U. S. DEPARTMENT OF COMMERCE, WEATHER BUREAU
IN COOPERATION WITH Escondido Chamber of Commerce
CLIMATOGRAPHY OF THE UNITED STATES NO. 20 — 04

LATITUDE 33° 07'N
LONGITUDE 117° 05' W
ELEV. (GROUND) 660 Feet

CLIMATOLOGICAL SUMMARY

STATION Escondido, California

MEANS AND EXTREMES FOR PERIOD 1930-1960

Month	Temperature (°F) Means: Daily maximum	Daily minimum	Monthly	Extremes: Record highest	Year	Record lowest	Year	** Mean degree days	Precipitation Totals (Inches): Mean	Greatest daily	Year	Snow, Sleet: Mean	Maximum monthly	Year	Greatest daily	Year	Mean number of days: Precip. .10 inch or more	Temperatures Max.: 90° and above	32° and below	Min.: 32° and below	0° and below	Month
(a)	30	30	30	30		30		30	30	30		30	30		30		30	30	30	30	30	
Jan.	65.4	36.7	51.1	89	1938	17	1950	430	2.94	2.55	1956	T	1.0	1949	1.0	1949	5	0	0	10	0	
Feb.	66.4	39.1	52.8	91	1943	24	1953	340	3.23	3.92	1937	0	0		0		5	*	0	6	0	
Mar.	69.6	41.9	55.8	95	1951	26	1939	290	2.56	2.47	1938	0	0		0		4	*	0	2	0	
Apr.	72.6	46.6	59.6	99	1940	31	1945	180	1.36	1.85	1940	0	0		0		3	1	0	*	0	
May	76.0	50.5	63.3	100	1942	34	1950	100	0.32	1.08	1955	0	0		0		1	1	0	0	0	
June	80.8	54.0	67.4	102	1957	39	1950+	20	0.09	0.42	1957	0	0		0		*	3	0	0	0	
July	87.8	58.5	73.2	107	1934	43	1940	0	0.01	0.12	1937	0	0		0		*	11	0	0	0	
Aug.	88.1	59.0	73.6	105	1955	44	1933	0	0.15	1.57	1945	0	0		0		*	12	0	0	0	
Sept.	86.7	55.8	71.3	108	1955	37	1941	10	0.21	1.77	1939	0	0		0		*	11	0	0	0	
Oct.	79.7	49.0	64.4	104	1950	31	1935	70	0.84	4.84	1936	0	0		0		1	4	0	*	0	
Nov.	74.2	40.4	57.3	96	1941	24	1956	240	1.30	2.49	1941	0	0		0		2	1	0	3	0	
Dec.	68.0	37.8	52.9	96	1938	23	1953+	380	3.21	3.94	1945	0	0		0		5	*	0	7	0	
Year	76.3	47.4	61.9	108	Sept. 1955	17	Jan. 1950	2060	16.22	4.84	Oct. 1936	T	10	Jan. 1949	1.0	Jan. 1949	26	44	0	28	0	Year

(a) Average length of record, years.

T Trace, an amount too small to measure.

** Base 65°F, Estimated

+ Also on earlier dates, months, or years.

* Less than one half.

NARRATIVE CLIMATOLOGICAL SUMMARY

The city of Escondido lies in a valley almost surrounded by the coastal range at an elevation of 650 to 750 feet above sea level. The valley is about 5 miles long from southwest to northeast and ranges up to 3 miles in width. To the west and southwest the hills rise to 300 to 800 feet above the valley, while on the northeast they reach heights of 800 to 1300 feet above the valley within about 5 miles of the city. Only 20 miles to the northeast the Agua Tibia Mountains rise to 5000 feet above sea level and Palomar Mountain, site of the famed observatory with its 200-inch telescope, 6140 feet high. Lake Hodges lies about 5 miles south of the city.

The valley is in the midst of the ranching and fruit producing section of San Diego County, and although it is relatively level there are extensive areas above the valley floor. The flow of cold air away from these benches helps to prevent frost damage on cold nights, facilitating the development of the avocado and citrus groves for which the area is famous. The records used in this summary are taken from stations at a low elevation in the valley, and consequently they represent the coldest portion of the area. It is likely that minimum temperatures during cold weather are several degrees warmer than this on the benchland where most of the groves are located.

Temperatures are moderate, with only a small annual range. The mean monthly value for January is 51°, while August has 74°, making an annual mean temperature of 61.9. The mean minimum temperature in January is 37°, and afternoon temperatures in mid-winter average in the middle 60s. The absolute extreme temperatures in winter range from a low of 17° to a high of 90° during the 30 years covered by this summary. In a typical year there are 28 days during the winter when the minimum temperature for the day drops to 32° or lower. One of the coldest months was January 1947, when there were 23 days of frost during the month--more than twice the usual number.

Summer temperatures are not excessive, as a rule. The average afternoon temperature in the warmest month is only 88°, and minimums during this period are, on the average, 44 days each summer with maximum temperatures of 90° or above. The hot spell of August 1939 is noteworthy because of 25 days during the month with maximum readings of 90 or higher, and because the lowest maximum observed during the entire month was 87°.

The heating degree day figure, computed from a base of 65°, is 2060, and the coldest month, January, averages 430 of these units.

Precipitation averages 16.22 inches per year, and 94% of this occurs during the winter half of the year. The records suggest that in 1 year out of 10 the annual precipitation can be expected to total not more than 9.30 inches, while with the same frequency an annual total of 24.60 can be expected. One half of the time this figure can be expected to fall between 12.20 and 20.10 inches. Snow in the Escondido area is a rarity, although it has been observed on at least one occasion. Figures tabulated locally in Escondido seem to indicate that the precipitation during the night hours is more than during the day.

Studies of rainfall intensity indicate that as often as once in every two years, on the average, the area can expect to receive rainfall at the rate of 0.60 inch in one hour, 1.30 inches in 6 hours, and 1.75 inches in 24 hours. An estimate of the same figures adjusted to a once-in-a-hundred-years level would be 1.40 inches, 3.12 inches, and 4.20 inches.

We are told that plant production is proportional to the amount of moisture transpired. Transpiration, therefore, provides a yardstick we can use to estimate the potential productivity of an area. The temperature distribution in the Escondido area leads us to expect that plants which grow the year around could make use of 32.60 inches of moisture in a year if the water were made available to them. If we consider only that portion of the year that falls between the average dates of the last frost in the spring and the first frost in the fall the figure is reduced to 28.20 inches. To estimate plant growth in the absence of irrigation it would be necessary to compute how much moisture the plants could obtain under natural precipitation, taking into account the moisture that could be stored in the root zone of the soil. Using a figure of 4 inches of water as the amount that might be stored, the moisture available to the plant that is not susceptible to frost would be 13.30 inches, while a crop with a growing season limited to the period between 32° readings would be able to make use of only 9.00 inches. It is apparent from these figures that irrigation offers a major boost to crop production in this climate.

The mountains surrounding the city in almost all directions provide protection against extreme winds, much of the time. Such winds as are experienced are likely to be associated with one of three situations: (a) the major winter storms that occasionally cross Southern California; (b) strong northerly winds that sweep across most of the State; or (c) infrequent local thunderstorms. It has been estimated that wind speeds up to 30 or 35 miles per hour may be expected at least once every other year, while speeds of 60 to 65 miles per hour might be as frequent as once in fifty years, and 65 to 70 miles per hour as often as once in a hundred years.

Humidity has been recorded for approximately 10 years in a near-by coastal valley that has characteristics almost identical with the geographical and climatical conditions in Escondido. These records show the early morning humidity to average 75%, while the mid-day values average 44%.

Average Temperature (°F)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann'l
1930	51.2	55.4	57.9	62.8	61.8	69.4	75.8	75.2	-	-	55.2	49.4	-
1931	51.8	54.5	58.6	63.6	68.4	71.6	78.6	76.9	70.4	64.2	51.8	47.6	63.2
1932	47.0	53.0	58.8	60.3	65.0	69.8	73.4	74.4	72.0	64.9	60.9	49.3	62.4
1933	47.3	49.4	55.9	58.0	59.7	66.0	72.2	73.0	66.2	65.5	57.3	50.0	60.0
1934	50.2	54.8	60.4	63.0	66.2	63.8	73.8	73.7	71.6	63.4	54.6	51.1	62.2
1935	-	-	52.6	60.7	62.4	68.8	73.8	75.4	71.4	62.8	55.6	54.0	-
1936	54.3	54.4	58.3	60.4	64.0	68.2	75.3	75.2	71.4	65.0	59.8	54.0	63.4
1937	44.9	52.6	55.0	57.2	64.4	69.1	74.8	75.4	74.5	66.3	59.0	56.8	62.5
1938	55.9	53.8	54.8	59.8	62.4	67.2	72.6	74.4	73.6	62.4	54.7	56.4	62.3
1939	51.8	48.4	54.4	62.2	64.0	68.2	74.2	75.6	73.8	66.9	61.0	58.0	63.2
1940	56.8	56.2	58.6	61.0	67.3	68.4	73.0	72.8	69.6	66.2	58.0	57.4	63.8
1941	54.0	56.2	58.3	58.0	66.5	67.2	73.2	73.8	68.0	64.0	60.7	53.0	62.7
1942	54.5	52.2	55.4	57.8	62.6	67.8	74.3	74.2	70.6	66.1	59.2	54.2	62.4
1943	53.8	57.6	58.6	61.2	63.6	65.2	71.6	73.6	73.3	66.4	58.8	52.8	63.0
1944	51.7	50.2	55.2	56.2	61.8	64.0	69.6	72.1	70.6	65.1	57.0	54.6	60.7
1945	51.4	53.0	52.7	56.4	60.5	64.8	71.2	74.8	73.1	65.4	55.9	52.3	61.0
1946	51.6	49.8	54.6	60.1	61.2	-	72.0	72.8	71.4	59.6	53.8	52.6	-
1947	49.2	54.6	56.9	60.2	64.2	67.0	72.1	71.9	72.4	64.5	54.4	52.8	61.7
1948	53.8	50.7	52.0	58.1	60.7	62.0	70.5	70.8	71.0	64.1	56.2	49.2	59.9
1949	43.7	49.1	52.7	61.1	62.1	68.8	71.0	71.5	71.5	61.5	61.3	50.1	60.4
1950	45.9	52.4	54.6	59.9	59.0	64.3	69.6	69.9	67.1	65.2	59.1	56.2	60.3
1951	50.6	51.7	56.2	59.2	63.0	66.8	72.5	71.8	70.7	64.3	57.3	50.7	61.3
1952	49.1	51.9	51.6	58.2	65.7	64.5	72.2	73.4	72.6	65.1	54.3	50.3	60.7
1953	55.4	51.9	55.0	56.8	60.3	65.6	74.6	71.1	69.4	64.3	57.7	50.9	61.1
1954	50.3	57.2	53.7	60.3	63.7	66.3	75.5	71.9	70.3	61.9	58.8	51.6	61.8
1955	48.2	50.8	56.3	57.0	61.2	67.1	71.2	75.1	73.0	61.5	55.8	51.8	60.8
1956	51.5	47.1	55.5	57.3	63.7	69.4	72.3	71.3	73.1	61.9	60.0	-	-
1957	50.6	56.1	55.2	58.5	61.0	71.1	74.3	74.9	70.5	61.9	54.4	54.9	62.0
1958	52.2	55.1	52.6	60.6	66.0	69.2	73.0	75.3	72.7	68.6	57.0	56.4	63.2
1959	54.4	51.5	59.5	64.3	63.3	71.1	76.7	74.8	71.8	65.5	60.1	54.2	64.0
1960	49.1	51.9	58.1	61.0	64.3	69.7							

Total Precipitation (Inches)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann'l
1930	7.73	1.42	3.45	1.93	4.42	.00	0.02	.00	.00	-	2.35	0	
1931	3.27	5.27	0.10	2.28	0.60	0.33	.00	0.51	.00	1.09	3.59	7.56	24.60
1932	1.76	9.37	0.33	1.00	0.23	0.08	.00	.00	.00	2.50	.00	5.34	20.61
1933	6.12	0.25	.00	2.07	1.19	0.08	.00	0.07	T	0.33	0.42	3.51	14.04
1934	1.04	2.42	0.61	.00	0.08	0.60	.00	.00	1.08	1.45	1.82	4.83	13.93
1935	3.51	4.74	2.74	1.43	0.12	.00	T	0.32	0.03	0.08	0.75	0.89	14.61
1936	0.57	7.91	2.47	0.92	0.07	.00	0.04	0.03	0.03	6.18	0.45	9.17	27.84
1937	2.84	8.71	5.61	0.59	0.96	.00	0.12	.00	.00	.00	0.12	1.87	20.82
1938	2.19	6.81	7.24	0.63	0.17	0.05	.00	.00	.00	.07	0.03	7.18	24.37
1939	2.84	2.14	2.02	0.76	0.11	.00	.00	.00	3.57	0.37	0.63	0.60	13.04
1940	4.85	4.73	1.10	3.01	.00	0.02	.00	.00	0.12	1.49	0.58	8.51	24.41
1941	2.06	5.47	8.09	5.32	.08	0.01	0.08	0.09	0.19	3.21	2.77	5.27	32.64
1942	0.69	2.49	1.68	2.24	.00	.00	.00	0.30	.00	0.36	0.15	1.22	9.13
1943	6.66	1.95	3.62	1.90	0.14	0.07	.00	.00	0.08	0.23	0.02	7.24	21.91
1944	1.71	4.41	1.32	0.97	0.18	0.37	.00	.00	0.04	0.04	5.18	1.56	15.78
1945	0.13	2.91	5.01	0.14	0.13	0.10	.00	2.20	0.11	0.02	0.60	5.24	16.59
1946	0.61	1.12	3.01	0.76	0.12	.00	.00	.00	0.03	1.10	4.75	1.64	13.14
1947	0.52	0.47	2.49	0.66	0.06	.00	.00	.00	0.12	0.60	0.85	2.43	8.20
1948	.00	1.71	2.06	0.81	.00	0.39	.00	.00	.00	1.25	.00	3.05	9.27
1949	5.07	2.05	1.68	0.11	0.99	.00	.00	.00	.00	0.21	1.90	1.55	13.56
1950	3.66	1.66	1.21	0.53	0.30	0.07	.00	.00	0.14	0.04	2.01	0.06	9.68
1951	3.18	1.20	0.65	2.49	0.07	.00	0.05	0.89	0.22	0.95	1.41	6.62	17.73
1952	6.10	0.57	6.43	1.83	.00	0.05	T	.00	0.07	.00	3.24	3.03	21.32
1953	1.66	0.75	1.46	1.37	0.31	0.04	.00	.00	.00	0.04	1.22	0.27	7.12
1954	4.87	2.71	5.19	0.23	0.06	0.12	.00	.00	.00	.00	0.98	1.05	15.21
1955	4.38	0.93	0.65	0.57	1.58	.00	.00	.06	.00	.00	1.36	0.94	10.47
1956	4.60	0.62	.00	1.45	0.14	.00	.00	.00	.00	0.19	.00	0.58	7.58
1957	7.82	0.60	1.48	1.21	1.44	0.42	.00	.00	.00	1.95	1.47	1.61	18.00
1958	1.02	4.73	7.57	3.96	0.25	.00	.00	.00	0.46	0.28	0.20	0.19	18.66
1959	0.57	4.62	.00	0.54	0.06	.00	.00	.00	0.08	1.10	.00	3.20	10.17
1960	3.86	3.47	1.10	1.09	0.22	0.02							

STATION HISTORY

Temperature and rainfall records at Escondido began in January 1894, when a raingage was placed in the yard behind a jewelry store operated by Mr. A. R. Moon; small maximum and minimum thermometers were placed on the north wall of the store. The station was one block WSW of the Post Office and at an elevation of 657 feet. These records were published in the Bulletin of the California State Weather Service until 1897 and were then transferred to the Climatological Data, where their publication continued until additional construction impaired the exposure site in December 1918. However, Mr. Moon continued recording data from that location until the station was moved in 1935. His services covered a period of 42 years.

The station was transferred to the residence of Mr. Darwin M. Ting, 0.3 mile SE of the Post Office, at an elevation of 657 feet. Here the instruments were located in an open area northwest of the residence, and the record was published in the Hydrologic Bulletin beginning in July 1940. The station was moved to its present location in July 1945, when Mr. Ting moved to 4th Avenue--0.3 mile SSE of the Post Office and 300 feet SSE of his earlier home. The new elevation was near 660 feet. This station was selected in July 1948 for publication in the Climatological Data, and it still appears in that publication. Mr. Ting is now serving his 26th year as an official weather observer.

Meanwhile a new observing station had been established at the A. F. Hubbard Ranch in October 1914 as a project, in part, of the Citrus Growers Union in cooperation with the Fruit Frost Service. These records were published from January 1919 until July 1948. The station was located 1.6 miles north of the Post Office at an elevation of 700 feet. The instruments, a standard shelter housing maximum and minimum thermometers and a standard rain gage, were located in an open field and were exposed over cultivated ground. In October 1919 the shelter was moved 480 feet west and 72 feet north to a location that was 20 feet higher in elevation, and the name was changed to Escondido # 1. There was another move in 1924, a distance of 30 feet to the north northwest, the move made necessary

STATION HISTORY - Cont.

by the growth of trees in the previous location. Another move in October 1927 put the station 500 feet further northeast, now about 1.8 miles north of the Post Office, near the edge of an open field, with a grove of orange trees about 15 feet to the south. Here the elevation was 750 feet. Mr. H. L. Harlow was the observer until 1929, when he was relieved by Mr. Hubbard. In 1935 Mr. L. E. Bagley took over, and in 1947 Mr. Quentin H. Thompson became the official observer and continued in that capacity until September 1949. In August 1948 the name of the station was changed to Escondido Thompson Ranch. The data were published in the Climatological Data until the station was closed in 1949. The record at this location covers 35 years, although there were several individual observers during this period.

Upon the resignation of Mr. Thompson the station was moved to and became known as Escondido Church Ranch. The new location was 2.6 miles S of the Post Office, at an elevation of 715 feet, and Mr. Albert A. Church, the ranch owner, was the observer. The countryside was hilly, and the instruments were placed near the crest of a gentle north-south ridge within an avacado and citrus grove. A recording rain gage was added to the instrumentation in 1941, and Escondido Church Ranch was added to the Weekly Crop Reporting Network from that date until 1953. The precipitation data were published in the Hydrologic Bulletin from 1941 to 1949.

The Escondido Church Ranch station was closed in May 1958, after 12 years of operation, and the equipment was moved to Escondido Park Hill, at the Park Hill Reservoir, located 1.1 miles east of the Post Office at an elevation of 850 feet. The City of Escondido is responsible for the observations, which are now published in the Hourly Precipitation Data.

The extensive weather record in the Escondido area has been accumulated as a result of the generous community service of the men who have served as weather observers. The payment these public-spirited citizens have received, for the most part, has been only the appreciation of their neighbors. As individuals and as a government we owe them a debt of gratitude, and we are happy to express here our acknowledgment of that debt.