

CLIMATOLOGICAL DATA FOR SEPTEMBER, 1913.

DISTRICT NO. 11, CALIFORNIA.

Local Forecaster G. H. WILLSON, District Editor.

GENERAL SUMMARY.

September, 1913, was a very warm and dry month with an abundance of sunshine and very little fog along the coast. The mean temperature for the State (70.7°) was, with two exceptions, the highest for any September since the records began in 1897. There was a period of very warm weather from the 15th to the 18th, when the maximum temperatures in the coast section from San Francisco Bay southward equaled and in some places exceeded all previous records of high temperature. At San Francisco, where the record covers a period of 40 years, the highest previous record (101°) was equaled, and at San Diego with the same length of record the maximum temperature (110°) on the 17th exceeded the former record by 9°. During this period the day temperatures ranged from 100° to 114° in the Great Valley, but these do not break the records for that section, although they equaled them at some places. In the mountains the temperatures were also very high, but records were not broken.

The month was an ideal one for harvesting and curing the fruit and raisin crop. In the fruit belt there was over 90 per cent of the possible sunshine during the month and the atmosphere was very dry, making the weather conditions most favorable.

The precipitation was mostly in the form of thunder-showers and was very light and generally confined to the higher levels and the extreme northwestern portion of the State. This was one of the driest Septembers on record. Many springs ceased to flow, and the rivers in all parts of the State approximated the lowest stages known. Water and power companies were taxed to their limits, and there was not sufficient water for irrigation purposes in most sections.

A noteworthy feature of the month was the numerous forest fires caused by lightning. Owing to the light precipitation during the past two years the forest floor had become very dry, so that in many instances where lightning struck it set fire to the parched underbrush and debris.

TEMPERATURE.

The mean temperature for the State was 2.2 degrees above the normal. The following table gives the means and departures for each September from 1897 to 1913, inclusive:

Year.	Mean.	Departure.	Year.	Mean.	Departure.
	° F.	° F.		° F.	° F.
1897.....	67.7	-0.8	1906.....	68.6	+0.1
1898.....	69.2	+0.7	1907.....	65.6	-2.9
1899.....	70.9	+2.4	1908.....	68.1	-0.4
1900.....	65.4	-3.1	1909.....	68.2	-0.3
1901.....	66.0	-2.5	1910.....	67.3	-1.2
1902.....	70.7	+2.2	1911.....	63.9	-4.6
1903.....	68.7	+0.2	1912.....	66.5	-2.0
1904.....	70.3	+1.8	1913.....	70.7	+2.2
1905.....	68.6	+0.1			

PRECIPITATION.

The following table gives the average precipitation and departure from the normal for each September from 1897 to 1913, inclusive:

Year.	Average.	Departure.	Year.	Average.	Departure.
	Inches.	Inches.		Inches.	Inches.
1897.....	0.03	-0.46	1906.....	0.25	-0.24
1898.....	0.64	+0.15	1907.....	0.13	-0.36
1899.....	0.03	-0.46	1908.....	0.49	0.00
1900.....	0.22	-0.27	1909.....	0.52	+0.03
1901.....	0.94	+0.45	1910.....	0.69	+0.20
1902.....	0.01	-0.48	1911.....	0.19	-0.30
1903.....	0.10	-0.39	1912.....	1.65	+1.16
1904.....	2.66	+2.17	1913.....	0.07	-0.42
1905.....	0.16	-0.33			

The greatest monthly amount was 1.37 inches at Weitchpec and the greatest 24-hourly amount was 1.17 inches at Descanso on the 12th. There was no rainfall at 133 stations.

The following table gives the hours of sunshine and the percentage of the possible:

Stations.	Hours.	Percentage of possible.	Stations.	Hours.	Percentage of possible.
Eureka.....	217	56	Sacramento.....	361	97
Fresno.....	353	95	San Diego.....	310	84
Los Angeles.....	305	82	San Francisco.....	318	85
Mount Tamalpais.....	348	93	San Jose.....	332	89
Red Bluff.....	326	87	San Luis Obispo.....	293	79

NOTES ON THE RIVERS OF THE SACRAMENTO AND LOWER SAN JOAQUIN WATERSHEDS DURING THE MONTH OF SEPTEMBER, 1913.

By N. R. TAYLOR, Local Forester.

Sacramento watershed.—The streams in this watershed remained at extreme low stages during the entire month. The Sacramento River from Red Bluff to Walnut Grove was the lowest of which there is an authentic record. At Colusa the river was 1.5 feet below the September normal stage and 0.3 of a foot below the lowest average on record. At Knights Landing it was -1.6 feet, which is 2.2 feet below the normal for the month and 0.7 of a foot below the lowest average stage in the history of the station. The river at Sacramento City averaged only 3.5 feet, which is 3.2 feet below the normal and the lowest since the low-water season of 1856. An extreme low-water stage of 2.6 feet was recorded at Sacramento on September 23, which is the lowest authentic record in the history of the station.

Sacramento was well within the tidal limits during the entire month and occasionally noticeable tides were observed for 10 miles above the city.

Navigation between the Southern Pacific and Northern Electric Bridges was impeded at various times during the month by sand deposits.

A shortage of water in the foothills and mountains has been general and has resulted in the suspension of several mines and power plants. Water for irrigation purposes has become alarmingly scarce.

Lower San Joaquin watershed.—All streams in this watershed remained at low stages, there being little difference between the average stages of the present month and those of the month preceding.

Practically no precipitation occurred in any section of either watershed during the month.

NOTES ON STREAMS AND WEATHER OF THE UPPER SAN JOAQUIN WATERSHED.

By W. E. BONNETT, Local Forester.

Phenomenal rains in the mountains during the last decade of August had raised the streams to unusual stages for that month and the increased flow continued at all points during the first week of September. This resulted in mean stages for September that are quite close to the averages for the last seven years, although the snow cover in the mountains which is the only source of summer supply in ordinary years had promised very low September stages this year. The highest stages at all points were recorded on the 1st or 2d, followed by a gradual fall during the first half of the month after which the stages were low and practically stationary.

No September of recent years has been so favorable for raising making as the one just closed. Twenty-eight days were clear, there was 95 per cent of the possible sunshine and the per cent of humidity was very low, so that drying has gone on under the most favorable conditions and the bulk of the crop is safe in stack at the close of the month. But one rain warning was issued, that of the 20th, and it was amply justified in the sharp local showers that fell at nearby points. While it is not the highest of record for September, the maximum of 107° on the 18th is noteworthy for the late date in the month on which it occurred.

THE SEPTEMBER HOT WAVE IN LOS ANGELES, CAL.

By FORD A. CARPENTER, Local Forecaster.

The year 1913 will go down in the meteorological history of southern California as a record breaker of extremes in temperature. In many localities the early part of the year witnessed the lowest temperatures ever known, although records extend to 1849, and during the latter half of the year heat records were also broken. On September 17, 80° was the highest minimum temperature ever recorded in Los Angeles, and the highest temperature, 108°, on that day was within 1° of the absolute maximum for the station, 109° on July 25, 1891. That such conditions are uncommon may be gained from the fact that this temperature was 26° higher than the mean daily maximum for the month from 37 years' record at this station. Otherwise September was a typical month, the mean highest temperature being only 2° above the daily normal maximum.

MONTHLY AND ANNUAL DISTRIBUTION OF TEMPERATURES OF 100° AND OVER AT LOS ANGELES, CAL.

Year.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Total.
1877.....								0
1878.....						1 108		3
1879.....			1 104			1 101		4
1880.....								0
1881.....					100	102		2
1882.....						100		1
1883.....		100	100			2 104		6
1884.....					2 102			2
1885.....					2 106	108	102	5
1886.....								0
1887.....			100					1
1888.....								0
1889.....						103		1
1890.....			1 105					2
1891.....				109		100		2
1892.....								0
1893.....								0
1894.....								0
1895.....			100					1
1896.....		103						1
1897.....								0
1898.....								0
1899.....							100	1
1900.....								0
1901.....								0
1902.....								0
1903.....								0
1904.....								0
1905.....					101			1
1906.....						105		1
1907.....				1 103	101			4
1908.....								0
1909.....					101	1 103		3
1910.....	100							1
1911.....								0
1912.....						100		1
1913.....						108		(1)
Total.....	1	2	7	6	8	17	2	(44)

References: 1 also 100; 2 also 101; 3 also 102; 4 also 103; 5 also 104; 6 102 twice.

Month with maximum number, September.....	17
Year with maximum number, 1883.....	6
Average number per year (over).....	1

Remarks.—The absolute highest temperature, 109°, was registered on July 25, 1891.

The cause of this hot spell, like all instances of temperatures above 90° in this portion of southern California, was a well-defined "norther" condition brought about by pressure distribution typical of such phenomena.

On September 15 the barometric pressure was high over the northwest and low in the southwest. While the low area remained stationary for many days, the high area progressed in a southeasterly direction. The greatest difference in pressure was coincident with the warmest day, when the weather map showed a gradient of a tenth of an inch in barometric pressure to the hundred miles on an east and west line.

The effect of this pressure distribution on the weather in the coast districts of southern California was so give that region the driest and warmest day on record. Previous records were broken at surrounding stations, notably that of San Diego, which has the longest unbroken series of observations in this section. At that station the thermometer rose 9° higher than ever before recorded, and 33° above the mean daily maximum temperature of the month.

The Los Angeles thermogram and hygrogram of the four-day period presents an excellent example of the relationship between temperature and moisture in southern