7.8	--	9.1	--	10.1	--	10.9	--
Maximum	8	--	7	--	8	--	10	--	12	--	12	--	13	--
Mean Max.	7.6	--	6.9	--	7.2	--	9.4	--	9.9	--	11.0	--	12.3	--
Mean Min.	5.4	--	5.9	--	6.0	--	6.9	--	8.2	--	9.3	--	10.0	--
Minimum	5	--	6	--	6	--	6	--	8	--	9	--	9	--
	EVERETT,													
1934-1935	7.0	15.3	6.9	13.1	7.1	15.8	9.5	14.0	12.5	10.1	14.1	10.4	16.4	11.3
	BREMERTON,													
1934-1936	7.8	20.8	7.1	20.8	7.8	20.4	9.1	20.8	11.9	21.3	13.9	21.2	15.2	21.8
	SEATTLE (Elliott													
1922-1924	8.9	18.6	8.7	18.1	8.6	18.2	9.3	16.6	10.7	16.9	12.0	18.5	13.1	20.5
1925-1929	8.6	19.8	8.4	19.4	8.9	18.7	9.8	18.2	11.8	18.0	13.7	18.6	14.9	20.7
1930-1934	8.0	19.2	7.7	19.3	7.9	18.2	8.9	17.7	10.3	18.0	11.9	18.6	13.1	19.7
1935-1939	8.5	20.2	7.9	20.2	7.9	19.5	8.6	19.2	10.2	18.9	12.0	19.0	12.9	20.3
1940-1944	9.3	22.3	8.8	22.1	8.7	22.1	9.3	21.8	10.6	21.7	11.7	21.9	12.8	22.2
1945-1949	8.7	21.8	8.1	21.8	8.0	21.5	8.5	21.3	9.8	21.3	11.4	21.1	12.3	21.5
1950-1954	8.4	21.7	7.8	21.3	7.6	21.2	8.1	21.2	9.2	21.2	10.6	21.3	12.2	21.4
1955-1959	8.7	21.5	8.2	21.5	7.9	21.3	8.3	21.3	9.6	21.3	11.1	21.2	12.5	21.7
1960	8.5	21.8	8.0	21.7	7.8	21.5	8.5	21.5	9.4	21.9	11.2	21.1	12.5	21.4
1961	9.1	21.8	8.8	21.6	8.6	21.1	8.9	20.9	9.9	20.9	11.8	20.8	12.7	21.6
1962	8.3	21.7	8.1	22.0	7.4	22.0	8.3	21.5	9.2	21.8	10.6	21.9	12.0	22.0
1963	9.3	21.6	8.6	21.7	8.4	21.5	8.8	21.6	9.8	21.6	11.4	21.6	12.2	21.7
1964	9.5	21.8	8.9	21.4	8.5	21.6	8.8	21.5	9.4	21.7	--	--	13.3	18.6
Mean	8.7	20.9	8.2	20.7	8.2	20.3	8.8	20.0	10.2	20.0	11.8	20.2	12.9	21.0
Maximum	11	24.0	10	25.7	12	23.4	16	25.9	18	26.3	18	24.9	20	23.9
Mean Max.	9.4	21.9	8.7	21.8	8.8	21.6	9.8	21.5	11.8	21.5	13.3	21.6	14.1	22.0
Mean Min.	7.9	19.2	7.7	18.9	7.7	18.5	8.1	18.1	9.1	18.0	10.6	18.2	11.8	19.8
Minimum	4	12.3	6	9.9	6	10.6	6	10.4	7	6.8	9	10.1	10	15.4
	SEATTLE (Duwamish													
1924-1925	5.7	9.6	6.9	9.9	7.1	10.6	10.0	10.3	--	--	--	--	17.8	8.8
	TACOMA,													
1934-1935	7.3	16.0	7.3	17.2	7.4	18.7	8.5	17.2	11.1	15.3	13.3	14.5	14.2	14.7
	OLYMPIA,													
1923-1924	6.5	17.4	7.9	13.5	8.7	17.1	--	--	--	--	--	--	--	--
1934-1935	6.7	12.1	6.9	13.1	7.2	14.1	9.9	13.5	12.0	16.6	14.6	16.9	16.1	18.8
	ANACORTES,													
1922-1924	6.9	22.1	6.8	22.0	7.2	22.2	8.2	22.4	9.3	22.5	10.7	22.2	11.8	22.0
1934-1935	6.6	21.7	6.9	21.0	7.1	21.5	8.0	21.5	10.3	21.7	11.2	21.9	12.1	21.0

*Observations for the year are incomplete; extremes are for the months shown.

Temperatures and Densities
Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
(town), WASH.															
11.1	--	10.4	--	9.8	--	8.7	--	8.0	--	8.8	--	13	--	5	--
11.1	--	10.4	--	9.8	--	8.7	--	8.0	--	8.8	--	13	--	5	--
13	--	12	--	11	--	10	--	10	--			13	--		
12.1	--	11.5	--	10.8	--	9.4	--	8.8	--						
10.2	--	9.8	--	8.9	--	7.6	--	6.9	--					5	--
9	--	9	--	9	--	7	--	6	--						
WASH.															
15.9	17.3	14.2	18.9	11.9	18.3	9.8	14.6	8.1	15.6	11.1	14.6	21	22.1	3	-1.5
WASH.															
15.7	21.9	14.9	22.2	12.7	22.2	10.3	22.2	9.1	21.4	11.3	21.4	18	25.7	6	9.7
Bay), WASH.															
13.7	21.2	13.1	21.6	11.8	21.6	10.3	20.8	9.7	19.8	10.8	19.4	17	23.2	6	6.8
14.5	21.3	13.6	21.5	12.3	21.3	10.4	21.1	9.2	20.7	11.3	19.9	21	22.8	3	10.1
13.3	20.5	12.9	20.9	11.8	20.8	10.6	19.8	9.3	19.5	10.5	19.4	16	22.1	6	12.3
13.1	21.0	12.8	21.4	12.1	21.9	10.8	21.8	9.8	21.4	10.6	20.4	18	24.1	7	13.2
13.2	22.6	13.3	22.8	13.0	22.9	11.8	22.9	10.4	22.6	11.1	22.3	16	25.2	8	16.7
12.9	21.9	12.7	22.3	11.9	22.5	10.9	22.4	9.4	22.0	10.4	21.8	14	26.3	6	18.1
12.3	21.7	12.1	22.1	11.8	21.9	10.8	22.3	9.7	21.9	10.0	21.6	14	23.7	6	16.2
12.8	21.9	12.7	22.2	12.1	22.3	10.8	22.0	9.6	21.8	10.4	21.7	14	23.2	7	19.7
12.8	21.8	12.4	22.2	11.8	22.4	10.8	22.3	9.7	22.1	10.3	21.8	14	22.9	7	19.8
13.1	21.8	12.9	22.2	12.1	22.4	10.7	22.5	9.4	22.2	10.7	21.6	14	23.2	8	19.5
12.8	22.0	12.8	22.3	11.9	22.4	11.2	22.4	9.7	21.6	10.2	22.0	13	23.7	7	19.4
12.9	22.0	12.9	22.4	12.5	22.6	11.4	22.4	10.5	21.9	10.7	21.9	14	23.1	8	20.2
13.3	20.7	12.8	20.0	12.2	18.9	10.8	20.6	8.2	17.5	--	--	14	22.2*	7	10.7*
13.2	21.5	12.9	21.8	12.1	21.9	10.8	21.7	9.6	21.2	10.6	20.9				
18	25.2	16	24.4	15	25.0	15	25.4	12	24.1			20	26.3		
14.2	22.2	13.7	22.5	13.0	22.6	11.7	22.6	10.4	22.3						
12.4	20.7	12.2	20.9	11.4	20.6	9.9	20.5	8.7	19.5						
11	18.5	10	11.6	10	13.7	8	14.6	6	10.7					4	6.8
River), WASH.															
17.0	18.5	15.5	18.8	12.3	19.9	7.1	12.0	4.1	10.5	--	--	21*	24.0*	0*	3.8*
WASH.															
14.7	16.0	12.9	19.4	11.8	19.2	10.0	16.1	8.7	17.5	10.6	16.8	17	23.0*	4	5.9*
WASH.															
--	--	--	--	--	--	10.6	19.9	8.4	17.1	--	--	--	21.4*	3	1.4*
16.4	19.0	14.9	19.8	12.8	19.2	10.5	14.3	8.5	15.9	11.4	16.1	18	21.6*	4	-1.4*
WASH.															
11.9	22.4	11.7	22.0	10.6	22.4	9.2	22.4	7.8	22.5	9.3	22.3	15	24.0	4	19.2
11.9	21.5	11.4	21.8	--	--	8.6	22.2	8.1	21.9	--	--	16*	23.0*	5*	19.0*

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
ANACORTES,														
Mean	6.9	22.0	6.8	21.8	7.2	22.0	8.1	22.2	9.6	22.3	10.9	22.1	11.9	21.6
Maximum	8	23.2	8	22.4	8	23.0	10	23.2	12	24.0	15	23.3	16	23.3
Mean Max.	7.5	22.6	7.4	22.1	7.9	22.6	9.1	22.8	10.9	23.2	13.5	23.0	14.8	23.1
Mean Min.	5.5	21.4	5.8	21.1	6.4	21.6	7.2	21.6	8.4	20.8	9.7	20.6	10.3	19.8
Minimum	5	20.9	4	20.0	6	21.0	6	20.2	8	19.7	9	20.4	10	19.0
FRIDAY HARBOR, SAN														
1935-1939	7.4	22.3	6.9	22.5	7.1	22.6	7.8	22.6	8.9	22.4	9.8	22.3	10.7	21.8
1940-1944	8.2	22.3	8.1	22.2	8.3	22.4	9.1	22.5	10.0	22.3	10.8	22.3	11.5	22.3
1945-1949	7.3	22.3	6.9	22.4	7.2	22.5	8.1	22.5	9.3	22.4	10.4	21.9	11.1	22.1
1950-1952	6.8	22.6	6.4	22.5	6.7	22.5	7.5	22.6	8.4	22.7	9.3	22.5	10.3	22.1
Mean	7.4	22.4	7.1	22.4	7.3	22.5	8.1	22.5	9.2	22.4	10.2	22.2	10.9	22.0
Maximum	9	23.2	8	23.2	9	23.2	10	23.2	13	23.3	13	23.6	16	24.7
Mean Max.	7.8	22.7	7.4	22.7	7.7	22.7	8.6	22.8	10.0	23.0	11.3	22.9	13.1	23.1
Mean Min.	6.9	21.9	6.7	22.1	7.0	22.2	7.6	22.2	8.6	21.4	9.6	20.2	10.1	19.7
Minimum	5	19.3	5	21.2	6	21.5	7	21.6	8	18.9	9	16.4	9	14.1
BLAINE,														
1934-1935	4.8	--	6.4	--	6.6	--	8.7	--	12.1	--	14.9	--	16.2	--
KETCHIKAN,														
1922-1924	5.4	21.5	5.1	21.6	5.3	21.9	6.1	21.9	8.2	20.1	12.3	18.4	13.6	19.0
1925-1929	5.6	20.5	5.6	21.8	5.9	21.4	6.8	21.6	9.4	20.5	12.9	18.9	14.2	18.3
1930-1934	5.1	20.6	5.1	21.1	5.4	21.4	6.9	21.6	9.6	20.2	11.9	18.7	13.5	18.1
1935-1939	4.7	20.5	3.9	20.5	5.0	20.9	5.9	20.8	8.6	20.4	12.6	20.2	13.8	19.0
1940-1944	5.4	20.2	5.5	21.4	5.7	22.0	7.4	22.0	9.4	21.8	12.6	21.7	14.3	20.6
1945-1949	5.1	21.4	4.7	22.2	5.3	22.0	6.2	21.8	9.4	20.5	12.6	18.0	13.7	17.6
1950-1954	5.1	22.1	4.9	21.9	4.9	22.3	5.7	22.0	8.4	19.9	12.1	17.7	13.7	17.8
1955-1959	5.3	21.2	5.2	21.9	5.4	22.2	6.4	21.9	8.7	20.8	12.2	18.9	13.9	18.4
1960	5.3	21.7	5.8	21.7	5.6	21.6	6.4	19.9	9.6	20.3	11.1	20.0	13.5	17.0
1961	5.8	19.8	5.7	20.7	6.1	21.6	7.1	20.8	10.1	20.2	12.2	18.3	14.7	18.5
1962	4.9	20.1	4.8	21.1	5.3	22.6	6.2	22.1	8.2	21.5	11.2	19.3	13.9	17.9
1963	5.8	20.1	6.2	20.6	6.4	20.9	7.3	21.7	9.3	21.5	11.5	20.1	14.3	19.3
1964	5.7	19.6	6.1	20.4	5.9	21.0	6.8	21.2	8.4	21.2	13.1	17.5	13.4	16.2
Mean	5.2	20.9	5.1	21.5	5.4	21.7	6.5	21.6	9.1	20.6	12.3	19.1	13.8	18.5
Maximum	8	24.4	9	24.4	8	25.0	11	26.7	15	24.0	20	24.4	20	24.2
Mean Max.	6.3	21.8	6.1	22.6	6.3	22.8	8.1	22.9	11.6	22.4	14.6	21.0	15.8	20.3
Mean Min.	3.7	17.8	3.6	18.7	4.2	19.1	5.4	19.3	6.9	17.8	10.2	16.5	11.9	16.5
Minimum	1	10.7	0	10.1	0	10.7	3	11.0	4	11.1	7	10.7	8	11.4
SITKA,														
1924-1925	3.0	21.1	3.4	22.8	3.7	21.3	5.2	21.1	8.3	15.9	10.4	16.4	12.0	13.6
--														
1943-1944	6.0	21.8	5.6	22.1	5.4	22.0	6.7	21.6	9.4	19.4	11.7	17.4	13.4	17.8
1945-1949	4.5	21.8	4.5	22.9	4.7	22.0	6.0	22.0	9.3	19.5	11.2	18.4	13.2	18.3
1950-1954	4.6	23.2	3.8	22.8	3.9	23.0	5.2	22.4	7.9	20.1	11.2	18.3	13.5	18.6
1955-1959	4.8	22.5	4.3	22.5	4.4	22.4	6.1	21.8	8.6	19.8	11.4	18.7	13.7	18.6
1960	5.3	21.9	5.7	22.6	5.2	22.5	6.7	22.0	10.5	20.4	11.9	20.1	13.2	19.7
1961	5.5	21.1	5.5	22.1	5.9	22.2	6.9	20.6	10.4	21.4	11.8	20.2	14.4	19.0
1962	4.5	21.2	4.2	21.6	4.5	21.2	6.1	21.5	9.3	20.8	11.5	18.7	13.4	18.1
1963	5.1	19.6	6.0	21.4	5.9	21.2	7.1	21.8	10.7	20.8	11.7	19.7	14.5	19.1
1964	5.7	21.5	5.1	20.6	5.2	21.5	6.4	20.2	9.0	19.9	12.6	18.5	13.6	18.4

*Observations for the year are incomplete; extremes are for the months shown.

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
WASH.-continued															
11.9	22.1	11.6	22.0	10.6	22.4	9.0	22.4	7.9	22.3	9.4	22.1				
14	23.9	15	22.9	14	23.2	10	23.0	9	23.2			16	24.0		
13.8	23.2	14.3	22.8	12.8	23.0	9.8	22.8	8.8	22.6						
10.7	20.4	10.3	19.6	9.2	21.8	7.8	21.8	5.8	21.8						
10	19.4	10	19.2	9	21.5	7	21.5	6	21.2					4	19.0
JUAN ISLAND, WASH.															
10.9	22.1	10.3	22.3	9.6	22.8	8.7	22.8	8.2	22.5	8.9	22.4	14	23.6	6	17.6
11.4	22.5	11.0	22.6	10.2	22.6	9.6	22.6	8.7	22.5	9.7	22.4	15	24.7	7	18.9
11.1	22.4	10.6	22.6	9.7	22.7	8.8	22.7	8.0	22.6	9.0	22.4	16	23.9	6	14.1
10.8	22.4	10.6	22.6	9.5	23.0	8.7	22.9	8.1	22.6	8.6	22.6	13	23.7	5	19.4
11.1	22.3	10.6	22.5	9.8	22.8	8.9	22.7	8.3	22.5	9.1	22.4				
15	23.7	13	23.5	11	23.7	11	23.5	9	23.4			16	24.7		
12.9	23.0	11.7	23.1	10.4	23.2	9.4	23.1	8.6	22.9						
10.2	20.2	10.1	21.4	9.3	22.0	8.5	22.3	7.7	22.0						
9	18.5	9	19.4	9	20.0	8	21.8	7	19.8					5	14.1
WASH.															
16.2	--	13.8	--	10.7	--	9.1	--	6.9	--	10.5	--	18	--	0	--
ALASKA															
14.1	19.3	11.5	17.8	9.4	18.3	7.3	17.7	5.3	20.4	8.6	19.8	17	23.8	3	8.0
14.5	18.6	12.2	20.1	9.3	19.5	7.3	19.4	5.9	20.1	9.1	20.1	18	24.2	2	10.1
14.5	18.0	11.9	18.6	9.2	18.3	7.1	18.0	5.7	19.7	8.8	19.5	17	25.4	2	10.2
13.2	18.4	12.1	18.5	9.7	18.2	7.2	17.2	5.2	17.4	8.5	19.3	20	26.7	1	10.1
13.9	19.3	12.7	19.4	9.9	18.9	7.1	18.4	6.2	19.3	9.2	20.4	20	24.4	0	12.4
13.9	18.3	12.1	18.4	9.2	18.0	6.9	18.5	5.4	20.8	8.7	19.8	17	24.6	0	11.2
14.2	18.1	12.2	18.7	9.5	18.5	7.4	19.1	6.2	20.3	8.7	19.9	17	23.8	2	10.7
13.8	17.9	12.3	18.6	9.2	18.8	6.8	19.1	5.7	20.2	8.7	20.0	18	24.3	0	10.0
14.2	17.8	12.2	18.4	9.8	17.7	7.4	17.6	6.6	20.1	9.0	19.5	16	23.4	4	14.8
15.1	19.3	12.4	18.4	9.2	17.0	6.5	18.0	5.6	21.6	9.2	19.5	17	22.4	4	13.6
13.8	18.0	11.8	19.2	9.7	19.2	8.1	18.6	6.7	18.2	8.7	19.8	16	23.4	3	14.4
15.0	19.0	13.3	18.1	10.6	17.4	7.6	18.9	6.9	20.7	9.5	19.9	16	22.8	4	14.2
13.3	17.0	12.2	18.5	9.9	18.4	7.3	18.6	5.7	21.1	9.0	19.2	14	22.5	4	14.6
14.1	18.4	12.2	18.8	9.4	18.5	7.2	18.5	5.8	19.8	8.8	19.8				
18	22.8	19	22.8	15	22.9	16	22.6	10	23.3			20	26.7		
15.9	20.3	14.1	20.8	11.1	20.7	8.7	20.5	7.2	21.9						
12.4	16.4	10.4	16.2	7.8	15.0	5.4	15.3	4.1	16.9						
8	11.3	8	9.7	4	10.1	2	8.0	1	10.1					0	8.0
ALASKA															
13.4	15.1	11.4	15.7	9.7	17.2	6.4	18.7	5.4	18.6	7.7	18.1	18	23.3	-1	8.2
14.2	17.8	12.4	17.4	9.8	19.1	7.3	20.8	6.1	20.4	9.0	19.8	17	24.0	4	10.2
13.7	19.1	11.9	18.3	9.2	19.9	6.9	20.9	5.2	22.4	8.4	20.5	17	23.9	1	10.5
14.2	19.3	12.1	19.2	9.4	20.6	7.3	21.4	5.9	22.0	8.2	20.9	18	24.2	2	10.7
14.1	18.6	12.2	19.9	8.9	20.5	6.9	20.6	5.7	21.8	8.4	20.6	17	23.8	2	11.1
13.4	19.3	12.0	18.9	9.6	19.2	7.3	21.0	6.4	20.9	8.9	20.7	16	23.2	4	14.7
14.9	18.1	12.7	18.3	9.1	19.2	6.9	21.3	5.2	21.9	9.1	20.4	18	26.3	4	11.5
13.9	18.7	12.2	18.4	9.8	20.5	8.1	20.8	6.6	20.8	8.7	20.2	17	23.0	2	14.4
15.4	20.0	13.8	20.1	10.7	19.4	7.9	21.7	6.1	21.2	9.6	20.5	18	23.3	3	15.1
14.0	18.4	12.4	20.6	9.8	19.7	7.4	20.7	4.8	21.9	8.8	20.2	17	23.3	3	13.0

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
SITKA,														
Mean	4.8	22.1	4.4	22.5	4.6	22.2	6.0	21.8	8.9	19.8	11.4	18.5	13.5	18.3
Maximum	8	24.2	7	24.2	7	24.2	11	24.2	15	23.5	18	22.5	17	26.3
Mean Max.	5.9	23.3	5.2	23.4	5.4	23.3	7.9	23.0	11.7	22.4	13.4	21.3	15.6	21.4
Mean Min.	3.3	19.8	3.4	20.5	3.6	20.0	4.6	19.9	6.9	16.0	9.6	14.7	11.7	14.8
Minimum	-1	15.1	2	15.9	2	14.1	3	16.9	5	10.2	7	10.5	10	9.3
JUNEAU,														
1937-1939	3.0	21.1	1.9	21.5	3.4	21.8	5.1	21.1	8.2	14.9	10.8	10.9	11.5	9.4
1940-1944	3.2	20.4	3.2	21.1	3.4	21.5	5.2	18.8	8.4	13.8	11.1	10.0	10.9	7.9
1945-1949	2.3	20.2	1.9	22.0	2.8	21.2	4.1	20.3	7.5	13.3	10.2	9.1	10.6	8.8
1950-1954	1.4	21.9	1.3	22.0	2.2	22.4	3.9	21.0	7.1	13.7	10.2	11.2	10.9	9.9
1955-1959	2.0	21.1	2.0	21.2	2.5	22.1	4.3	21.0	6.9	14.5	10.3	9.7	10.9	8.0
1960	3.3	20.9	3.8	21.2	3.8	21.7	5.8	20.6	9.5	13.7	9.7	9.7	10.2	7.9
1961	3.9	20.1	3.6	21.3	3.7	21.4	5.4	19.1	7.7	13.7	10.3	9.4	10.6	6.9
1962	2.1	20.0	2.2	21.6	2.3	22.2	4.5	21.4	7.6	16.8	9.1	8.9	11.8	8.0
1963	3.0	20.7	3.6	20.3	3.7	19.6	4.9	21.5	9.3	15.9	9.9	11.1	11.8	7.8
1964	3.7	21.2	3.7	20.8	3.3	21.7	4.9	21.0	7.3	19.3	11.3	9.4	11.1	9.5
Mean	2.4	20.9	2.3	21.5	2.9	21.7	4.6	20.5	7.7	14.3	10.4	10.1	10.9	8.7
Maximum	6	25.9	5	24.4	5	27.7	10	24.5	15	24.5	15	20.6	16	19.4
Mean Max.	3.7	23.0	3.4	23.1	3.9	23.6	6.6	23.0	11.0	21.2	13.6	16.2	13.6	13.8
Mean Min.	0.6	15.3	0.8	15.9	1.6	16.9	3.1	14.3	5.3	6.2	7.4	4.3	8.6	3.7
Minimum	-2	5.4	-1	9.5	-1	5.0	1	5.8	4	-0.9	4	-0.1	6	1.1
HAINES,														
1949-1950	1.4	22.7	-0.9	22.8	2.9	23.2	4.3	22.4	8.8	19.9	12.6	13.3	12.8	6.4
SKAGWAY,														
1944	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1945-1949	2.8	23.0	2.4	23.5	2.8	22.8	3.7	23.0	7.4	14.7	10.2	5.6	10.5	3.6
1950-1954	2.3	23.3	1.9	23.5	2.1	23.4	3.1	22.9	7.2	16.4	10.4	6.0	10.9	1.8
1955-1959	2.6	22.6	2.2	22.8	2.3	23.2	3.1	22.9	6.8	17.6	10.4	7.2	10.8	3.5
1960	2.3	22.4	3.2	23.0	3.3	24.1	4.4	23.6	7.7	17.7	10.2	12.2	8.8	8.9
1961	3.0	21.5	3.3	22.4	3.6	22.6	4.3	23.0	5.6	23.0	8.0	15.1	9.4	4.4
1962	2.4	23.4	1.7	23.1	1.7	23.0	2.6	22.6	3.9	21.9	7.0	11.2	10.1	1.8
1963	2.6	23.7	1.8	22.8	3.5	22.8	3.6	24.0	7.4	19.1	10.4	8.3	10.7	6.3
1964	3.7	22.8	3.3	22.8	--	--	3.9	23.0	4.4	22.1	7.9	7.6	9.7	4.0
Mean	2.6	22.9	2.3	23.1	2.5	23.2	3.4	23.0	6.8	17.5	9.9	7.6	10.5	3.5
Maximum	5	24.8	4	25.2	4	24.9	7	25.1	14	24.2	14	23.4	15	18.2
Mean Max.	3.4	23.6	2.9	23.7	3.0	23.8	4.9	24.0	9.5	22.7	11.8	16.1	12.2	7.8
Mean Min.	1.7	22.1	1.6	22.4	2.0	21.9	2.4	20.3	4.6	9.5	8.0	2.1	9.0	3.5
Minimum	-1	20.2	0	20.6	0	13.5	1	9.5	3	1.3	4	-0.6	7	-1.3
YAKUTAT,														
1941-1944	5.1	22.0	5.0	22.1	5.4	21.7	6.4	21.6	8.9	20.9	11.5	19.0	13.4	17.0
1945-1949	4.2	22.1	3.5	22.6	4.0	22.2	5.2	22.1	8.1	20.5	10.9	19.3	12.7	18.0
1950-1954	3.2	22.5	3.0	22.8	3.3	22.8	4.9	22.2	7.1	21.2	10.3	19.3	12.7	17.1
1955-1959	3.2	21.7	2.8	21.7	3.3	21.8	5.4	21.2	7.9	20.1	11.3	19.0	13.4	17.0
1960	3.3	21.6	4.3	21.8	3.9	22.1	5.6	21.4	9.7	20.9	11.6	20.0	12.9	17.0
1961	4.6	21.8	3.4	22.0	4.1	22.2	6.1	21.1	9.6	20.4	11.0	19.4	12.1	16.9
1962	2.9	22.0	2.4	22.4	2.8	22.7	4.3	22.0	7.7	21.1	10.1	20.0	13.2	17.4
1963	4.7	22.2	4.9	22.3	5.1	22.3	5.6	22.7	8.3	22.3	10.2	21.0	13.4	19.2
1964	5.2	22.1	4.4	21.9	4.3	22.2	5.1	21.8	7.1	21.6	11.8	19.7	12.6	19.6

*Observations for the year are incomplete; extremes are for the months shown.

**Temperatures and Densities
Extremes**

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
ALASKA—continued															
14.1	18.7	12.2	18.9	9.4	19.9	7.1	20.8	5.7	21.5	8.5	20.4				
18	23.2	16	22.8	13	23.3	10	24.2	8	24.2			18	26.3		
15.7	21.4	13.8	21.7	11.2	22.2	8.6	22.8	6.9	22.9						
12.7	14.5	10.4	14.8	7.6	15.3	5.4	16.8	4.1	17.9						
11	9.1	8	9.5	6	11.1	3	8.2	0	8.9					-1	8.2
ALASKA															
11.1	9.4	9.6	11.0	7.2	13.6	5.1	18.6	3.7	19.8	6.7	16.1	14	24.3	-2	0.5
10.6	9.2	9.3	11.0	6.8	13.2	4.9	17.4	3.5	20.6	6.7	15.4	15	23.5	-1	0.8
10.4	9.8	8.9	11.0	6.4	13.1	4.2	15.9	2.6	20.6	6.0	15.4	16	27.5	-2	-1.4
11.1	10.9	9.3	10.8	6.6	14.3	4.5	17.3	3.2	19.4	6.0	16.2	16	27.7	-1	1.4
10.0	8.8	9.0	12.0	6.2	15.0	4.5	17.7	3.3	19.6	6.0	15.9	15	24.5	-1	-0.9
10.5	8.5	8.9	9.7	6.9	11.6	4.9	16.7	4.2	17.6	6.8	15.0	13	22.7	2	1.9
10.7	6.7	9.3	9.7	6.2	11.8	4.0	17.7	2.7	21.7	6.5	15.0	14	22.7	1	1.1
11.7	9.4	9.0	10.5	7.2	14.0	5.8	16.8	4.1	18.1	6.4	15.6	16	23.3	-1	2.0
12.1	9.7	10.0	10.4	7.6	14.2	5.1	20.4	4.5	20.8	7.1	16.0	15	22.8	1	4.9
10.4	10.0	9.7	14.7	7.2	16.0	4.9	19.3	2.2	21.7	6.6	17.0	14	23.6	-1	5.7
10.7	9.6	9.2	11.1	6.7	13.8	4.7	17.4	3.3	20.0	6.3	15.8				
16	23.5	14	20.1	9	22.2	8	23.7	6	24.9			16	27.7		
13.1	15.3	11.2	16.8	8.4	18.9	6.0	21.4	4.4	22.8						
8.9	4.3	7.6	4.5	4.9	6.8	2.8	10.1	1.5	13.2						
8	0.5	6	-0.3	2	-1.4	0	2.8	-2	5.8					-2	-1.4
ALASKA															
12.7	5.3	10.6	7.3	6.8	17.5	3.4	20.8	1.8	22.2	6.4	17.0	18	26.1*	-2	0.9*
ALASKA															
9.4	3.6	8.2	7.1	6.2	10.2	4.5	21.4	3.6	20.5	--	--	12*	25.9*	2*	-0.3*
10.1	3.0	9.0	7.2	6.6	13.7	4.7	19.4	3.6	22.2	6.2	15.1	14	25.9	-1	-0.5*
10.4	2.5	8.5	8.0	6.3	16.4	4.5	20.0	3.3	22.2	5.9	15.5	15	25.2	0	-1.2
9.8	3.5	9.2	7.7	6.4	18.4	3.8	21.4	2.9	22.1	5.9	16.1	15	25.4	1	-0.4
9.5	1.2	9.3	10.2	8.1	10.9	5.1	20.6	2.7	20.8	6.2	16.3	11	24.9	1	-0.3
8.9	-0.7	9.2	7.4	6.9	17.4	3.9	15.1	3.1	23.4	5.8	16.2	10	23.9	2	-1.5
10.3	1.8	9.6	10.2	7.2	14.7	5.7	20.3	3.9	23.6	5.5	16.5	11	24.1	2	-1.0
10.7	2.8	8.6	12.4	7.2	13.2	5.1	13.5	4.3	21.8	6.3	15.9	11	25.1	1	-0.6
10.7	3.9	9.1	9.8	7.6	16.9	4.8	21.0	3.3	24.0	--	--	13*	25.2*	2*	-0.1*
10.1	2.7	8.9	8.3	6.7	15.6	4.4	19.8	3.3	22.2	6.0	15.8				
13	19.3	13	22.4	9	25.4	7	25.9	6	25.2			15	25.9		
11.4	7.6	10.2	16.5	8.1	20.8	5.6	22.5	4.1	23.4						
8.8	2.9	7.4	2.6	5.1	7.2	3.2	13.9	2.4	19.6						
7	-1.5	5	-0.3	2	0.0	1	0.9	1	10.8					-2	-1.5
ALASKA															
13.7	16.9	11.8	19.2	9.2	19.8	7.6	21.5	5.5	21.8	8.6	20.3	17	26.5	2	10.5
12.6	17.8	11.2	18.9	8.9	20.6	6.8	21.7	4.7	22.3	7.7	20.7	18	24.2	1	10.3
12.8	17.0	11.3	18.0	8.9	20.4	6.6	21.3	4.9	22.0	7.4	20.6	17	24.9	1	10.1
13.1	17.0	11.2	18.6	8.2	20.0	5.7	20.5	4.1	21.5	7.5	20.0	18	25.1	-1	5.4
13.0	16.9	10.8	17.8	8.8	19.7	6.1	21.1	5.2	21.0	7.9	20.1	15	23.0	2	10.0
12.8	16.0	11.6	19.1	8.3	20.4	5.9	22.1	2.9	22.2	7.7	20.3	15	23.3	2	13.8
13.4	18.2	11.6	19.3	9.2	20.8	7.9	21.5	6.0	22.1	7.6	20.8	16	23.1	2	15.1
13.5	18.0	12.6	18.8	10.4	20.9	7.1	22.2	5.8	21.8	8.5	21.1	16	23.5	3	14.4
12.7	19.9	11.5	20.1	8.7	20.7	7.1	20.7	4.2	22.0	8.0	21.1	14	23.1	3	13.7

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
	YAKUTAT,													
Mean	3.9	22.0	3.6	22.3	3.9	22.2	5.4	21.8	8.1	20.8	10.9	19.4	13.0	17.4
Maximum	7	25.1	8	24.2	8	25.1	9	24.9	15	23.9	16	23.3	18	23.3
Mean Max.	5.1	23.2	4.7	23.2	5.0	23.2	7.6	23.0	10.7	22.9	13.8	22.1	15.2	21.1
Mean Min.	2.3	20.2	2.6	20.5	2.7	20.5	3.8	19.6	5.7	17.7	8.7	15.4	10.9	13.0
Minimum	-1	16.8	1	17.8	-1	17.7	2	14.6	4	10.0	7	10.1	9	5.4
	CORDOVA,													
1949-1953	3.2	22.9	2.1	22.8	2.1	23.0	3.5	22.7	5.3	22.5	7.8	21.4	9.8	20.2
--	--	--	--	--	--	--	--	--	4.1	--	6.1	--	9.5	--
1956	--	--	--	--	--	--	--	--	--	--	9.7	22.3	10.9	21.1
1957	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1959	--	--	--	--	--	--	--	--	6.9	22.9	10.6	22.3	10.4	20.7
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1961	--	--	--	--	--	--	--	--	7.8	21.6	10.1	20.5	--	--
Mean	3.2	22.9	2.1	22.8	2.1	23.0	3.5	22.7	5.8	22.4	8.6	21.6	10.0	20.5
Maximum	8	23.4	4	23.6	4	23.8	7	23.4	10	23.6	14	23.8	13	22.9
Mean Max.	5.0	23.3	3.3	23.3	2.9	23.4	5.0	23.3	7.6	23.3	10.9	22.8	12.4	21.8
Mean Min.	1.5	22.5	1.0	21.5	0.6	22.5	2.6	21.7	4.6	20.6	6.7	20.2	8.4	18.2
Minimum	0	22.3	1	18.7	-1	22.4	1	20.3	3	18.0	5	19.2	8	16.3
	SEWARD,													
1926-1929	4.1	20.8	3.7	21.4	3.3	21.4	4.8	20.3	7.6	16.5	11.3	9.4	12.3	4.4
1930-1934	3.6	23.0	2.9	22.0	3.5	21.3	4.7	21.1	7.5	16.8	10.9	11.0	12.2	7.9
1935-1939	3.7	21.3	3.8	21.6	3.8	22.4	5.3	21.9	7.8	17.3	11.9	8.5	13.1	6.6
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1945-1949	3.2	21.2	3.1	21.2	3.3	20.8	4.2	21.4	6.8	15.5	9.4	7.8	10.9	5.8
1950-1954	3.5	22.0	2.6	21.9	2.8	22.2	4.1	20.4	7.2	15.3	9.3	10.7	11.8	7.1
1955-1959	3.0	22.2	3.3	22.7	3.3	22.8	4.1	22.1	7.1	17.5	10.2	10.0	11.5	3.8
1960	--	--	3.6	22.4	3.7	22.9	4.5	21.8	7.9	10.3	10.8	8.4	12.9	7.8
1961	4.4	21.1	--	--	3.3	23.3	4.9	22.5	8.4	18.0	11.3	9.4	--	--
1962	1.9	23.4	2.3	23.2	2.2	23.4	3.6	23.0	6.6	19.2	10.7	11.8	12.8	6.8
1963	3.1	21.7	3.4	22.5	3.6	22.4	4.6	22.5	7.2	18.8	10.9	10.6	13.2	9.9
1964	4.6	22.4	3.1	22.6	--	--	--	--	--	--	11.6	14.1	13.7	12.8
Mean	3.5	22.0	3.2	22.0	3.3	22.0	4.6	21.4	7.3	16.5	10.6	9.8	12.1	6.5
Maximum	7	29.2	6	25.5	7	25.5	8	27.4	12	23.9	16	24.4	18	24.3
Mean Max.	4.9	23.6	4.3	23.6	4.4	23.8	6.4	23.8	10.0	22.6	13.4	20.2	14.8	17.1
Mean Min.	1.9	17.6	1.6	18.3	2.2	18.6	3.1	15.7	4.8	6.8	7.8	1.5	9.1	0.7
Minimum	0	6.4	-2	7.9	0	9.8	1	6.2	0	-2.2	6	-1.6	6	-1.5
	KODIAK, KODIAK													
1889-1890	3.3	--	2.8	--	3.2	--	2.7	--	6.1	--	7.8	--	9.4	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1935-1936	3.9	22.7	3.9	23.2	3.1	23.7	4.3	24.1	6.3	22.3	8.6	22.8	9.8	23.2
Mean	3.5	--	3.2	--	3.2	--	3.4	--	6.2	--	8.2	--	9.6	--
Maximum	5	--	5	--	5	--	6	--	9	--	12	--	14	--
Mean Max.	4.6	--	4.0	--	3.8	--	4.6	--	7.9	--	10.7	--	12.0	--
Mean Min.	2.3	--	0.9	--	1.9	--	2.1	--	5.2	--	6.5	--	8.0	--
Minimum	2	--	0	--	1	--	1	--	4	--	6	--	7	--
	WOMENS BAY, KODIAK													
1950-1954	0.4	22.0	0.2	22.4	1.2	23.0	3.7	21.7	6.4	17.2	8.8	13.3	11.9	15.3
1955-1959	-0.2	21.2	0.6	19.9	1.2	21.7	3.8	21.6	6.5	16.0	9.0	12.4	11.4	14.1

*Observations for the year are incomplete; extremes are for the months shown.

**Temperatures and Densities
Extremes**

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
ALASKA-continued															
13.1	17.3	11.4	18.7	8.9	20.3	6.7	21.3	4.8	21.9	7.8	20.4				
18	23.1	15	22.8	12	23.4	10	23.8	8	26.5			18	26.5		
14.9	20.9	12.9	21.5	10.6	22.0	8.3	22.5	6.4	23.0						
11.6	13.4	9.8	15.4	7.2	17.1	4.7	19.2	3.2	20.3						
10	10.0	8	11.1	5	10.4	2	14.4	0	17.4					-1	5.4
ALASKA															
11.3	18.5	10.0	18.6	7.5	20.2	5.3	21.7	4.6	22.5	6.0	21.4	14	23.8	-1	13.5
10.8	--	--	--	--	--	--	--	--	--	--	--	12*	--	--	--
11.9	19.8	--	--	--	--	--	--	--	--	--	--	14*	23.8*	--	12.7*
11.7	20.4	--	--	--	--	--	--	--	--	--	--	14*	23.7*	--	16.3*
12.0	--	--	--	--	--	--	--	--	--	--	--	13*	23.3*	--	18.0*
11.4	19.2	10.0	18.6	7.5	20.2	5.3	21.7	4.6	22.5	6.2	21.5	14	23.8	-1	13.5
14	21.9	13	22.5	9	22.3	7	23.1	7	23.2			14	23.8		
13.0	20.4	11.7	21.1	8.6	21.8	6.1	22.7	5.6	23.0						
10.0	16.0	7.8	15.1	6.2	17.7	3.7	20.5	2.3	21.8						
9	12.7	7	13.5	5	16.1	1	20.2	-1	21.3					-1	13.5
ALASKA															
12.4	6.9	11.5	10.7	7.8	18.1	4.4	17.6	4.7	21.6	7.3	15.8	18	27.4	0	-0.2
12.0	7.3	10.5	14.0	7.8	17.6	5.8	20.3	4.7	21.4	7.2	17.0	18	29.2	1	-0.2
13.0	9.3	11.0	13.1	8.2	14.9	6.1	18.4	4.8	20.0	7.7	16.3	18	26.5	0	-0.4
11.1	8.8	9.6	10.6	7.5	15.1	5.8	19.5	4.6	21.7	6.6	15.8	14	23.6	-2	-0.5
11.8	8.5	10.1	12.4	7.9	15.7	6.1	18.8	4.5	21.4	6.8	16.4	15	26.0	-1	-1.3
12.3	10.1	10.7	13.7	7.9	19.3	5.9	20.2	4.1	22.1	7.0	17.2	16	26.4	1	-2.0
12.6	11.1	11.2	16.0	8.7	19.0	6.7	21.0	5.2	21.6	--	--	16	23.5*	1	-2.2*
--	--	11.2	14.8	--	--	--	--	--	--	--	--	--	23.7*	2*	0.9*
12.9	12.4	9.9	18.9	8.4	19.8	6.3	21.7	3.9	22.3	6.8	18.8	15	24.1	0	-1.1
13.7	11.9	12.2	14.6	9.2	18.2	6.7	21.8	4.6	20.7	7.7	18.0	16	23.8	1	1.6
12.4	16.3	11.9	15.9	9.4	19.4	6.4	20.6	4.8	--	--	--	15	23.2*	2*	5.0*
12.2	9.0	10.6	13.1	8.0	17.0	5.8	19.5	4.6	21.3	7.2	16.7				
18	22.8	15	23.6	13	26.9	9	26.6	8	27.4			18	29.2		
14.8	19.2	12.9	21.0	10.2	22.0	7.7	22.9	6.1	23.5						
9.4	1.5	8.1	3.4	5.6	7.6	3.6	10.8	2.6	16.0						
7	-0.5	6	-0.7	2	-0.4	0	0.6	0	4.5					-2	-2.2
ISLAND, ALASKA															
10.5	--	9.7	--	7.6	--	5.7	--	3.5	--	6.0	--	14	--	0	--
10.4	23.8	9.9	22.6	7.3	22.8	5.4	23.1	3.5	23.1	6.4	23.1	12	25.1	2	16.2
10.4	--	9.8	--	7.5	--	5.6	--	3.5	--	6.2					
12	--	12	--	9	--	7	--	6	--			14	--		
11.6	--	11.1	--	9.0	--	6.7	--	4.7	--						
9.8	--	8.8	--	6.0	--	4.1	--	2.2	--						
9	--	8	--	3	--	3	--	1	--					0	--
ISLAND, ALASKA															
11.8	17.5	10.4	18.6	7.2	19.4	3.9	19.7	1.5	21.8	5.6	19.3	17	28.5	-2	-0.1
12.2	19.0	9.7	19.6	6.1	20.2	3.1	18.6	0.8	21.2	5.4	18.8	17	27.8	-3	-1.2

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
WOMENS BAY, KODIAK ISLAND,														
1960	1.0	17.6	1.7	20.9	1.1	22.8	3.2	22.5	6.6	--	8.4	--	11.1	13.2
1961	2.1	17.1	1.9	22.1	0.1	23.3	3.4	23.1	7.8	17.7	9.8	16.9	11.3	19.1
1962	-0.8	18.8	-0.1	19.8	1.4	23.1	3.8	21.7	6.4	19.4	9.2	18.4	12.8	20.0
1963	1.8	17.6	1.8	19.3	2.6	19.4	3.6	23.3	7.7	20.3	10.3	18.5	13.4	20.2
1964	1.9	19.7	1.1	21.8	1.3	22.7	3.4	22.8	5.8	21.4	9.3	10.4	11.2	14.6
Mean	0.5	20.4	0.7	20.9	1.2	22.2	3.7	22.0	6.6	17.5	9.1	13.8	11.8	15.6
Maximum	4	26.8	4	25.1	6	25.0	8	27.8	11	27.6	16	23.8	17	23.7
Mean Max.	2.6	23.9	2.8	23.5	3.4	23.8	5.9	24.4	8.9	23.7	12.3	21.3	14.9	21.8
Mean Min.	-1.7	12.6	-1.5	14.4	-0.6	18.8	1.3	16.9	4.7	4.3	5.8	2.7	9.2	4.3
Minimum	-3	-0.1	-3	3.2	-3	1.3	-1	13.7	4	-1.2	4	-1.2	6	-1.0
DUTCH HARBOR, AMAKNAK														
1946-1949	2.2	23.8	2.3	23.6	2.4	23.7	4.2	23.6	5.0	23.9	6.9	23.0	9.0	23.6
1950-1954	2.9	23.7	2.2	23.7	3.0	23.8	3.9	23.6	5.7	23.4	7.2	23.1	9.3	23.4
1955	3.3	23.4	3.2	23.9	3.7	24.0	3.8	24.1	4.7	23.5	--	--	7.6	23.5
Mean	2.7	23.7	2.3	23.7	2.9	23.8	4.1	23.7	5.3	23.6	7.1	23.1	8.9	23.5
Maximum	4	24.6	4	24.6	4	24.8	7	25.2	9	25.2	11	26.2	12	24.8
Mean Max.	3.8	24.3	2.9	24.2	3.8	24.2	5.6	24.5	6.8	24.6	9.0	24.6	10.6	24.4
Mean Min.	1.7	22.6	1.4	23.0	1.8	23.0	2.6	21.7	4.0	22.0	5.5	21.2	6.9	21.7
Minimum	1	18.8	0	21.4	1	22.0	1	18.1	3	17.9	4	16.5	6	19.7
UNALASKA, UNALASKA														
1955-1959	2.0	19.4	1.5	17.0	1.5	20.6	3.8	18.9	5.3	16.2	7.7	15.8	9.8	18.0
1960	2.7	18.3	1.8	21.6	--	--	--	--	5.3	19.2	7.8	17.7	10.3	20.7
1961	2.0	19.8	1.4	19.3	2.0	17.6	4.4	--	6.8	14.3	8.8	18.4	9.8	20.9
1962	1.2	20.7	2.3	20.4	3.1	21.0	3.6	20.2	5.0	21.5	9.3	21.1	9.1	22.3
1963	3.1	20.2	2.0	22.0	3.7	22.7	4.4	22.6	5.6	22.4	6.5	22.2	9.6	22.7
1964	3.1	23.0	2.9	22.8	2.9	23.1	3.7	22.4	5.2	22.1	7.6	20.8	8.3	22.4
Mean	2.3	20.1	1.9	20.0	2.4	21.0	3.9	20.3	5.4	18.3	7.9	18.1	9.6	20.1
Maximum	4	23.9	4	25.2	4	23.8	7	24.3	9	24.2	13	23.8	15	25.1
Mean Max.	3.5	23.3	3.4	23.6	3.6	23.5	5.4	23.7	6.9	23.0	10.0	22.3	11.9	23.1
Mean Min.	0.3	13.5	-0.1	12.4	1.2	14.6	2.6	13.8	4.1	11.9	6.1	12.8	7.4	15.0
Minimum	-2	7.9	-1	-0.2	-1	4.2	1	5.8	3	3.4	4	5.9	4	7.2
SWEEPER COVE, ADAK														
1944	1.7	23.8	2.2	22.5	2.6	21.0	3.5	20.3	4.8	22.3	6.4	23.7	--	--
1945-1949	2.4	20.6	2.7	20.7	3.0	19.7	3.9	17.4	5.3	17.9	6.8	20.5	8.2	20.7
1950-1954	2.7	23.2	2.4	23.2	3.3	22.4	3.7	21.1	5.1	21.1	6.6	22.6	7.3	23.8
1955-1959	2.9	24.1	3.1	23.7	3.1	23.8	4.1	23.7	4.8	24.0	6.4	24.0	7.6	24.3
1960	3.2	24.0	2.6	24.4	3.5	22.9	3.4	24.5	4.7	24.1	6.6	24.2	7.9	24.2
1961	--	--	--	--	--	--	--	--	4.8	24.3	6.6	--	--	--
1962	--	--	--	--	--	--	3.8	24.5	4.6	24.3	7.3	24.3	7.6	23.8
1963	3.1	21.9	1.4	21.2	3.4	20.0	4.2	--	5.1	23.6	6.6	23.4	8.4	22.9
1964	--	--	--	--	--	--	1.1	24.1	3.3	24.4	5.4	24.5	5.6	24.6
Mean	2.7	22.7	2.6	22.4	3.2	21.7	3.7	21.0	4.9	21.6	6.6	22.8	7.6	23.1
Maximum	5	25.2	6	27.0	7	26.2	7	26.4	8	25.9	12	26.1	14	26.8
Mean Max.	4.0	24.8	4.1	24.8	4.8	24.8	5.3	24.9	6.8	25.0	9.1	25.0	10.9	25.2
Mean Min.	0.6	18.4	0.7	16.9	1.5	14.0	1.9	14.3	3.4	14.7	4.6	17.3	5.3	18.4
Minimum	-2	8.5	-1	8.9	-1	3.8	-2	0.5	1	-1.2	3	3.5	2	3.4

*Observations for the year are incomplete; extremes are for the months shown.

Temperatures and Densities
Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
ALASKA-continued															
--	--	9.5	18.9	--	--	3.6	21.5	2.7	20.4	--	--	14	26.2*	-2	0.9*
11.8	21.4	--	--	5.6	22.3	2.1	--	-0.1	--	--	--	14	26.8*	-1	-1.2*
12.4	21.5	9.9	21.3	7.0	21.6	4.4	17.1	2.2	18.2	5.7	20.1	16	26.1	-3	-0.3
14.4	21.9	11.4	14.9	7.2	21.0	3.0	22.6	2.9	16.4	6.7	19.6	17	26.0	-2	-1.5
11.3	18.0	10.1	17.6	6.7	19.3	3.1	21.1	-0.2	--	5.4	--	16	24.1*	-2	0.9*
12.1	18.9	10.1	18.8	6.6	20.1	3.4	19.6	1.3	20.8	5.6	19.2				
17	26.8	14	27.3	11	27.7	7	28.5	6	25.3			17	28.5		
14.7	23.1	12.2	23.4	9.2	24.6	5.7	23.8	3.5	23.7						
10.2	8.7	7.4	9.2	3.6	10.7	0.5	10.8	-1.2	12.2						
6	-0.1	4	0.0	2	0.6	-2	-0.4	-3	-1.5					-3	-1.5
ISLAND, ALASKA															
9.4	23.9	8.2	23.6	6.2	23.9	4.6	23.6	3.3	23.8	5.3	23.7	12	27.5	1	16.5
10.1	23.8	8.4	23.8	6.7	23.7	5.0	23.8	3.7	23.7	5.7	23.6	18	25.4	0	17.9
--	--	--	--	--	--	--	--	--	--	--	--	--	24.7*	2*	21.5*
9.8	23.8	8.3	23.7	6.5	23.8	4.8	23.7	3.6	23.8	5.5	23.7				
18	27.5	12	24.9	9	25.4	7	24.9	5	25.4			18	27.5		
12.2	24.9	10.0	24.4	7.7	24.4	5.8	24.4	4.6	24.4						
7.9	22.7	7.3	23.0	5.4	23.1	3.4	22.7	2.4	23.1						
6	22.0	7	22.3	4	22.1	2	19.1	1	22.8					0	16.5
ISLAND, ALASKA															
10.4	20.0	8.7	17.4	5.8	16.4	4.2	18.8	2.3	18.1	5.2	18.0	15	25.2	-1	-0.2
10.4	--	9.2	--	6.9	--	3.6	--	2.4	--	--	--	13	23.8*	0*	13.2*
10.1	21.2	9.4	20.9	6.1	21.4	--	--	2.1	21.1	--	--	14	23.5*	-1*	4.2*
9.7	23.4	8.6	22.4	6.4	22.0	4.7	21.7	2.9	22.6	5.5	21.6	13	24.1	-2	6.4
10.0	22.7	8.8	22.0	6.7	21.6	4.6	22.7	3.3	22.3	5.7	22.2	12	24.6	0	14.8
8.3	23.0	7.8	22.1	5.6	21.9	4.1	22.6	3.0	22.9	5.2	22.4	11	24.6	2	16.2
10.0	21.3	8.7	19.6	6.1	19.1	4.2	20.3	2.6	20.5	5.4	19.9				
13	24.6	14	23.9	9	24.3	6	24.6	7	23.9			15	25.2		
12.1	23.7	10.1	23.4	7.9	23.1	5.3	23.7	4.2	23.3						
8.4	15.2	7.2	11.2	4.1	13.2	2.8	13.9	0.4	14.4						
7	8.1	6	4.2	0	2.3	2	6.7	-1	4.9					-2	-0.2
ISLAND, ALASKA															
--	--	--	--	6.6	18.3	5.1	18.2	3.2	18.5	--	--	--	25.8*	0	6.6*
8.1	21.0	8.0	20.3	6.1	20.2	4.3	20.8	3.3	21.5	5.2	20.1	14	27.6	-2	0.5
8.3	23.9	7.9	24.2	6.1	23.9	4.6	23.7	3.2	23.6	5.1	23.1	13	27.0	-2	-1.2
8.6	24.5	7.7	24.0	6.3	24.1	4.6	24.1	3.3	23.9	5.2	24.0	13	26.2	-2	13.2
6.9	24.7	7.6	24.4	6.7	24.5	4.4	24.3	3.1	24.4	5.0	24.2	12	25.3	-1	19.2
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6.9	24.9	7.3	24.0	6.3	23.6	4.3	24.2	3.2	22.8	--	--	12	25.4*	--	14.6*
--	--	--	--	5.7	24.6	4.3	24.4	1.8	24.8	--	--	12	25.5*	-1*	13.0*
5.7	24.6	--	--	1.6	24.3	--	--	--	--	--	--	9*	25.1*	-2	22.6*
8.0	23.4	7.8	23.0	5.9	23.1	4.5	23.1	3.2	23.0	5.1	22.6				
14	27.6	11	26.3	9	25.8	8	25.3	8	25.6			14	27.6		
10.9	25.2	9.5	25.1	7.7	25.0	5.9	24.6	4.9	24.8						
6.1	19.0	6.6	17.1	4.4	19.2	2.6	19.1	0.9	18.8						
4	3.8	4	9.1	0	8.4	1	6.6	-1	9.2					-2	-1.2

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
CONSTANTINE HARBOR,														
1944-1948	3.1	24.4	2.8	25.0	3.1	24.8	4.5	24.5	--	--	5.5	24.7	6.3	24.6
Mean	3.1	24.4	2.8	25.0	3.1	24.8	4.5	24.5	--	--	5.5	24.7	6.3	24.6
Maximum	4	25.9	3	27.8	3	25.2	6	25.0	--	--	8	26.7	11	26.6
Mean Max.	3.6	25.2	3.3	26.4	--	--	--	--	--	--	6.9	25.4	8.4	25.4
Mean Min.	2.2	22.9	2.2	23.5	--	--	--	--	--	--	4.8	24.2	4.9	23.2
Minimum	2	19.7	2	22.1	2	23.7	3	22.9	--	--	4	23.9	4	22.1
MASSACRE BAY (Pyramid Cove),														
1946-1949	2.1	24.4	2.0	24.2	2.7	24.7	3.5	24.2	4.9	23.8	6.7	23.0	7.7	23.8
1950-1954	2.4	24.2	1.8	24.5	1.8	24.6	3.1	24.4	4.5	24.0	6.6	23.6	8.7	23.2
1955-1958	2.2	24.4	2.3	24.4	2.6	24.4	3.3	24.3	4.7	24.1	6.4	23.5	8.8	23.1
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1960	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1961	--	--	--	--	--	--	2.7	--	4.1	19.5	5.6	19.2	7.6	17.6
1962	--	--	--	--	2.6	19.4	3.8	23.9	5.0	23.7	6.6	23.2	8.1	23.5
1963	3.2	24.5	2.8	24.5	2.9	24.7	3.7	24.7	4.9	24.4	6.8	23.9	8.4	22.5
1964	2.6	24.3	1.3	24.4	1.7	24.7	2.2	24.6	4.9	23.9	6.1	24.1	6.6	24.0
Mean	2.3	24.3	2.1	24.4	2.3	24.2	3.2	24.3	4.7	23.6	6.5	23.2	8.2	22.9
Maximum	4	25.4	6	26.1	4	26.1	6	25.5	9	25.4	11	25.5	13	25.3
Mean Max.	3.2	24.9	3.1	25.1	3.4	24.7	4.4	25.0	6.2	24.5	8.8	24.5	11.1	24.3
Mean Min.	1.1	23.5	0.5	23.3	1.0	23.4	2.0	23.1	3.4	21.4	4.7	20.5	6.2	20.3
Minimum	-2	20.7	-2	19.6	-1	18.4	1	21.2	2	17.9	3	17.0	5	15.1
MASSACRE BAY (Murder Point),														
1958	--	--	--	--	--	--	--	--	--	--	7.8	22.7	8.5	23.3
1959	2.4	23.8	1.6	23.6	2.1	23.9	3.9	23.3	5.6	23.8	6.5	23.3	9.8	23.9
1960	0.9	24.2	0.6	24.3	2.2	24.2	3.2	23.7	4.9	23.2	6.5	23.3	8.2	23.3
PORT MOLLER,														
1948	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1949	(ice)	(ice)	(ice)	(ice)	0.4	22.2	0.9	22.5	4.8	22.7	10.4	22.7	11.8	23.0
1950	-0.1	21.6	(ice)	(ice)	-0.6	22.4	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1955	--	--	--	--	--	--	--	--	--	--	7.5	21.5	10.6	21.5
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1957	--	--	--	--	--	--	--	--	--	--	10.9	21.8	12.1	22.0
1958	--	--	--	--	--	--	--	--	--	--	--	--	10.8	21.9
1959	--	--	--	--	--	--	--	--	--	--	--	--	9.0	21.9
1960	--	--	--	--	--	--	--	--	--	--	--	--	11.9	22.6
PEARD BAY,														
1947	--	--	--	--	--	--	--	--	--	--	--	--	--	--
POINT BARROW														
1945	--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1951	--	--	--	--	--	--	--	--	--	--	--	--	6.8	21.4
POINT BARROW														
1945	--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1951	--	--	--	--	--	--	--	--	--	--	--	--	7.5	18.6

*Observations for the year are incomplete; extremes are for the months shown.

Temperatures and Densities

Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
AMCHITKA ISLAND, ALASKA															
7.0	24.6	6.9	24.3	5.8	24.5	4.7	24.3	3.7	24.2	--	--	11	27.8	2	19.7
7.0	24.6	6.9	24.3	5.8	24.5	4.7	24.3	3.7	24.2	--	--				
9	25.6	10	25.6	8	25.8	6	24.8	4	25.0			11	27.8		
9.0	25.1	8.6	24.9	6.8	24.9	5.3	24.7	4.4	24.8						
5.8	23.2	5.8	22.8	4.8	23.6	3.7	23.5	2.9	22.7						
6	21.6	6	20.2	4	22.3	3	22.9	2	21.0					2	19.7
ATTU ISLAND, ALASKA															
9.1	24.0	9.0	24.1	6.6	24.4	4.4	24.2	2.6	24.4	5.1	24.1	15	26.1	-1	17.9
9.5	23.9	8.8	24.3	6.8	24.3	4.6	24.2	2.9	24.2	5.1	24.1	14	26.1	-2	17.7
10.1	23.4	8.9	24.2	7.2	24.4	5.0	24.3	3.2	24.4	5.4	24.1	14	26.0	0	19.2
--	--	--	--	6.1	23.8	2.3	23.7	0.6	24.3	--	--	--	--	--	--
8.7	18.7	8.5	19.1	7.2	18.9	4.4	19.2	--	--	--	--	11*	19.9*	2*	15.1*
8.6	23.5	8.4	24.0	7.1	24.0	4.9	--	3.6	24.4	--	--	11*	25.3*	2*	18.4*
9.4	23.5	8.6	23.9	7.4	24.1	5.2	24.3	3.5	24.3	5.6	24.1	12	26.0	2*	18.2
7.8	24.1	7.7	24.0	6.4	24.1	2.6	23.8	2.7	24.1	4.4	24.2	11	25.6	-3	19.6
9.3	23.3	8.7	23.8	6.8	23.9	4.4	23.8	2.8	24.3	5.1	23.8				
15	25.9	11	25.5	10	26.0	7	25.5	5	25.3			15	26.1		
11.8	24.5	10.1	24.6	8.3	24.7	5.8	24.4	4.2	24.8						
7.6	21.2	7.3	22.0	5.1	22.4	2.5	22.5	1.3	23.4						
6	17.7	5	18.5	3	18.4	-3	18.3	-2	22.2					-3	15.1
ATTU ISLAND, ALASKA															
10.1	24.0	9.9	24.2	6.8	24.5	--	--	2.0	--	--	--	13	25.8*	1*	19.1*
11.3	22.9	9.7	22.9	6.3	23.3	4.6	23.7	1.2	24.3	5.4	23.6	14	25.5	0	18.6
9.1	23.9	--	--	--	--	--	--	--	--	--	--	11	25.1	-1*	18.2*
ALASKA															
--	--	10.9	22.3	6.1	22.2	2.2	22.3	(ice)	(ice)	--	--	--	22.8*(ice)	21.4*	
13.0	22.8	11.8	22.8	7.4	21.9	4.4	21.8	0.7	21.6	--	--	14	23.6*(ice)	21.1*	
--	--	--	--	--	--	--	--	--	--	--	--	--	22.7*(ice)	21.1*	
11.6	21.2	--	--	--	--	--	--	--	--	--	--	13	21.9*	--	20.0*
13.6	22.2	--	--	--	--	--	--	--	--	--	--	15	22.4*	--	21.3*
11.1	21.9	--	--	--	--	--	--	--	--	--	--	12*	22.4*	--	21.2*
8.9	22.0	--	--	--	--	--	--	--	--	--	--	11*	22.4*	--	21.6*
11.4	22.3	--	--	--	--	--	--	--	--	--	--	13*	22.8*	--	21.8*
ALASKA															
--	--	2.3	21.0	--	--	--	--	--	--	--	--	--	21.7*	--	18.4*
(ocean), ALASKA															
--	--	-0.3	19.8	--	--	--	--	--	--	--	--	--	21.7*	--	15.3*
--	--	--	--	--	--	--	--	--	--	--	--	--	24.1*	--	10.0*
(Elson Lagoon), ALASKA															
--	--	--	--	--	--	--	--	--	--	--	--	--	20.5*	--	11.1*
--	--	--	--	--	--	--	--	--	--	--	--	--	21.6*	--	12.2*

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
MIDWAY														
1944	--	--	--	--	18.9	26.2	21.1	26.1	--	--	24.8	26.2	26.2	26.3
1945-1949	19.6	26.0	19.1	26.0	20.3	26.3	21.1	26.6	22.1	26.5	24.7	26.8	25.9	26.6
1950-1954	20.2	26.4	20.2	26.5	20.5	26.5	21.5	26.5	23.6	26.5	25.1	26.5	26.7	26.8
1955-1959	19.1	26.4	19.1	26.3	19.9	26.4	20.8	26.4	22.6	26.6	25.2	26.8	26.3	26.7
1960	21.1	26.5	18.9	26.4	19.7	26.5	21.5	26.5	23.8	26.6	26.8	26.5	27.1	26.6
1961	19.9	27.1	20.3	26.8	21.2	26.6	19.2	26.5	20.8	26.5	24.7	26.2	26.2	26.5
1962	--	--	19.9	26.6	20.3	26.5	20.2	26.3	21.8	26.6	23.3	26.6	25.5	26.4
1963	19.0	26.4	18.7	26.7	20.4	26.4	21.1	27.0	23.7	26.9	25.8	27.0	26.2	26.9
1964	20.6	26.6	21.1	26.8	20.9	26.5	20.1	26.4	22.7	26.4	25.1	26.5	26.2	26.4
Mean	19.8	26.4	19.6	26.4	20.3	26.4	20.9	26.5	22.6	26.6	25.1	26.6	26.3	26.7
Maximum	23	27.8	22	27.5	24	27.3	25	28.1	27	27.7	28	28.1	29	27.9
Mean Max.	21.2	26.9	20.8	26.9	22.1	26.8	22.7	27.0	24.6	27.0	26.7	27.1	26.7	27.2
Mean Min.	18.1	25.8	18.0	25.9	18.5	26.0	19.2	26.0	20.9	26.2	22.8	26.0	25.3	26.1
Minimum	17	24.6	16	25.1	18	25.4	17	25.0	19	25.3	20	23.9	24	25.3
HONOLULU,														
1945-1949	24.1	25.3	24.3	25.4	24.1	25.7	24.4	25.7	25.3	25.8	26.0	25.9	26.4	26.0
1950-1954	24.3	25.0	24.9	25.7	24.6	24.9	24.9	25.7	25.1	25.8	25.5	25.9	26.4	25.9
1955-1959	24.6	25.2	24.2	25.4	24.4	25.7	24.7	25.8	25.3	25.8	26.1	25.6	26.7	25.6
1960	24.4	25.9	24.3	26.0	24.7	25.6	24.6	25.8	25.5	25.5	26.3	25.9	26.9	25.9
1961	25.1	25.8	25.0	26.1	25.4	26.4	26.1	26.5	26.3	26.0	26.8	26.0	27.0	25.8
1962	25.1	26.1	24.7	25.9	24.1	26.9	25.2	25.7	25.7	25.8	26.7	26.4	26.9	26.5
1963	24.4	25.2	24.2	26.0	24.4	25.7	24.9	25.4	24.8	25.8	25.8	26.0	26.3	26.1
1964	24.7	26.0	24.4	26.1	24.4	26.0	24.8	26.0	24.8	26.1	25.7	25.9	25.8	25.9
Mean	24.4	25.4	24.4	25.6	24.4	25.6	24.8	25.8	25.3	25.8	25.9	25.9	26.5	25.9
Maximum	27	27.9	27	28.1	28	28.4	27	28.7	28	27.6	29	28.0	29	27.8
Mean Max.	25.6	26.5	25.9	26.5	25.8	26.5	25.9	26.6	26.4	26.5	26.9	26.5	27.4	26.7
Mean Min.	22.9	23.0	23.1	23.5	23.1	23.7	23.6	24.5	24.2	24.7	25.2	25.3	25.6	25.0
Minimum	21	19.6	21	19.0	22	9.9	22	22.3	23	22.5	24	23.5	24	19.1
KANEHOE BAY (Mokuoioe I.),														
1957-1959	23.0	25.5	22.7	25.2	23.6	25.2	23.9	25.4	24.9	25.8	26.5	26.0	26.6	25.9
1960	22.2	25.6	22.2	25.8	23.3	24.8	23.5	25.2	25.2	25.4	26.4	25.8	26.4	25.8
1961	22.9	25.4	23.1	25.6	24.3	25.9	24.2	25.8	25.2	25.9	25.8	25.8	26.1	26.0
1962	22.3	26.1	23.1	25.9	22.1	24.9	24.6	25.6	25.1	25.6	26.0	26.2	25.7	26.2
1963	22.3	25.0	23.3	25.2	24.2	24.9	24.4	24.4	24.4	24.1	26.0	25.4	26.2	25.8
1964	23.5	25.7	22.9	25.8	23.4	25.8	23.9	25.6	23.9	26.0	26.0	26.0	26.2	26.0
Mean	22.8	25.5	22.8	25.5	23.5	25.2	24.1	25.4	24.8	25.5	26.2	25.9	26.3	25.9
Maximum	24	27.3	25	26.4	26	26.4	26	26.2	27	26.6	28	26.5	28	27.3
Mean Max.	23.6	26.1	24.1	26.0	24.8	26.1	25.3	25.9	25.8	26.3	27.2	26.2	27.2	26.4
Mean Min.	21.9	24.8	21.4	24.3	22.3	24.0	23.0	23.9	23.6	24.6	25.3	25.5	25.5	25.2
Minimum	21	24.0	21	21.7	21	22.8	23	21.9	23	22.5	24	24.9	25	23.6
HILO,														
1947-1949	21.2	18.2	22.0	20.0	21.8	17.8	21.3	15.5	21.8	15.4	22.7	16.9	22.7	15.7
1950-1954	21.2	17.4	20.9	16.5	20.4	15.1	20.7	15.1	21.2	14.8	21.5	15.2	21.9	15.1
1955-1959	21.2	16.6	20.9	16.1	20.8	16.0	20.8	14.9	20.9	14.6	21.3	14.9	21.9	15.5
1960	21.6	15.8	21.4	16.2	22.2	17.0	22.3	16.9	23.3	20.8	23.7	20.0	23.4	18.0
1961	24.1	24.1	23.8	19.7	23.7	22.3	24.5	24.3	24.0	19.9	25.6	25.0	25.6	24.0
1962	23.2	23.3	24.2	24.7	22.9	23.2	24.4	24.8	24.1	24.0	24.1	24.5	24.4	23.6
1963	22.5	23.0	22.9	25.5	22.7	23.6	23.3	18.0	23.1	23.0	24.3	21.9	24.7	21.0
1964	23.4	18.9	22.8	18.1	22.5	21.0	22.9	20.7	22.9	19.0	24.4	22.1	25.1	20.6

*Observations for the year are incomplete; extremes are for the months shown.

Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}
ISLANDS															
26.8	26.0	25.8	25.6	24.6	25.7	22.4	25.6	21.5	25.6	--	--	28	27.4*	19	24.6*
26.7	26.6	26.5	26.8	24.9	26.6	23.1	26.7	21.4	26.6	23.0	26.5	29	28.6	17	24.4
27.1	26.7	26.8	26.6	25.7	26.7	23.8	26.5	21.8	26.4	23.6	26.6	29	27.9	17	23.9
26.6	26.5	27.0	26.6	24.7	26.5	22.5	26.6	20.9	26.5	22.9	26.5	29	27.9	17	24.8
27.2	26.5	27.1	26.6	24.6	26.7	22.8	26.7	20.5	26.8	23.4	26.6	28	27.2	18	25.0
27.2	26.5	27.5	26.6	25.9	26.5	23.9	26.5	22.0	26.3	23.2	26.6	29	27.4	18	24.5
27.0	26.6	27.9	26.9	25.6	26.8	23.8	26.7	21.1	26.6	--	--	29	27.3*	18	25.0*
26.1	26.6	26.4	26.6	25.9	26.8	24.7	26.4	20.7	26.5	23.2	26.7	28	27.7	16	25.8
26.7	26.2	27.2	26.2	26.0	25.9	22.7	25.9	19.7	26.2	23.2	26.3	28	27.2	16	25.2
26.8	26.6	26.9	26.6	25.2	26.5	23.2	26.5	21.3	26.4	23.2	26.5				
29	27.9	29	28.6	29	27.5	26	27.6	26	27.5			29	28.6		
27.9	27.0	28.2	27.0	26.9	27.1	24.9	27.0	23.1	26.9						
25.6	26.0	25.3	26.1	23.2	26.1	21.2	26.0	19.4	25.9						
23	24.8	22	25.2	20	25.1	17	24.4	16	25.1					16	23.9
HAWAII															
26.6	26.1	26.8	25.9	26.6	26.1	25.8	26.0	25.1	25.9	25.5	25.8	28	27.0	22	20.0
26.8	25.9	26.9	25.8	27.0	25.8	25.9	25.4	24.9	25.2	25.6	25.6	29	25.7	22	9.9
26.8	25.7	27.1	25.8	26.9	25.9	26.3	25.8	24.9	25.7	25.7	25.7	29	27.5	21	16.1
26.8	26.0	27.3	25.9	27.4	25.9	26.2	26.0	25.7	25.9	25.8	25.9	29	27.4	23	22.5
27.1	26.2	27.0	26.3	27.5	26.2	26.3	26.4	24.9	26.6	26.2	26.2	29	28.4	22	19.2
27.2	26.5	26.9	26.8	27.1	25.8	25.9	--	25.1	27.0	25.9	--	29	28.4*	22	19.6*
26.9	26.1	26.9	26.1	26.7	26.2	25.9	26.2	25.4	26.2	25.6	25.9	28	26.8	22	21.0
26.3	26.1	26.6	26.1	25.9	26.1	25.5	25.9	25.3	25.5	25.4	26.0	27	26.4	24	22.5
26.8	26.0	26.9	25.9	26.8	26.0	26.0	25.8	25.1	25.8	25.6	25.8				
29	27.9	29	28.1	29	27.6	29	28.0	28	28.4			29	28.7		
27.8	26.6	27.9	26.6	27.9	26.7	27.3	26.6	26.3	26.6						
26.0	25.0	26.1	24.7	26.0	24.6	24.8	24.2	23.7	24.2						
24	22.8	25	20.0	25	19.2	23	16.1	22	19.2					21	9.9
OAHU I., HAWAII															
26.8	25.9	26.7	26.0	26.4	25.8	25.1	25.3	22.8	25.3	24.9	25.6	29	26.8	21	21.7
26.6	26.0	26.0	25.8	26.2	25.8	24.1	25.8	23.3	25.4	24.6	25.6	28	26.3	21	23.4
26.5	26.1	26.9	26.2	25.9	25.9	24.2	25.2	22.7	26.0	24.8	25.8	27	26.5	22	23.2
26.2	26.3	25.8	26.5	25.5	26.3	24.3	26.3	22.7	25.8	24.4	26.0	27	27.3	21	22.8
26.7	26.1	26.7	26.1	26.1	26.0	24.8	26.1	24.2	25.6	24.9	25.4	28	26.5	21	22.5
26.4	26.0	26.4	26.0	25.1	25.7	--	--	24.1	24.8	--	--	27	27.3*	22	22.4*
26.6	26.0	26.5	26.1	26.0	25.9	24.7	25.6	23.2	25.4	24.8	25.7				
28	26.8	28	27.3	29	26.8	27	27.0	26	26.4			29	27.3		
27.4	26.4	27.5	26.6	27.1	26.3	26.2	26.3	24.2	26.2						
26.2	25.6	25.6	25.3	24.9	25.0	23.1	24.6	22.1	24.4						
26	24.9	25	23.3	24	22.6	23	21.9	21	22.4					21	21.7
HAWAII															
23.0	16.0	23.3	16.9	23.3	17.3	22.4	17.2	21.4	15.3	22.2	16.8	27	26.5	18	2.8
22.0	15.5	22.4	16.0	22.4	16.4	22.2	16.7	21.8	16.5	21.6	15.9	27	26.1	19	4.9
22.3	14.8	22.2	15.4	22.6	16.4	22.1	16.1	21.7	16.5	21.6	15.6	27	25.9	19	7.3
24.2	19.3	24.4	20.8	24.6	--	24.7	22.5	24.4	24.0	23.4	--	26	27.5*	18	4.0*
25.9	23.9	26.3	24.6	25.7	23.9	25.4	22.9	22.9	21.8	24.8	23.0	27	27.6	22	12.4
24.9	25.0	25.1	25.6	23.7	25.6	23.4	24.2	22.0	20.0	23.9	24.0	26	26.9	21	18.4
25.3	21.4	26.0	21.4	25.6	22.3	25.1	21.0	24.8	23.0	24.2	22.1	27	26.4	21	13.9
24.7	20.4	24.5	19.5	--	--	23.2	19.7	24.2	22.0	--	--	26*	26.1*	20	10.6*

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
Mean	21.7	18.4	21.7	18.1	21.4	17.6	21.6	16.7	21.8	16.7	22.5	17.5	22.8	17.0
Maximum	25	26.5	26	26.3	24	25.4	27	26.1	26	27.5	26	27.6	26	25.8
Mean Max.	23.3	23.3	23.6	23.1	22.8	22.5	23.3	22.3	23.6	22.4	24.1	21.8	24.8	22.4
Mean Min.	20.3	14.6	20.2	13.9	20.1	12.9	20.4	12.4	20.4	11.9	21.2	13.7	21.3	13.1
Minimum	18	9.8	18	7.3	19	6.9	19	4.0	19	2.8	19	9.3	19	8.4
HILO,														
JOHNSTON														
1947-1949	--	--	23.7	26.0	23.9	26.0	24.4	26.4	25.4	26.2	25.6	26.0	26.6	26.2
1950-1954	25.3	26.1	25.1	26.1	24.9	26.0	25.6	26.0	25.9	26.1	26.7	26.0	27.3	26.2
1955-1959	25.3	26.2	24.7	26.3	24.7	26.4	25.1	26.4	25.7	26.4	26.5	26.5	27.2	26.5
1960	25.0	26.1	24.6	26.2	24.9	26.3	25.3	26.0	26.2	25.9	26.8	26.0	27.3	26.1
1961	25.3	25.8	25.2	26.0	25.3	26.2	25.8	26.2	26.3	26.2	26.7	26.2	26.9	26.3
1962	25.4	26.0	25.2	26.0	25.1	26.2	25.6	26.8	26.6	26.5	27.7	26.5	27.6	26.4
1963	24.1	26.2	24.4	26.5	24.3	26.2	25.3	26.0	25.2	26.0	25.6	26.4	26.3	26.4
1964	25.4	26.5	24.9	25.9	25.1	26.1	25.4	26.3	26.0	26.3	26.7	26.4	27.1	26.4
Mean	25.2	26.1	24.8	26.2	24.7	26.2	25.2	26.2	25.8	26.2	26.5	26.2	27.1	26.3
Maximum	27	27.3	27	27.6	27	27.8	27	28.2	28	27.5	29	27.7	29	27.6
Mean Max.	26.2	26.7	25.7	26.6	25.7	26.8	26.2	26.9	26.8	26.7	27.4	26.8	27.9	26.9
Mean Min.	23.9	25.6	23.8	25.7	23.6	25.7	23.9	25.6	24.8	25.6	25.5	25.8	26.3	25.9
Minimum	23	25.0	22	25.1	21	25.1	22	24.9	23	24.3	22	25.5	26	25.6
CHRISTMAS														
1956-1959	27.9	26.6	28.2	26.6	28.4	27.3	28.7	26.0	29.2	26.5	28.8	26.4	28.9	26.6
1960	27.2	26.8	27.2	26.6	27.7	27.3	28.0	27.4	28.2	27.2	28.6	27.3	28.4	27.2
1961	27.1	27.4	26.8	27.1	27.3	27.5	28.1	27.5	28.3	27.5	28.8	27.6	28.0	27.0
1962	26.2	27.9	26.7	28.0	27.2	27.5	27.4	27.9	27.6	27.4	27.9	26.6	27.6	27.1
1963	26.1	27.3	26.9	27.6	27.3	27.6	28.0	27.8	28.2	27.7	28.5	27.5	28.6	27.3
1964	27.9	26.5	27.7	26.9	27.6	25.1	28.1	26.9	27.1	27.5	27.1	27.4	26.5	27.5
Mean	27.3	26.9	27.6	27.0	27.8	27.1	28.3	26.8	28.4	27.0	28.4	26.9	28.2	27.0
Maximum	32	28.7	30	29.2	31	28.9	31	29.0	32	28.3	31	28.4	31	28.4
Mean Max.	28.6	27.8	28.7	27.9	29.1	28.1	29.6	27.9	29.6	27.7	29.4	27.6	29.2	27.9
Mean Min.	26.0	25.8	26.4	26.0	26.6	26.2	26.9	25.3	27.2	26.1	27.2	25.9	26.8	26.3
Minimum	24	20.2	25	21.0	26	23.0	26	21.3	26	24.8	26	23.6	26	25.5
CANTON ISLAND,														
1950-1954	28.3	26.9	28.0	27.1	28.3	27.0	28.8	26.7	28.8	27.0	28.8	26.8	28.3	26.7
1955-1959	28.4	27.0	28.2	27.0	28.2	26.9	28.8	27.0	28.8	26.8	28.9	27.0	28.5	26.8
1960	27.6	26.5	27.2	26.5	27.6	26.5	27.8	26.7	28.1	26.6	28.3	26.8	28.1	26.8
1961	28.3	26.8	27.8	27.2	27.7	27.1	28.3	27.1	28.6	27.0	--	--	28.4	26.9
1962	27.3	26.9	27.5	26.9	27.6	26.7	27.9	26.6	28.4	26.7	28.4	26.7	28.3	26.7
1963	27.4	27.0	27.6	27.1	27.7	27.1	28.4	26.9	28.5	26.6	28.7	26.7	28.7	26.6
1964	29.3	26.6	28.9	26.7	28.2	26.9	28.2	26.9	28.3	26.9	27.9	26.9	27.7	26.6
Mean	28.2	26.9	28.0	27.0	28.1	26.9	28.6	26.8	28.7	26.8	28.7	26.8	28.3	26.7
Maximum	30	27.8	31	27.8	31	27.7	31	27.9	31	27.8	30	27.7	30	27.7
Mean Max.	28.7	27.3	28.6	27.3	28.8	27.3	29.3	27.3	29.3	27.2	29.2	27.2	29.0	27.2
Mean Min.	27.6	26.5	27.4	26.6	27.3	26.6	27.8	26.5	28.1	26.4	28.1	26.4	27.9	26.4
Minimum	27	26.0	26	26.1	26	26.1	27	26.1	27	26.0	27	26.3	27	26.2

*Observations for the year are incomplete; extremes are for the months shown.

Temperatures and Densities
Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
HAWAII - continued															
23.1	17.2	23.3	17.8	23.2	18.0	22.8	18.1	22.2	17.9	22.3	17.6				
27	25.8	27	27.0	27	26.6	27	26.6	26	25.6			27	27.6		
24.8	21.9	25.2	22.7	25.0	23.2	24.5	23.1	23.8	22.8						
21.7	13.1	21.8	14.0	21.5	14.0	21.1	13.5	20.7	13.9					18	2.8
20	8.6	20	11.1	19	10.9	20	10.1	19	5.9						
ATOLL															
27.4	26.1	27.6	26.1	27.1	--	--	--	--	--	--	--	28	27.5*	22*	25.1*
27.4	26.1	27.6	26.2	27.3	26.2	26.7	26.1	25.7	26.1	26.3	26.1	31	27.4	23	25.2
27.6	26.5	27.7	26.6	27.6	26.5	26.9	26.4	25.8	26.2	26.2	26.4	31	28.2	21	23.1
27.6	26.2	27.5	26.1	27.4	26.1	26.7	26.2	25.8	25.8	26.3	26.1	28	27.3	24	25.4
27.1	26.1	27.2	26.3	27.0	26.1	26.2	26.3	25.6	26.0	26.2	26.1	28	27.1	25	24.9
27.2	--	27.2	26.3	27.1	26.3	25.0	26.2	24.3	26.3	26.2	--	29	27.7*	22	25.3*
26.8	26.5	27.5	26.5	27.2	26.2	26.9	26.1	26.3	26.2	25.8	26.3	28	27.2	23	24.3
27.3	26.5	27.3	26.8	26.9	26.8	26.4	26.7	26.1	26.2	26.2	26.4	28	27.2	24	25.6
27.4	26.3	27.6	26.4	27.3	26.3	26.6	26.3	25.7	26.1	26.2	26.2				
29	27.6	29	27.9	31	27.9	29	27.8	27	28.0			31	28.2		
28.2	26.8	28.3	26.9	28.4	26.9	27.6	27.0	26.6	26.8						
26.6	25.8	26.6	25.9	26.5	25.9	25.5	25.8	24.5	25.3					21	23.1
26	24.9	24	25.1	26	24.9	24	25.4	22	23.1						
ISLAND															
28.9	27.1	28.4	27.1	28.8	27.4	28.6	27.4	27.9	27.0	28.6	26.8	32	28.8	24	20.2
28.3	27.1	27.7	27.2	27.7	27.2	27.1	27.2	27.2	27.4	27.8	27.2	30	28.4	25	25.5
27.6	27.0	27.2	27.2	26.8	26.9	27.1	27.4	26.8	27.7	27.5	27.3	29	29.0	26	26.2
27.7	26.2	26.9	26.7	26.9	27.2	26.3	27.3	26.2	27.1	27.0	27.2	29	29.1	25	25.2
28.5	27.3	28.8	27.2	28.6	27.2	28.6	27.2	27.9	27.1	28.0	27.4	30	29.2	25	26.4
26.3	27.5	26.3	27.5	26.1	27.4	25.6	27.5	26.0	27.6	26.9	27.1	30	28.5	24	23.0
28.1	27.0	27.8	27.1	27.8	27.2	27.6	27.3	27.3	27.2	27.9	27.0				
30	28.4	30	28.3	31	28.3	31	28.5	31	28.4			32	29.2		
28.9	27.7	28.9	27.8	28.8	27.9	28.6	28.0	28.6	27.8						
26.7	26.4	26.6	26.5	26.6	26.7	26.1	26.6	26.1	26.3						
26	25.4	26	25.2	25	26.3	24	26.3	25	24.1					24	20.2
PHOENIX ISLANDS															
28.2	26.7	28.2	26.8	28.3	26.8	28.4	26.9	28.3	26.9	28.4	26.9	30	27.9	26	26.0
28.3	26.9	28.3	26.8	28.4	26.9	28.4	26.9	28.5	26.9	28.5	26.9	34	28.7	26	26.0
28.1	27.0	28.0	27.1	28.3	27.3	28.6	27.2	28.4	27.0	28.0	26.8	29	27.7	27	26.3
28.2	26.7	28.1	26.8	28.1	26.9	28.2	26.8	27.9	27.0	--	--	29*	27.8*	27	26.4*
28.2	26.8	27.6	26.6	27.9	26.5	27.7	26.7	28.0	26.8	27.9	26.7	29	27.2	27	26.1
28.8	26.5	29.0	26.5	29.2	26.5	29.7	26.8	29.8	26.8	28.6	26.8	30	27.6	27	26.2
27.4	26.5	27.3	26.7	27.3	26.6	26.9	26.6	27.1	26.5	27.9	26.7	30	27.6	27	26.2
28.2	26.8	28.2	26.8	28.3	26.8	28.4	26.9	28.3	26.9	28.3	26.8				
30	27.6	31	27.6	31	27.8	32	28.7	34	28.4			34	28.7		
28.7	27.1	28.8	27.2	28.7	27.2	29.2	27.3	29.1	27.3						
27.8	26.5	27.5	26.4	27.7	26.6	27.8	26.6	27.6	26.5						
26	26.2	26	26.0	27	26.2	26	26.2	26	26.1					26	26.0

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
	PAGO PAGO,													
1950-1954	27.9	25.7	28.0	25.9	28.3	25.9	28.8	25.8	28.8	25.5	28.8	25.6	28.3	25.8
1955-1959	29.1	25.8	28.9	25.7	29.1	26.0	29.1	25.8	28.9	25.7	29.0	25.6	27.7	26.0
1960	29.2	25.0	29.2	25.2	29.2	25.3	29.5	25.3	28.6	25.1	28.1	25.2	27.3	25.0
1961	29.5	25.9	29.6	25.9	28.2	25.3	28.4	25.4	28.6	25.6	27.6	25.2	27.6	25.7
1962	28.7	25.1	28.2	25.2	28.8	25.4	29.2	25.4	28.6	24.9	28.2	25.2	27.7	24.9
1963	28.6	25.7	28.9	25.8	28.6	25.5	28.9	24.8	28.6	24.9	27.8	25.6	27.4	25.9
1964	28.9	26.2	29.3	25.7	29.4	25.8	29.3	25.8	28.6	25.4	27.4	24.4	27.4	24.9
Mean	28.7	25.7	28.7	25.7	28.8	25.7	28.9	25.6	28.4	25.4	27.7	25.4	27.3	25.7
Maximum	31	26.7	31	26.8	32	27.3	31	26.9	30	27.1	30	27.0	29	27.4
Mean Max.	29.9	26.3	29.9	26.3	30.1	26.3	29.8	26.1	29.3	26.1	28.8	26.0	28.3	26.2
Mean Min.	27.3	24.0	27.4	24.5	27.3	24.1	27.9	24.4	27.3	23.2	26.7	24.1	26.4	24.3
Minimum	24	14.9	24	23.0	24	19.5	26	23.1	25	12.3	24	22.3	23	20.1
	APIA (observatory),													
1945-1949	29.2	25.9	29.1	26.2	29.3	25.9	29.3	25.8	28.8	25.6	28.3	26.0	27.7	26.2
1950-1954	29.1	26.9	29.2	26.9	29.3	26.6	29.2	26.4	28.6	26.4	27.9	26.4	27.3	26.7
1955-1959	29.1	26.8	29.1	26.6	29.1	26.4	29.1	26.6	28.8	26.8	28.0	26.7	27.7	26.9
1960	29.7	26.4	29.7	26.8	29.9	26.5	29.9	26.7	29.4	26.6	28.8	26.7	28.3	26.9
1961	29.8	27.2	29.8	27.2	28.5	26.6	29.3	26.5	29.4	26.7	28.7	26.7	28.3	26.7
1962	29.2	26.8	28.9	26.7	29.3	26.5	29.6	26.5	29.0	26.5	28.4	26.7	28.1	26.9
1963	28.8	27.4	29.0	27.3	28.4	27.1	28.7	27.0	28.7	27.2	28.1	27.3	27.6	27.2
1964	30.3	28.2	30.7	28.5	30.8	27.8	30.9	27.8	30.2	27.5	28.2	26.3	27.8	26.6
Mean	29.2	26.9	29.3	26.9	29.3	26.6	29.3	26.6	28.9	26.6	28.2	26.6	27.7	26.8
Maximum	35	29.6	35	29.5	34	28.9	34	32.5	33	28.7	30	28.4	30	28.1
Mean Max.	30.7	27.7	30.5	27.7	30.7	27.5	30.4	27.6	29.9	27.1	29.2	27.2	28.6	27.2
Mean Min.	27.7	25.6	27.9	25.6	27.9	23.8	28.3	25.2	27.8	25.7	27.2	25.7	26.7	26.0
Minimum	27	19.2	27	22.0	26	17.4	27	21.0	27	24.2	26	24.3	26	24.5
	FUNAFUTI ATOLL,													
1961	--	--	--	--	--	--	--	--	--	--	--	--	28.8	25.7
1962	30.3	26.1	29.8	25.9	30.2	26.0	30.3	26.1	30.6	26.2	30.6	26.1	29.8	26.0
1963	30.3	26.0	29.8	25.9	30.2	26.2	29.8	26.0	29.7	26.0	29.4	26.0	29.3	26.0
1964	30.2	26.2	29.9	26.1	29.9	26.3	29.9	26.2	29.5	26.1	29.4	26.0	29.0	26.2
Mean	30.3	26.1	29.8	26.0	30.1	26.2	30.0	26.1	29.9	26.1	29.8	26.0	29.2	26.0
Maximum	31	26.6	31	26.6	31	27.4	31	26.5	31	26.7	32	26.6	31	27.3
Mean Max.	31.1	26.5	31.1	26.4	30.9	26.9	31.1	26.4	30.9	26.6	30.6	26.5	30.1	26.6
Mean Min.	29.1	25.6	28.3	25.3	28.9	25.5	28.7	25.6	28.2	25.4	28.7	25.5	28.3	25.4
Minimum	29	25.3	28	25.2	29	25.3	28	25.4	27	24.9	28	25.3	28	25.2
	GUADALCANAL I. (Kukum),													
1947-1949	29.4	25.4	29.7	25.5	29.4	25.5	30.0	25.3	29.9	25.2	29.3	25.2	28.8	25.4
	ADMIRALTY ISLANDS													
1947-1948	--	--	29.6	--	29.3	--	30.0	--	29.4	--	29.5	--	29.1	--
	WAKE													
1950-1954	24.8	26.1	25.2	26.2	24.8	26.4	26.0	26.4	27.1	26.3	28.2	26.3	28.3	26.3
1955-1959	23.8	26.0	24.0	26.1	24.8	26.2	25.1	26.1	26.1	26.1	27.9	26.3	28.2	26.6

*Observations for the year are incomplete; extremes are for the months shown.

Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}
AMERICAN SAMOA															
28.2	25.8	28.2	25.9	28.3	25.7	28.4	25.4	28.3	25.6	28.4	25.7	32	27.3	22	12.3
27.4	25.8	27.3	25.8	27.9	25.9	28.4	25.7	28.7	25.7	28.5	25.8	31	27.4	26	22.3
26.9	24.8	27.6	25.9	27.6	25.8	28.8	25.9	29.3	25.9	28.4	25.4	30	26.4	26	22.4
27.1	25.5	27.3	25.8	27.5	25.7	27.8	25.6	28.6	25.8	28.2	25.6	31	36.4	27	19.5
27.1	25.1	27.6	25.3	27.3	25.5	27.9	25.5	28.1	25.0	28.1	25.2	30	26.2	27	14.9
27.2	25.5	27.7	25.6	27.3	24.5	27.9	25.3	28.6	25.9	28.1	25.4	30	26.6	24	15.8
27.2	25.3	27.4	25.0	28.0	24.8	28.2	25.9	27.9	25.5	28.2	25.4	30	26.5	26	21.1
27.1	25.6	27.3	25.8	27.5	25.7	28.0	25.6	28.4	25.6	28.1	25.6				
29	27.1	31	26.9	30	27.0	31	26.7	31	27.2			32	27.4		
27.9	26.2	28.2	26.3	28.7	26.3	29.4	26.4	29.6	26.3						
26.3	24.4	26.2	24.4	26.4	23.8	26.9	23.7	27.1	23.7						
24	22.4	24	21.1	24	15.8	24	20.7	22	18.1					22	12.3
WESTERN SAMOA															
27.6	26.4	28.0	26.6	28.4	26.6	29.2	26.5	29.2	26.2	28.7	26.2	31	27.4	26	19.2
27.4	26.8	28.1	27.0	28.2	27.0	28.7	27.0	28.9	27.0	28.5	26.8	31	28.7	25	20.9
27.6	26.8	27.8	27.1	28.6	27.1	29.2	26.8	29.0	26.8	28.6	26.8	32	28.3	26	17.4
28.4	27.0	28.5	27.2	28.6	27.2	29.7	27.1	29.9	27.1	29.2	26.8	31	28.6	28	25.7
28.2	26.9	28.0	27.1	28.3	27.1	28.7	27.0	29.2	27.0	28.8	26.9	31	28.6	26	24.2
27.7	26.8	27.9	27.0	27.8	27.0	28.4	27.3	--	--	--	--	31*	27.6*	27*	23.4*
28.9	27.8	29.4	27.8	30.1	28.4	29.3	27.8	29.8	28.1	28.9	27.5	35	29.5	27	22.9
27.7	26.8	28.2	26.7	28.7	26.8	28.8	27.1	28.6	27.4	29.2	27.3	35	32.5	26	24.6
27.7	26.8	28.1	27.0	28.5	27.1	29.0	27.0	29.1	27.0	28.7	26.8				
30	29.1	33	29.1	32	29.4	32	29.9	35	30.9			35	32.5		
28.7	27.5	29.5	27.6	29.9	27.7	30.4	27.9	30.7	27.8						
26.8	26.0	27.0	26.3	27.3	25.9	27.7	26.2	27.6	25.7						
25	24.6	26	24.2	26	21.1	26	25.0	26	23.6					25	17.4
ELLICE ISLANDS															
28.9	25.7	28.9	25.8	29.6	26.0	29.7	26.0	30.1	26.0	--	--	32*	26.7*	26*	25.2*
29.8	26.0	30.1	26.1	29.9	26.0	30.0	26.0	29.8	25.9	30.1	26.0	32	26.6	28	25.2
29.1	25.9	29.4	26.0	29.7	26.0	30.1	26.2	30.1	26.2	29.7	26.0	31	26.6	27	24.9
28.9	26.6	29.3	26.8	29.7	27.2	29.4	27.1	29.3	27.0	29.5	26.5	31	28.6	27	24.7
29.2	26.0	29.4	26.2	29.7	26.3	29.8	26.3	29.8	26.3	29.8	26.1				
31	27.6	31	27.6	31	28.5	31	28.6	32	28.4			32	28.6		
30.3	26.7	30.3	26.7	30.7	26.8	31.0	27.0	31.2	27.0						
28.1	25.6	28.1	25.6	28.8	25.8	28.2	25.6	28.2	25.3						
27	25.3	26	25.3	28	25.4	28	25.3	28	24.7					26	24.7
SOLOMON ISLANDS															
28.7	25.5	29.0	25.6	29.1	25.6	29.7	25.5	29.9	25.3	29.4	25.4	32	26.2*	28	20.4*
(Seadler Harbor)															
29.6	--	29.3	--	28.9	--	--	--	--	--	--	--	31	--	27	--
ISLAND															
28.3	26.0	28.1	25.8	27.6	25.6	26.7	25.8	25.7	25.7	26.7	26.1	33	28.4	22	22.5
28.5	26.2	28.2	26.0	27.6	26.0	25.8	25.9	25.2	26.0	26.3	26.1	31	27.9	18	22.0

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
	WAKE													
1960	25.6	26.3	25.0	26.3	26.5	26.3	26.3	26.0	27.2	26.4	28.4	26.6	28.3	26.4
1961	25.1	26.4	26.1	26.6	25.8	26.3	25.1	26.6	25.9	26.8	27.8	26.8	27.7	26.4
1962	24.9	26.3	24.4	26.3	24.4	26.5	26.1	26.6	26.9	26.8	27.5	26.3	28.1	26.0
1963	26.1	26.2	25.7	26.3	26.4	26.4	24.4	26.2	26.3	26.2	27.7	26.2	28.3	26.4
1964	25.0	26.0	24.7	26.2	25.7	26.2	24.8	26.2	26.7	26.3	27.9	26.1	27.8	26.0
Mean	24.7	26.1	24.8	26.2	25.2	26.3	25.4	26.3	26.6	26.3	28.0	26.3	28.2	26.4
Maximum	28	27.6	27	27.6	28	27.6	28	28.4	30	27.9	31	27.7	32	27.6
Mean Max.	26.2	26.8	26.3	26.9	26.9	27.0	26.9	27.1	28.1	27.1	29.3	27.1	29.5	26.9
Mean Min.	22.6	25.0	23.0	25.0	23.4	24.9	23.9	25.0	25.1	25.0	26.8	25.3	26.9	25.5
Minimum	18	23.3	21	22.0	22	22.4	22	22.8	23	23.5	26	23.8	26	24.7
	KWAJALEIN ATOLL,													
1949	--	--	27.2	25.9	27.1	25.8	27.2	25.8	27.6	25.6	28.0	25.3	28.7	25.6
1950-1954	26.7	25.3	26.9	25.6	27.9	25.7	27.8	25.7	28.1	25.8	28.1	25.7	28.0	25.7
1955-1959	27.6	25.9	27.3	26.2	27.6	26.1	27.6	26.3	27.6	26.2	28.0	26.1	28.4	26.1
1960	27.1	25.8	27.1	26.1	27.8	26.2	27.5	25.9	27.7	26.2	28.0	26.2	28.4	26.1
1961	27.9	25.8	28.1	25.8	28.3	25.6	28.3	25.6	28.4	25.5	28.7	25.8	28.8	25.3
1962	27.9	25.6	28.1	25.7	28.0	26.1	28.5	25.9	28.5	26.4	28.7	26.0	28.8	26.2
1963	27.4	25.7	27.2	25.6	27.6	25.9	28.2	25.9	28.9	25.9	28.9	25.8	28.9	25.7
1964	27.3	25.9	27.0	26.1	27.3	26.3	26.2	25.4	28.2	26.2	28.6	26.3	28.6	26.3
Mean	27.3	25.6	27.2	25.9	27.7	26.0	27.7	25.9	28.0	26.0	28.2	25.9	28.7	25.9
Maximum	29	26.8	31	26.8	31	27.6	32	27.6	31	27.0	31	27.8	33	27.2
Mean Max.	28.3	26.3	28.3	26.3	28.7	26.6	28.9	26.4	29.0	26.5	29.3	26.6	29.7	26.5
Mean Min.	26.4	25.0	26.3	25.4	26.6	25.2	26.7	25.2	27.0	25.4	27.0	24.7	27.4	25.0
Minimum	24	24.1	24	24.4	26	21.8	26	24.0	26	24.5	26	19.9	26	23.8
	ENIWETOK ATOLL,													
1951-1954	26.8	25.6	26.7	25.7	26.7	25.6	27.1	25.6	27.4	25.8	28.2	25.7	28.7	25.6
1955-1959	28.4	26.1	28.2	26.0	27.7	26.0	27.7	26.0	27.9	26.0	28.3	26.0	28.7	26.1
1960	28.1	25.8	27.7	25.6	27.9	25.7	28.2	25.9	28.2	26.0	28.6	26.0	29.0	26.3
1961	27.4	25.7	27.2	25.7	27.1	25.8	27.4	25.8	27.4	25.6	27.9	25.4	28.3	25.7
1962	26.9	25.7	27.0	25.7	26.5	25.8	27.0	25.8	28.1	26.1	28.9	26.0	28.2	26.0
1963	26.8	25.8	26.7	25.5	26.9	25.8	27.2	25.8	27.9	25.8	28.2	26.0	28.3	25.5
1964	26.8	25.7	26.7	25.7	26.6	25.7	26.9	25.9	28.7	26.2	28.4	26.1	28.4	25.9
Mean	27.5	25.8	27.3	25.7	27.2	25.8	27.4	25.8	27.8	25.9	28.3	25.9	28.6	25.9
Maximum	30	26.9	30	26.7	29	27.1	30	27.1	30	27.3	31	26.9	30	27.1
Mean Max.	28.4	26.3	28.3	26.1	28.0	26.2	28.7	26.4	28.8	26.3	29.2	26.3	29.4	26.3
Mean Min.	26.3	25.4	26.4	25.4	26.2	25.4	26.3	25.4	26.9	25.5	27.5	25.4	27.3	25.4
Minimum	24	25.0	26	25.0	24	25.0	24	24.0	26	25.0	27	24.7	26	24.6
	TRUK ISLANDS (Moen Island),													
1949	--	--	--	--	--	--	--	--	--	--	--	--	28.6	25.1
1950-1954	27.9	25.4	27.8	25.6	27.9	25.6	28.4	25.4	28.6	25.5	28.8	25.3	29.2	25.2
1955-1959	27.5	25.9	27.2	26.0	27.5	26.1	27.9	25.9	28.2	25.8	28.4	25.8	28.7	25.6
1960	--	--	--	--	28.1	25.7	28.3	25.8	28.8	25.5	28.7	25.4	29.0	25.5
1961	28.3	25.1	28.2	25.3	28.2	25.4	28.5	25.4	28.8	25.4	29.2	25.5	29.0	25.0
1962	27.9	25.3	27.7	25.8	27.6	25.2	28.2	25.5	28.5	25.6	29.0	25.6	28.7	24.8
1963	28.2	25.0	28.1	25.1	28.0	25.2	28.3	25.3	28.7	25.2	29.3	25.0	29.3	25.0
1964	27.8	25.4	--	--	28.0	26.0	28.5	26.0	30.6	26.8	29.3	25.6	29.4	25.1

*Observations for the year are incomplete; extremes are for the months shown.

Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
ISLAND - continued															
28.8	26.5	28.8	26.3	27.8	26.2	26.2	26.3	25.7	26.1	27.0	26.3	30	27.2	24	25.5
--	--	28.2	26.2	27.2	26.0	25.9	26.1	25.4	26.1	--	--	29*	27.1*	22	25.4*
28.4	25.9	28.6	26.0	27.0	25.6	26.3	26.0	25.1	26.1	26.5	26.2	29	27.4	22	25.3
28.7	26.2	28.6	26.1	28.0	26.0	27.2	26.0	25.2	26.1	26.9	26.2	30	26.8	22	25.1
28.4	26.0	28.1	25.7	27.7	25.9	27.4	26.0	25.4	26.1	26.6	26.1	29	26.7	22	25.2
28.4	26.1	28.3	25.9	27.6	25.9	26.4	25.9	25.4	25.9	26.6	26.1				
33	27.2	31	27.3	32	27.6	29	27.7	28	27.2			33	28.4		
30.0	26.8	29.4	26.7	29.2	26.7	27.6	26.7	26.6	26.6						
27.2	25.3	27.3	24.9	26.2	24.7	25.0	24.7	23.8	24.7						
26	24.0	26	23.3	25	22.9	23	22.5	23	23.0					18	22.0
MARSHALL ISLANDS															
28.6	25.3	28.4	25.4	28.5	25.4	27.7	25.3	26.3	25.0	--	--	29	26.3*	24*	23.4*
28.4	26.0	29.2	25.8	29.1	25.8	28.5	25.6	27.9	25.4	28.0	25.7	34	27.3	24	15.8
28.7	26.1	28.9	25.7	29.2	25.7	28.6	25.7	28.2	25.8	28.1	26.0	32	27.6	26	19.7
--	--	29.4	25.8	29.4	25.7	28.6	25.5	28.5	25.6	--	--	31*	27.0*	26	23.4*
29.1	25.6	29.3	25.1	29.4	25.1	29.0	25.4	28.3	25.7	28.6	25.5	31	27.8	27	23.1
28.9	26.2	28.6	26.0	28.9	26.0	28.3	25.6	27.8	25.8	28.4	26.0	29	27.6	27	24.4
29.1	25.6	29.6	25.7	29.3	25.4	28.9	25.6	27.8	25.8	28.5	25.7	31	26.5	27	24.3
28.7	26.2	28.6	26.0	28.7	25.6	28.3	25.9	27.8	26.1	27.9	26.0	29	27.6	27	24.2
28.7	25.9	29.1	25.7	29.1	25.7	28.5	25.6	27.9	25.6	28.2	25.8				
34	27.6	34	27.6	31	26.8	31	27.2	31	27.2			34	27.8		
30.1	26.6	30.3	26.5	30.2	26.2	29.6	26.3	29.0	26.2						
27.6	25.1	27.8	24.3	27.9	24.4	27.4	24.2	26.8	24.3					24	15.8
26	23.4	27	19.7	27	22.4	27	22.3	24	15.8						
MARSHALL ISLANDS															
28.8	25.8	28.9	25.8	28.7	25.7	28.2	25.6	28.3	25.6	27.9	25.7	30	26.7	24	24.4
29.0	26.2	29.2	26.1	29.1	26.0	28.7	25.8	28.6	26.0	28.5	26.0	31	27.1	25	23.8
28.9	25.9	28.2	25.7	28.4	25.7	28.9	25.8	27.6	25.5	28.3	25.8	30	26.9	27	25.0
28.8	25.9	28.6	25.7	28.1	25.5	27.7	25.6	27.2	25.8	27.8	25.7	30	26.5	26	24.8
29.1	26.5	28.9	26.1	28.6	25.5	28.3	25.9	27.5	25.5	27.9	25.9	30	28.0	24	24.0
28.7	25.6	--	--	--	--	28.1	25.4	27.6	25.6	--	--	30*	26.7*	26	24.0*
28.5	26.1	28.4	25.7	28.3	26.1	27.6	25.6	27.1	25.9	27.7	25.9	30	26.9	26	25.1
28.9	26.0	28.8	25.9	28.7	25.8	28.3	25.7	27.8	25.8	28.0	25.8				
31	28.0	31	26.9	31	26.9	31	26.7	31	26.9			31	28.0		
30.0	26.5	29.9	26.4	29.9	26.3	29.6	26.2	29.0	26.2						
27.9	25.5	27.7	25.5	27.2	25.2	26.9	24.9	26.5	25.2					24	23.8
27	25.1	26	24.7	27	24.8	25	23.8	26	24.0						
CAROLINE ISLANDS															
29.3	25.0	29.5	24.8	29.8	25.1	28.7	24.9	28.0	25.1	--	--	32*	26.9*	27*	22.6*
28.8	24.0	29.3	24.5	29.2	24.8	29.0	25.2	28.4	25.4	28.6	25.2	32*	27.3	25	14.5
28.9	25.7	29.1	25.6	28.9	25.5	28.8	25.6	28.3	25.7	28.3	25.8	32	27.8	25	17.0
29.3	25.4	29.5	25.4	29.7	25.3	29.5	25.3	28.7	25.0	--	--	31	26.1*	27*	20.0*
29.2	25.2	29.4	24.6	29.2	25.1	28.8	25.0	28.4	25.0	28.8	25.2	31	25.8	27	20.7
28.9	25.0	29.3	24.8	29.5	24.9	28.8	24.2	28.5	24.7	28.6	25.1	30	27.3	27	16.4
29.4	24.8	29.2	24.4	28.6	24.1	28.8	25.1	28.4	25.2	28.7	25.0	31	25.7	27	19.2
29.3	24.8	29.2	25.0	29.2	25.4	29.2	25.7	28.9	25.9	--	--	32	29.0*	28*	22.8*

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
TRUK ISLANDS (Moen Island),														
Mean	27.8	25.5	27.6	25.8	27.8	25.7	28.2	25.6	28.6	25.7	28.8	25.6	28.9	25.3
Maximum	31	27.8	29	27.3	30	27.4	31	28.3	30	29.0	31	27.0	32	26.8
Mean Max.	28.8	26.3	28.4	26.3	28.7	26.3	29.2	26.4	29.4	26.3	29.5	26.2	29.9	26.1
Mean Min.	26.8	24.1	26.6	25.2	26.9	24.9	27.2	24.2	27.6	24.3	27.9	24.6	27.6	22.9
Minimum	25	17.5	26	24.7	26	20.9	26	16.4	26	20.0	27	23.2	25	17.0
YAP ISLAND,														
1951-1953	28.1	25.4	27.7	25.0	28.3	25.7	29.3	25.8	29.8	24.4	29.7	23.4	30.2	24.6
Mean	28.1	25.4	27.7	25.0	28.3	25.7	29.3	25.8	29.8	24.4	29.7	23.4	30.2	24.6
Maximum	30	26.1	29	26.1	29	26.2	32	26.5	32	26.1	31	25.7	32	25.4
Mean Max.	29.7	25.9	29.2	26.0	29.4	26.2	30.8	26.3	31.4	25.4	31.1	24.8	31.7	25.4
Mean Min.	26.7	24.6	26.9	23.6	27.2	25.0	28.6	24.6	27.8	22.8	27.8	19.1	28.6	22.8
Minimum	27	24.5	27	22.3	27	24.7	28	23.7	27	20.6	28	17.0	28	21.9
ANGAUR ISLAND,														
1951-1952	28.4	22.7	28.2	24.1	28.2	24.4	28.9	23.5	29.2	21.9	--	--	--	--
KOROR, KOROR ISLAND,														
1947	--	--	28.2	--	28.2	--	28.6	--	--	--	28.7	--	28.9	--
1949-1950	--	--	--	--	27.4	--	28.7	--	29.0	--	29.4	--	29.6	--
GUAM (Apra Harbor),														
1949	--	--	--	--	--	--	--	--	28.2	25.7	28.7	25.6	29.1	25.5
1950-1954	27.5	25.6	27.3	25.7	27.5	25.8	27.9	25.9	28.4	26.0	28.9	26.1	29.4	26.0
1955-1959	26.8	25.6	26.8	25.5	27.2	25.9	27.7	26.0	28.2	26.1	28.6	26.0	28.9	25.9
1960	27.4	25.6	27.4	25.9	28.1	26.2	29.1	26.3	28.9	26.1	28.7	25.8	29.4	26.0
1961	28.7	26.4	28.1	26.1	27.4	25.7	28.2	25.4	28.2	25.3	29.0	25.2	29.1	25.3
1962	27.8	25.3	27.1	25.5	--	--	28.5	25.6	28.9	25.7	29.4	25.6	29.7	25.8
1963	28.1	26.0	27.6	25.6	28.2	25.1	28.7	26.0	28.6	25.6	29.6	25.6	29.4	25.7
1964	27.9	26.0	27.2	26.2	27.4	26.0	28.2	25.8	28.6	25.3	29.6	25.8	29.8	25.6
Mean	27.4	25.7	27.2	25.7	27.5	25.9	28.1	25.9	28.4	25.9	28.9	25.9	29.3	25.8
Maximum	29	27.2	29	26.9	29	27.4	32	27.4	31	27.1	31	27.1	31	26.9
Mean Max.	28.3	26.2	28.0	26.1	28.3	26.3	28.9	26.3	29.1	26.3	29.6	26.3	30.2	26.3
Mean Min.	26.6	25.3	26.6	25.1	26.6	25.5	27.2	25.4	27.7	25.4	28.1	25.4	28.2	25.2
Minimum	24	24.1	25	24.0	26	25.0	26	24.7	26	23.3	27	24.0	27	23.7
MARCUS														
1964	24.2	26.6	23.9	26.6	23.6	26.3	26.7	26.7	27.4	26.9	30.1	26.4	31.1	26.5
SAN FERNANDO, LUZON ISLAND,														
1948-1949	27.1	24.7	26.2	24.8	27.1	24.9	28.3	24.7	30.6	25.5	29.7	24.8	29.4	24.2
MANILA, LUZON ISLAND,														
1947-1949	26.5	22.0	26.6	22.2	27.1	23.3	27.9	24.2	29.1	24.8	29.9	25.0	29.3	22.4
1950-1954	27.8	23.7	28.2	23.7	28.5	23.8	29.7	24.1	30.4	24.8	30.2	24.2	29.7	21.8
1955-1959	27.6	22.5	28.0	22.7	28.2	23.6	29.1	25.1	30.2	25.4	30.4	25.2	29.9	22.4

*Observations for the year are incomplete; extremes are for the months shown.

Temperatures and Densities
Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
CAROLINE ISLANDS-continued															
29.1	25.1	29.2	25.0	29.2	25.1	28.9	25.3	28.4	25.4	28.5	25.4				
32	27.3	32	27.0	32	27.3	32	27.2	30	27.0			32	29.0		
30.2	26.1	30.6	26.1	30.3	25.9	29.9	26.1	29.3	25.9						
27.8	22.3	28.0	22.6	27.7	23.1	27.7	23.9	27.3	24.5						
27	14.5	27	17.4	27	15.8	27	16.4	25	22.0					25	14.5
CAROLINE ISLANDS															
29.3	24.0	29.6	24.0	29.4	24.4	29.6	24.6	29.1	24.7	29.2	24.7	32	26.5	24	16.8
29.3	24.0	29.6	24.0	29.4	24.4	29.6	24.6	29.1	24.7	29.2	24.7	32	26.5	24	16.8
32	25.4	32	25.5	32	25.3	31	26.0	31	25.6			32	26.5		
31.1	25.0	31.4	25.4	31.4	25.3	30.8	25.6	30.3	25.6						
27.8	20.8	27.8	19.2	27.5	20.7	26.7	22.8	27.8	20.6						
28	20.7	27	16.8	27	17.2	24	21.7	28	20.4					24	16.8
PALAU ISLANDS															
--	--	29.1	21.2	29.2	21.0	29.0	21.7	29.0	23.1	--	--	31	28.7*	26	12*
PALAU ISLANDS															
29.0	--	--	--	--	--	--	--	--	--	--	--	31*		27*	
28.9	--	29.4	--	29.7	--	--	--	--	--	--	--	32		27	
MARIANAS															
29.7	25.4	29.7	25.1	29.1	25.1	28.6	25.4	27.7	25.5	--	--	31	25.9*	27*	23.4*
29.3	25.6	29.2	25.5	29.3	25.4	28.9	25.5	28.3	25.7	28.5	25.7	31	26.9	27	23.0
28.9	25.8	28.8	25.5	29.1	25.5	28.7	25.7	27.6	25.4	28.1	25.7	31	27.2	24	23.1
29.6	25.4	30.0	25.8	29.6	25.8	29.2	25.9	28.9	26.4	28.9	25.9	32	27.4	27	23.9
29.3	24.7	29.6	24.6	29.1	25.1	29.1	25.2	27.9	25.2	28.6	25.4	32	27.4	26	21.8
29.7	25.6	29.9	25.7	28.9	25.2	28.7	25.9	27.9	25.8	--	--	31	26.7*	27*	23.2*
29.9	25.8	30.1	25.1	29.6	25.0	29.1	26.2	28.5	26.0	29.0	25.7	31	26.8	27	23.3
29.4	25.6	29.5	25.8	29.6	25.8	30.1	25.8	29.6	25.6	28.9	25.8	31	26.8	26	24.2
29.3	25.6	29.3	25.4	29.2	25.4	28.9	25.6	28.2	25.6	28.5	25.7				
31	26.8	32	26.5	31	26.5	31	26.8	30	26.9			32	27.4		
30.1	26.3	30.3	26.0	30.3	26.0	29.7	26.1	28.9	26.1						
28.2	24.6	28.2	24.6	28.1	24.6	28.2	24.9	27.3	24.9						
26	21.8	26	22.5	26	23.4	27	23.0	26	23.1					24	21.8
ISLAND															
30.8	26.5	28.1	26.2	27.6	26.2	26.6	26.3	23.8	26.4	27.0	26.5	33	28.5	21	25.4
PHILIPPINE ISLANDS															
29.3	22.6	28.8	21.5	29.1	22.8	28.3	24.1	27.9	24.8	28.5	24.1	32	26.4	25	14.9
PHILIPPINE ISLANDS															
29.5	21.1	29.5	16.0	29.1	18.4	28.6	22.0	27.4	22.1	28.4	22.0	33	26.0	24	0.8
28.9	16.8	29.6	18.5	29.8	20.3	28.9	20.9	27.9	23.1	29.1	22.1	32	26.8	26	5.9
29.6	19.6	29.0	14.4	29.4	19.6	28.9	22.3	27.9	22.3	29.0	22.1	33	27.8	27	5.8

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
MANILA, LUZON ISLAND,														
1960	27.8	23.3	27.6	22.7	28.6	23.0	29.4	25.1	29.8	24.3	29.4	19.6	29.4	18.2
1961	25.9	22.6	27.1	22.6	28.3	23.0	29.3	24.9	29.7	25.4	29.1	24.7	27.6	9.7
1962	26.1	22.3	24.8	21.6	26.7	23.4	28.1	24.3	29.6	--	30.1	23.9	28.4	16.2
1963	25.6	22.2	24.8	22.5	25.6	23.6	27.4	24.2	29.2	--	28.7	19.3	28.7	14.7
1964	26.9	22.1	25.8	--	26.6	--	27.4	--	29.4	--	29.8	--	29.3	19.3
Mean	27.2	22.8	27.3	22.9	27.8	23.6	28.9	24.6	29.9	25.0	30.0	24.0	29.4	20.4
Maximum	31	26.8	31	26.7	32	26.4	32	26.6	32	26.8	32	27.8	33	26.5
Mean Max.	28.8	25.0	28.6	24.8	29.2	25.3	30.2	25.4	31.1	25.8	31.2	25.3	30.9	23.7
Mean Min.	25.7	19.2	26.1	19.5	26.6	21.1	27.7	22.9	28.8	22.6	28.3	21.9	27.6	16.2
Minimum	23	14.0	24	10.1	24	16.0	27	16.6	28	14.9	25	13.5	26	3.2
LEGASPI, LUZON ISLAND,														
1947-1949	26.4	20.5	27.6	20.9	28.2	21.2	30.1	21.8	30.9	21.4	30.8	23.9	30.0	23.8
1950-1954	28.1	20.0	28.4	20.6	28.3	19.4	29.3	20.6	29.4	20.3	29.5	21.3	29.3	22.0
1955-1959	26.1	18.5	26.5	19.6	27.0	19.4	28.1	20.7	29.1	20.8	29.4	21.3	29.0	22.7
1960	26.7	19.6	26.4	19.4	27.8	20.8	29.4	19.8	29.4	23.6	28.9	22.1	29.2	23.1
1961	25.1	23.6	26.2	23.5	27.9	24.4	28.6	23.8	29.2	24.5	29.4	24.9	28.4	25.2
1962	25.8	21.4	25.2	22.6	27.5	--	28.8	23.6	29.4	23.2	29.9	24.8	28.4	24.8
1963	24.7	22.7	23.9	22.6	25.7	23.5	27.4	24.3	28.9	24.2	27.2	24.4	27.8	25.2
1964	26.9	--	25.7	--	27.2	23.5	27.7	--	28.7	24.2	29.3	25.3	28.7	25.2
Mean	26.6	20.0	26.9	20.7	27.6	20.6	28.8	21.3	29.5	21.6	29.6	22.6	29.1	23.2
Maximum	31	29.9	31	28.6	31	29.7	32	30.0	33	29.8	34	29.6	33	30.2
Mean Max.	28.5	23.0	28.8	23.6	29.8	23.9	30.7	24.0	31.2	24.7	31.6	25.1	31.2	26.1
Mean Min.	24.9	14.6	25.1	16.3	25.7	16.6	26.9	17.3	27.8	16.1	27.4	18.2	27.3	18.8
Minimum	23	9.3	23	10.5	23	8.6	26	11.7	26	8.3	24	8.6	27	4.8
TACLOBAN, LEYTE ISLAND,														
1951-1954	29.8	24.3	29.3	24.2	29.8	24.5	30.2	24.9	30.3	24.6	30.1	24.6	30.1	24.4
1955-1959	28.8	24.4	28.6	23.8	29.0	23.9	29.6	24.4	30.0	24.1	30.6	24.9	30.2	24.4
1960	29.6	24.0	29.1	22.6	29.3	23.1	29.6	24.4	29.7	24.4	29.8	24.5	29.8	24.6
1961	29.4	23.4	29.2	23.1	29.8	24.6	29.8	24.7	29.8	24.7	29.8	24.6	29.6	24.2
1962	29.5	22.6	29.6	23.1	29.8	23.8	29.1	24.4	29.7	23.5	29.6	23.4	29.4	23.0
1963	27.9	20.9	26.2	22.4	26.3	24.0	27.5	23.9	28.9	24.2	29.2	24.4	29.4	24.6
1964	28.9	23.6	28.7	23.5	29.9	24.1	29.4	23.6	30.2	24.5	30.0	24.0	30.4	24.7
Mean	29.2	23.6	28.7	23.5	29.2	24.1	29.6	24.4	29.9	24.3	30.1	24.5	29.9	24.3
Maximum	32	25.6	32	26.3	32	26.1	32	26.3	32	26.6	33	26.4	32	26.5
Mean Max.	30.2	24.5	29.7	24.5	30.1	25.0	30.2	25.2	30.6	25.2	30.9	25.2	30.8	25.1
Mean Min.	28.3	22.5	27.7	21.7	28.3	22.3	28.9	23.4	29.2	22.7	29.0	23.5	28.8	23.1
Minimum	26	19.6	26	18.0	24	17.9	26	19.5	27	15.9	26	19.8	26	20.1
CEBU, CEBU ISLAND,														
1947-1949	26.7	24.6	27.3	25.2	27.7	25.4	29.1	25.6	29.9	25.3	30.2	24.6	29.8	24.4
1950-1954	27.6	24.5	27.7	25.0	28.3	25.2	29.4	25.5	29.9	25.3	30.0	25.0	29.8	25.0
1955-1959	27.4	24.7	27.6	24.9	28.1	25.3	29.0	25.5	29.8	25.6	30.2	25.7	29.6	25.4
1960	27.7	25.6	27.1	25.7	28.3	25.6	29.0	25.8	29.8	26.0	29.8	25.8	30.1	25.6
1961	26.2	25.4	27.0	24.2	27.8	25.8	29.0	25.6	29.8	25.6	29.7	25.6	28.8	25.2
1962	26.9	25.2	25.7	24.6	27.5	24.8	28.9	24.5	29.7	25.2	30.1	25.2	29.3	25.3
1963	26.5	24.6	25.8	24.8	26.5	24.8	28.3	24.8	29.4	25.0	29.0	25.4	30.4	25.1
1964	27.7	24.7	26.9	24.7	27.3	24.6	28.7	25.1	29.7	25.3	30.4	25.2	29.4	25.0

*Observations for the year are incomplete; extremes are for the months shown.

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
PHILIPPINE ISLANDS—continued															
28.2	12.2	29.1	14.8	28.8	16.6	28.8	21.2	27.9	22.9	28.7	20.3	32	25.7	26	9.7
27.8	12.2	28.6	9.9	28.9	15.7	27.6	21.6	27.1	21.9	28.1	19.5	32	25.7	23	3.2
29.3	12.7	27.8	14.4	28.9	18.4	27.9	22.4	26.7	22.2	27.9	--	31	25.2*	24	5.0*
28.6	17.8	28.2	12.5	28.8	18.6	28.4	22.6	27.7	22.9	27.6	--	32	24.7*	24	4.5*
28.3	14.0	28.7	15.9	28.3	17.4	28.1	21.1	26.7	21.4	27.9	--	31	25.2*	24	6.7*
29.1	17.4	29.1	15.6	29.3	19.0	28.7	21.7	27.7	22.5	28.7	21.6				
33	25.8	32	25.6	32	25.4	32	26.7	32	26.8			33	27.8		
30.7	22.7	30.4	20.0	30.7	23.4	30.2	24.6	29.1	24.7						
27.1	12.0	27.4	10.9	27.8	13.3	27.2	16.3	26.4	17.2					23	0.8
24	4.4	26	4.5	27	8.5	26	0.8	24	11.2						
PHILIPPINE ISLANDS															
29.6	24.4	29.8	24.7	29.4	23.9	28.1	20.9	27.6	19.5	29.1	22.2	34	27.7	24	11.3
28.8	23.2	28.8	23.5	28.8	22.9	28.2	22.3	27.9	21.1	28.7	21.4	33	30.2	24	12.4
28.9	23.7	28.5	24.5	28.4	22.6	27.6	21.0	26.5	19.2	27.9	21.2	33	26.7	24	4.8
28.1	25.7	29.1	23.7	28.3	22.2	27.5	--	26.9	23.5	28.1	--	32	26.2*	24	12.4*
28.1	25.3	28.0	25.1	28.1	24.7	27.6	--	26.9	22.1	27.8	--	32	26.4*	23	12.4*
28.4	25.4	28.2	23.5	28.9	24.7	27.4	19.0	25.9	--	27.8	--	32	26.4*	23	3.3*
28.6	24.3	28.6	25.1	28.7	24.4	27.6	--	27.2	--	27.2	--	31	26.9*	23	8.8*
27.8	25.2	28.4	23.6	28.3	22.1	28.1	21.7	25.9	17.5	27.7	--	31	26.7*	24	5.6*
28.8	24.1	28.8	24.2	28.7	23.2	27.9	21.3	27.1	20.1	28.3	21.9				
32	29.6	33	29.8	32	28.1	31	27.8	30	29.6			34	30.2		
30.6	26.3	30.7	26.3	30.6	25.9	29.8	25.1	28.9	24.4						
27.2	19.5	27.3	18.7	27.0	17.5	26.0	13.7	25.2	13.9					23	3.3
26	10.4	27	8.6	26	7.5	25	3.3	24	5.6						
PHILIPPINE ISLANDS															
30.1	24.5	30.1	24.4	30.1	24.2	29.9	24.7	29.6	24.3	30.0	24.5	32	26.4	28	21.9
30.0	24.6	30.1	24.7	29.9	24.7	29.3	23.0	28.8	22.9	29.6	24.2	32	26.1	26	3.0
29.7	24.4	29.7	24.4	28.9	23.0	28.6	23.2	29.4	23.5	29.4	23.8	30	25.4	24	18.5
29.7	24.0	29.7	24.5	29.7	24.4	29.6	23.6	29.5	22.8	29.6	24.0	30	25.4	28	21.4
29.0	22.5	28.9	22.4	29.1	22.6	28.5	21.8	28.5	21.8	29.2	22.9	30	25.0	28	21.0
29.2	23.8	29.2	24.4	29.5	24.3	29.5	23.6	29.7	24.0	28.5	23.7	32	25.8	24	6.3
30.7	24.8	30.4	24.6	29.9	25.5	30.5	25.6	29.9	24.1	29.9	24.4	33	28.6	26	14.1
29.9	24.3	29.9	24.4	29.8	24.2	29.5	23.9	29.3	23.5	29.6	24.1				
32	26.3	32	26.7	32	28.6	32	28.5	32	26.4			33	28.6		
30.6	25.0	30.6	25.0	30.6	25.2	30.4	25.2	30.3	24.8						
29.1	21.8	29.2	23.1	28.7	22.8	28.1	21.2	27.9	20.4						
27	3.4	27	17.0	26	14.1	24	12.6	26	3.0					24	3.0
PHILIPPINE ISLANDS															
29.4	24.8	29.4	24.5	29.3	24.4	28.3	24.0	27.9	24.1	28.8	24.7	32	26.3	22	12.7
29.4	25.0	29.3	24.7	29.6	24.6	29.1	24.7	27.9	24.4	29.0	24.9	31	26.2	26	15.7
29.6	25.1	29.6	25.5	29.4	25.1	28.9	25.1	28.1	25.1	28.9	25.2	32	27.7	26	19.3
29.3	25.7	29.8	24.9	28.9	25.1	28.9	23.4	27.7	24.8	28.9	25.3	31	26.5	26	19.5
29.0	25.5	29.1	25.1	28.9	24.3	28.7	23.9	28.1	24.8	28.5	25.1	31	26.4	26	20.6
28.8	25.1	29.1	24.6	29.8	24.5	28.8	24.5	27.8	24.5	28.5	24.8	31	26.6	24	21.5
29.9	25.1	29.7	25.2	29.2	24.2	28.7	24.5	28.2	24.5	28.5	24.8	33	26.6	25	22.4
29.2	25.4	29.6	25.4	29.4	24.8	29.0	23.7	27.6	24.0	28.7	24.8	31	26.6	26	20.5

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
CEBU, CEBU ISLAND,														
Mean	27.2	24.8	27.3	24.9	27.9	25.2	29.1	25.4	29.8	25.4	30.0	25.2	29.7	25.1
Maximum	29	26.2	29	26.4	30	26.5	31	26.5	31	27.0	32	27.0	33	26.5
Mean Max.	28.1	25.5	28.2	25.7	28.8	25.9	29.9	26.0	30.6	26.1	30.9	26.0	30.7	25.8
Mean Min.	26.2	22.3	26.4	23.1	27.1	23.3	28.1	24.1	28.8	23.7	29.1	23.0	28.6	22.1
Minimum	22	18.9	24	21.0	25	20.5	27	22.1	27	20.0	28	14.8	28	12.7
DAVAO, MINDANAO ISLAND,														
1947-1949	27.2	25.6	27.0	25.6	27.1	25.7	28.3	25.0	29.2	24.1	29.4	21.9	29.1	20.5
1950-1954	28.1	24.5	28.3	24.4	28.1	24.4	28.8	24.3	29.5	22.2	29.1	21.4	29.1	20.5
1955-1959	28.2	24.8	28.2	24.8	28.7	24.8	29.1	23.6	29.3	22.8	29.4	21.7	29.4	21.1
1960	27.3	25.3	26.8	24.6	27.4	24.6	28.1	23.6	28.3	23.6	28.2	22.6	28.1	21.4
1961	26.3	22.8	26.1	22.9	26.5	25.0	28.0	24.8	28.2	24.2	28.1	20.6	27.9	22.7
1962	26.5	22.8	25.6	20.4	26.3	22.2	27.4	22.8	27.7	21.0	28.3	20.4	27.9	21.9
1963	27.0	24.8	26.0	24.7	26.0	23.4	27.3	24.3	28.1	23.0	29.0	22.4	28.4	21.6
1964	27.3	--	26.4	23.5	26.9	23.8	28.1	23.4	29.1	22.1	29.3	22.3	29.3	21.6
Mean	27.7	24.6	27.4	24.3	27.7	24.5	28.5	24.1	29.1	22.8	29.1	21.6	28.9	21.0
Maximum	31	27.1	31	27.4	31	27.5	32	27.4	32	27.8	32	27.2	32	26.6
Mean Max.	29.1	26.1	28.7	26.1	29.4	26.2	30.7	26.2	30.8	26.0	31.0	25.6	30.7	25.3
Mean Min.	26.3	19.5	26.0	18.7	26.2	18.7	26.9	18.1	27.5	15.3	27.2	14.6	27.6	14.1
Minimum	24	8.5	23	12.3	24	10.1	26	14.2	25	4.4	26	6.8	26	5.8
JOLO, JOLO ISLAND,														
1947-1949	26.7	24.8	26.3	24.9	26.1	24.6	26.8	25.0	27.6	25.2	27.7	25.2	27.4	25.1
1950-1954	27.4	25.2	27.4	25.1	27.6	25.0	28.1	25.2	28.6	25.1	28.4	24.8	28.2	24.5
1955	27.8	24.8	27.2	24.3	27.3	25.0	26.8	25.0	28.2	25.4	27.6	25.2	28.1	25.4
Mean	27.3	25.0	27.1	25.0	27.1	24.9	27.5	25.1	28.3	25.2	28.1	24.9	27.9	24.7
Maximum	30	27.2	30	26.6	29	26.1	31	26.2	32	31.1	32	28.5	32	26.6
Mean Max.	28.7	26.0	28.6	26.4	28.4	25.7	29.1	25.8	30.3	26.8	29.7	26.2	29.7	25.8
Mean Min.	26.1	23.5	25.9	22.4	25.6	23.3	26.3	23.3	26.8	23.2	26.8	22.9	26.7	22.4
Minimum	26	21.3	26	17.0	24	22.1	24	19.8	26	16.3	26	18.9	26	15.5
CALETA PERCY, MAGELLAN														
1962	10.8	22.8	10.9	22.7	9.6	22.4	7.4	22.2	5.8	22.3	3.7	22.2	3.7	22.2
1963	10.3	23.6	11.1	24.6	9.0	23.3	6.7	23.2	5.2	23.4	3.8	23.4	2.7	23.3
1964	11.4	23.8	10.7	24.6	9.3	23.6	7.4	23.3	5.1	23.3	2.8	23.0	3.2	23.0
Mean	10.8	23.4	10.9	23.3	9.3	23.1	7.2	22.9	5.4	23.0	3.4	22.9	3.2	22.8
Maximum	15	25.1	13	23.9	12	24.3	9	23.6	7	23.7	9	23.8	5	23.5
Mean Max.	13.9	24.0	12.4	23.6	10.9	23.5	9.1	23.2	6.3	23.3	6.3	23.1	4.6	23.1
Mean Min.	8.2	23.0	9.3	22.9	7.9	22.8	6.1	22.6	3.5	22.6	0.9	22.5	2.1	22.6
Minimum	7	22.5	8	22.3	8	22.1	6	21.9	3	21.8	0	21.6	1	21.8
PUNTA ARENAS, MAGELLAN														
1944	--	--	--	--	--	--	--	--	6.6	22.6	4.6	22.2	4.3	22.5
1945-1949	9.1	22.6	9.1	22.4	7.9	22.2	7.4	22.0	6.1	21.8	5.3	21.6	5.4	21.7
1950-1954	8.1	22.5	8.6	22.6	8.6	22.6	7.4	22.4	6.2	22.2	5.6	22.0	4.8	22.2
1955-1959	8.4	22.7	8.0	22.7	7.8	22.7	7.0	22.7	6.4	22.6	5.3	22.5	4.8	22.4
1960	8.9	22.6	8.5	22.6	9.0	22.4	7.2	22.2	5.8	22.0	3.5	--	5.3	22.8
1961	9.3	22.8	9.3	22.8	7.8	22.6	7.1	22.4	5.9	22.2	--	--	--	--
1962	8.6	23.8	8.3	23.5	7.8	23.1	6.8	23.1	4.8	22.8	4.5	23.2	5.2	23.5
1963	8.1	23.8	10.7	24.0	7.4	23.8	4.9	23.6	4.4	23.5	3.9	23.5	3.2	23.4
1964	9.8	24.2	10.2	24.2	9.7	24.0	--	--	--	--	--	--	--	--

*Observations for the year are incomplete; extremes are for the months shown.

Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
PHILIPPINE ISLANDS—continued															
29.4	25.1	29.4	25.0	29.4	24.7	28.8	24.5	27.9	24.6	28.8	25.0				
32	26.6	31	27.7	31	26.4	32	26.2	30	26.2			33	27.7		
30.4	25.9	30.2	25.8	30.4	25.5	29.8	25.5	28.7	25.4						
28.3	22.6	28.3	22.5	28.2	22.1	27.8	21.5	27.1	22.3						
28	17.8	28	15.7	27	14.9	26	13.1	26	18.4					22	12.7
PHILIPPINE ISLANDS															
29.3	22.2	29.2	20.0	29.1	20.3	28.8	22.3	28.0	24.0	28.5	23.1	33	28.6	24	4.0
29.1	21.4	28.7	20.1	29.1	20.8	28.9	22.7	28.4	24.4	28.8	22.6	32	28.8	26	6.8
29.2	21.2	29.3	21.8	29.4	21.8	29.2	22.9	28.4	24.8	29.0	23.0	32	27.8	25	12.9
27.8	22.3	27.3	20.2	27.3	20.7	27.4	22.6	26.9	23.3	27.6	22.9	31	27.0	25	12.5
28.1	23.6	27.9	24.3	27.9	24.2	27.7	24.8	27.6	24.9	27.5	23.7	32	26.6	25	13.4
28.0	22.2	27.9	21.8	28.4	23.8	28.0	23.9	27.1	25.4	27.4	22.4	34	26.6	23	13.6
28.0	22.1	28.7	22.7	28.5	23.7	28.1	23.8	27.6	24.4	27.7	23.4	32	26.9	24	13.2
28.8	22.8	29.0	22.8	29.3	22.5	28.9	23.5	28.6	24.3	28.4	--	32	25.7*	22	15.3*
28.8	21.8	28.8	21.3	28.9	21.7	28.7	23.0	28.1	24.5	28.5	22.9				
32	28.6	32	28.8	33	26.1	34	27.6	31	27.7			34	28.8		
30.8	25.7	30.3	25.7	30.7	25.4	30.4	26.0	29.2	26.1						
27.6	14.8	27.4	15.3	27.5	15.2	27.3	16.1	26.3	19.3					22	4.0
26	4.0	25	6.4	26	5.7	26	6.2	22	9.9						
PHILIPPINE ISLANDS															
27.4	25.3	27.4	25.1	28.0	25.2	28.0	24.3	27.5	24.2	27.2	24.9	31	26.6	24	17.1
28.2	24.8	28.1	24.6	28.1	24.5	28.2	24.4	28.1	24.6	28.0	24.8	32	31.1	26	14.9
28.3	25.4	27.6	25.2	28.1	25.3	--	--	--	--	--	--	29*	26.2*	24	21.3*
28.0	25.0	27.6	24.8	28.1	24.8	28.2	24.4	27.8	24.5	27.8	24.9				
31	26.8	31	26.5	31	26.6	31	28.8	30	26.7			32	31.1		
29.8	25.9	29.4	25.6	29.1	26.1	29.7	25.9	29.1	25.6						
26.6	23.0	26.9	22.6	26.8	21.0	27.0	20.4	26.8	21.5					24	14.9
26	20.2	27	19.3	26	14.9	26	17.1	26	15.9						
STRAIT, CHILE															
3.3	22.4	5.4	22.6	7.4	22.5	9.0	22.3	10.7	22.5	7.3	22.4	12	23.0	0	21.6
2.4	23.3	4.3	23.2	6.8	23.2	8.9	23.4	10.3	23.5	6.8	23.4	15	24.6	0	22.9
3.6	23.1	4.6	23.0	7.3	23.3	8.7	23.6	10.6	23.6	7.1	23.4	19	25.1	0	22.7
3.1	22.9	4.8	22.9	7.2	23.0	8.9	23.1	10.5	23.2	7.1	23.0				
4	23.8	7	23.5	9	23.6	11	23.6	19	24.6			19	25.1		
4.4	23.4	6.7	23.2	8.9	23.3	10.2	23.2	13.9	23.7						
0.9	22.6	3.2	22.7	5.6	22.7	5.7	22.9	7.9	22.9						
0	21.9	3	22.2	6	22.1	4	22.1	6	22.2					0	21.6
STRAIT, CHILE															
3.7	22.4	5.1	22.7	7.4	22.9	6.9	22.9	7.9	23.0	--	--	--	23.1*	2	20.9*
5.1	22.1	5.4	22.2	6.0	22.4	6.6	22.4	7.7	22.4	6.8	22.2	13	23.3	2	19.3
5.1	23.3	5.5	23.3	6.4	22.3	7.1	22.5	7.3	22.7	6.7	22.6	11	25.5	-1	20.1
4.4	22.4	4.7	22.4	5.9	22.5	7.1	22.6	7.7	22.7	6.5	22.6	14	24.5	0	20.4
6.2	22.8	6.4	22.7	6.4	22.7	7.3	22.8	8.8	22.8	6.9	--	12	23.3*	1	21.4*
3.9	22.9	3.9	22.4	5.9	23.3	6.8	23.5	7.0	23.5	--	--	14	24.1*	1*	21.8*
4.6	23.4	5.6	23.6	7.4	23.8	7.7	23.9	8.7	24.0	6.7	23.5	12	24.8	1	21.7
2.5	23.4	4.0	23.5	6.1	23.7	7.4	23.8	9.0	24.1	6.0	23.7	18	25.4	-2	23.2
5.4	23.5	5.5	23.8	7.0	24.2	7.6	24.0	9.7	23.8	--	--	16*	25.2*	3*	22.9*

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}
	PUNTA ARENAS, MAGELLAN													
Mean	8.6	22.8	8.8	22.9	8.2	22.8	7.1	22.6	6.1	22.4	5.1	22.3	4.8	22.4
Maximum	14	25.1	18	25.4	16	24.4	10	24.1	9	24.5	8	24.1	8	23.9
Mean Max.	11.3	23.4	11.3	23.4	10.1	23.3	8.6	23.0	7.7	22.9	6.7	22.9	6.3	22.3
Mean Min.	7.1	22.4	6.6	22.3	6.5	22.3	5.2	22.0	4.0	21.8	3.3	21.5	3.1	21.8
Minimum	6	20.4	3	20.9	3	21.7	0	20.3	1	20.9	1	19.3	1	19.8
	PUERTO MONTT,													
1944	--	--	--	--	--	--	--	--	11.1	23.8	10.2	22.5	9.8	22.8
1945-1949	16.5	19.6	15.6	20.7	14.8	22.0	12.5	22.7	11.2	22.9	10.3	22.8	10.2	23.1
1950-1954	16.4	19.8	16.2	20.7	13.7	22.2	12.2	22.5	10.9	23.6	9.9	22.9	10.1	23.3
1955-1959	14.4	21.7	15.7	21.3	14.4	21.9	11.6	22.7	10.5	22.8	10.3	23.3	10.3	23.1
1960	16.7	20.0	18.7	20.4	16.2	21.3	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1964	--	--	--	--	--	--	--	--	--	--	10.1	23.5	10.7	24.0
Mean	16.0	20.2	16.0	20.9	14.4	22.0	12.1	22.6	10.9	23.1	10.2	23.0	10.2	23.2
Maximum	21	25.1	21	24.7	20	24.7	15	25.4	14	28.4	15	25.3	15	25.7
Mean Max.	18.7	23.3	18.3	23.3	17.1	23.8	13.6	24.3	12.2	24.7	11.6	24.4	11.9	24.5
Mean Min.	13.1	17.3	13.1	18.2	11.9	19.5	10.5	20.4	9.6	20.2	8.3	20.9	8.1	20.6
Minimum	11	15.1	11	12.4	11	15.6	9	17.8	8	15.8	6	15.9	5	14.5
	CORRAL,													
1963	16.7	--	16.4	--	14.7	--	13.9	--	11.6	--	9.9	--	9.4	2.3
1964	17.1	9.9	15.9	10.9	14.7	11.9	13.1	12.9	11.7	7.6	9.7	2.5	10.0	4.9
	TALCAHUANO,													
1945-1949	12.1	--	12.3	--	11.8	--	11.6	--	12.2	--	11.7	--	11.0	--
1950-1954	14.5	25.6	14.7	25.8	14.0	25.7	13.0	25.8	12.8	24.2	11.4	20.8	10.9	21.0
1955-1959	14.1	25.7	13.9	25.9	13.8	25.8	12.6	25.4	11.4	24.3	10.8	22.9	10.6	22.5
1960	16.8	25.4	14.7	26.2	14.5	25.7	13.2	26.1	12.8	25.7	12.3	23.2	11.2	21.1
1961	15.1	25.8	14.3	25.9	14.3	25.8	12.4	25.8	11.9	25.4	11.1	24.0	11.3	22.6
1962	13.2	25.5	14.4	25.6	13.5	25.7	13.0	25.5	12.4	--	11.7	24.9	11.0	24.3
1963	14.0	25.7	15.6	25.6	14.5	25.6	13.5	25.6	13.2	25.6	11.8	25.3	11.5	24.6
1964	14.0	25.9	14.0	25.6	13.6	--	13.4	25.5	12.9	25.6	11.5	24.6	10.8	24.4
Mean	13.9	25.7	13.9	25.8	13.4	25.7	12.6	25.6	12.2	24.7	11.4	22.8	10.9	22.6
Maximum	18	26.9	18	27.1	18	29.0	16	30.6	15	26.8	14	27.4	14	27.4
Mean Max.	15.8	26.4	15.7	26.6	15.3	26.7	14.0	26.7	13.5	26.1	12.6	25.2	12.4	25.1
Mean Min.	12.0	24.5	12.4	25.0	11.8	24.4	11.6	24.5	10.5	22.0	9.3	18.1	8.9	16.1
Minimum	9	22.7	10	23.1	9	20.8	9	21.7	7	17.2	6	14.4	6	0.5
	VALPARAISO,													
1944	--	--	--	--	--	--	15.3	26.1	13.0	26.2	13.4	26.0	13.2	26.1
1945-1949	15.6	26.2	15.7	26.3	14.8	26.3	14.0	26.0	13.3	25.8	12.2	25.7	12.1	25.5
1950-1954	15.8	26.1	15.9	26.2	15.0	26.2	14.0	25.8	13.5	25.7	12.9	25.5	12.7	25.4
1955-1959	15.7	26.0	15.6	26.1	14.6	25.9	13.4	26.0	12.5	26.1	12.6	25.7	12.4	25.6
1960	17.3	25.9	17.1	25.9	15.8	26.1	13.3	26.4	12.7	26.4	12.3	25.8	12.3	25.8
1961	15.6	26.2	16.5	26.5	14.8	26.5	13.4	26.5	12.9	26.2	12.9	26.0	12.6	25.8
1962	16.6	26.6	16.3	26.6	15.7	26.5	13.7	26.4	13.3	26.5	13.0	25.7	12.4	25.6
1963	16.2	26.5	17.7	26.2	15.6	26.2	13.9	26.1	13.2	25.9	12.6	25.7	13.4	24.4
1964	17.5	24.7	15.5	25.8	15.2	26.0	13.7	26.2	13.4	25.9	12.7	25.9	11.7	25.6

*Observations for the year are incomplete; extremes are for the months shown.

Temperatures and Densities
Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
STRAIT, CHILE - continued															
4.7	22.6	5.2	22.6	6.3	22.7	7.1	22.9	7.9	22.9	6.7	22.7				
9	24.3	9	24.4	10	25.1	11	24.6	13	25.5			18	25.5		
6.3	23.1	7.2	23.0	7.8	23.3	8.7	23.3	9.7	23.5						
2.7	22.1	3.5	22.2	4.3	22.1	5.4	22.4	6.3	22.4						
-2	20.5	1	21.7	1	20.1	3	21.0	5	21.0					-2	19.3
CHILE															
9.8	23.5	10.5	23.2	10.9	22.9	13.6	19.9	--	--	--	--	--	25.1*	7	17.6*
10.3	22.9	11.2	22.3	12.1	22.1	13.8	22.3	15.1	19.6	12.8	21.9	20	28.4	7	15.0
10.1	23.7	10.4	23.2	11.8	22.0	12.8	21.9	15.8	19.5	12.5	22.1	21	25.3	6	12.4
10.7	22.6	10.0	22.8	11.8	21.4	14.3	19.8	14.9	20.5	12.4	22.0	20	25.7	5	14.1
--	--	--	--	--	--	--	--	--	--	--	--	21*	23.5*	--	17.3*
10.6	23.8	10.9	23.9	12.6	18.9	14.2	18.5	14.3	19.7	--	--	18	25.8*	9*	0.0
10.3	23.1	10.6	22.8	11.9	21.6	13.7	21.2	15.2	19.9	12.6	22.0				
13	25.3	15	27.0	15	25.5	19	27.8	19	25.1			21	28.4		
11.5	24.3	12.3	24.4	14.2	23.9	16.6	24.0	17.9	23.4						
8.7	21.4	9.2	20.7	10.2	17.2	11.1	16.7	12.4	15.2					5	0.0
7	18.4	7	17.2	9	0.0	10	0.0	10	0.0						
CHILE															
9.8	2.5	10.3	2.5	12.2	4.0	14.4	7.2	15.6	9.1	12.9	--	20	10.9	7	0.0
10.2	6.7	10.8	5.1	13.8	7.3	14.7	1.2	16.9	1.3	13.2	6.8	21	19.3	6	0.5
CHILE															
11.1	--	11.3	--	11.9	--	12.4	--	12.6	--	11.8	--	16	--	7	--
10.8	22.0	12.1	23.4	12.3	25.1	13.3	25.3	14.3	25.3	12.8	24.2	26	30.6	6	0.5
10.7	23.0	11.2	23.9	12.2	25.1	12.9	25.6	13.4	25.7	12.3	24.6	18	29.0	6	9.2
11.5	24.7	12.3	25.1	12.5	25.6	12.8	25.8	13.6	25.9	13.2	25.0	19	27.0	8	11.3
12.1	22.1	12.2	22.9	12.5	24.7	12.1	25.4	12.7	25.5	12.7	24.7	18	27.1	9	9.3
11.5	24.1	11.7	24.5	12.3	24.9	13.6	25.4	15.1	25.6	12.8	--	17	26.1*	10	21.7*
11.4	24.0	11.3	22.3	13.4	24.8	--	--	13.7	25.7	--	--	18	27.4*	7	19.6*
11.0	25.0	10.6	24.6	11.5	25.3	12.6	25.4	14.8	25.1	12.6	--	17	26.4*	5	22.2*
11.0	23.1	11.5	23.8	12.2	25.1	12.8	25.5	13.5	25.6	12.4	24.7				
15	26.5	14	26.6	16	26.6	17	27.2	20	27.7			20	30.6		
12.5	25.3	12.8	25.4	13.8	26.1	14.6	26.5	15.7	26.3						
9.1	18.8	9.8	21.1	10.8	23.2	10.9	24.1	11.7	24.5						
7	9.3	5	18.1	9	21.5	9	21.2	10	21.6					5	0.5
CHILE															
13.1	25.6	12.6	26.3	13.2	26.2	14.3	26.3	15.6	25.9	--	--	18*	27.7*	12	24.0*
11.9	25.8	12.6	25.9	13.2	26.1	13.7	26.2	15.1	26.2	13.7	26.0	20	29.1	8	23.7
12.5	25.7	12.8	25.9	12.9	26.2	14.3	26.2	15.1	25.9	14.0	25.9	19	27.6	11	21.1
12.2	25.5	12.2	25.9	12.9	26.1	14.4	26.1	15.3	26.2	13.6	25.9	19	27.8	10	23.4
12.3	26.3	12.8	26.5	12.7	26.4	13.6	26.3	15.7	26.1	14.0	26.2	20	27.5	11	24.3
13.1	26.1	12.8	25.9	13.4	26.2	14.0	26.2	15.4	26.1	14.0	26.2	19	27.2	12	24.6
12.8	26.1	12.6	26.6	13.3	26.2	16.1	26.2	16.6	26.3	14.4	26.3	19	27.3	12	23.8
13.4	24.2	13.7	25.0	14.2	25.9	14.7	26.2	15.4	25.7	14.5	25.7	21	27.2	12	19.6
11.6	25.9	12.1	26.5	13.2	26.4	14.1	26.7	15.2	26.5	13.8	26.0	21	27.3	11	22.7

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
VALPARAISO,														
Mean	15.9	26.1	15.9	26.2	14.9	26.1	13.8	26.1	13.2	26.0	12.6	25.7	12.4	25.5
Maximum	21	28.9	21	28.0	19	29.1	17	27.8	16	27.5	15	27.0	15	27.1
Mean Max.	18.0	26.7	17.7	26.8	16.8	26.7	15.3	26.7	14.4	26.5	13.7	26.3	13.4	26.2
Mean Min.	13.6	25.3	13.9	25.5	13.1	25.6	12.5	25.4	12.1	25.2	11.6	24.8	11.4	24.5
Minimum	12	22.7	12	24.0	10	25.0	11	24.4	11	23.8	10	23.7	8	20.2
CALDERA,														
1951-1954	17.3	25.4	17.4	25.2	17.2	25.3	16.0	25.5	15.9	25.6	14.8	25.8	15.0	25.8
1955-1959	18.1	25.5	18.1	25.7	17.5	25.7	16.0	25.7	15.1	25.6	14.0	25.6	13.8	25.5
1960	18.6	24.7	17.7	25.3	17.9	25.4	17.8	25.4	14.8	25.3	13.9	25.3	14.0	25.3
1961	18.8	25.4	18.8	25.3	18.8	25.3	16.4	25.2	15.4	25.2	14.2	25.2	13.3	25.3
1962	17.9	25.4	17.8	25.4	19.2	25.9	17.3	25.7	16.4	25.8	14.3	25.5	14.2	25.5
1963	19.4	25.9	19.9	26.0	19.4	25.9	17.8	25.7	16.8	25.6	15.3	25.4	15.3	25.5
1964	19.4	26.1	19.3	26.1	18.3	25.8	16.6	25.7	16.0	25.6	13.9	25.5	13.7	25.5
Mean	18.1	25.5	18.1	25.5	17.8	25.6	16.4	25.6	15.6	25.6	14.3	25.6	14.2	25.6
Maximum	22	26.7	22	26.8	22	26.8	21	26.5	19	26.7	18	26.6	18	26.6
Mean Max.	20.5	26.1	20.2	25.9	20.2	26.0	18.3	26.0	17.4	26.0	15.7	25.9	15.6	26.0
Mean Min.	15.3	25.0	16.1	25.1	15.4	25.0	14.6	25.1	13.6	25.2	13.0	25.2	12.9	25.3
Minimum	12	24.0	14	24.1	13	24.5	12	24.6	10	24.8	9	24.8	9	25.0
ANTOFAGASTA,														
1946-1949	20.8	26.2	20.4	26.1	19.1	26.1	17.6	26.1	16.1	26.1	15.3	25.9	14.6	26.1
1950-1954	20.9	26.2	20.6	26.1	19.3	25.9	17.2	25.8	16.4	25.8	15.4	25.8	15.0	25.8
1955-1959	19.8	25.9	20.6	25.8	19.1	25.8	17.3	25.8	16.1	25.8	15.1	25.7	15.0	25.8
1960	20.3	25.7	20.6	25.6	19.6	25.4	18.7	25.5	16.1	25.4	15.4	25.4	15.1	25.6
1961	20.6	25.4	21.2	25.5	19.4	25.4	17.7	25.4	16.0	25.3	14.7	25.5	13.9	25.5
1962	20.2	25.8	20.2	25.9	19.3	25.7	17.7	25.6	16.9	25.7	14.9	25.8	14.6	25.7
1963	20.6	25.8	20.9	25.7	19.6	25.6	17.8	25.4	16.4	25.5	14.9	25.4	15.2	25.5
1964	20.2	26.0	19.4	25.9	19.3	26.0	17.5	25.9	15.9	25.7	15.1	25.6	14.2	25.8
Mean	20.4	26.0	20.5	25.9	19.2	25.8	17.5	25.8	16.2	25.8	15.2	25.7	14.8	25.8
Maximum	25	27.3	23	27.2	23	26.8	20	27.1	19	27.2	18	26.9	17	27.0
Mean Max.	22.0	26.4	22.2	26.4	21.0	26.3	18.9	26.3	17.4	26.2	16.2	26.1	15.3	26.2
Mean Min.	18.9	25.6	18.8	25.5	17.4	25.4	16.2	25.5	15.2	25.4	14.4	25.5	14.2	25.4
Minimum	18	24.9	17	25.2	15	24.9	15	25.1	14	25.0	13	25.0	13	24.9
IQUIQUE,														
1959	--	--	19.3	25.5	18.7	25.4	18.6	25.5	17.5	25.5	16.6	25.5	16.1	25.5
ARICA,														
1951-1954	19.1	26.0	19.4	25.7	19.2	25.4	18.1	25.4	17.7	25.4	16.7	25.5	16.0	25.6
1955-1959	19.3	25.8	19.8	25.8	19.6	25.8	18.4	25.8	17.7	25.7	16.9	25.7	16.1	25.7
1960	19.1	26.3	19.5	26.2	19.6	26.1	19.2	26.0	17.5	25.8	16.6	25.7	15.9	25.6
1961	19.7	26.0	20.3	26.2	19.2	26.0	19.2	26.0	17.2	25.6	16.2	25.7	15.2	25.6
1962	17.9	25.8	18.1	25.8	18.6	26.0	17.7	25.6	17.4	25.6	16.1	25.5	15.3	25.5
1963	19.8	26.1	19.6	25.5	19.2	25.2	17.5	25.4	16.6	25.4	16.8	25.5	16.8	25.4
1964	19.4	25.8	19.6	25.6	19.6	25.6	17.3	25.8	15.8	25.4	15.1	25.3	14.8	25.2
Mean	19.2	25.9	19.6	25.8	19.3	25.7	18.3	25.7	17.4	25.6	16.6	25.6	15.9	25.6
Maximum	23	26.8	22	27.1	23	26.7	25	27.1	21	26.9	19	26.8	19	26.4
Mean Max.	20.5	26.4	21.1	26.4	20.8	26.1	20.4	26.2	18.7	26.0	17.6	26.0	16.8	25.9
Mean Min.	17.2	25.5	17.8	25.2	17.6	25.3	17.0	25.3	16.3	25.3	15.8	25.2	15.2	25.3
Minimum	16	24.9	16	24.1	15	24.2	14	24.8	15	24.8	14	23.8	14	24.8

*Observations for the year are incomplete; extremes are for the months shown.

Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}
CHILE—continued															
12.4	25.7	12.6	26.0	13.1	26.2	14.2	26.2	15.3	26.1	13.9	26.0				
15	27.2	17	27.6	16	27.7	18	27.8	20	27.6			21	29.1		
13.4	26.4	14.1	26.7	14.7	26.7	16.2	26.8	17.4	26.8						
11.3	24.7	11.6	24.9	11.7	25.6	12.4	25.6	13.1	25.2						
11	19.6	11	22.1	11	24.9	11	24.8	12	23.5					8	19.6
CHILE															
14.3	25.6	14.4	25.6	14.8	25.6	15.7	25.6	16.2	25.4	15.8	25.5	22	26.7	12	24.1
13.9	25.6	14.4	25.6	15.0	25.5	15.7	25.5	16.9	25.4	15.7	25.6	22	26.8	9	24.5
14.4	25.3	14.7	25.4	15.6	25.7	16.9	25.5	17.9	25.4	16.2	25.3	21	26.1	12	24.0
14.8	25.7	14.9	25.6	15.8	25.5	17.0	25.4	17.3	25.4	16.3	25.4	21	26.1	12	24.8
14.4	25.5	15.1	25.7	16.1	25.8	17.3	25.9	19.8	26.0	16.6	25.7	22	27.0	10	25.0
15.0	25.5	15.7	25.7	15.8	25.7	17.1	25.8	18.7	26.0	17.2	25.7	22	26.8	13	24.7
14.4	25.5	14.6	25.7	15.5	25.8	17.9	25.7	18.0	25.7	16.5	25.7	21	26.6	11	24.9
14.3	25.5	14.6	25.6	15.2	25.6	16.3	25.6	17.3	25.5	16.0	25.6				
16	26.2	18	26.3	21	26.7	20	26.6	22	27.0			22	27.0		
15.6	25.8	16.3	26.0	17.2	26.0	18.6	26.0	19.5	26.0						
12.7	25.2	13.1	25.2	13.3	25.1	14.6	25.2	15.3	25.2						
9	24.9	12	25.0	12	24.7	12	24.6	13	24.4					9	24.0
CHILE															
14.8	26.2	15.3	26.0	16.3	26.2	17.8	26.2	19.7	26.3	17.3	26.1	27	27.5	13	24.3
15.3	25.8	16.3	25.9	16.7	26.0	17.7	26.2	19.3	26.2	17.5	26.0	23	27.4	13	24.9
14.9	25.8	15.3	25.6	16.4	25.6	17.6	25.7	19.2	25.8	17.2	25.8	23	26.8	12	24.8
14.7	25.5	15.3	25.5	16.7	25.5	17.9	25.5	20.2	25.4	17.6	25.5	22	26.0	14	24.6
15.0	25.8	15.2	25.7	16.3	25.7	17.8	25.7	18.8	25.6	17.2	25.5	23	26.1	13	24.9
15.1	25.7	15.8	25.6	16.5	25.7	17.8	25.8	19.8	26.0	17.4	25.8	21	26.5	14	25.3
15.3	25.6	15.8	25.8	16.0	25.9	17.4	26.0	18.4	25.9	17.4	25.7	23	26.3	14	25.2
14.2	25.8	15.3	26.0	16.4	25.9	18.2	25.9	19.8	26.0	17.1	25.9	22	26.5	14	24.9
14.9	25.8	15.6	25.8	16.4	25.8	17.8	25.9	19.3	26.0	17.3	25.8				
18	27.0	18	26.9	19	27.2	20	27.5	27	27.4			27	27.5		
15.8	26.2	16.7	26.2	17.7	26.3	19.3	26.4	21.2	26.4						
14.2	25.5	14.7	25.5	15.1	25.4	16.5	25.5	17.6	25.5						
13	24.8	13	25.0	14	24.3	16	24.6	12	24.9					12	24.3
CHILE															
16.6	25.4	16.7	25.5	--	--	--	--	17.9	25.7	--	--	22*	26.1*	15*	25.2*
CHILE															
16.4	25.6	16.7	25.5	16.9	25.6	17.3	25.7	18.1	25.6	17.6	25.6	22	27.1	14	24.1
15.9	25.7	15.8	25.7	16.7	25.8	17.5	25.8	18.1	25.9	17.6	25.8	25	27.1	14	24.6
15.7	25.6	15.9	25.6	16.4	25.8	17.0	26.0	18.3	26.1	17.6	25.9	21	26.8	15	25.3
15.6	25.6	15.8	25.7	16.6	25.6	16.9	25.6	18.2	25.8	17.5	25.8	24	27.1	14	24.9
16.2	25.6	16.2	25.5	16.1	25.6	16.4	25.7	18.4	25.9	17.0	25.7	21	26.8	14	23.8
16.0	25.3	17.6	25.4	16.0	25.7	16.6	25.7	18.2	26.1	17.6	25.6	22	26.7	14	24.2
14.4	25.2	15.4	25.3	16.6	25.5	15.6	25.9	17.5	25.6	16.8	25.5	22	26.4	14	25.0
15.9	25.6	16.2	25.6	16.7	25.7	17.1	25.8	18.1	25.8	17.5	25.7				
21	26.8	19	26.5	19	26.6	20	26.7	21	26.9			25	27.1		
17.0	25.9	17.3	25.9	18.1	26.1	18.6	26.2	19.6	26.3						
15.1	25.3	15.2	25.3	15.3	25.3	15.9	25.4	16.6	25.4						
14	25.0	14	25.1	14	25.2	14	25.1	16	25.1					14	23.8

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
EASTER ISLAND,														
1957-1958	25.5	26.7	25.2	26.6	24.5	26.5	23.3	26.4	21.5	26.1	20.2	25.8	19.8	26.1
1962	--	--	26.6	27.5	26.2	27.5	24.9	27.5	--	--	--	--	20.3	26.0
1963	24.9	25.4	26.1	27.3	25.7	27.2	24.4	27.3	21.6	25.8	19.9	25.4	19.2	24.8
1964	--	--	--	--	--	--	--	--	22.5	26.9	19.8	25.7	19.2	25.9
Mean	25.3	26.3	25.8	27.0	25.2	26.9	23.9	26.9	21.8	26.2	20.0	25.7	19.7	25.8
Maximum	29	28.1	29	28.2	29	28.1	27	28.8	24	27.8	26	27.8	23	27.5
Mean Max.	28.3	27.7	28.6	27.8	28.4	27.8	26.9	28.0	24.3	27.4	23.1	27.3	22.2	27.3
Mean Min.	21.8	24.2	23.2	25.7	22.2	25.2	21.0	25.5	18.8	24.4	17.1	23.3	16.9	22.8
Minimum	19	22.9	21	25.2	20	24.0	21	24.6	17	23.3	17	21.9	16	21.5
MATARANI,														
1944	--	--	--	--	15.3	26.2	15.4	26.2	15.2	26.2	15.3	26.0	15.5	26.4
1945-1949	16.8	26.3	16.4	26.4	17.0	26.3	16.6	26.3	16.2	26.3	15.4	26.2	14.7	26.4
1950-1954	17.3	26.5	15.6	26.2	15.7	26.2	16.0	26.2	15.4	26.3	15.6	26.4	15.3	26.3
1955-1959	16.9	26.4	17.1	26.7	18.0	26.8	17.2	26.4	16.7	26.7	15.8	26.6	15.3	26.4
1960	16.8	26.2	16.6	26.7	16.0	26.2	16.5	26.7	16.5	26.6	15.9	26.5	15.3	26.4
1961	16.7	26.2	17.0	26.8	16.9	26.6	15.9	26.5	15.1	26.4	14.9	26.4	14.5	26.3
1962	15.7	26.8	15.5	26.4	15.5	26.7	15.7	26.5	15.8	26.5	15.3	--	14.6	26.3
1963	16.2	26.7	16.4	26.5	15.7	26.7	15.4	26.5	15.7	26.7	15.7	26.5	15.3	26.7
1964	16.8	26.0	17.9	26.0	16.3	25.7	15.3	26.4	14.5	26.4	14.0	26.2	14.1	26.2
Mean	16.8	26.4	16.7	26.5	16.7	26.4	16.3	26.4	15.9	26.5	15.4	26.4	15.0	26.4
Maximum	22	27.4	20	27.4	21	27.8	21	27.4	21	28.2	19	27.4	18	28.5
Mean Max.	18.4	26.9	17.8	26.9	18.1	27.0	17.6	26.8	16.9	27.0	16.2	26.8	15.9	26.9
Mean Min.	15.6	25.9	15.6	25.9	15.6	26.0	15.4	25.9	15.3	26.0	14.8	26.1	14.3	26.0
Minimum	14	25.0	14	22.0	14	25.1	14	25.1	14	24.9	14	24.9	12	24.4
SAN JUAN,														
1958-1959	16.2	25.6	17.4	25.7	18.0	25.7	16.3	25.6	15.4	25.6	14.6	25.6	14.2	25.7
1960	15.3	25.5	15.4	25.7	15.0	25.7	15.1	25.7	14.5	25.6	14.3	25.6	15.0	25.6
1961	15.8	25.8	15.7	25.8	15.9	25.8	14.4	25.6	14.3	25.6	14.2	25.7	13.7	25.6
1962	14.8	25.6	15.2	25.7	14.9	25.6	14.6	25.6	--	--	14.0	25.6	--	--
1963	15.5	26.3	15.2	--	14.9	26.1	14.7	26.1	14.9	26.0	14.7	25.8	14.7	25.9
1964	15.0	25.9	15.7	26.1	15.8	26.0	14.4	25.8	13.6	25.9	13.1	25.8	12.8	25.7
Mean	15.6	25.8	16.0	25.8	16.1	25.8	15.2	25.7	14.7	25.7	14.2	25.7	14.1	25.7
Maximum	19	27.0	21	26.5	22	26.5	18	26.8	17	26.3	16	26.1	16	26.3
Mean Max.	16.7	26.2	18.1	26.1	17.9	26.2	16.3	26.1	15.7	25.9	15.0	25.8	14.8	25.9
Mean Min.	14.7	25.4	14.8	25.5	14.9	25.4	14.2	25.5	13.7	25.5	13.6	25.5	13.2	25.5
Minimum	13	24.6	14	25.2	14	25.1	13	25.3	12	25.1	12	25.3	12	25.2
CALLAO (Naval Arsenal),														
1944	--	--	21.7	23.9	20.7	23.4	19.9	23.5	18.7	24.2	17.9	24.4	--	--
1945-1949	21.1	25.2	21.7	24.6	21.9	24.7	20.7	24.1	18.9	24.6	17.3	24.5	17.3	24.4
1950-1953	19.1	25.0	19.9	24.6	20.4	24.6	19.7	24.6	18.2	25.3	17.4	25.6	17.1	25.1
Mean	20.1	25.1	21.0	24.5	21.2	24.5	20.3	24.2	18.7	24.8	17.4	24.9	17.2	24.7
Maximum	26	29.6	27	27.0	26	28.4	24	27.7	22	27.0	20	27.0	21	26.7
Mean Max.	22.7	26.8	23.1	26.0	23.3	26.1	22.4	25.9	20.6	26.0	18.8	26.3	18.7	25.8
Mean Min.	18.1	23.8	18.4	23.1	19.4	22.9	18.0	22.8	17.2	23.3	16.5	23.9	16.3	23.5
Minimum	17	21.9	17	21.5	17	22.0	15	21.3	16	21.3	14	22.0	15	22.0

*Observations for the year are incomplete; extremes are for the months shown.

Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
CHILE															
19.9	25.3	20.5	25.0	21.2	25.4	22.0	25.7	23.6	26.1	22.3	26.0	29	28.8	16	21.0
20.3	26.2	20.6	25.9	22.1	25.5	22.7	25.6	24.9	26.3	--	--	30	28.2*	18*	20.5*
20.4	25.0	21.5	25.1	21.8	25.5	22.0	26.3	24.9	26.6	22.7	26.0	31	29.9	16	21.9
20.6	24.6	20.8	25.8	22.1	26.0	22.9	25.3	25.8	26.1	--	--	31*	27.8*	17*	21.8*
20.2	25.3	20.9	25.4	21.7	25.5	22.3	25.7	24.6	26.2	22.6	26.1				
24	27.6	26	28.8	27	29.9	28	28.6	31	29.4			31	29.9		
22.9	26.9	24.2	27.7	25.1	28.0	25.6	27.6	29.4	27.9						
17.4	22.4	18.1	22.6	18.8	22.1	18.9	22.4	20.8	24.0					16	20.5
16	21.5	17	21.3	17	20.5	17	21.0	20	23.4						
PERU															
16.1	26.3	15.7	26.3	15.0	26.4	15.7	26.2	--	--	--	--	18*	28.0*	14	24.7*
14.3	26.3	14.5	26.5	14.6	26.4	15.3	26.3	15.7	26.4	15.6	26.3	20	28.5	12	24.4
15.2	26.3	14.1	26.4	15.3	26.5	15.6	27.1	17.2	27.0	15.7	26.4	20	28.0	13	25.6
14.9	26.4	14.4	26.2	15.0	26.4	15.4	26.2	16.1	26.5	16.1	26.5	22	28.2	13	25.0
--	--	14.5	26.2	14.1	26.2	15.2	26.2	16.5	26.7	--	--	18	27.0*	14	25.7*
14.8	26.4	14.2	26.2	14.5	26.3	15.1	26.6	16.8	26.8	15.5	26.5	19	27.3	13	26.0
14.2	26.2	14.7	26.2	14.2	26.3	14.9	26.3	15.8	26.6	--	--	18	27.2*	14	25.8*
15.0	26.4	14.9	26.2	14.6	26.3	14.9	26.1	15.8	26.0	15.5	26.4	18	27.3	14	22.0
13.4	26.1	14.2	26.2	14.3	26.2	14.9	26.2	15.3	26.5	15.1	26.2	20	27.3	13	25.3
14.8	26.3	14.5	26.3	14.8	26.4	15.3	26.3	16.2	26.5	15.7	26.4				
18	28.1	17	28.1	19	28.1	18	27.3	19	27.8			22	28.5		
15.5	26.8	15.4	27.0	15.9	26.8	16.6	26.8	17.7	27.0						
14.1	25.9	13.9	25.9	14.0	26.0	14.6	25.9	15.1	26.2					12	22.0
12	24.7	12	25.5	12	25.7	13	25.2	13	25.5						
PERU															
13.4	25.6	13.0	25.7	13.4	25.8	13.9	25.7	14.4	25.4	15.0	25.6	22	26.8	12	24.6
13.8	25.6	13.4	25.6	13.3	25.6	--	--	14.4	25.6	--	--	18	25.9*	13	25.3*
13.7	25.6	12.9	25.5	13.1	25.5	--	--	--	--	--	--	18	26.2*	12*	25.2*
--	--	--	--	--	--	--	--	14.3	26.1	--	--	19	27.1*	13*	25.1*
14.2	25.8	13.9	25.8	13.4	25.7	13.7	25.7	14.5	25.9	14.5	--	17	27.0*	13	25.4*
12.6	25.7	12.6	25.7	12.7	25.7	12.9	25.7	13.7	25.8	13.7	25.8	19	26.5	12	25.4
13.6	25.6	13.2	25.7	13.2	25.7	13.6	25.7	14.3	25.7	14.5	25.7				
14	26.2	14	26.7	14	26.1	17	26.2	19	27.1			22	27.1		
14.0	25.8	13.8	25.9	14.1	25.9	14.7	26.0	16.0	26.2						
12.9	25.4	12.6	25.5	12.7	25.5	12.7	25.4	13.5	25.3					12	24.6
12	25.2	12	25.3	12	25.3	12	25.2	13	24.7						
PERU															
18.3	24.7	17.5	24.8	17.5	25.0	18.8	25.1	19.2	25.4	--	--	24*	27.5*	17*	21.4*
16.7	24.9	17.1	24.9	17.8	25.1	18.7	25.2	19.7	25.1	19.1	24.8	27	29.6	15	19.8
17.0	25.2	17.1	25.2	17.7	25.0	17.9	25.0	18.6	25.1	18.3	25.0	24	27.0	14	22.0
17.0	25.0	17.1	25.0	17.7	25.1	18.4	25.1	19.2	25.1	18.8	24.8				
20	26.9	20	26.7	22	27.0	22	27.1	22	26.9			27	29.6		
18.1	26.0	18.9	25.9	19.8	26.2	20.1	26.1	21.1	26.1						
16.1	23.9	15.9	23.7	16.2	23.3	16.8	24.0	17.5	23.9					14	19.8
15	22.4	15	21.6	15	19.8	15	22.7	16	21.6						

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}
	CALLAO (La Punta),													
1954	--	--	16.3	26.3	16.4	26.4	16.2	26.2	15.5	26.0	15.2	25.7	14.7	25.8
1955-1959	16.8	26.5	18.4	26.3	18.8	26.4	18.3	26.4	17.9	26.4	17.1	26.1	16.9	26.3
1960	16.7	26.6	17.2	26.3	17.6	26.4	16.9	26.5	16.2	26.2	16.1	26.2	15.6	26.1
1961	16.2	26.2	17.6	26.3	17.9	26.4	17.1	26.2	17.2	25.9	15.9	26.0	15.6	25.9
1962	16.7	26.3	17.8	26.4	16.6	26.2	16.3	26.1	15.7	25.9	16.2	26.1	16.0	26.2
1963	15.6	26.1	16.3	26.0	18.2	26.4	17.3	26.1	17.1	26.0	17.3	26.1	16.9	26.1
1964	17.3	26.3	18.2	26.4	17.3	26.2	16.7	26.2	15.8	26.1	--	--	14.9	26.4
Mean	16.7	26.4	17.8	26.3	18.0	26.3	17.4	26.3	17.0	26.2	16.6	26.1	16.1	26.2
Maximum	21	28.2	22	27.1	23	27.4	21	27.5	22	27.0	20	26.9	21	27.9
Mean Max.	18.1	27.1	19.7	26.8	19.8	26.8	19.7	26.9	18.3	26.6	17.6	26.4	17.1	26.6
Mean Min.	15.4	26.0	16.2	25.8	16.4	26.0	16.3	25.8	16.1	25.9	16.1	25.6	15.6	25.8
Minimum	14	25.7	14	25.0	16	25.4	15	25.3	14	25.3	14	23.9	14	25.1
	CHIMBOTE,													
1955-1959	20.1	25.8	22.5	25.8	23.2	25.8	21.6	25.9	20.1	25.8	19.2	26.0	18.7	25.9
1960	20.3	26.2	21.5	26.2	21.1	26.3	19.4	26.5	17.9	26.5	17.7	26.4	16.8	26.5
1961	20.1	26.4	22.0	26.4	21.7	26.3	20.4	26.3	18.9	26.5	17.8	26.5	17.1	26.2
1962	20.7	26.0	21.7	26.6	20.1	26.2	19.1	26.1	18.6	26.1	16.8	26.0	16.9	26.1
1963	18.8	26.1	19.7	26.1	21.9	26.2	20.1	26.4	19.4	25.8	18.3	26.1	18.0	26.0
1964	21.3	26.5	--	--	--	--	20.6	26.3	17.7	26.0	16.1	26.1	16.2	26.1
Mean	20.2	26.0	21.9	26.1	22.3	26.0	20.7	26.1	19.3	26.0	18.3	26.1	17.8	26.0
Maximum	25	27.5	26	26.9	27	27.2	24	27.5	26	27.0	23	27.3	23	27.4
Mean Max.	21.9	26.5	23.4	26.5	24.2	26.5	22.5	26.6	20.9	26.4	19.4	26.5	19.0	26.6
Mean Min.	18.1	25.5	20.0	25.7	20.6	25.6	19.2	25.5	17.8	25.3	17.1	25.6	16.7	25.6
Minimum	15	24.9	18	25.3	19	25.1	17	25.1	16	22.3	14	25.2	14	25.1
	TALARA,													
1944	22.4	--	--	--	23.4	--	21.0	--	20.4	--	19.3	26.8	19.4	26.6
1945-1949	22.4	26.5	24.1	26.4	22.9	26.7	20.9	26.8	19.3	26.7	19.4	26.6	18.7	26.7
1950-1954	20.4	26.2	21.4	25.9	21.7	26.0	19.6	26.3	18.6	26.2	17.9	26.2	17.9	26.2
1955-1959	21.3	26.0	23.7	25.9	22.8	25.7	21.4	26.1	20.3	26.2	19.9	26.2	18.3	26.1
1960	21.3	25.7	20.4	26.1	20.6	26.0	18.7	26.1	17.7	26.2	18.7	26.2	17.6	26.1
1961	22.4	--	24.2	26.4	20.7	26.1	19.9	26.3	18.9	25.9	18.1	26.3	17.8	26.3
1962	21.8	26.4	19.3	26.1	18.2	26.1	17.7	26.2	18.2	26.2	17.5	26.1	17.1	26.1
1963	19.4	26.0	22.3	25.7	20.8	26.1	19.4	26.3	19.9	26.3	18.9	26.2	19.0	--
1964	20.2	25.9	19.9	26.3	21.4	26.8	18.8	25.7	14.9	24.7	16.0	25.8	16.1	25.6
Mean	21.4	26.2	22.6	26.1	21.9	26.2	20.2	26.4	19.1	26.2	18.8	26.3	18.2	26.3
Maximum	28	28.0	28	27.8	29	28.1	27	29.3	24	27.7	25	27.9	22	27.6
Mean Max.	24.3	26.9	25.3	27.0	25.1	26.9	22.7	27.1	21.1	26.8	20.9	26.9	20.0	26.8
Mean Min.	18.3	25.4	19.9	25.4	19.0	25.4	18.7	25.7	17.7	25.8	17.3	25.8	16.8	25.7
Minimum	14	24.6	17	24.4	17	23.5	16	22.9	16	25.2	15	25.3	15	24.0
	LA LIBERTAD,													
1949	25.2	25.4	25.9	25.6	27.1	25.7	--	--	--	--	24.7	26.5	--	--
1950-1953	26.1	25.3	26.9	25.6	27.6	25.8	25.7	26.2	25.2	26.2	24.9	25.8	23.6	25.8
--														
1955-1959	25.8	25.3	27.3	25.5	27.2	25.6	26.4	26.0	25.1	26.1	24.4	26.0	23.7	25.7
1960	26.4	24.9	26.7	25.0	27.3	25.3	25.3	25.9	26.1	25.3	21.8	25.5	22.5	25.6
1961	26.9	25.0	28.4	24.9	26.4	25.4	25.6	25.9	25.1	26.0	24.2	25.4	22.3	25.2
1962	25.1	25.7	26.2	26.4	26.1	27.0	25.8	27.0	25.4	26.8	23.6	26.6	22.8	26.2
1963	27.4	25.9	27.3	26.1	27.1	26.5	26.1	26.8	24.7	26.9	23.1	26.8	23.4	26.4
1964	26.1	25.9	26.6	26.0	28.7	26.0	26.4	26.1	25.6	26.5	24.3	26.3	22.9	26.2

*Observations for the year are incomplete; extremes are for the months shown.

Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}
PERU															
14.5	25.7	14.4	25.8	14.2	25.9	14.1	26.0	15.2	26.0	--	--	19*	26.7*	13	23.9*
15.9	26.2	15.4	26.3	15.3	26.4	15.6	26.4	16.1	26.4	16.9	26.3	23	27.4	13	25.0
15.6	26.1	15.4	26.1	15.1	26.0	15.2	26.1	15.8	26.1	16.1	26.2	19	28.2	14	25.9
15.7	26.0	15.5	26.4	15.4	26.0	15.1	25.9	15.3	25.9	16.2	26.1	20	28.0	14	25.6
15.6	25.9	15.5	26.0	15.4	26.0	15.2	26.0	15.7	26.1	16.1	26.1	21	27.9	14	25.8
16.5	26.0	16.2	26.1	15.6	26.0	15.9	26.2	15.8	26.1	16.6	26.1	21	26.8	15	25.7
14.7	26.1	14.6	25.9	14.3	25.9	14.5	26.0	14.9	26.2	--	--	19	26.9*	14	25.7*
15.7	26.1	15.3	26.2	15.1	26.1	15.3	26.2	15.7	26.2	16.4	26.2				
18	27.0	18	27.1	18	26.7	18	27.4	20	27.2			23	28.2		
16.4	26.4	16.3	26.4	16.2	26.4	16.4	26.6	17.1	26.6						
15.2	25.8	14.6	25.9	14.4	25.9	14.4	26.0	14.7	25.9					13	23.9
14	24.8	14	25.5	13	25.7	13	25.6	13	25.7						
PERU															
17.9	25.9	17.6	25.8	18.1	25.8	18.8	25.8	19.4	25.9	19.8	25.8	27	27.5	14	25.0
16.9	26.2	17.6	26.0	17.2	26.1	18.2	26.2	18.9	26.2	18.6	26.3	23	27.2	14	25.5
17.3	26.1	17.3	26.0	17.7	26.0	18.6	26.1	19.2	26.2	19.0	26.2	23	27.4	16	24.9
17.1	25.9	17.6	26.0	16.8	26.0	18.1	26.1	18.7	26.3	18.5	26.1	23	27.2	14	25.3
18.2	26.1	18.6	26.1	18.9	26.1	19.3	26.3	20.2	26.4	19.3	26.1	23	27.5	16	22.3
15.8	26.0	16.1	26.1	17.1	26.1	17.4	26.4	18.6	26.4	--	--	22*	27.5*	14	25.1*
17.5	26.0	17.5	25.9	17.8	25.9	18.6	26.0	19.3	26.1	19.3	26.0				
22	26.8	20	26.8	20	26.7	21	27.0	23	27.3			27	27.5		
18.7	26.4	18.5	26.3	18.7	26.3	19.8	26.4	20.4	26.5						
16.2	25.6	16.2	25.5	16.8	25.5	17.3	25.7	18.1	25.7					14	22.3
14	25.0	14	25.1	16	25.1	16	25.1	17	25.2						
PERU															
18.3	26.8	18.8	26.8	17.7	26.6	17.2	26.6	17.2	26.9	--	--	27*	27.5*	15	25.9*
18.1	26.6	17.7	26.4	17.8	26.4	17.7	26.4	18.9	26.5	19.8	26.6	28	29.5	14	24.9
17.2	26.3	18.0	26.2	17.9	26.5	18.6	26.1	18.3	26.3	19.0	26.2	29	27.9	14	22.9
18.1	26.2	18.0	26.1	18.0	26.2	18.7	26.1	18.6	26.1	19.9	26.1	28	27.8	15	24.1
17.7	25.8	18.0	25.9	--	--	17.7	26.0	19.6	25.7	--	--	24	27.0*	16*	24.1*
17.6	26.0	17.3	26.1	17.4	25.8	17.1	26.1	18.1	26.1	19.1	--	28	27.3*	15	24.0*
17.3	25.9	17.8	26.1	16.4	26.0	17.2	25.9	16.7	25.6	17.9	26.1	26	27.9	15	25.2
19.0	26.1	18.7	25.9	17.8	25.8	17.9	25.8	19.3	25.7	19.4	--	25	27.6*	16	24.3*
16.0	25.6	15.9	25.9	16.9	25.8	17.6	25.7	17.6	25.6	17.6	25.8	24	26.9	14	24.7
17.8	26.3	17.8	26.2	17.7	26.3	18.1	26.1	18.4	26.2	19.3	26.2				
22	29.5	23	27.4	24	27.4	23	27.3	24	27.5			29	29.5		
19.7	26.9	20.2	26.8	20.9	26.9	20.8	26.9	21.5	26.8						
16.6	25.7	16.1	25.6	15.9	25.6	15.8	25.5	16.2	25.7					14	22.9
15	25.3	15	24.1	14	25.1	14	24.3	14	24.8						
ECUADOR															
--	--	23.5	25.6	22.8	25.6	22.8	25.3	24.2	25.2	--	--	29*	27.5*	22*	24.1*
22.9	25.9	23.4	25.8	23.3	25.3	24.2	25.3	24.7	25.3	24.9	25.7	31	30.0	19	22.2
23.6	25.7	23.8	25.6	23.9	25.5	23.9	25.4	25.1	25.4	25.0	25.6	31	27.5	18	23.4
22.4	25.4	23.1	25.4	23.1	25.0	23.3	24.7	24.8	25.0	24.4	25.2	29	26.2	18	24.2
21.4	25.6	23.1	26.0	23.7	26.0	23.5	25.9	25.1	25.7	24.6	25.6	30	27.0	20	24.3
22.6	26.3	23.6	26.2	23.8	26.3	24.6	26.2	25.8	26.0	24.6	26.4	29	27.6	21	25.1
23.4	26.1	23.2	26.0	24.0	26.0	23.9	25.8	--	--	--	--	29	27.1*	21	25.2*
23.3	25.9	23.4	26.0	23.9	25.9	24.2	25.7	24.8	25.5	25.0	26.0	30	27.3	20	25.2

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}
LA LIBERTAD,														
Mean	26.0	25.4	27.0	25.6	27.3	25.8	26.0	26.2	25.2	26.2	24.2	26.0	23.3	25.8
Maximum	29	26.4	30	27.4	31	27.8	30	27.6	29	28.0	28	27.5	27	28.6
Mean Max.	27.8	25.9	28.6	26.2	29.2	26.5	28.0	26.8	27.3	26.7	26.1	26.5	24.8	26.5
Mean Min.	24.2	24.9	24.7	24.8	24.6	25.1	23.3	25.7	22.4	25.7	22.3	25.6	21.6	25.3
Minimum	22	24.2	23	23.4	22	22.2	21	24.3	20	24.5	18	24.6	18	24.4
GALÁPAGOS ISLANDS														
1959	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1960	21.4	25.7	23.3	25.6	24.9	25.5	21.8	26.0	20.9	26.1	19.9	25.9	19.8	25.9
1961	22.7	25.4	25.4	24.9	24.7	25.4	24.8	25.8	22.0	26.2	20.4	26.3	19.3	26.1
1962	22.6	25.9	24.6	25.2	22.7	26.0	21.1	27.3	22.1	27.6	20.4	27.4	19.5	27.1
1963	21.2	26.3	24.4	26.2	25.1	26.1	23.6	26.0	22.0	26.1	21.3	26.2	21.3	26.0
1964	23.4	25.7	23.7	25.4	24.1	25.7	22.9	25.8	19.0	26.3	19.1	26.0	18.3	25.9
Mean	22.3	25.8	24.3	25.5	24.3	25.7	22.8	26.2	21.2	26.5	20.2	26.4	19.6	26.2
Maximum	25	27.2	27	26.9	27	27.2	27	27.8	23	27.8	22	28.1	22	27.5
Mean Max.	24.4	26.3	26.1	26.1	26.3	26.4	25.0	26.6	23.0	27.0	21.2	26.7	20.9	26.6
Mean Min.	19.2	25.2	21.9	24.6	21.3	25.1	20.7	25.7	19.1	26.2	19.2	26.1	17.6	25.1
Minimum	17	24.7	19	23.9	19	24.8	19	25.0	17	25.7	18	25.5	16	22.1
TUMACO,														
1951-1954	26.9	22.1	26.7	21.4	26.8	23.1	27.6	22.2	27.6	21.1	27.3	21.6	27.0	22.4
1955-1959	26.1	21.9	26.7	21.4	26.6	22.3	27.4	22.5	27.4	22.6	27.3	22.2	27.1	22.6
1960	26.4	21.2	26.7	21.9	26.7	21.9	27.2	22.7	27.2	21.2	26.8	22.6	26.2	23.0
1961	26.3	21.6	26.7	22.9	25.7	23.7	27.2	22.6	27.4	22.4	26.8	22.2	26.7	22.4
1962	26.8	20.5	26.2	21.3	26.4	22.3	26.9	21.8	27.2	21.6	26.7	22.0	26.4	23.1
1963	26.4	21.6	26.7	21.6	27.3	21.1	27.2	22.2	26.9	22.1	27.1	22.9	27.0	22.7
1964	26.8	20.9	26.7	21.9	27.6	21.2	27.1	21.3	26.9	22.1	26.7	21.9	26.4	22.1
Mean	26.5	21.6	26.7	21.6	26.7	22.4	27.3	22.3	27.4	22.0	27.1	22.1	26.8	22.6
Maximum	28	24.0	28	24.4	29	25.1	29	24.8	30	24.5	28	24.0	28	24.0
Mean Max.	27.3	22.9	27.7	23.4	28.2	24.1	28.2	24.3	28.2	23.5	27.9	23.3	27.4	23.5
Mean Min.	25.7	19.1	24.8	19.2	24.9	19.8	26.3	18.7	26.8	19.7	26.4	19.5	26.3	21.2
Minimum	24	15.2	22	16.6	22	17.6	26	13.8	27	13.8	26	14.7	26	18.0
BUENAVENTURA,														
1953-1954	28.1	9.8	28.1	11.4	28.7	13.3	28.3	12.1	27.9	9.8	28.2	9.9	28.3	10.1
1955-1959	28.2	10.0	28.8	12.4	28.9	14.2	29.3	12.8	28.7	10.8	28.5	10.2	28.7	10.5
1960	27.9	8.2	28.5	9.7	28.8	11.4	28.7	11.2	28.5	8.7	28.3	9.2	28.3	8.3
1961	28.4	11.4	28.9	13.7	28.4	14.0	28.8	12.9	28.9	11.6	27.9	9.6	28.0	9.8
1962	28.3	9.6	28.2	12.0	28.0	11.7	28.1	11.9	28.2	10.1	27.8	8.7	28.0	10.2
1963	28.2	9.9	28.3	12.6	29.2	13.2	28.3	10.8	28.4	9.8	28.5	9.7	28.4	9.4
1964	28.4	10.9	28.4	11.2	29.3	12.9	28.4	11.2	27.6	8.3	27.4	9.1	27.6	8.8
Mean	28.2	10.0	28.6	12.0	28.8	13.3	28.8	12.1	28.4	10.2	28.2	9.8	28.3	9.9
Maximum	31	15.3	31	18.8	31	19.5	31	17.2	30	16.1	30	15.3	30	14.2
Mean Max.	29.2	13.1	29.5	15.2	29.7	16.0	29.6	15.5	29.3	13.2	28.9	12.7	29.2	12.8
Mean Min.	27.3	6.7	27.8	9.0	27.8	10.4	27.8	8.6	27.4	7.2	27.4	6.6	27.6	7.6
Minimum	27	3.3	27	6.4	26	6.5	26	6.5	27	5.9	27	5.4	27	5.4
BAHÍA SOLANO,														
1964	28.8	19.2	28.6	20.8	28.5	22.0	28.5	20.4	28.0	18.5	27.3	16.9	28.2	17.9

*Observations for the year are incomplete; extremes are for the months shown.

Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}
ECUADOR—continued															
23.1	25.8	23.5	25.8	23.6	25.6	23.9	25.5	24.9	25.4	24.8	25.8				
27	30.0	26	27.2	26	26.6	26	27.0	28	26.3			31	30.0		
24.3	26.5	24.6	26.2	24.6	26.1	25.1	26.0	26.4	25.9						
21.4	25.2	21.9	25.4	22.3	25.2	22.6	25.0	22.9	24.8						
19	24.7	18	24.8	20	24.6	21	24.2	21	23.7					18	22.2
(San Cristóbal), ECUADOR															
--	--	--	--	--	--	20.2	25.2	20.4	25.6	--	--	--	--	--	--
18.5	25.9	19.1	25.8	18.3	25.8	18.8	25.5	20.9	25.6	20.6	25.8	27	27.6	16	24.4
18.6	25.8	17.8	26.0	18.3	25.9	19.1	25.8	20.8	25.7	21.6	25.8	27	26.7	16	23.9
19.7	26.4	18.5	26.2	19.4	26.0	19.2	25.9	19.0	26.0	20.7	26.4	27	28.1	15	24.1
21.4	25.7	20.2	25.7	20.6	25.6	21.8	25.6	21.9	25.8	22.1	25.9	27	27.2	16	25.2
17.2	26.0	18.7	25.7	18.3	25.6	19.1	25.6	19.3	25.8	20.3	25.8	27	26.6	16	22.1
19.1	26.0	18.8	25.9	19.0	25.8	19.7	25.6	20.4	25.8	21.0	26.0				
23	27.3	23	26.7	23	26.4	24	26.5	24	26.5			27	28.1		
21.0	26.3	21.0	26.3	21.8	26.2	22.5	26.2	22.6	26.2						
17.3	25.6	16.3	25.4	16.1	25.2	16.8	25.0	17.7	25.3						
16	25.3	16	25.2	16	25.1	15	24.4	16	25.2					15	22.1
COLOMBIA															
27.0	23.1	26.9	22.7	27.1	21.7	27.0	21.6	26.8	22.0	27.1	22.1	30	25.1	22	13.8
26.9	22.8	26.7	22.4	26.6	22.2	26.5	22.3	26.4	22.2	26.8	22.3	29	24.8	23	15.1
26.4	23.0	26.6	22.1	26.4	22.7	26.2	21.7	26.2	21.2	26.6	22.1	28*	23.9	24*	16.2
--	--	--	--	26.6	22.3	26.4	21.0	26.4	21.2	--	--	28	24.6*	24*	18.7*
26.6	23.3	26.8	22.4	26.5	22.1	26.3	21.5	26.3	21.7	26.6	22.0	28	24.0	22	17.6
26.9	22.9	26.9	23.1	27.0	21.7	26.8	21.6	26.8	21.7	26.9	22.1	28	24.6	26	17.6
26.2	22.7	26.7	21.9	26.5	21.6	26.4	20.9	26.0	21.6	26.7	21.7	29	23.5	26	17.7
26.8	22.9	26.8	22.5	26.8	22.0	26.6	21.7	26.4	21.9	26.8	22.1				
28	24.0	29	24.3	29	23.4	28	23.7	28	23.4			30	25.1		
27.6	23.5	27.6	23.2	27.6	23.0	27.2	22.6	27.0	22.8						
26.3	22.1	26.4	21.7	26.1	20.7	26.2	20.7	25.8	20.6						
26	20.6	26	20.5	26	17.9	26	17.7	25	18.7					22	13.8
COLOMBIA															
28.4	10.2	28.3	8.6	28.0	7.9	27.7	6.6	27.6	7.6	28.1	9.8	30	15.2	27	2.5
28.7	10.4	28.7	9.2	28.0	7.8	27.8	7.0	27.7	7.5	28.5	10.2	31	19.5	26	2.4
28.3	8.1	28.3	8.2	27.8	7.0	27.4	6.6	27.6	7.0	28.2	8.6	30	15.4	27	3.3
28.2	8.8	27.7	7.2	27.8	7.5	27.2	6.7	27.3	7.2	28.1	10.0	30	17.0	26	3.7
28.2	9.2	28.6	8.3	27.6	6.1	27.6	7.2	27.7	7.8	28.0	9.4	29	15.7	27	4.0
28.4	9.1	27.9	9.0	28.2	7.0	27.6	7.9	28.0	8.4	28.3	9.7	30	16.1	27	4.0
27.6	8.0	--	--	27.3	8.7	27.3	8.6	26.9	8.3	--	--	30	16.7*	26	4.0
28.4	9.6	28.3	8.7	27.9	7.6	27.6	7.1	27.6	7.6	28.3	9.8				
30	14.4	30	14.7	30	13.8	30	12.3	29	12.5			31	19.5		
29.2	12.4	29.4	12.0	28.9	11.1	28.6	10.2	28.4	11.2						
27.6	6.6	27.4	6.1	26.8	4.1	26.6	4.0	26.7	4.6						
27	5.2	27	3.7	26	3.4	26	2.4	26	3.2					26	2.4
COLOMBIA															
27.8	16.7	27.6	16.8	27.6	16.4	27.2	16.8	27.4	17.4	28.0	18.3	31	25.0	26	-0.3

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}
	NAOS ISLAND,													
1949	--	--	--	--	--	--	--	--	27.4	25.4	28.3	22.8	28.4	22.1
1950-1954	26.4	23.3	24.3	24.8	23.9	25.4	25.3	25.5	28.3	24.0	28.7	22.5	28.3	22.0
1955-1959	26.1	23.5	25.3	24.4	24.3	25.4	25.8	25.5	27.9	24.4	28.6	22.8	28.3	22.6
1960	27.7	22.0	27.4	23.8	24.6	25.6	26.8	25.3	28.6	23.4	28.7	21.0	28.4	21.5
1961	26.4	23.5	23.4	25.8	22.4	26.9	27.4	26.3	28.1	25.9	28.4	22.6	28.4	21.8
1962	27.0	23.1	22.9	25.7	23.7	26.0	26.7	26.6	27.9	25.2	28.3	20.7	27.9	20.8
1963	26.1	23.7	27.3	24.0	25.4	25.3	26.9	24.7	28.1	24.7	28.7	22.6	28.6	21.5
1964	27.2	23.1	24.9	25.6	25.1	25.6	26.2	25.1	--	--	28.3	20.1	28.2	21.0
Mean	26.4	23.3	24.9	24.7	24.2	25.6	26.0	25.5	28.1	24.4	28.6	22.3	28.3	22.0
Maximum	30	26.1	30	27.2	28	27.2	30	28.7	31	26.7	31	25.2	30	24.1
Mean Max.	28.2	24.8	27.2	25.7	26.1	26.1	28.4	26.2	29.6	25.6	29.7	23.9	29.3	23.1
Mean Min.	24.1	21.8	22.4	23.6	21.8	24.9	22.8	24.7	26.4	22.7	27.7	20.4	27.6	20.2
Minimum	21	20.7	20	21.8	20	23.9	20	22.0	24	20.6	27	17.3	27	15.4
	PUERTO ARMUELLES,													
1951-1954	28.9	23.2	28.7	23.8	28.7	24.5	28.8	25.0	28.2	25.2	28.2	24.8	28.4	24.2
1955-1959	29.0	22.7	29.1	23.5	29.1	24.2	29.2	24.8	28.8	24.9	28.7	24.5	29.0	24.0
1960	28.7	24.2	28.6	23.9	28.7	24.0	28.7	24.0	28.2	24.3	28.3	24.1	28.3	23.5
1961	28.7	23.3	29.7	23.6	29.0	24.6	29.1	25.4	28.6	25.3	29.0	24.9	29.1	23.6
1962	29.2	22.9	29.8	23.3	--	--	--	--	29.6	24.1	29.2	23.4	29.1	23.1
1963	--	--	29.4	23.5	30.4	23.5	29.5	23.6	29.3	23.7	29.2	23.5	29.4	23.2
1964	29.3	22.2	29.3	23.0	29.2	23.8	--	--	29.1	24.3	27.5	24.2	27.4	24.2
Mean	28.9	23.0	29.1	23.6	29.1	24.2	29.0	24.7	28.7	24.8	28.6	24.4	28.7	23.9
Maximum	31	25.2	31	25.1	31	26.1	31	26.6	31	26.4	31	26.8	31	26.7
Mean Max.	29.8	23.8	30.0	24.1	30.1	24.9	30.4	25.5	30.1	25.6	29.9	25.3	29.8	24.9
Mean Min.	27.8	22.2	28.0	22.9	27.7	23.5	27.6	24.0	27.0	23.2	27.1	23.2	27.4	22.8
Minimum	27	21.0	27	21.5	27	22.2	27	22.4	23	21.2	26	22.1	26	21.5
	QUEPOS,													
1957-1959	29.2	22.8	29.4	23.6	29.6	24.0	29.3	24.4	29.6	24.3	29.1	22.8	28.7	22.5
1960	28.5	23.6	28.7	24.1	29.3	24.5	29.4	24.5	28.5	23.6	27.7	22.6	28.2	22.0
1961	29.1	22.8	28.9	23.5	29.2	24.5	28.2	24.6	28.8	24.2	28.3	23.0	28.7	21.8
1962	28.8	23.4	29.6	24.0	29.3	24.8	28.9	24.9	28.9	23.7	28.5	22.9	28.5	22.5
1963	29.1	23.0	29.3	23.8	29.8	23.8	29.7	23.8	29.6	23.6	29.1	22.5	29.3	22.7
1964	29.3	23.3	29.8	24.1	30.1	25.1	30.0	25.1	29.1	24.3	28.1	21.8	28.4	21.2
Mean	29.0	23.1	29.3	23.8	29.6	24.4	29.3	24.5	29.2	24.0	28.6	22.6	28.7	22.2
Maximum	31	24.3	31	25.2	31	25.6	31	25.8	31	25.9	31	25.1	31	24.5
Mean Max.	29.9	23.9	30.3	24.4	30.7	24.9	30.7	25.2	30.2	24.9	29.8	24.3	30.0	23.8
Mean Min.	28.0	22.2	28.2	23.1	28.2	23.8	27.8	23.2	27.8	21.8	27.2	19.6	27.4	18.2
Minimum	27	21.7	27	22.3	27	23.3	26	22.2	27	19.2	27	14.3	27	15.2
	SAN JUAN DEL													
1950-1953	24.3	25.9	21.8	25.4	22.4	25.8	25.0	26.1	27.0	25.5	28.5	25.0	27.7	25.4
Mean	24.3	25.9	21.8	25.4	22.4	25.8	25.0	26.1	27.0	25.5	28.5	25.0	27.7	25.4
Maximum	29	28.4	28	28.0	30	28.1	32	28.6	32	26.8	32	26.8	32	27.4
Mean Max.	27.3	27.1	26.8	26.6	27.3	27.3	29.6	27.4	30.4	26.7	31.0	26.0	30.4	26.6
Mean Min.	19.6	24.6	18.2	24.2	19.3	24.6	21.1	25.0	21.1	24.1	24.9	23.4	24.3	23.9
Minimum	18	24.3	16	23.4	17	24.0	19	24.2	18	21.7	22	23.1	22	23.1

*Observations for the year are incomplete; extremes are for the months shown.

Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}
CANAL ZONE															
28.2	22.4	28.5	20.9	27.8	19.6	27.4	20.3	26.6	20.9	--	--	30	26.7*	--	12.7*
28.3	22.4	28.9	20.7	28.2	20.2	27.8	20.5	27.4	21.4	27.2	22.7	31	26.4	20	13.7
28.2	22.2	28.7	21.4	28.6	20.0	27.9	20.3	27.7	21.5	27.3	22.8	31	26.2	21	12.1
28.4	21.0	28.8	20.7	28.8	20.5	28.1	19.8	27.0	20.3	27.8	22.1	31	26.8	21	17.4
28.2	22.3	28.3	21.2	28.2	20.8	27.6	17.8	27.3	20.7	27.0	23.0	30	27.2	20	13.1
28.2	21.7	28.8	20.8	28.3	19.7	27.7	19.7	27.4	21.4	27.1	22.6	30	28.7	20	17.9
28.5	21.5	29.1	20.5	29.3	19.9	28.1	19.1	28.3	20.7	27.9	22.4	31	26.2	22	16.9
28.2	21.2	28.8	20.1	28.2	19.3	27.7	19.9	27.2	21.6	--	--	31	26.4*	20	16.9*
28.3	22.0	28.8	20.9	28.4	20.1	27.8	20.0	27.4	21.2	27.3	22.7				
30	23.9	31	23.5	31	23.3	30	23.6	29	24.1			31	28.7		
29.2	23.1	29.9	22.1	29.7	21.6	29.2	21.7	28.4	22.6						
27.4	20.5	27.8	19.4	27.3	17.4	26.9	17.9	26.4	19.3					20	12.1
27	16.8	27	17.5	27	12.1	26	13.1	24	14.8						
PANAMA															
28.7	23.7	28.4	23.7	28.1	23.6	28.2	23.4	28.4	23.0	28.5	24.0	30	26.8	26	21.2
29.0	23.5	29.0	23.0	28.2	22.6	28.1	22.9	28.4	22.8	28.8	23.6	32	26.4	23	15.5
28.5	23.4	28.7	23.5	28.8	22.1	--	--	28.4	22.6	--	--	31	25.3*	24	20.8*
29.5	22.7	28.5	22.4	28.2	22.4	27.3	22.8	29.0	21.9	28.8	23.6	31	25.7	26	20.8
29.4	22.1	29.5	22.5	28.5	21.7	--	--	--	--	--	--	31*	25.6*	27*	16.6*
--	--	29.4	22.4	29.1	23.0	28.7	23.2	29.2	22.6	--	--	31	24.9*	27	21.1*
28.4	23.5	28.3	23.2	27.7	22.5	27.9	22.5	28.4	22.1	--	--	31	25.7*	27	18.6*
28.9	23.4	28.8	23.1	28.3	22.8	28.1	23.0	28.5	22.7	28.7	23.6				
32	26.0	31	25.2	32	25.3	31	25.3	31	25.2			32	26.8		
30.3	24.5	30.3	24.2	30.0	24.0	29.6	24.1	29.7	23.5						
27.4	22.2	27.3	21.7	26.6	20.4	26.7	21.5	27.4	21.8					23	15.5
26	19.2	25	20.5	24	15.5	25	19.9	26	20.4						
COSTA RICA															
28.6	22.2	28.8	22.1	28.4	21.2	28.3	21.9	28.4	22.5	29.0	22.9	31	25.3	26	13.4
27.8	21.8	27.8	20.8	27.8	20.1	26.8	21.9	28.0	22.6	28.2	22.7	30	25.0	26	11.8
28.6	21.5	27.8	21.5	28.3	22.3	26.7	22.2	28.3	22.4	28.4	22.9	31	25.2	24	12.4
28.8	22.2	29.1	21.8	28.3	21.0	28.3	22.0	28.3	21.8	28.8	22.9	31	25.8	27	14.0
29.1	22.5	29.6	22.0	29.2	21.5	27.4	21.4	29.1	23.0	29.2	22.8	31	24.5	26	16.5
28.1	20.8	28.4	21.8	28.3	21.0	27.8	21.7	28.4	21.6	28.8	22.6	31	25.9	26	14.3
28.5	21.9	28.7	21.8	28.4	21.2	27.8	21.9	28.4	22.4	28.8	22.8				
31	23.9	31	23.9	30	23.7	30	24.0	30	24.1			31	25.9		
29.9	23.6	29.8	23.4	29.5	23.2	29.1	23.6	29.4	23.2						
27.2	17.8	27.2	18.1	27.0	15.4	26.2	19.2	27.2	19.6						
27	15.4	26	12.4	26	11.8	24	16.6	27	15.3					24	11.8
SUR, NICARAGUA															
28.8	25.5	30.8	25.7	29.8	25.2	27.8	25.4	25.9	25.9	26.6	25.6	37	28.6	16	21.7
28.8	25.5	30.8	25.7	29.8	25.2	27.8	25.4	25.9	25.9	26.6	25.6				
34	27.7	36	28.0	37	26.9	36	27.5	33	28.1			37	28.6		
32.9	27.3	33.8	27.4	34.8	26.8	32.4	26.9	31.5	27.9						
24.6	24.0	26.0	24.0	23.5	22.9	22.6	23.5	21.1	24.0						
24	23.5	25	23.3	22	22.0	22	23.4	20	23.8					16	21.7

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
PUERTO SOMOZA,														
1958	27.2	24.8	27.2	25.3	28.8	25.7	29.3	25.9	29.2	24.6	29.0	18.7	29.1	24.1
CORINTO,														
1963	26.6	25.1	--	--	27.4	26.1	28.2	26.2	28.8	25.7	29.0	24.5	28.7	23.5
1964	26.1	25.3	26.9	25.6	27.2	26.2	28.4	26.3	28.6	26.2	28.1	24.9	28.4	23.6
Mean	26.4	25.2	26.9	25.6	27.3	26.2	28.3	26.2	28.7	26.0	28.6	24.7	28.6	23.6
Maximum	27	25.9	29	26.0	30	27.0	30	27.1	29	26.8	30	26.1	30	26.0
Mean Max.	26.9	25.8	28.9	26.0	29.7	26.8	29.7	26.8	29.4	26.8	29.4	26.0	29.7	25.8
Mean Min.	25.6	24.5	25.6	25.2	25.8	25.6	27.2	25.8	27.8	24.8	27.5	22.0	27.5	21.2
Minimum	26	24.3	26	25.2	26	25.5	27	25.7	28	24.0	27	21.8	27	20.8
LA UNIÓN,														
1949	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1950-1954	27.2	25.2	27.3	26.1	28.3	26.7	29.9	26.8	30.3	24.7	29.9	20.1	30.1	19.8
1955-1959	27.1	25.2	28.1	26.0	29.3	26.4	30.3	26.7	30.7	25.7	30.7	20.9	30.7	21.5
1960	27.7	25.6	28.0	26.3	28.6	26.7	29.8	27.1	31.1	25.7	31.1	19.0	31.0	20.2
1961	27.8	25.2	28.7	26.1	29.7	26.7	31.1	26.9	31.6	26.5	29.9	23.1	30.8	22.2
1962	27.0	25.0	28.0	25.9	29.2	26.5	30.0	27.0	30.7	26.4	30.9	22.5	31.0	20.3
1963	27.7	25.2	28.4	25.9	29.9	26.5	29.8	26.9	31.3	26.7	31.1	24.0	31.5	20.9
1964	27.4	--	28.7	25.8	29.9	26.5	30.7	27.0	31.0	26.6	30.6	21.8	31.0	19.9
Mean	27.3	25.2	27.9	26.0	29.1	26.6	30.2	26.8	30.7	25.6	30.4	21.0	30.6	20.7
Maximum	30	27.8	31	29.1	32	28.5	32	28.5	34	28.4	33	27.5	33	26.4
Mean Max.	29.4	26.4	29.8	26.8	30.6	27.3	31.2	27.6	32.2	27.3	32.0	24.4	31.8	23.1
Mean Min.	25.4	24.3	26.0	24.9	27.6	25.9	28.8	26.2	29.4	22.8	28.2	16.8	29.2	16.7
Minimum	23	22.3	24	20.8	26	25.2	27	25.3	28	17.1	28	12.7	28	13.9
ACAJUTLA,														
1963	27.9	26.0	28.8	26.0	29.2	26.2	29.6	26.3	29.8	26.3	29.9	26.1	29.9	26.0
1964	28.4	25.8	29.1	25.9	29.4	26.1	29.7	26.0	29.2	25.9	29.2	25.7	29.4	25.2
Mean	28.1	25.9	28.9	26.0	29.3	26.2	29.6	26.2	29.5	26.1	29.6	25.9	29.6	25.6
Maximum	30	26.4	31	27.1	31	26.7	31	27.0	31	26.9	31	26.5	31	26.6
Mean Max.	29.4	26.4	30.6	26.8	30.6	26.6	30.6	26.8	30.8	26.6	30.3	26.4	31.1	26.5
Mean Min.	26.7	25.4	27.8	25.3	27.8	25.6	28.6	25.6	27.8	25.5	28.1	24.6	28.3	24.9
Minimum	27	25.3	28	25.2	28	25.5	28	25.5	27	25.2	28	23.6	28	24.1
SAN JOSÉ,														
1949	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1950-1954	28.2	25.3	28.2	25.5	28.6	25.7	29.4	25.8	29.8	25.5	29.8	24.6	30.2	23.9
1955-1959	28.1	24.5	28.1	25.0	28.2	25.2	28.7	25.3	29.9	25.3	29.9	24.9	30.0	24.3
1960	27.3	24.7	27.1	25.2	28.8	25.2	28.6	25.4	29.9	25.4	29.6	24.5	30.1	23.1
1961	28.5	25.4	28.6	25.1	28.9	25.3	29.3	25.6	29.9	25.0	29.8	24.8	30.3	25.0
1962	28.8	24.6	28.7	24.8	29.0	25.0	29.2	25.3	29.5	25.6	29.2	24.2	29.8	24.0
1963	28.9	24.8	29.5	25.1	29.3	25.2	29.3	25.5	30.6	25.6	30.4	25.3	30.7	24.9
1964	28.5	24.6	28.6	24.9	29.3	24.9	29.8	24.7	29.7	25.0	29.5	25.1	29.7	23.7
Mean	28.2	24.9	28.2	25.2	28.6	25.4	29.1	25.5	29.9	25.4	29.8	24.8	30.1	24.1
Maximum	31	26.4	30	26.3	31	26.7	31	26.8	31	26.6	31	26.6	32	26.4
Mean Max.	29.2	25.4	29.2	25.6	29.6	25.8	29.9	25.9	30.6	25.9	30.9	25.7	31.0	25.2
Mean Min.	27.3	24.6	27.1	24.5	27.5	24.6	27.8	24.7	28.8	24.6	28.2	23.5	28.9	22.6
Minimum	24	22.7	24	23.1	24	22.9	24	23.5	27	23.8	22	20.9	28	19.6

*Observations for the year are incomplete; extremes are for the months shown.

Temperatures and Densities
Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
NICARAGUA															
29.4	24.5	30.2	23.4	29.5	20.7	28.9	23.7	--	--	--	--	32	26.7*	26*	-0.2*
NICARAGUA															
29.4	23.6	28.7	22.7	28.5	23.1	27.4	22.9	26.5	25.1	--	--	31	27.0	23	18.6
27.2	22.9	28.8	23.7	28.0	22.6	27.4	24.1	26.3	25.3	27.6	24.7	31	27.1	26	18.3
28.3	23.2	28.8	23.2	28.2	22.8	27.4	23.5	26.4	25.2	27.8	24.6				
31	25.5	31	25.7	29	25.1	30	25.9	28	26.4			31	27.1		
30.6	25.4	30.6	25.5	29.2	25.0	29.4	25.3	27.8	26.2						
28.1	21.6	27.5	20.2	27.2	19.2	26.4	20.0	24.4	23.8					23	18.3
28	21.2	27	18.9	27	18.3	26	18.6	23	22.9						
EL SALVADOR															
--	--	29.9	19.9	28.1	17.4	25.6	21.8	26.6	23.8	--	--	31*	25.4*	23*	14.2*
30.6	21.9	30.1	17.6	28.9	17.8	28.0	22.2	27.1	24.0	29.0	22.7	33	29.1	23	12.7
31.1	22.0	30.2	20.4	29.7	18.6	29.1	21.9	27.5	24.0	29.5	23.3	34	28.5	23	12.9
30.8	20.9	31.2	18.2	30.1	18.1	29.4	20.9	27.4	24.0	29.7	22.7	33	28.5	24	14.3
31.4	23.2	30.6	19.3	30.0	19.7	28.1	20.6	27.8	23.8	29.8	23.6	33	27.7	26	13.1
30.8	22.3	30.7	17.3	30.2	16.3	28.6	21.9	27.2	24.0	29.5	23.0	33	27.5	24	14.3
31.6	21.7	31.0	20.0	30.3	20.5	28.8	20.4	27.6	23.8	29.9	23.5	33	27.3	25	14.3
31.3	23.2	31.3	18.5	29.8	19.9	29.4	22.7	28.4	24.4	30.0	--	33	27.6*	24	14.5*
30.9	22.0	30.4	18.9	29.4	18.4	28.4	21.8	27.4	24.0	29.4	23.1				
33	25.0	33	24.6	32	24.3	32	24.5	32	27.6			34	29.1		
32.4	23.3	31.9	22.4	31.1	21.6	30.3	23.5	29.4	25.5						
29.6	18.6	28.8	14.6	27.6	14.5	26.3	18.1	25.1	22.6					23	12.7
28	14.4	27	12.9	24	13.3	23	13.1	23	20.8						
EL SALVADOR															
29.8	26.0	29.9	25.3	29.4	25.9	29.2	25.4	28.6	25.8	29.3	25.9	31	27.1	27	23.8
29.6	24.9	29.5	24.9	29.2	24.8	29.1	25.4	28.8	25.4	29.2	25.5	31	27.1	27	23.6
29.7	25.4	29.7	25.1	29.3	25.4	29.1	25.4	28.7	25.6	29.3	25.7				
31	27.1	31	26.0	31	26.4	31	25.9	31	26.3			31	27.1		
30.8	26.4	30.8	25.9	30.3	26.1	30.3	25.9	30.3	26.0						
28.1	24.4	28.6	23.8	28.3	24.6	27.8	24.9	27.2	25.2						
28	24.3	28	23.8	28	24.0	28	24.7	27	25.1					27	23.6
GUATEMALA															
--	--	--	--	27.7	--	28.7	24.5	28.4	25.4	--	--	--	--	26*	24.5*
30.2	24.3	30.3	23.6	29.1	22.9	28.6	24.2	29.3	24.7	29.3	24.7	32	26.8	22	16.8
29.8	24.1	29.6	23.8	29.6	23.5	29.3	24.0	28.9	24.4	29.2	24.5	32	26.7	24	13.1
30.7	23.2	30.0	22.7	30.4	23.3	29.7	22.6	28.3	24.7	29.2	24.2	31	26.0	26	19.4
30.6	24.4	30.2	24.0	30.4	24.1	29.1	22.7	29.9	25.1	29.6	24.7	31	26.3	27	19.9
30.6	24.3	30.6	23.7	30.8	23.9	30.6	24.0	30.2	24.8	29.8	24.5	31	25.9	28	22.4
30.8	24.5	30.6	23.9	30.4	24.5	30.0	24.5	29.1	24.4	30.0	24.8	31	26.1	28	23.1
30.2	23.8	30.4	22.3	30.1	23.4	29.6	24.4	29.2	24.6	29.6	24.3	31	25.7	27	19.8
30.2	24.2	30.1	23.6	29.6	23.4	29.4	24.0	28.9	24.7	29.3	24.6				
32	25.8	32	25.4	32	25.7	31	26.2	31	26.0			32	26.8		
31.0	25.1	31.1	24.6	30.6	24.7	30.3	25.0	30.4	25.2						
28.9	22.1	28.7	21.5	28.3	21.6	28.4	22.8	27.9	23.9						
27	13.1	27	19.3	24	16.8	26	19.9	26	22.8					22	13.1

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}
SALINA CRUZ,														
1952-1954	22.9	25.9	23.7	25.8	23.6	26.1	25.5	25.9	27.8	25.8	28.6	25.0	28.5	25.0
1955-1959	23.4	25.4	24.1	25.6	25.9	25.8	27.3	25.8	28.6	25.8	28.8	25.2	28.5	25.1
1960	23.6	25.6	23.1	25.8	23.3	25.9	--	--	28.2	26.0	29.6	25.6	28.9	24.7
1961	21.9	25.7	23.7	25.5	25.7	25.8	26.1	25.9	29.6	25.8	29.2	25.6	28.9	25.3
1962	22.0	25.4	25.5	25.4	24.9	25.0	23.5	25.6	27.3	25.6	29.9	25.1	28.9	24.9
1963	23.4	25.6	21.8	25.4	24.9	25.4	27.5	25.4	28.2	25.6	30.4	25.3	29.7	25.2
1964	23.2	25.5	24.7	25.6	26.2	25.6	27.2	25.7	27.5	25.9	28.9	25.5	28.7	25.3
Mean	23.1	25.6	23.9	25.6	25.3	25.7	26.4	25.7	28.2	25.8	29.1	25.3	28.7	25.1
Maximum	28	27.3	30	26.9	29	27.9	28	28.1	31	27.3	31	27.3	32	26.6
Mean Max.	26.3	26.4	27.0	26.1	28.1	26.4	29.2	26.4	30.3	26.4	30.2	26.0	29.9	25.7
Mean Min.	18.4	24.9	20.4	24.9	20.3	25.1	22.5	25.1	25.3	25.3	27.6	23.6	27.5	24.3
Minimum	17	24.2	16	24.0	17	24.5	17	24.8	21	24.6	25	17.6	26	23.1
ACAPULCO,														
1950-1954	27.3	25.4	27.0	25.5	25.9	25.7	26.4	25.7	26.9	25.8	28.7	25.3	29.3	24.7
1955-1959	27.3	25.2	26.8	25.4	26.7	25.4	26.7	25.6	28.4	25.6	29.1	25.2	29.7	24.4
1960	27.5	25.1	26.8	25.4	25.7	25.5	25.4	25.6	25.3	25.6	28.0	25.6	29.6	25.0
1961	27.8	25.2	26.9	25.2	25.7	25.4	24.8	25.5	27.4	25.6	29.1	25.2	29.6	24.8
1962	26.8	25.1	26.5	25.2	24.3	25.4	25.4	25.7	26.7	25.7	28.3	25.0	29.2	24.6
1963	27.4	25.3	25.9	25.5	25.9	25.6	25.4	25.7	27.8	25.6	28.8	25.7	29.4	25.2
1964	27.7	25.3	26.7	25.4	26.0	25.6	26.0	25.4	24.7	25.6	27.3	25.3	28.9	24.5
Mean	27.4	25.2	26.8	25.4	26.1	25.5	26.1	25.6	27.3	25.7	28.7	25.3	29.4	24.6
Maximum	30	26.1	29	26.7	29	26.1	30	26.3	30	26.2	31	27.1	31	26.5
Mean Max.	28.3	25.6	28.2	25.8	27.3	25.8	27.4	25.9	28.9	26.0	30.2	26.1	30.3	25.6
Mean Min.	26.4	24.9	25.4	25.1	24.5	25.3	24.3	25.3	25.2	25.1	26.7	23.3	27.8	22.6
Minimum	25	23.5	24	24.6	22	24.9	22	24.6	23	24.3	24	19.2	26	15.9
MANZANILLO,														
1953-1954	26.9	27.0	27.5	26.2	24.1	26.0	25.2	26.2	25.1	26.2	27.4	26.1	29.1	26.5
1955-1959	27.6	25.5	26.9	26.1	25.9	26.0	26.1	26.2	27.8	26.4	28.4	26.1	29.1	26.1
1960	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1961	26.4	25.6	25.5	25.8	23.5	26.1	23.2	26.2	25.7	26.1	27.4	25.9	29.4	25.7
1962	26.0	25.8	24.9	26.0	20.9	26.2	22.7	26.3	24.9	26.3	27.3	26.2	29.3	25.5
1963	26.1	26.1	--	--	23.6	26.3	25.3	26.3	26.8	26.3	28.6	26.1	29.2	25.5
1964	26.3	25.7	25.8	26.0	23.7	26.1	25.3	26.4	24.3	26.3	25.5	26.3	28.3	25.9
Mean	26.9	25.8	26.4	26.1	24.4	26.1	25.0	26.2	26.3	26.3	27.8	26.1	29.1	26.0
Maximum	31	27.9	31	27.5	28	27.0	28	27.2	30	27.8	31	27.9	31	27.7
Mean Max.	28.2	26.5	27.7	26.6	26.1	26.5	26.7	26.6	27.9	26.8	29.2	26.8	30.1	26.5
Mean Min.	25.6	25.0	24.7	25.6	22.3	25.6	23.7	25.8	24.5	25.8	26.0	25.4	27.8	25.0
Minimum	24	23.7	22	25.0	19	25.1	21	25.4	22	25.2	23	24.0	26	20.8
MAZATLÁN,														
1953-1954	21.9	26.0	21.7	26.0	21.0	26.0	22.5	26.2	23.9	26.4	28.2	26.5	29.9	25.8
1955-1959	22.2	26.0	20.7	26.1	21.3	26.3	22.3	26.4	25.2	26.4	28.6	26.5	29.6	25.8
1960	--	--	19.6	26.0	20.9	26.8	22.2	26.6	23.8	27.0	--	--	29.4	26.8
1961	22.3	25.9	23.3	25.9	21.6	26.6	23.8	26.7	26.4	26.8	28.4	26.0	--	--
1962	21.7	25.9	23.6	26.5	17.6	26.0	19.8	25.9	23.4	26.1	26.2	26.6	29.8	26.2
1963	18.7	24.8	18.1	24.4	20.5	24.7	22.3	25.0	--	--	--	--	--	--
1964	22.4	25.6	20.6	26.0	19.3	26.2	21.2	26.2	23.5	26.5	25.8	26.5	--	--

*Observations for the year are incomplete; extremes are for the months shown.

Temperatures and Densities

Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}
MEXICO															
28.9	25.3	28.8	24.7	25.1	25.0	24.1	25.6	23.3	25.8	25.9	25.5	31	27.8	17	17.6
28.9	25.2	29.0	24.4	28.2	24.8	24.8	25.3	22.3	25.5	26.6	25.3	32	28.1	17	15.8
29.4	24.3	28.8	24.4	28.2	24.3	22.6	25.4	21.2	25.6	--	--	31	27.0*	17	21.9*
28.4	25.3	28.9	25.0	25.2	25.1	22.7	24.8	24.8	25.0	26.3	25.4	31	26.6	17	23.7
29.2	25.0	29.4	24.3	27.7	24.3	24.2	24.6	23.8	25.3	26.4	25.0	31	26.1	16	22.8
28.9	24.8	28.8	24.5	25.6	25.1	24.9	25.3	22.2	25.7	26.4	25.3	31	27.3	18	23.2
29.6	24.8	29.6	24.4	24.2	25.2	23.7	25.6	23.2	25.6	26.4	25.4	31	26.4	18	23.7
28.9	25.1	29.0	24.5	26.7	24.8	24.1	25.3	22.8	25.5	26.4	25.3				
31	26.9	31	26.5	32	27.0	29	26.5	29	27.8			32	28.1		
30.3	25.7	30.2	25.4	29.8	25.7	28.6	26.0	27.4	26.3						
27.6	24.2	27.7	22.9	22.6	23.7	18.9	24.3	18.2	24.8					16	15.8
24	21.9	27	15.8	18	22.4	17	22.8	17	24.3						
MEXICO															
29.9	24.9	29.6	24.2	28.8	24.3	28.3	25.0	27.7	25.1	28.0	25.1	32	26.7	22	15.5
30.1	24.6	29.4	24.0	29.1	24.1	28.3	24.7	27.9	25.1	28.3	24.9	31	27.1	22	15.9
29.8	24.6	29.3	23.7	29.4	23.8	28.2	24.6	28.2	24.9	27.8	25.0	31	26.1	23	18.6
29.8	25.0	29.7	23.5	29.7	24.9	26.7	24.1	27.1	24.9	27.9	24.9	31	26.1	22	16.2
30.0	24.9	29.8	24.1	29.1	23.9	28.5	24.8	27.2	25.1	27.6	25.0	31	26.0	22	19.7
29.9	24.7	29.8	23.9	29.5	24.3	28.6	24.8	28.2	25.0	28.0	25.1	31	26.3	23	15.2
29.5	24.7	29.8	24.1	29.4	24.4	27.2	25.0	26.4	25.2	27.5	25.0	31	26.2	23	20.7
29.9	24.8	29.6	24.0	29.1	24.2	28.2	24.8	27.7	25.1	28.0	25.0				
31	26.0	32	26.2	31	25.8	31	26.0	30	26.4			32	27.1		
30.7	25.4	30.7	25.1	30.1	25.1	29.4	25.4	28.8	25.6						
29.2	23.5	27.9	20.4	27.8	22.0	26.9	23.6	26.4	24.5					22	15.2
28	22.3	24	15.2	23	18.6	24	19.5	23	23.7						
MEXICO															
30.2	26.4	29.9	25.6	--	--	27.1	--	28.0	26.5	--	--	31	27.9*	23	25.3*
29.9	25.6	29.4	25.1	28.9	24.5	28.0	24.6	27.6	25.2	28.0	25.6	31	27.9	21	19.2
--	--	28.9	25.7	29.5	25.6	28.2	25.7	27.0	25.7	--	--	31*	26.1*	26*	25.0*
29.9	25.9	29.4	25.3	30.1	25.4	26.9	25.7	25.7	25.9	26.9	25.8	31	26.6	21	23.7
29.9	25.6	29.5	23.7	29.3	23.4	28.0	24.6	25.7	25.5	26.5	25.4	31	26.8	19	19.2
29.9	25.6	29.7	24.8	29.2	23.8	27.7	25.2	26.9	25.8	--	--	31	27.2*	21*	20.6*
29.3	25.8	29.6	25.5	29.2	25.3	27.9	26.1	25.2	26.2	26.7	26.0	31	26.9	21	24.7
29.9	25.8	29.4	25.1	29.2	24.6	27.8	25.1	26.9	25.6	27.4	25.7				
31	27.1	31	26.5	31	26.5	30	26.5	30	27.0			31	27.9		
30.7	26.3	30.4	25.8	30.1	25.6	29.1	25.9	27.9	26.2						
28.8	25.3	28.2	25.0	28.1	23.1	26.3	24.0	25.6	24.7					19	19.2
26	23.3	27	20.0	26	19.2	23	21.4	23	22.0						
MEXICO															
30.2	25.2	30.2	25.0	28.4	25.6	26.0	26.1	22.8	26.0	25.6	25.9	32	27.3	16	7.7
30.1	25.0	29.8	24.1	28.8	25.1	25.3	26.1	20.9	26.2	25.4	25.8	32	27.9	14	3.6
29.5	26.6	30.2	25.7	29.7	25.9	26.4	26.1	22.5	26.5	--	--	31*	28.0*	17*	24.2*
--	--	--	--	28.8	25.9	21.9	25.7	22.8	26.7	--	--	33	27.8*	19	24.6*
30.3	25.4	30.1	24.6	29.3	25.4	27.2	26.8	--	--	--	--	32	27.5*	16	23.0*
--	--	--	--	29.2	25.0	25.9	25.9	23.9	25.7	--	--	31*	25.9*	17	22.6*
29.9	25.6	30.0	25.1	29.1	24.9	22.9	25.3	21.3	25.7	--	--	31*	27.0*	17	22.8*

Table 1. - Surface Water
Means and

Years	January		February		March		April		May		June		July	
	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
MAZATLÁN,														
Mean	21.8	25.8	21.0	26.0	20.7	26.1	22.1	26.2	24.6	26.4	27.9	26.4	29.7	26.0
Maximum	26	26.9	26	27.1	26	27.4	27	27.9	30	28.0	31	27.5	31	27.8
Mean Max.	23.1	26.4	22.9	26.5	22.9	26.6	24.2	26.8	27.0	27.1	29.7	27.0	30.6	26.8
Mean Min.	20.3	25.2	19.0	25.5	18.0	25.7	19.9	25.7	21.9	25.9	26.0	25.8	28.5	24.6
Minimum	16	24.0	15	24.1	14	24.4	17	24.6	19	25.4	23	24.6	27	23.1
TOPOLOBAMPO,														
1956-1959	19.6	26.6	20.7	26.8	20.8	27.0	23.7	27.4	26.3	27.7	29.8	28.0	31.2	28.1
1960	16.9	25.2	17.9	25.7	21.3	26.3	23.8	26.8	26.4	27.3	29.3	27.4	30.9	27.7
1961	19.1	26.3	20.1	26.5	21.2	26.7	23.4	--	25.6	--	29.8	28.1	31.1	27.8
1962	--	--	--	--	--	--	--	--	26.2	27.9	29.4	27.7	--	--
1963	18.6	26.6	20.2	26.6	20.9	27.0	22.5	27.4	26.3	27.7	29.2	28.2	30.4	27.9
1964	18.9	26.3	18.1	26.3	19.1	26.8	22.4	27.1	24.8	27.4	28.4	27.7	30.5	27.8
Mean	18.9	26.3	19.7	26.5	20.7	26.8	23.3	27.3	26.1	27.6	29.4	27.9	30.9	27.9
Maximum	22	28.0	22	27.8	23	28.5	29	28.5	30	28.5	32	28.8	32	29.3
Mean Max.	20.7	27.0	20.8	26.9	22.6	27.5	25.8	27.9	28.3	28.2	31.0	28.5	31.9	28.5
Mean Min.	17.4	25.9	18.5	26.2	19.1	26.4	21.3	26.6	23.6	27.0	27.8	27.2	29.6	27.1
Minimum	16	24.8	17	25.2	17	25.9	20	25.9	21	26.4	26	26.7	29	26.3
GUAYMAS,														
1950-1952	17.9	27.0	18.3	26.9	18.1	26.8	21.0	26.8	24.7	27.4	29.2	27.9	31.0	27.6
1957-1959	18.1	26.3	19.3	26.6	20.0	26.8	23.5	27.0	25.9	27.4	29.7	27.2	32.3	27.3
1960	15.0	25.5	15.4	25.9	19.6	26.2	21.9	26.6	25.1	26.9	29.8	27.2	31.9	27.3
1961	16.7	--	17.7	25.9	19.2	26.3	22.8	26.8	24.2	26.6	29.4	27.0	32.1	27.2
1962	15.9	25.9	18.7	26.0	17.4	26.2	22.8	26.4	25.5	26.9	27.8	26.8	32.2	27.2
1963	15.8	26.2	19.1	26.3	19.9	26.6	21.1	26.6	25.4	26.8	28.3	27.2	31.5	26.2
1964	16.3	--	15.5	--	17.1	--	21.2	--	23.7	--	29.3	--	31.5	28.1
Mean	17.0	26.3	18.1	26.4	18.9	26.6	22.2	26.8	25.1	27.1	29.2	27.3	31.7	27.4
Maximum	27	29.3	22	27.9	23	27.8	27	28.4	31	29.3	35	30.6	36	29.8
Mean Max.	19.3	27.0	20.0	26.9	21.7	27.1	24.7	27.3	27.8	27.7	32.2	28.0	33.3	28.2
Mean Min.	14.7	25.7	16.1	26.0	16.6	26.1	19.3	26.2	21.3	26.6	25.9	26.7	30.0	26.4
Minimum	12	24.6	13	25.3	14	25.2	14	25.5	14	25.2	14	25.1	22	22.6
PUERTO PEÑASCO,														
1952-1955	14.9	26.8	15.7	26.8	17.8	27.0	20.5	27.2	23.7	27.1	26.3	27.2	29.6	27.2
1963	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1964	14.6	26.9	--	--	--	--	--	--	--	--	--	--	--	--
Mean	14.8	26.8	15.7	26.8	17.8	27.0	20.5	27.2	23.7	27.1	26.3	27.2	29.6	27.2
Maximum	18	28.8	19	27.3	21	27.8	24	29.1	27	28.3	29	28.0	32	28.5
Mean Max.	17.6	27.7	17.8	27.2	20.2	27.6	23.3	28.2	26.0	27.9	28.9	27.9	31.9	28.0
Mean Min.	12.4	26.2	14.4	26.4	15.7	26.5	17.8	26.4	21.0	26.5	22.9	26.3	27.5	26.6
Minimum	11	26.2	12	26.3	15	26.3	17	25.8	19	26.3	22	25.8	26	26.2
LA PAZ,														
1950-1954	19.4	26.7	19.8	26.8	21.4	27.3	22.4	27.3	23.9	27.3	24.8	27.2	27.3	27.2
1955-1959	20.8	26.9	20.7	27.0	21.5	27.1	22.9	27.1	24.7	27.1	25.6	27.3	27.6	27.3

*Observations for the year are incomplete; extremes are for the months shown.

Temperatures and Densities

Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅	Temp. °C	Dens. σ ₁₅
MEXICO-continued															
30.1	25.3	30.0	24.7	28.9	25.3	25.2	26.0	22.2	26.2	25.4	25.9				
32	27.4	32	26.3	33	27.1	29	27.2	27	27.8			33	28.0		
31.2	26.3	31.4	26.0	30.6	26.3	27.5	26.5	24.1	26.7						
28.7	22.8	28.1	19.8	26.8	22.8	22.6	25.6	19.9	25.6						
28	14.9	26	3.6	25	14.8	17	24.8	16	24.7				14	3.6	
MEXICO															
31.6	27.0	31.2	25.3	29.4	25.2	23.4	25.6	20.4	26.2	25.7	26.7	33	29.3	18	13.0
31.2	27.0	31.5	26.2	28.6	26.6	24.7	26.6	18.4	26.5	25.1	26.6	33	28.3	16	24.8
31.2	25.6	31.2	25.8	29.1	25.1	--	--	--	--	--	--	33	28.4*	18	24.3*
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
31.1	26.8	31.1	--	30.8	27.2	25.4	26.4	21.8	26.4	25.7	--	33	28.8*	17	25.2*
30.9	27.4	31.1	27.6	30.3	27.3	23.6	26.6	20.1	26.6	24.8	27.1	32	28.3	17	25.7
31.4	26.8	31.2	25.9	29.6	25.8	24.0	26.1	20.3	26.3	25.5	26.8				
33	28.3	33	28.6	32	28.4	28	28.2	25	28.2			33	29.3		
32.7	27.9	32.6	27.1	31.7	26.8	27.1	27.0	22.3	27.0						
30.1	26.1	29.1	23.7	26.9	24.7	21.1	24.9	18.5	25.9						
28	24.9	26	13.0	25	16.3	20	22.3	17	24.9				16	13.0	
MEXICO															
31.1	26.7	31.1	27.0	29.2	27.3	24.1	26.9	18.5	26.9	24.5	27.1	37	30.6	11	23.2
32.4	26.7	31.6	26.9	27.2	26.3	21.2	26.6	18.6	26.3	25.0	26.8	35	28.0	15	24.8
30.8	26.2	31.3	26.4	26.4	25.2	22.2	24.1	15.7	22.8	23.8	25.9	33	27.9	13	22.4
32.3	27.2	30.9	26.7	26.7	26.4	20.7	26.3	17.7	26.1	24.2	--	33	28.0*	16	25.3*
33.2	27.4	31.4	27.0	28.1	26.9	23.8	26.8	19.9	26.4	24.7	26.7	34	27.9	14	25.2
31.3	24.5	31.2	26.1	28.8	26.7	23.7	26.6	18.8	26.3	24.6	26.3	33	27.8	12	22.6
31.3	26.8	--	--	28.9	27.3	20.8	27.4	17.3	27.3	--	--	37	29.8*	13	23.7*
31.7	26.6	31.2	26.8	28.1	26.7	22.6	26.5	18.2	26.2	24.5	26.7				
37	30.3	37	29.1	33	29.3	29	28.2	27	29.0			37	30.6		
33.9	27.7	33.4	27.6	30.9	27.6	26.0	27.1	20.7	27.0						
29.6	25.0	29.8	26.2	24.9	25.9	18.9	25.8	15.6	25.5						
24	22.8	28	25.3	22	23.9	17	23.3	11	22.4				11	22.4	
MEXICO															
31.2	27.2	31.0	27.3	28.4	27.2	21.9	27.0	17.1	26.8	23.2	27.1	33	29.1	11	24.1
30.9	27.0	30.1	27.5	27.6	27.5	22.7	27.3	18.1	27.1	--	--	32*	28.5*	16*	26.2*
--	--	--	--	26.7	27.0	21.1	27.2	17.3	26.8	--	--	28*	28.8*	12*	26.1*
31.1	27.1	30.8	27.4	27.9	27.2	21.9	27.1	17.3	26.9	23.1	27.1				
33	28.5	33	28.6	31	28.5	27	28.5	23	28.0			33	29.1		
32.2	27.9	32.2	28.1	30.2	28.1	25.4	27.8	20.4	27.7						
29.8	26.4	29.0	26.6	25.3	26.6	18.9	26.6	14.4	25.8						
29	26.3	28	26.2	24	26.1	18	26.4	11	24.1				11	24.1	
MEXICO															
29.1	26.9	29.7	26.9	28.6	26.9	25.4	26.7	21.6	26.5	24.4	27.0	33	20.2	17	25.3
29.2	27.2	29.5	26.9	27.8	26.9	24.8	26.9	21.9	26.9	24.8	27.0	32	28.6	17	25.3

Extremes

August		September		October		November		December		Means		Maximum		Minimum	
Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}	Temp. °C	Dens. σ_{15}
MEXICO—continued															
29.2	26.8	30.8	26.7	28.5	26.8	26.1	26.7	22.1	26.6	--	--	32	28.4*	18	25.8*
30.3	26.6	29.2	26.3	--	--	26.1	26.5	23.1	26.4	--	--	33	28.3*	18	25.2*
30.5	26.6	31.1	26.6	31.0	26.7	25.4	26.6	22.2	26.5	25.8	26.6	33	27.8	18	25.8
27.9	26.4	28.7	26.4	28.5	26.4	23.8	25.2	21.7	26.3	24.0	26.4	32	28.0	16	25.6
29.2	26.9	29.7	26.8	28.4	26.8	25.3	26.7	22.0	26.6	24.7	26.9				
33	30.2	33	28.0	33	28.8	28	28.2	28	28.1			33	30.2		
31.4	27.7	31.5	27.3	30.6	27.6	27.6	27.4	24.8	27.4						
27.3	26.4	27.8	26.1	26.5	26.3	22.8	26.1	19.9	26.1					16	25.2
26	25.6	25	25.2	24	25.9	21	25.4	18	25.3						
MEXICO															
21.8	25.2	20.7	25.1	19.4	25.1	17.1	25.1	16.4	25.1	18.3	25.1	24	26.2	13	23.4
22.0	25.3	21.2	25.2	17.6	24.9	16.6	25.0	14.4	25.0	17.6	25.2	24	25.7	13	24.0
20.8	25.3	19.9	25.3	18.3	25.3	14.8	25.2	14.3	25.1	17.1	25.3	23	25.8	13	24.8
20.2	25.3	19.9	25.3	17.6	25.2	16.2	25.2	14.9	25.3	16.9	25.3	22	25.8	13	24.8
21.6	25.4	21.7	25.3	19.8	25.2	17.6	25.3	15.9	25.3	17.8	25.3	23	25.6	13	24.5
21.0	25.5	19.2	25.4	18.8	25.5	15.3	25.3	14.2	25.3	16.9	25.4	23	25.9	13	24.2
21.4	25.3	20.5	25.2	18.8	25.2	16.6	25.2	15.5	25.2	17.6	25.2				
24	25.9	24	26.2	23	25.7	19	25.6	19	25.9			24	26.2		
23.0	25.5	22.3	25.6	20.5	25.4	17.9	25.4	16.4	25.5						
19.4	25.0	17.7	24.8	17.3	24.9	15.2	24.8	14.5	24.8						
18	24.7	16	24.2	16	24.6	14	24.5	13	24.3					13	23.4

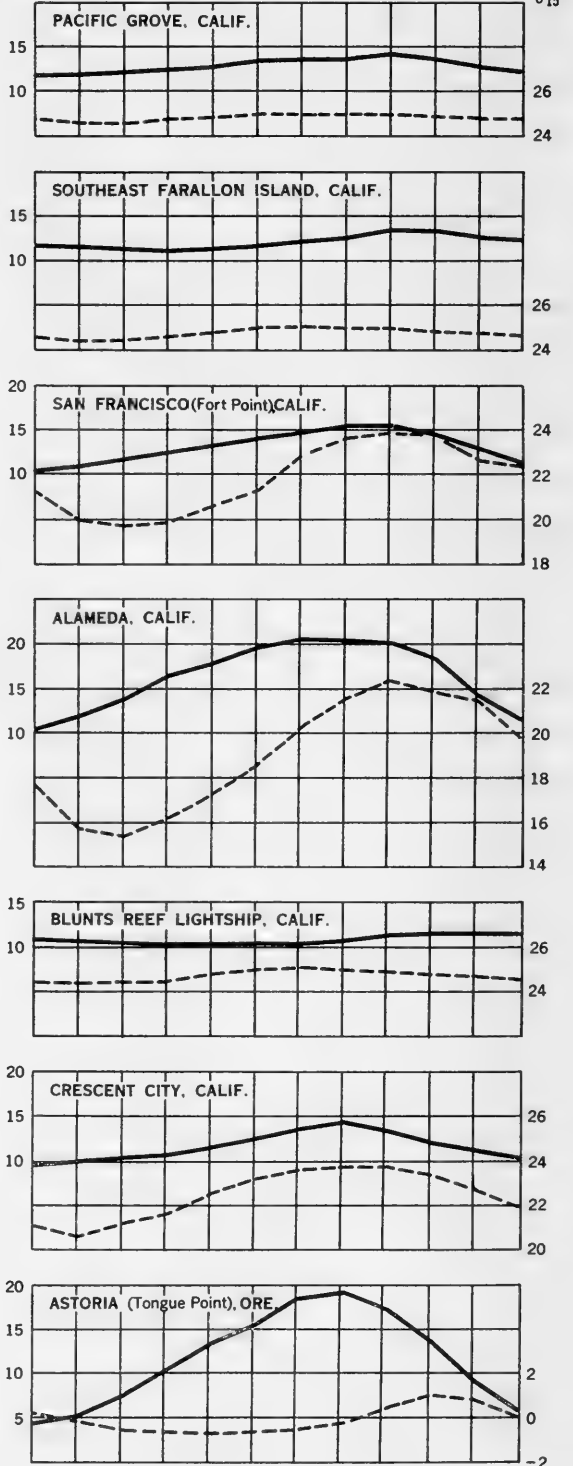
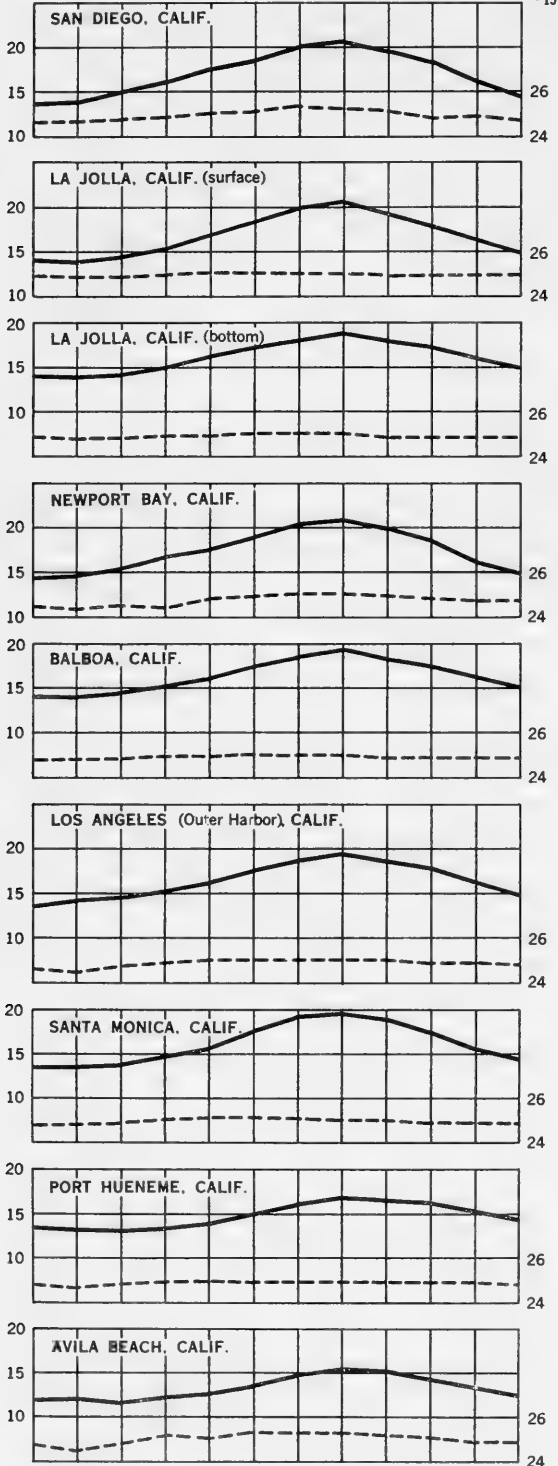
Mean Temperature and Density Curves

Monthly mean surface water temperatures (in degrees Celsius) and densities (σ_{15}) are presented graphically to show the seasonal variation.

————— Temperatures - - - - - Densities

°C JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. σ_{15}

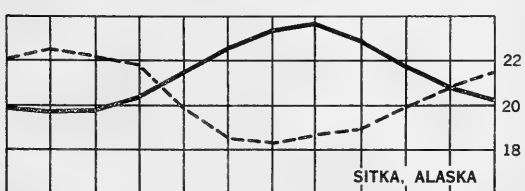
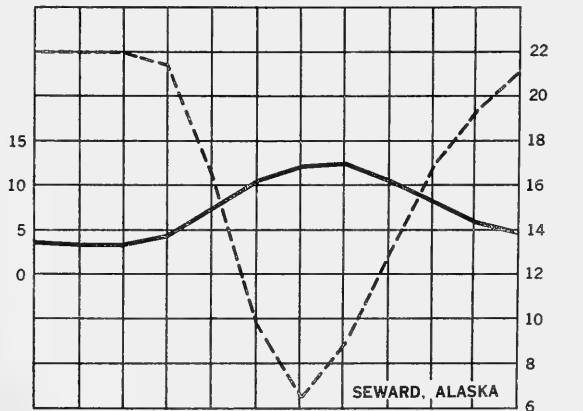
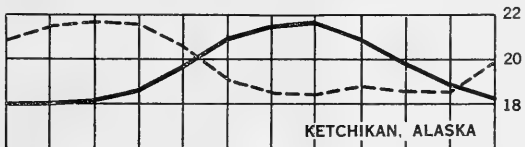
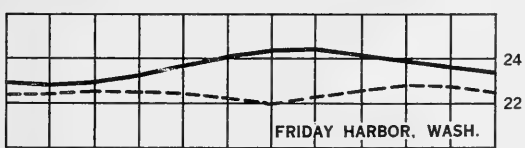
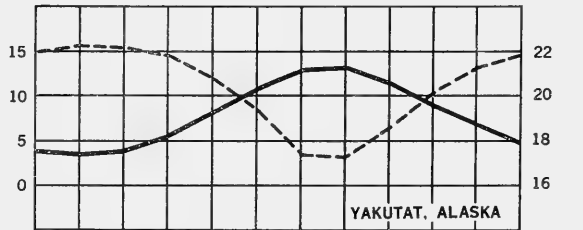
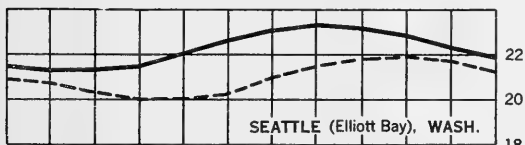
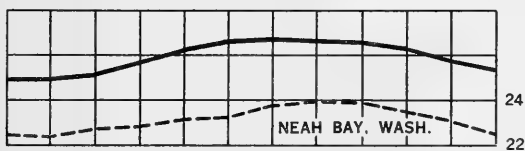
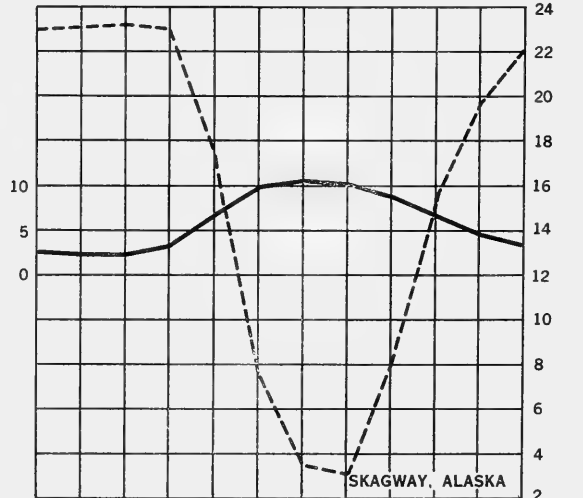
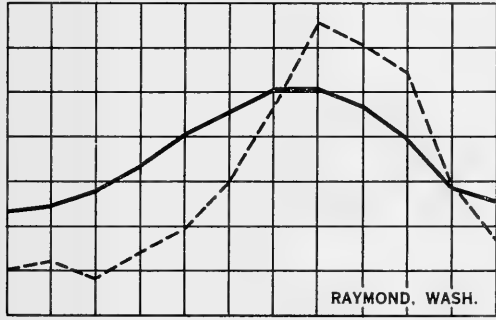
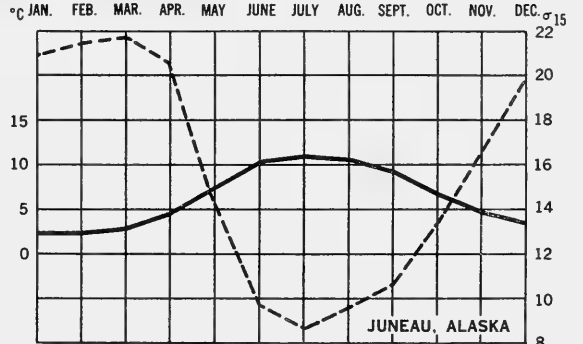
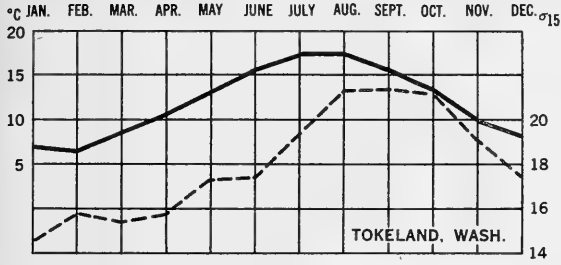
°C JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. σ_{15}



Mean Temperature and Density Curves

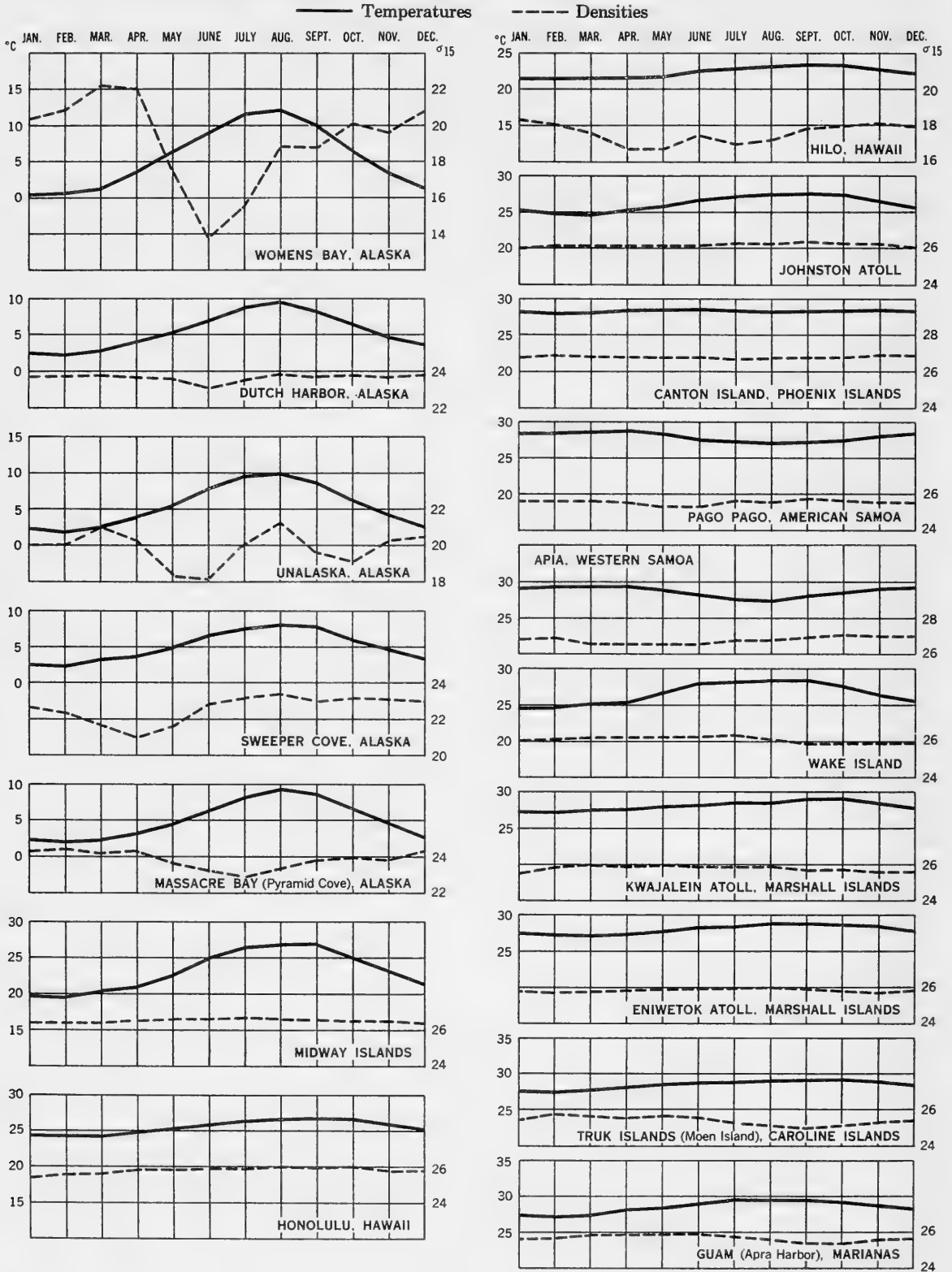
Monthly mean surface water temperatures (in degrees Celsius) and densities (σ_{15}) are presented graphically to show the seasonal variation.

— Temperatures - - - - Densities



Mean Temperature and Density Curves

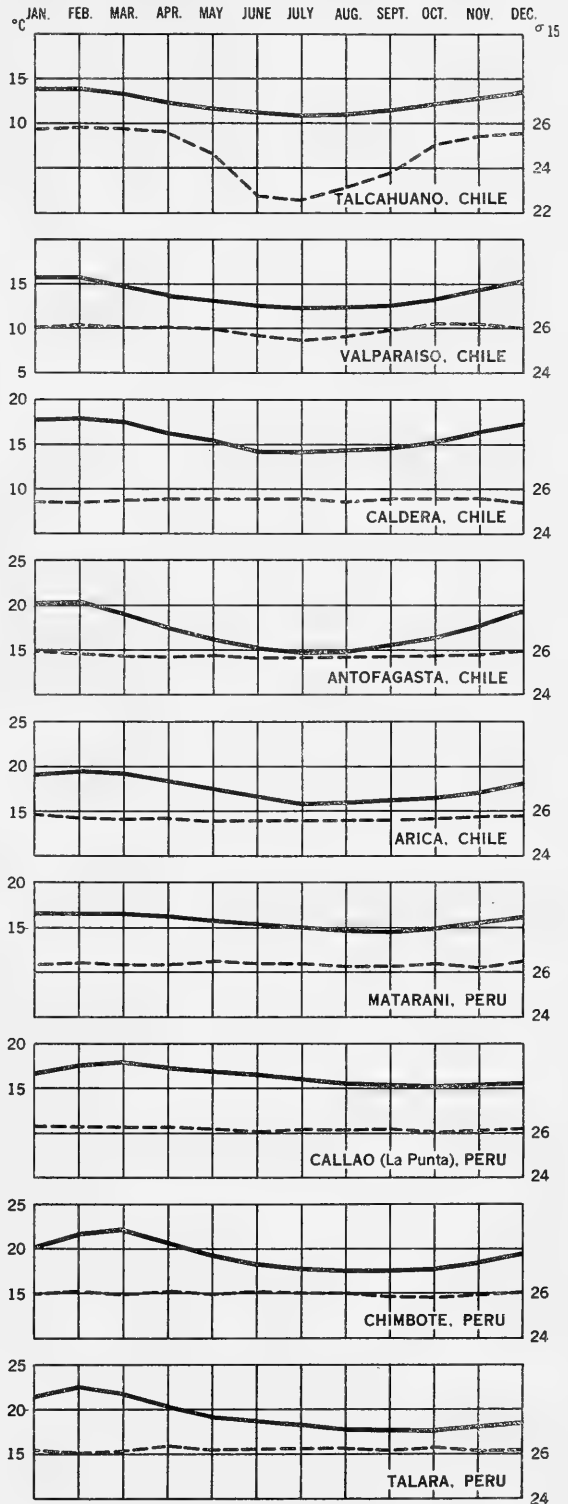
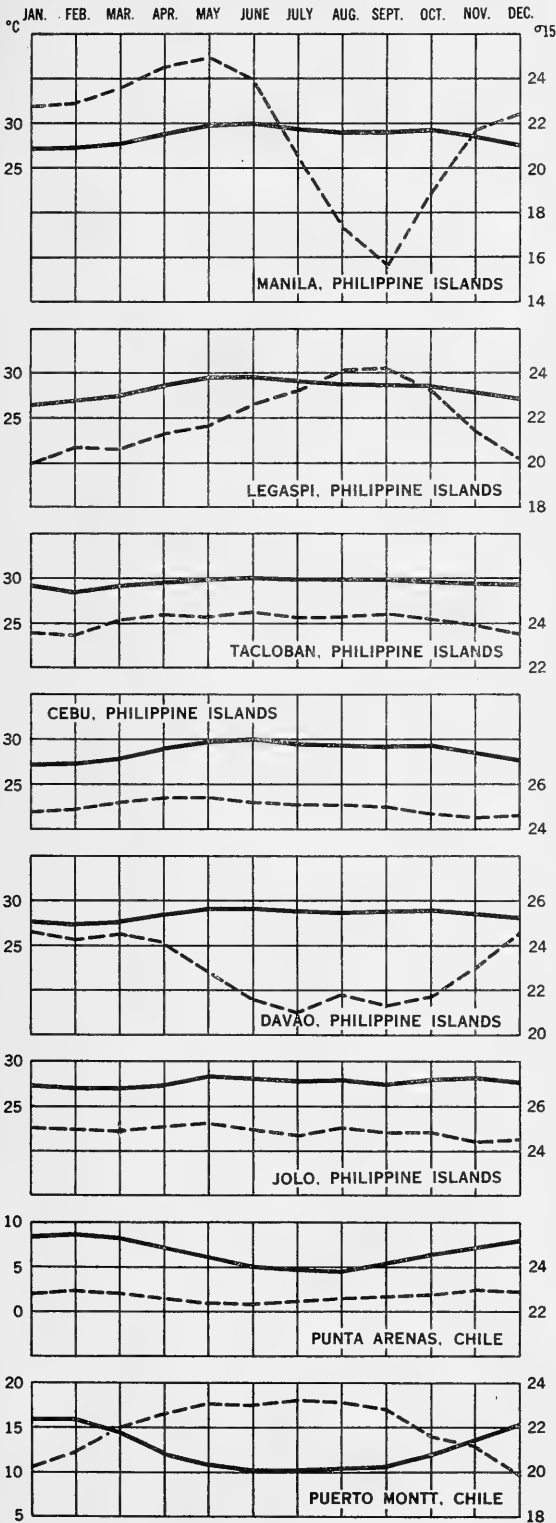
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————— Temperatures - - - - - Densities

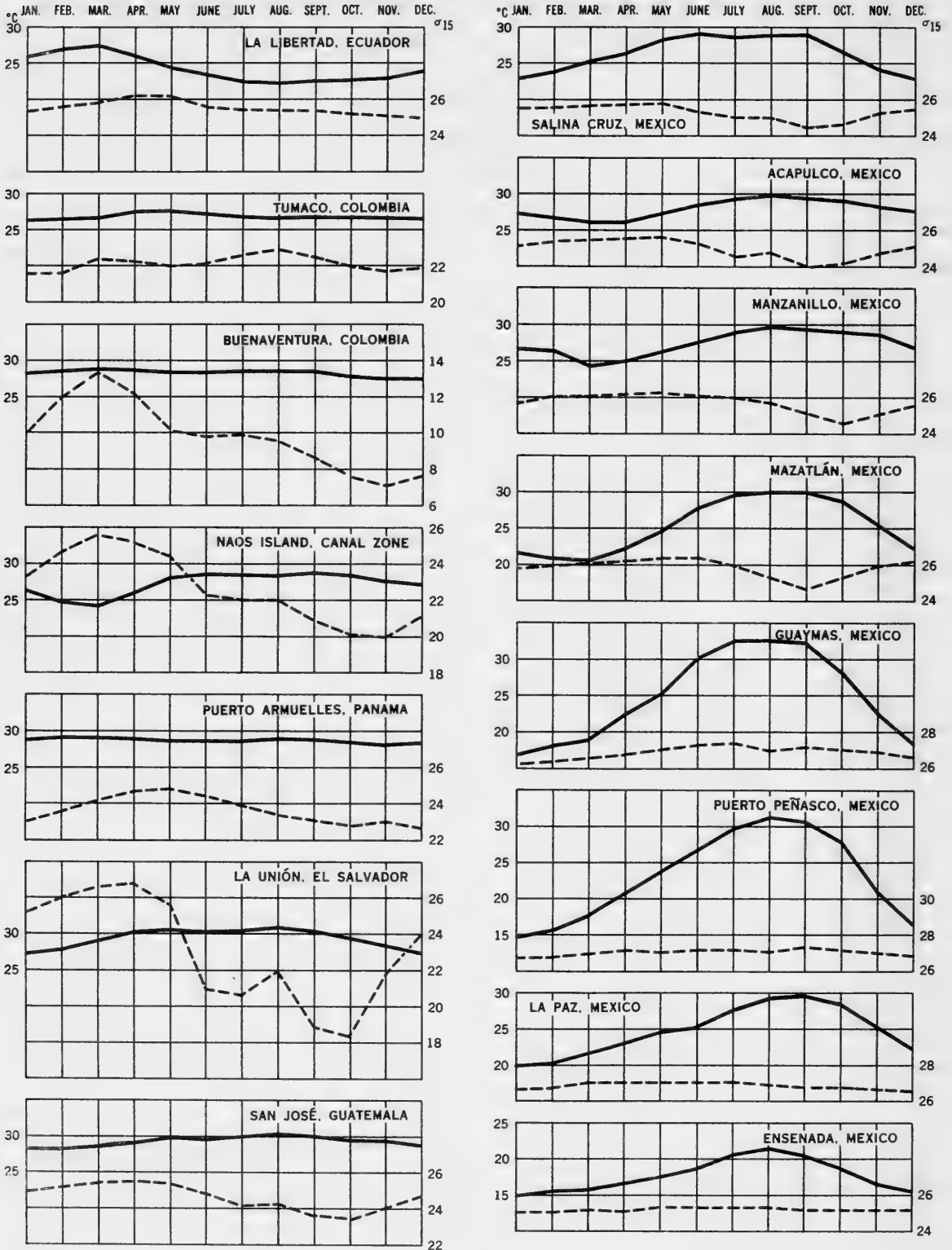


Table 2.—Conversion of Celsius to Fahrenheit

°C	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
-3	26.6	26.4	26.2	26.1	25.9	25.7	25.5	25.3	25.2	25.0
-2	28.4	28.2	28.0	27.9	27.7	27.5	27.3	27.1	27.0	26.8
-1	30.2	30.0	29.8	29.7	29.5	29.3	29.1	28.9	28.8	28.6
-0	32.0	31.8	31.6	31.5	31.3	31.1	30.9	30.7	30.6	30.4
0	32.0	32.2	32.4	32.5	32.7	32.9	33.1	33.3	33.4	33.6
1	33.8	34.0	34.2	34.3	34.5	34.7	34.9	35.1	35.2	35.4
2	35.6	35.8	36.0	36.1	36.3	36.5	36.7	36.9	37.0	37.2
3	37.4	37.6	37.8	37.9	38.1	38.3	38.5	38.7	38.8	39.0
4	39.2	39.4	39.6	39.7	39.9	40.1	40.3	40.5	40.6	40.8
5	41.0	41.2	41.4	41.5	41.7	41.9	42.1	42.3	42.4	42.6
6	42.8	43.0	43.2	43.3	43.5	43.7	43.9	44.1	44.2	44.4
7	44.6	44.8	45.0	45.1	45.3	45.5	45.7	45.9	46.0	46.2
8	46.4	46.6	46.8	46.9	47.1	47.3	47.5	47.7	47.8	48.0
9	48.2	48.4	48.6	48.7	48.9	49.1	49.3	49.5	49.6	49.8
10	50.0	50.2	50.4	50.5	50.7	50.9	51.1	51.3	51.4	51.6
11	51.8	52.0	52.2	52.3	52.5	52.7	52.9	53.1	53.2	53.4
12	53.6	53.8	54.0	54.1	54.3	54.5	54.7	54.9	55.0	55.2
13	55.4	55.6	55.8	55.9	56.1	56.3	56.5	56.7	56.8	57.0
14	57.2	57.4	57.6	57.7	57.9	58.1	58.3	58.5	58.6	58.8
15	59.0	59.2	59.4	59.5	59.7	59.9	60.1	60.3	60.4	60.6
16	60.8	61.0	61.2	61.3	61.5	61.7	61.9	62.1	62.2	62.4
17	62.6	62.8	63.0	63.1	63.3	63.5	63.7	63.9	64.0	64.2
18	64.4	64.6	64.8	64.9	65.1	65.3	65.5	65.7	65.8	66.0
19	66.2	66.4	66.6	66.7	66.9	67.1	67.3	67.5	67.6	67.8
20	68.0	68.2	68.4	68.5	68.7	68.9	69.1	69.3	69.4	69.6
21	69.8	70.0	70.2	70.3	70.5	70.7	70.9	71.1	71.2	71.4
22	71.6	71.8	72.0	72.1	72.3	72.5	72.7	72.9	73.0	73.2
23	73.4	73.6	73.8	73.9	74.1	74.3	74.5	74.7	74.8	75.0
24	75.2	75.4	75.6	75.7	75.9	76.1	76.3	76.5	76.6	76.8
25	77.0	77.2	77.4	77.5	77.7	77.9	78.1	78.3	78.4	78.6
26	78.8	79.0	79.2	79.3	79.5	79.7	79.9	80.1	80.2	80.4
27	80.6	80.8	81.0	81.1	81.3	81.5	81.7	81.9	82.0	82.2
28	82.4	82.6	82.8	82.9	83.1	83.3	83.5	83.7	83.8	84.0
29	84.2	84.4	84.6	84.7	84.9	85.1	85.3	85.5	85.6	85.8
30	86.0	86.2	86.4	86.5	86.7	86.9	87.1	87.3	87.4	87.6
31	87.8	88.0	88.2	88.3	88.5	88.7	88.9	89.1	89.2	89.4
32	89.6	89.8	90.0	90.1	90.3	90.5	90.7	90.9	91.0	91.2
33	91.4	91.6	91.8	91.9	92.1	92.3	92.5	92.7	92.8	93.0
34	93.2	93.4	93.6	93.7	93.9	94.1	94.3	94.5	94.6	94.8
35	95.0	95.2	95.4	95.5	95.7	95.9	96.1	96.3	96.4	96.6
36	96.8	97.0	97.2	97.3	97.5	97.7	97.9	98.1	98.2	98.4
37	98.6	98.8	99.0	99.1	99.3	99.5	99.7	99.9	100.0	100.2
38	100.4	100.6	100.8	100.9	101.1	101.3	101.5	101.7	101.8	102.0
39	102.2	102.4	102.6	102.7	102.9	103.1	103.3	103.5	103.6	103.8

$$F = 1.8C + 32$$

Table 3.—Corresponding Densities and Salinities

(Density at 15°C. -- Salinity in parts per 1000)

Density	Salinity	Density	Salinity	Density	Salinity	Density	Salinity	Density	Salinity	Density	Salinity
0.9991	0.0	1.0046	7.1	1.0101	14.2	1.0156	21.4	1.0211	28.6	1.0266	35.8
0.9992	0.0	1.0047	7.2	1.0102	14.4	1.0157	21.6	1.0212	28.8	1.0267	35.9
0.9993	0.2	1.0048	7.3	1.0103	14.5	1.0158	21.7	1.0213	28.9	1.0268	36.0
0.9994	0.3	1.0049	7.5	1.0104	14.6	1.0159	21.8	1.0214	29.0	1.0269	36.2
0.9995	0.4	1.0050	7.6	1.0105	14.8	1.0160	22.0	1.0215	29.1	1.0270	36.3
0.9996	0.6	1.0051	7.7	1.0106	14.9	1.0161	22.1	1.0216	29.3	1.0271	36.4
0.9997	0.7	1.0052	7.9	1.0107	15.0	1.0162	22.2	1.0217	29.4	1.0272	36.6
0.9998	0.8	1.0053	8.0	1.0108	15.2	1.0163	22.4	1.0218	29.5	1.0273	36.7
0.9999	0.9	1.0054	8.1	1.0109	15.3	1.0164	22.5	1.0219	29.7	1.0274	36.8
1.0000	1.1	1.0055	8.2	1.0110	15.4	1.0165	22.6	1.0220	29.8	1.0275	37.0
1.0001	1.2	1.0056	8.4	1.0111	15.6	1.0166	22.7	1.0221	29.9	1.0276	37.1
1.0002	1.3	1.0057	8.5	1.0112	15.7	1.0167	22.9	1.0222	30.1	1.0277	37.2
1.0003	1.5	1.0058	8.6	1.0113	15.8	1.0168	23.0	1.0223	30.2	1.0278	37.3
1.0004	1.6	1.0059	8.8	1.0114	16.0	1.0169	23.1	1.0224	30.3	1.0279	37.5
1.0005	1.7	1.0060	8.9	1.0115	16.1	1.0170	23.3	1.0225	30.4	1.0280	37.6
1.0006	1.9	1.0061	9.0	1.0116	16.2	1.0171	23.4	1.0226	30.6	1.0281	37.7
1.0007	2.0	1.0062	9.2	1.0117	16.3	1.0172	23.5	1.0227	30.7	1.0282	37.9
1.0008	2.1	1.0063	9.3	1.0118	16.5	1.0173	23.7	1.0228	30.8	1.0283	38.0
1.0009	2.2	1.0064	9.4	1.0119	16.6	1.0174	23.8	1.0229	31.0	1.0284	38.1
1.0010	2.4	1.0065	9.6	1.0120	16.7	1.0175	23.9	1.0230	31.1	1.0285	38.2
1.0011	2.5	1.0066	9.7	1.0121	16.9	1.0176	24.1	1.0231	31.2	1.0286	38.4
1.0012	2.6	1.0067	9.8	1.0122	17.0	1.0177	24.2	1.0232	31.4	1.0287	38.5
1.0013	2.8	1.0068	9.9	1.0123	17.1	1.0178	24.3	1.0233	31.5	1.0288	38.6
1.0014	2.9	1.0069	10.1	1.0124	17.3	1.0179	24.4	1.0234	31.6	1.0289	38.8
1.0015	3.0	1.0070	10.2	1.0125	17.4	1.0180	24.6	1.0235	31.8	1.0290	38.9
1.0016	3.2	1.0071	10.3	1.0126	17.5	1.0181	24.7	1.0236	31.9	1.0291	39.0
1.0017	3.3	1.0072	10.5	1.0127	17.7	1.0182	24.8	1.0237	32.0	1.0292	39.2
1.0018	3.4	1.0073	10.6	1.0128	17.8	1.0183	25.0	1.0238	32.1	1.0293	39.3
1.0019	3.5	1.0074	10.7	1.0129	17.9	1.0184	25.1	1.0239	32.3	1.0294	39.4
1.0020	3.7	1.0075	10.8	1.0130	18.0	1.0185	25.2	1.0240	32.4	1.0295	39.6
1.0021	3.8	1.0076	11.0	1.0131	18.2	1.0186	25.4	1.0241	32.5	1.0296	39.7
1.0022	3.9	1.0077	11.1	1.0132	18.3	1.0187	25.5	1.0242	32.7	1.0297	39.8
1.0023	4.1	1.0078	11.2	1.0133	18.4	1.0188	25.6	1.0243	32.8	1.0298	39.9
1.0024	4.2	1.0079	11.4	1.0134	18.6	1.0189	25.8	1.0244	32.9	1.0299	40.1
1.0025	4.3	1.0080	11.5	1.0135	18.7	1.0190	25.9	1.0245	33.1	1.0300	40.2
1.0026	4.5	1.0081	11.6	1.0136	18.8	1.0191	26.0	1.0246	33.2	1.0301	40.3
1.0027	4.6	1.0082	11.8	1.0137	19.0	1.0192	26.1	1.0247	33.3	1.0302	40.4
1.0028	4.7	1.0083	11.9	1.0138	19.1	1.0193	26.3	1.0248	33.5	1.0303	40.6
1.0029	4.8	1.0084	12.0	1.0139	19.2	1.0194	26.4	1.0249	33.6	1.0304	40.7
1.0030	5.0	1.0085	12.2	1.0140	19.3	1.0195	26.5	1.0250	33.7	1.0305	40.8
1.0031	5.1	1.0086	12.3	1.0141	19.5	1.0196	26.7	1.0251	33.8	1.0306	41.0
1.0032	5.2	1.0087	12.4	1.0142	19.6	1.0197	26.8	1.0252	34.0	1.0307	41.1
1.0033	5.4	1.0088	12.6	1.0143	19.7	1.0198	26.9	1.0253	34.1	1.0308	41.2
1.0034	5.5	1.0089	12.7	1.0144	19.9	1.0199	27.1	1.0254	34.2	1.0309	41.4
1.0035	5.6	1.0090	12.8	1.0145	20.0	1.0200	27.2	1.0255	34.4	1.0310	41.5
1.0036	5.8	1.0091	12.9	1.0146	20.1	1.0201	27.3	1.0256	34.5	1.0311	41.6
1.0037	5.9	1.0092	13.1	1.0147	20.3	1.0202	27.5	1.0257	34.6	1.0312	41.7
1.0038	6.0	1.0093	13.2	1.0148	20.4	1.0203	27.6	1.0258	34.8	1.0313	41.9
1.0039	6.2	1.0094	13.3	1.0149	20.5	1.0204	27.7	1.0259	34.9	1.0314	42.0
1.0040	6.3	1.0095	13.5	1.0150	20.6	1.0205	27.8	1.0260	35.0	1.0315	42.1
1.0041	6.4	1.0096	13.6	1.0151	20.8	1.0206	28.0	1.0261	35.1	1.0316	42.3
1.0042	6.6	1.0097	13.7	1.0152	20.9	1.0207	28.1	1.0262	35.3	1.0317	42.4
1.0043	6.7	1.0098	13.9	1.0153	21.0	1.0208	28.2	1.0263	35.4	1.0318	42.5
1.0044	6.8	1.0099	14.0	1.0154	21.2	1.0209	28.4	1.0264	35.5	1.0319	42.7
1.0045	6.9	1.0100	14.1	1.0155	21.3	1.0210	28.5	1.0265	35.7	1.0320	42.8

Sea Water Density at Various Temperatures

The purpose of this graph is to provide the density of sea water at any temperature apt to be encountered when the density at the standard temperature of 59° F (15°C) is known. To convert a density at 59° F (15°C) to density at another temperature, enter the graph horizontally from the left with the known density and downward from the top or upward from the bottom with the desired temperature; the position of the point of intersection with respect to the curves gives the density at the desired temperature. Interpolate between curves when necessary. For example, by this method, water having a density of 1.0162 at 59° F is found to have a density of 1.0124 at 85° F. The densities are referred to the density of fresh water at 4° C (39.2° F) as unity.

