

Operating capital represented by current assets constituted 70 per cent of the total or \$82,461 per association. Accounts receivable from patrons, one of the important items of operating capital, averaged \$8,992, but one tenth of the associations had outstanding accounts of \$16,000 or more.

The over-extension of credit to purchasers of merchandise with the accompanying difficulty of maintaining collections is one of the most serious problems of management. This is well evidenced by the fact that for more than one fifth of the associations, the days sales outstanding in receivables were 50 or more.

Of the total capital required, 26 per cent was used for fixed assets. The original investment was \$45,511 per association but one third of this had been depreciated leaving a net value of \$30,295.

Creditors supplied 42 per cent of the capital. Patronage dividends payable, which amounted to 5.2 per cent of the assets, are included in this proportion. Inasmuch as most of the patrons are members, the amount of this item can be considered as capital provided by members, bringing the total capital supplied by members and patrons to an average of 63 per cent of the assets.

Capital stock, including both common and preferred, accounted for 20 per cent, and patrons' deferred dividends, 24 per cent of the total net worth. The surplus which constituted 11 per cent of the net worth is in the main not credited to individual patrons' accounts. Any association which hopes to maintain an income tax exempt status should avoid placing any of the net margins in an unallocated account.

On the basis of averages, the financial status of Minnesota cooperative elevator associations at the end of the 1947-48 fiscal year was very satisfactory. The ratio of current assets to current liabilities was slightly over the standard of 2 to 1; the ratio of net worth to debt was well above the minimum accepted standard of 1.5 to 1. For many associations, however, these ratios were below the standard. For example, 8 per cent of the associations did not have enough liquid assets to meet current creditor claims in full on demand. In the cases of 29 per cent of the associations, the ratio of net worth to debt was less than 1.0, indicating that the owners actually control less than one half of the assets.

Sales of grain averaged \$711,460 and merchandise \$116,543. The total gross margin averaged \$41,140 or 4.5 per cent of the total sales and was about equally divided between operating expenses and operating savings.

Labor and management expense represented 52 per cent of operating expenses. Probably the best way to attack high operating costs among those associations with adequate volume is to obtain a more efficient management and utilization of labor.

The net margins of \$19,716 were 2.4 per cent of total sales plus service income. For the 80 associations the net margins totaled \$2,070,423. Of this amount, 80 per cent was paid out in cash, made currently payable, or placed in a patrons' equity reserve. In addition, almost 7 per cent was distributed to the patrons in the form of capital stock or stock credits. About 10 per cent of the margins were added to surplus, and 6 per cent represented undistributed margins.

# 50 YEARS OF Weather



## IN THE RED RIVER VALLEY

O. C. SOINE

Agricultural Experiment Station  
University of Minnesota



# FIFTY YEARS OF WEATHER

in the

## *Red River Valley*

O. C. SOINE

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"EVERYBODY talks about the weather, but nobody does anything about it," is a quotation commonly attributed to Mark Twain. Weather is one of the most dynamic forces of nature, touching the life of every individual, affecting his water supply, food, and shelter, and sometimes destroying life itself.

Because of this great importance weather records have been kept for the past 50 years at the Northwest School and Experiment Station, Crookston, Minnesota. During the early period, from 1900 to 1910, the records were not as complete as they are at the present time. But since 1910 the records have included maximum and minimum temperatures; precipitation, including both rainfall and snowfall; direction of wind; and character of the day.

In 1915 this station began operating in cooperation with the United States Weather Bureau, and in 1922 it was designated as a corn and wheat region station. During the crop-growing season, April through September, the daily weather data are telegraphed to the Minneapolis office of the Weather Bureau.

Official equipment furnished by the United States Weather Bureau is used

for collecting and recording all weather data. Complete records are kept in accordance with the regulations of this bureau.

The Northwest School and Experiment Station is located about two miles north of the city of Crookston, approximately in the center of the Red River Valley. The altitude at Stephens Hall on the Northwest School campus is 888.34 feet.

### A Normal Year

IT IS extremely difficult to describe a normal weather year because the weather in this area fluctuates widely. However, weather data can be summarized for definite periods of time to find averages which may help to define a normal year. Some weather reports make use of these averages as a basis for comparison.



From the 50-year records the following averages have been computed:

<b>Total Precipitation, 1900-49</b>	
(inches) .....	<b>20.29</b>
Rainfall, 1915-49 (inches) .....	16.26
Snowfall, 1915-49 (melted inches) .....	3.14
Number of days with 0.01 inch or more of rain or snow, 1915-49 .....	90.1
<b>Mean Annual Temperature, 1910-49 (degrees) .....</b>	<b>39.47</b>
Mean winter temperature, 1910-49 (degrees) .....	19.94
Mean summer temperature, 1910-49 (degrees) .....	58.68
<b>Number of frost-free days, 1900-49 (days) .....</b>	<b>128</b>
<b>Prevailing wind is northwest</b>	

**Seasonal Extremes**

IT IS interesting to note some of the wide variations that have occurred over this 50-year period. The coldest day on record occurred on February 15, 1936, when a minimum of -51 degrees was recorded. The warmest day occurred on July 28, 1917, with a high reading of 108 degrees. The coldest month of the period was February 1936, and the warmest month was July 1936.

The winter of 1935-36 (October through March) was the coldest, and the summer of 1942 (April through September) was the warmest. For a calendar year, 1917 was the coldest while 1931 was the warmest.

The greatest total precipitation (rain and snow) occurred during the year of

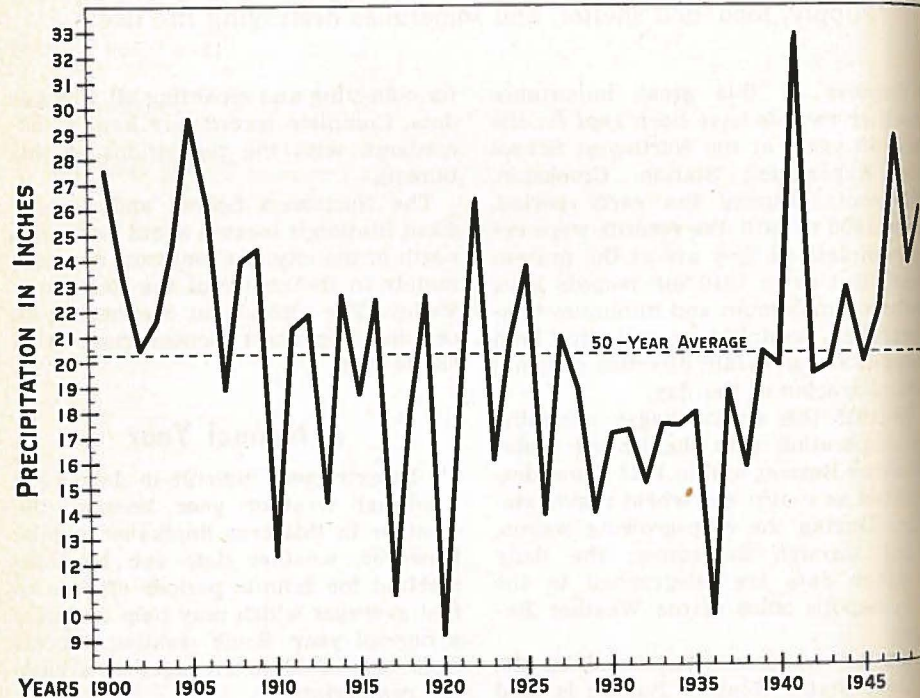


Fig. 1. Total precipitation by years, 1900-1949

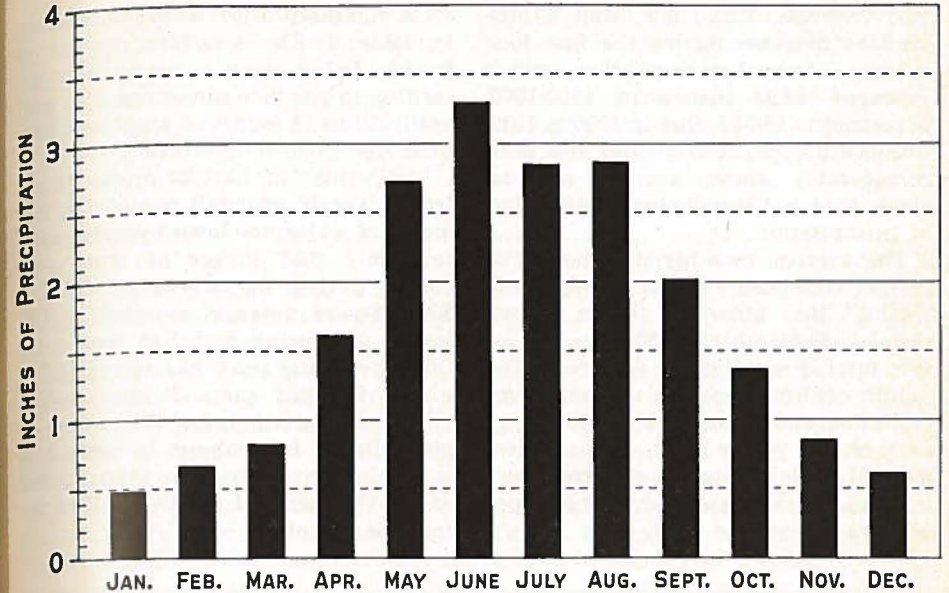


Fig. 2. Average monthly distribution of precipitation, 1900-1949

1941 and measured 32.87 inches. The least total precipitation of 9.27 inches was recorded for the year 1920. The rainfall of 1917 measured only 6.27 inches, the lowest recorded in the period 1915-49, and the high amount of 28.49 inches fell during the summer of 1941.

The greatest amount of snow fell during the winter of 1921-22 when 8.10 inches of melted snow were recorded; the least amount fell during the winter of 1930-31 when only 0.88 inch of melted snow was recorded.

The year with the longest growing season occurred in 1914 with a frost-free period of 171 days. This is well over twice as long as the shortest season of only 78 days, which occurred in 1915.

**Precipitation**

TOTAL PRECIPITATION, which includes both rainfall and melted snow, is collected and measured daily at

the Northwest School with standard Weather Bureau equipment. Precipitation is measured accurately to the one-hundredth of an inch and always recorded as inches of water. In the case of snowfall, it is collected, melted, and then measured.

During the 50-year period total annual precipitation averaged 20.29 inches and varied from a low of 9.27 inches in 1920 to a high of 32.87 inches in 1941. Just 25 years have been below this average and 25 have been above. According to figure 1 the precipitation has fluctuated greatly during the entire period—following no definite pattern or trend. The longest consecutive period of above-normal precipitation occurred in 1900-07, a period of seven years. The longest period of below-normal precipitation covered an 11-year period from 1928 through 1938.

In table 1<sup>1</sup> the precipitation is given for each month and year, followed by the 10-year average and finally the 50-

<sup>1</sup> Tables appear on pages 10-19.



year average. There has been a progressive decrease during the first four decades. Annual precipitation, which averaged 24.08 inches in 1900-1909, decreased to 16.74 inches in 1930 to 1939. The last decade, 1940 to 1949, has been considerably above average and no single year has been below 19.48 inches of precipitation.

The average monthly distribution of precipitation can be seen in figure 2. During the growing season, April through September, 73.38 per cent of the total precipitation occurred. The month of June received the most precipitation and accounted for 16.26 per cent of the yearly total. The smallest amount of precipitation occurred during January and equalled only 2.66 per cent of the yearly total.

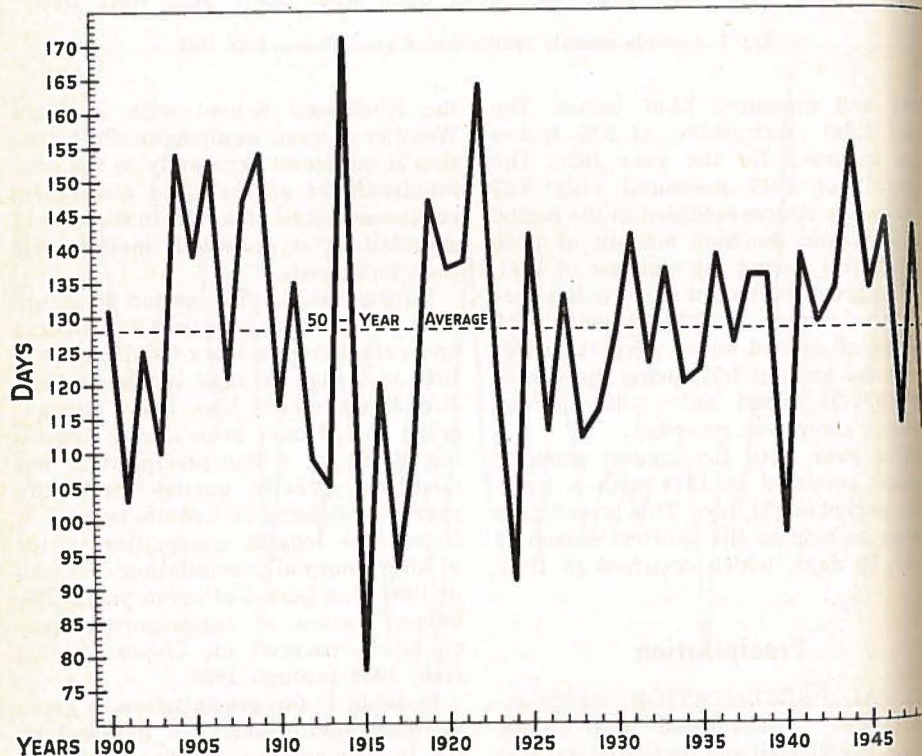


Fig. 3. Number of frost-free days for each year, 1900-1949

A summary of the snowfall is given in table 2. The moisture content of freshly fallen snow varies greatly according to weather conditions, but generally 10 to 12 inches of snow will produce one inch of moisture.

The winter of 1921-22 produced the largest yearly snowfall, measuring 8.1 inches of water; the lowest yearly snowfall—only 0.88 inches of water—occurred during the winter of 1930-31. The 35-year average snowfall is 1.9 inches for spring and 1.16 inches for fall. The winter snow has averaged 3.3 inches for this same 35-year period.

The precipitation for the season is given in the last column in table 2. It is obtained by adding the total rainfall of the summer and the snowfall of the following winter.

A summary of the number of days on which .01 inch or more precipitation has occurred is shown in table 3. The 35-year average of days per year that this amount of precipitation has occurred is 90.1, but yearly totals vary from a low of 52 in 1915 to a high of 136 days in 1947. This average also shows February to be the low month and June the high month.

The number of times that 0.1 inch or more of precipitation has occurred from 1915-49 is given for each day of the month in table 4. Some companies selling rain insurance use this figure as a basis for paying claims. There are a few blanks in the table, showing that precipitation has never occurred on those days in the 35-year period. For example, on the third days of January, March, and December, no precipitation has occurred. The table also brings out the fact that the six months of the growing season contain the most days with 0.1 inch or more of precipitation.

The probability of rain falling on a certain day during the summer can be ascertained from this table. For example, on July 3, it has rained 13 times or 36 per cent of the time; on July 4, seven times or 20 per cent; and on July 5, rain has fallen 12 times or 34 per cent of the time.

### Frost-Free Period

THE DATES of the spring and fall frosts and the length of the frost-free periods are shown in table 5. In accordance with U. S. Weather Bureau procedure, three types of frost are noted for each year:

A *light frost* may injure only tender plants and vines in exposed places, a *heavy frost* is more severe but will not destroy the staple crops of an area, while a *killing frost* generally destroys all vegetation, including the staple crops.

The first killing frost in the fall is recorded when the corn plant is killed.

In the spring light or heavy frosts are recorded if tender garden plants are injured by frost.

The frost-free season has averaged 128 days for the 50-year period, as shown in table 5. And according to the average, the last spring frost occurs May 19 and the first fall frost September 24.

There is a great deal of variation in the dates on which spring frosts come. For example, the latest one recorded came on June 19, 1940, and the earliest day of the last frost came on April 20, 1904. This is a range of 60 days when spring frost may be expected.

The earliest fall frost occurred on August 26, 1915, and the latest day of the first fall frost was October 26, 1914. This is a range of 61 days when frost may be expected in the fall.

The shortest frost-free period occurred in 1915 and extended over only 78 days, while the longest frost-free period, 171 days, was recorded in 1914. According to figure 3, no definite pattern or trend has been followed in the 50-year period.

The greatest number of consecutive years in which the frost-free period was above average was six years—from 1941 through 1946. The greatest number of consecutive years in which the frost-free period was below average was four years—from 1915 through 1918. Twenty-four seasons of the 50-year period have had frost-free periods shorter than the average, while the remaining 26 have been longer.

### Temperatures

BOTH MAXIMUM and minimum temperatures are recorded on official U. S. Weather Bureau thermometers and are read once daily during the winter and twice daily during the growing season. The maximum thermometer, filled with mercury, records the highest temperature for the day, and the



minimum thermometer, filled with alcohol, records the lowest temperature for the day. Both instruments are mounted in an official thermometer shelter—an arrangement which enables air temperature to register accurately.

The mean temperature for each day is obtained by averaging the maximum and minimum for that day and likewise for the month. These temperatures for the 40-year period, 1910-1949, are averaged in table 6 for each month, year, and the entire 40-year period. The average annual temperature for the 40 years has been 39.47 degrees, as reported in table 6, and has varied from a high of 44.88 degrees in 1931 to a low of 36.08 degrees in 1917. According to figure 4, 18 years have been below average and 22 years above.

The longest consecutive period of average below-normal temperatures

extended over five years, from 1913 to 1917; the longest consecutive period of average above-normal temperatures extended over two five-year periods, from 1930 to 1934 and from 1938 to 1942. It is apparent from figure 4 that no definite temperature pattern or cycle can be ascertained for the past 40 years.

The mean temperatures for the six months of the growing season, April through September, and the mean temperatures for the remaining six winter months, October through March, are given at the right in table 7. The average 40-year mean temperature for the summer months has been 58.68 degrees and has varied from a high of 65.11 degrees in 1942 to a low of 41.13 degrees in 1948.

A total of 22 years have been above average in mean temperatures while 18 have been below. The 40-year average

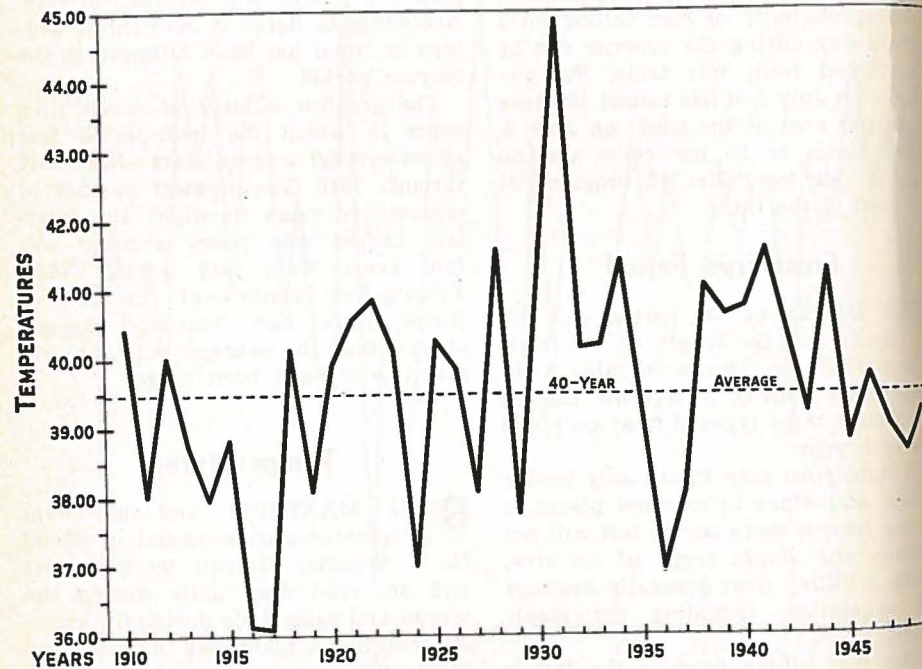


Fig. 4. Mean temperature for each year, 1910-1949

temperature for the six winter months has been 19.94 degrees. The yearly temperature has varied from a high of 26.67 degrees in 1930 to a low of 11.48 degrees in the winter of 1935-36.

The two coldest consecutive winter months were January and February, 1936, when the mean temperature was  $-9.0$  and  $-13.9$  degrees respectively. During this period there were 38 consecutive days, from January 15 to February 22, when the mean temperature remained below zero; and for 45 consecutive days, January 10 to February 24, the minimum temperature remained below zero.

The coldest winter month on record was February, 1936, when the mean temperature was  $-13.9$  degrees. The lowest temperature on record was  $-51$  degrees, which occurred February 15, 1936.

The warmest summer month, as reported in table 6, has been July, with an average of 69.96 degrees for the 40 years. The highest temperature on record was 108 degrees on July 28, 1917.

The maximum temperatures for each month and year are given in table 8. The minimum temperatures are given in table 9.

Table 8 shows that maximum annual temperatures have ranged from 88 to 108 degrees from 1915 to 1949. Minimum yearly temperatures, shown in table 9, have varied from  $-18$  to  $-51$  degrees in the same period.

## Prevailing Winds

A summary of the prevailing winds for the 35-year period is given in table 10. It is difficult to prepare such a table because an average does not always give the true picture. For example, the prevailing winds for January for the 35 years have been south, but table 10 shows that for 15 years they were from the south, for 11 years from the northwest, for six years from the north, and for three years from the southeast.

The direction of the prevailing winds for the 35-year period has been as follows:

January	—south
February	—northwest
March	—northwest
April	—northwest
May	—northwest
June	—southeast
July	—northwest and south
August	—southeast
September	—northwest
October	—northwest
November	—northwest
December	—northwest

The following figures give the percentage of days of the prevailing wind direction for the 35 years:

Northwest	..... 35.0	Southwest	..... 5.0
South	..... 25.4	Northeast	..... 3.0
North	..... 14.6	West	..... 1.5
Southeast	..... 14.0	East	..... 1.5

100.0





Table 1. Precipitation in Inches, Monthly and Annual, 1900-1949

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1900	0.32	0.60	1.33	1.59	0.77	1.07	3.68	7.51	5.08	4.95	0.45	0.20	27.55
1901	0.35	0.40	0.20	2.45	0.26	7.41	4.61	2.60	2.32	2.00	T*	0.76	23.36
1902	0.11	0.73	1.91	1.41	3.25	2.35	2.92	3.24	1.27	2.42	0.42	0.45	20.48
1903	0.65	0.20	0.80	0.98	3.74	0.70	1.79	4.86	3.78	2.02	0.82	1.30	21.64
1904	0.30	1.80	2.81	3.90	2.09	3.92	2.02	1.94	2.12	2.98	0.10	0.60	24.58
1905	0.75	0.40	1.85	1.27	5.82	2.84	6.17	5.66	2.27	1.18	0.99	0.40	29.60
1906	1.20	0.10	0.48	2.56	4.16	3.21	4.87	2.92	1.59	1.11	2.18	1.90	26.20
1907	1.80	0.10	0.60	1.50	0.98	5.14	2.38	2.15	2.71	0.90	0.25	0.40	18.91
1908	1.50	2.20	1.50	1.79	3.97	1.42	0.83	7.28	0.56	1.33	0.58	1.00	23.56
1909	0.90	1.70	0.80	1.03	2.93	3.71	3.92	3.38	1.56	0.81	1.30	2.40	24.44
10-year average	0.79	0.82	1.23	1.85	2.80	3.18	3.32	4.15	2.33	1.97	0.71	0.94	24.08
1910	1.20	0.45	0.70	2.18	0.64	0.62	1.18	1.42	2.60	0.52	0.45	0.40	12.36
1911	0.70	1.20	0.10	2.23	3.77	4.00	1.87	3.27	1.23	1.01	1.58	0.42	21.28
1912	0.55	0.45	0.70	1.53	1.89	2.86	2.65	3.78	5.32	0.42	0.10	1.60	21.85
1913	0.35	0.12	1.22	1.11	1.41	1.12	3.22	0.89	2.86	1.89	0.20	0.10	14.49
1914	0.95	0.33	1.25	1.67	2.77	5.33	4.56	2.31	0.67	2.25	0.50	0.00	22.50
1915	0.00	0.35	0.15	0.95	2.96	8.46	2.18	T	1.75	0.41	0.91	0.60	18.72
1916	1.40	0.00	1.71	1.32	2.63	4.48	1.91	4.01	3.28	0.71	0.05	0.93	22.43
1917	0.24	2.08	0.11	1.47	0.10	0.53	1.55	0.72	1.71	0.76	0.63	0.89	10.79
1918	0.12	0.25	T	2.14	2.96	1.60	3.37	3.81	0.55	1.78	0.87	0.62	18.07
1919	0.30	0.43	0.71	1.38	3.60	3.47	8.83	1.69	0.60	0.30	1.27	T	22.58
10-year average	0.58	0.57	0.67	1.60	2.27	3.25	3.13	2.19	2.06	1.01	0.66	0.56	18.52
1920	0.10	0.01	0.08	0.42	1.99	2.65	0.90	0.05	1.71	0.61	0.70	0.05	8.27
1921	1.04	0.04	0.33	0.86	1.77	2.60	3.74	1.53	2.99	0.51	2.70	0.52	18.63
1922	0.21	3.80	1.04	1.24	6.97	2.41	3.08	1.97	1.08	0.24	3.69	0.67	26.40
1923	0.27	0.32	0.19	1.10	1.32	3.34	4.82	1.63	1.98	0.39	0.43	0.35	16.14
1924	0.34	0.06	0.32	5.10	2.81	1.58	2.64	1.65	3.54	2.24	0.14	0.44	20.66
1925	0.09	0.22	0.31	2.79	4.60	6.82	0.86	1.46	5.66	0.58	0.25	0.12	23.76
1926	0.25	0.09	0.05	0.14	2.16	3.43	1.28	1.49	0.65	3.51	0.72	0.22	13.99
1927	0.35	0.49	0.35	2.09	4.40	4.83	2.35	3.79	0.25	1.36	0.26	0.42	20.94
1928	0.07	T	0.77	0.64	1.18	6.58	2.21	4.14	1.71	0.65	0.60	0.34	18.99
1929	0.35	0.17	0.31	1.77	1.94	1.28	2.23	1.16	1.33	2.48	0.53	0.51	14.06
10-year average	0.31	0.52	0.37	1.61	2.91	3.55	2.41	1.89	2.09	1.26	1.00	0.36	18.29
1930	0.09	0.68	0.15	0.80	4.12	2.17	1.69	0.52	2.77	2.10	1.88	0.16	17.13
1931	0.06	0.09	0.70	0.05	3.09	2.64	3.06	1.07	2.33	2.59	1.51	0.10	17.29
1932	0.22	0.54	0.36	1.46	2.23	1.80	1.49	3.60	1.04	1.82	0.52	0.13	15.21
1933	0.64	0.02	0.47	1.23	3.05	3.00	1.50	2.43	2.36	0.75	0.65	1.37	17.47
1934	0.18	0.12	0.46	0.68	2.78	4.95	2.32	0.97	1.28	2.55	0.57	0.59	17.45
1935	0.68	0.05	1.04	1.77	1.20	2.90	4.47	3.80	0.68	0.15	0.87	0.36	17.97
1936	0.65	0.93	1.24	0.28	1.41	1.80	0.52	0.91	1.42	0.16	0.32	0.35	9.96
1937	0.91	0.75	0.22	4.26	4.13	1.41	3.95	1.79	0.37	0.08	0.25	0.66	19.71
1938	0.32	0.90	0.37	1.77	4.66	1.20	2.96	1.40	0.43	0.42	0.98	0.41	15.82
1939	0.46	1.28	0.69	0.66	0.69	3.35	1.92	4.71	3.70	2.45	0.05	0.36	20.32
10-year average	0.42	0.54	0.57	1.30	2.74	2.52	2.39	2.12	1.64	1.31	0.76	0.45	16.74
1940	0.10	0.63	0.91	2.08	1.30	1.02	4.24	2.14	1.51	2.26	2.55	1.06	19.80
1941	0.75	0.39	2.26	2.34	5.29	7.44	1.12	8.02	4.14	0.83	0.14	0.15	32.87
1942	0.21	0.20	2.21	1.73	2.67	1.18	2.73	5.60	1.22	0.17	0.53	1.03	19.48
1943	0.51	1.51	1.39	1.83	2.87	2.50	3.33	2.62	1.44	0.81	0.78	0.22	19.81
1944	0.42	0.08	1.63	0.32	2.46	4.54	1.41	8.24	0.69	0.36	2.51	0.20	22.84
1945	0.62	0.23	1.13	2.86	0.78	2.60	2.66	2.57	4.11	0.52	0.23	1.64	19.96
1946	0.45	1.76	0.92	1.14	2.21	5.41	1.24	2.62	3.22	1.72	0.52	0.81	22.02
1947	0.98	2.08	0.63	2.33	3.26	7.17	3.46	3.06	2.53	1.27	2.19	0.49	28.85
1948	0.62	1.11	1.27	1.47	1.29	4.67	5.73	4.19	0.52	0.63	1.34	0.98	23.82
1949	1.96	0.80	0.84	0.12	7.24	3.35	3.90	0.91	0.80	4.33	0.68	1.08	26.01
10-year average	0.60	0.88	1.32	1.62	2.94	3.99	2.98	4.00	2.02	1.29	1.15	0.77	23.56
50-year average	0.54	0.67	0.83	1.62	2.73	3.30	2.85	2.87	2.03	1.37	0.86	0.62	20.23
1950	1.40	0.19	2.29	2.30	4.60	3.76	1.25	1.39	4.72	1.99	0.90	0.45	25.24

\* T = trace.

Table 2. Rainfall and Snowfall in Inches, 1915-1949

Year	Total rainfall	Precipitation* during growing season, Apr.-Sept.	Snowfall†			Precipitation for season‡	
			Spring	Fall	Total‡		
1915	17.16	16.30	0.53	1.03	1.56	4.46	21.62
1916	17.67	17.63	3.43	1.33	4.76	4.01	21.68
1917	6.27	6.08	2.68	1.84	4.52	2.21	8.48
1918	17.46	14.43	0.37	0.24	0.61	0.97	18.43
1919	20.57	19.57	0.73	1.27	2.00	1.46	22.03
1920	9.03	7.72	0.19	0.05	0.24	1.73	10.76
1921	13.91	13.49	1.68	3.04	4.72	8.10	22.01
1922	19.96	16.75	5.06	1.38	6.44	2.82	22.78
1923	14.35	14.19	1.44	0.35	1.79	2.40	16.75
1924	18.52	17.32	2.05	0.29	2.34	0.91	19.43
10-year average	15.49	14.35	1.82	1.08	2.90	2.91	18.40
1925	22.46	22.19	0.62	0.68	1.30	1.17	23.63
1926	12.47	9.15	0.49	1.03	1.52	3.50	15.97
1927	17.65	17.71	2.47	0.82	3.29	2.07	19.72
1928	17.32	16.46	1.25	0.32	1.57	0.93	18.25
1929	12.48	9.71	0.61	0.97	1.58	1.93	14.41
1930	15.62	12.07	0.96	0.55	1.51	0.88	16.50
1931	15.84	12.24	0.33	1.12	1.45	2.36	18.20
1932	12.67	11.62	1.24	1.30	2.54	3.24	15.91
1933	13.00	13.57	1.94	2.53	4.47	3.76	16.76
1934	15.06	12.98	1.23	1.16	2.39	3.08	18.14
10-year average	15.46	13.77	1.14	1.08	2.16	2.29	17.75
1935	14.80	14.82	1.92	1.25	3.17	3.94	19.74
1936	6.59	6.34	2.69	0.71	3.40	3.45	10.04
1937	15.20	15.91	2.74	0.84	3.58	2.06	17.26
1938	13.26	12.42	1.22	1.34	2.56	4.32	17.58
1939	16.62	15.03	2.98	0.72	3.70	2.45	19.07
1940	14.69	12.29	1.73	3.38	5.11	7.28	21.97
1941	28.49	28.35	3.90	0.48	4.38	2.10	30.59
1942	16.20	15.13	1.62	1.66	3.28	5.10	21.30
1943	15.91	14.59	3.44	0.46	3.90	2.48	18.39
1944	20.19	17.66	2.02	0.60	2.67	2.05	22.24
10-year average	16.20	15.25	2.43	1.14	3.58	3.52	19.64
1945	16.89	15.58	1.45	1.61	3.06	4.53	21.42
1946	17.95	15.84	2.92	1.15	4.07	5.01	22.96
1947	23.34	21.81	3.86	2.17	6.03	5.75	29.09
1948	18.55	17.87	3.58	1.69	5.27	5.29	23.84
1949	21.02	16.32	3.60	1.39	4.99	7.87	28.89
5-year average	19.95	17.48	3.08	1.60	4.68	5.68	25.24
35-year average	16.26	14.89	1.97	1.16	3.14	3.31	19.54
1950	17.70	18.02	6.48	1.06	7.54	3.31	21.01

\* Both rain and snow.

† Melted; measured as water.

‡ Calendar year.

§ Fall of this year and spring of next.

|| Total rainfall of summer plus snowfall of following winter.



Table 3. Number of Days with .01 Inch or More Rain or Snow, 1915-49

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1915	0	1	1	2	5	13	10	0	8	3	5	4	52
1916	3	0	6	9	11	13	8	8	5	7	1	6	77
1917	4	6	2	8	1	4	7	6	4	6	4	6	58
1918	3	1	0	6	15	5	7	14	8	7	4	3	73
1919	6	4	6	9	11	9	7	6	4	7	4	4	77
1920	8	5	4	3	7	7	4	5	10	5	4	5	67
1921	6	5	5	7	4	9	9	10	13	8	13	8	97
1922	4	4	5	9	14	11	8	7	8	4	13	8	95
1923	6	3	3	7	6	8	14	13	5	7	8	4	84
1924	4	2	7	17	14	10	9	9	11	7	9	7	106
1925	6	7	7	12	5	23	12	11	13	8	4	8	116
1926	4	2	2	3	9	8	8	9	7	9	6	6	73
1927	3	3	4	9	14	9	9	10	1	7	4	3	76
1928	3	0	5	2	6	11	10	11	10	6	2	6	72
1929	2	2	6	6	4	12	10	5	6	8	7	11	79
1930	6	7	3	5	15	10	6	4	5	7	6	5	79
1931	3	2	5	1	9	10	12	6	8	8	7	3	74
1932	4	4	7	9	12	9	8	6	4	9	6	3	81
1933	6	1	2	4	10	7	7	5	12	5	10	6	75
1934	6	3	3	6	8	12	8	8	10	7	6	7	84
1935	10	1	8	9	6	11	10	12	6	4	9	8	94
1936	7	5	11	4	5	7	4	6	7	3	7	7	73
1937	11	7	4	15	11	8	11	7	7	3	7	7	88
1938	6	5	4	9	16	7	12	9	4	7	10	6	95
1939	9	5	2	8	6	13	6	11	10	10	3	2	85
1940	5	7	4	6	10	11	11	7	6	6	9	7	89
1941	8	6	5	12	13	12	7	15	18	8	5	6	115
1942	4	7	11	4	11	9	12	15	10	4	5	14	106
1943	11	11	6	9	10	11	11	10	5	3	5	4	96
1944	5	3	11	2	16	16	9	13	7	4	13	6	105
1945	9	3	7	9	10	16	12	13	17	6	5	11	118
1946	10	7	8	7	13	14	7	13	9	7	8	9	112
1947	7	10	13	11	17	13	11	11	12	8	14	9	136
1948	9	8	9	10	6	16	15	12	6	5	7	11	114
1949	10	9	4	4	19	14	15	7	7	14	9	8	120
35-year average	5.9	4.5	5.4	7.2	10.0	10.8	9.3	9.0	8.2	6.4	6.9	6.5	90.1
1950	14	4	9	12	14	16	11	10	11	8	8	6	123

Table 4. Number of Times in 35 Years (1915-49) That 0.1 Inch or More of Precipitation Has Occurred, Given for Each Day of the Month

Day of month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1	2	2	2	8	11	3	5	5	1	3	1
2	2	1	1	1	5	7	3	4	3	2	2	1
3	—	1	—	1	5	6	13	4	1	6	2	—
4	2	3	1	4	8	7	7	3	3	4	7	2
5	1	1	5	8	5	10	12	6	3	4	3	3
6	1	2	4	7	8	11	9	8	2	3	1	4
7	1	4	1	7	6	9	5	6	5	6	2	3
8	1	5	1	3	10	6	9	10	7	4	4	2
9	2	2	2	1	4	7	9	4	4	1	2	—
10	1	1	3	4	5	8	7	5	9	4	3	7
11	1	1	—	3	6	8	9	4	3	5	2	1
12	1	2	1	2	5	11	7	3	10	4	4	2
13	1	4	3	2	4	5	6	6	4	3	4	1
14	3	1	3	5	6	6	7	8	9	—	3	—
15	1	2	3	2	6	5	1	5	2	1	3	4
16	3	2	4	9	8	6	7	10	7	6	4	2
17	1	3	1	2	3	10	6	7	4	3	1	3
18	3	—	—	4	7	3	5	4	7	5	3	1
19	—	2	—	2	3	6	4	6	7	6	—	2
20	2	—	4	4	6	11	10	7	2	2	3	3
21	—	2	1	1	2	11	5	5	7	4	5	2
22	—	2	1	5	3	6	6	3	3	5	—	—
23	1	5	4	3	5	5	6	2	6	3	—	5
24	1	2	3	9	11	6	3	7	4	3	2	1
25	3	2	6	8	9	8	4	2	8	—	6	3
26	2	3	4	4	8	8	4	4	1	5	2	—
27	2	3	3	2	2	6	10	9	4	1	1	3
28	1	1	4	9	5	7	5	7	7	7	2	5
29	1	1	4	7	6	8	4	8	4	3	2	2
30	—	—	3	8	8	8	5	8	2	2	2	1
31	1	—	1	—	6	—	2	7	—	3	—	3



Table 5. Dates of Spring and Fall Frosts and Length of Frost-Free Periods, 1900-49

Year	Latest in spring	Earliest in fall	Days between frosts
1900	May 9	Sept. 17	131
1901	June 7	Sept. 18	103
1902	May 9	Sept. 11	125
1903	May 29	Sept. 16	110
1904	April 20	Sept. 21	154
1905	May 25	Oct. 11	139
1906	May 9	Oct. 9	153
1907	May 27	Sept. 25	121
1908	May 5	Sept. 29	147
1909	May 10	Oct. 11	154
10-year average	May 15	Sept. 26	133.7
1910	June 2	Sept. 27	117
1911	May 12	Sept. 24	135
1912	June 7	Sept. 24	109
1913	June 7	Sept. 20	105
1914	May 8	Oct. 26	171
1915	June 9	Aug. 26	78
1916	May 18	Sept. 15	120
1917	June 1	Sept. 2	93
1918	May 21	Sept. 8	110
1919	May 1	Sept. 25	147
10-year average	May 24	Sept. 20	118.5
1920	May 16	Sept. 30	137
1921	May 18	Oct. 3	138
1922	April 27	Oct. 8	164
1923	May 16	Sept. 13	120
1924	June 6	Sept. 5	91
1925	May 17	Oct. 6	142
1926	May 22	Sept. 12	113
1927	May 15	Sept. 25	133
1928	June 3	Sept. 23	112
1929	May 24	Sept. 17	116
10-year average	May 20	Sept. 24	126.6
1930	May 24	Sept. 28	127
1931	May 22	Oct. 11	142
1932	May 17	Sept. 17	123
1933	May 20	Oct. 4	137
1934	May 24	Sept. 21	120
1935	June 6	Sept. 26	122
1936	May 13	Sept. 29	139
1937	May 9	Sept. 12	126
1938	May 6	Sept. 19	136
1939	May 12	Sept. 25	136
10-year average	May 18	Sept. 25	130.8
1940	June 19	Sept. 25	98
1941	May 9	Sept. 25	139
1942	May 14	Sept. 20	129
1943	May 14	Sept. 25	134
1944	May 7	Oct. 9	155
1945	May 16	Sept. 28	134
1946	May 15	Oct. 7	144
1947	May 30	Sept. 22	114
1948	May 10	Oct. 1	143
1949	May 24	Sept. 15	113
10-year average	May 19	Sept. 27	130.3
50-year average	May 19	Sept. 24	128.0
1950	May 15	Oct. 3	141

Table 6. Mean Temperatures in Degrees Fahrenheit, 1910-49

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1910	9.1	2.6	37.5	44.1	50.0	70.0	70.8	64.2	56.1	48.2	23.0	9.5	40.42
1911	4.3	3.6	24.6	40.3	56.2	69.5	67.0	63.3	54.9	42.5	15.8	14.3	38.02
1912	11.3	8.7	16.4	43.3	56.0	63.7	68.7	64.4	53.7	47.1	30.9	16.0	40.01
1913	0.02	3.7	13.0	45.9	51.0	62.1	68.3	68.4	57.6	39.5	34.0	21.5	38.75
1914	11.7	10.8	21.9	38.2	51.1	64.1	73.2	63.0	59.0	52.5	28.5	3.1	37.96
1915	2.1	16.1	23.6	48.7	52.0	58.9	61.8	63.4	54.4	45.6	26.3	13.0	38.82
1916	-6.4	1.0	16.2	39.5	51.9	60.0	74.9	68.4	54.4	40.5	30.7	2.5	36.13
1917	-1.6	-2.2	18.5	39.0	54.1	59.8	72.1	67.2	56.4	33.7	35.4	0.6	36.08
1918	-3.1	9.4	35.4	42.9	53.8	64.1	66.3	66.8	50.9	46.6	31.2	17.3	40.13
1919	13.9	6.2	17.9	38.5	57.1	68.6	70.8	67.0	58.7	36.3	16.3	5.7	38.08
10-year average	4.13	3.83	22.50	42.04	53.32	64.08	69.39	65.61	55.61	43.25	27.21	10.35	38.44
1920	2.8	7.8	20.4	31.9	55.2	65.5	65.8	69.8	62.3	53.1	27.9	16.5	39.91
1921	9.3	14.3	22.8	44.8	57.2	70.6	73.2	63.5	58.0	46.8	12.5	13.8	40.56
1922	5.1	3.3	26.9	43.7	61.6	65.3	67.8	70.7	60.5	45.8	33.4	6.1	40.85
1923	6.9	3.4	10.8	38.5	56.5	69.7	72.4	63.0	60.2	44.4	35.7	20.0	40.12
1924	-0.6	15.4	26.6	40.4	46.8	47.8	66.4	65.2	56.0	51.9	26.5	1.5	36.99
1925	6.0	11.8	27.6	48.9	53.4	62.9	67.4	70.0	59.8	34.8	28.0	12.4	40.25
1926	13.4	18.6	23.5	43.1	59.8	60.5	69.0	66.4	54.6	42.8	20.4	5.9	39.83
1927	7.2	11.8	30.7	42.8	50.4	63.1	66.6	63.9	59.2	38.0	22.6	0.4	38.06
1928	12.0	17.3	25.3	37.8	58.4	60.3	69.1	66.4	54.6	45.0	31.3	21.3	41.57
1929	-8.4	2.0	30.0	43.5	50.6	63.2	70.4	67.9	54.5	46.5	23.3	9.4	37.74
10-year average	5.37	10.57	24.46	41.54	54.99	62.89	68.81	66.68	57.97	44.91	26.16	10.73	39.59
1930	-2.6	18.4	24.8	45.7	54.4	65.4	71.8	71.0	58.1	43.2	29.9	16.9	41.42
1931	17.0	25.6	27.4	44.6	53.2	67.8	70.9	67.6	63.5	49.5	32.4	19.1	44.88
1932	11.6	10.7	18.0	43.4	57.2	69.2	71.6	69.2	57.8	40.2	23.1	9.7	40.14
1933	9.8	5.6	26.5	40.4	57.1	71.6	72.2	69.3	61.4	40.4	23.4	4.4	40.18
1934	11.4	10.6	23.0	42.7	63.0	64.4	69.8	66.6	53.6	48.8	33.4	9.5	41.40
1935	-1.9	21.8	26.7	39.2	51.4	60.7	74.2	67.2	56.0	45.2	15.8	9.8	38.84
1936	-9.0	13.9	21.0	33.2	61.4	64.4	78.7	69.4	60.2	40.9	23.5	13.4	36.93
1937	-9.0	5.1	20.0	40.0	57.4	63.8	70.2	72.6	58.5	42.9	26.0	9.2	38.06
1938	3.6	8.3	34.0	42.4	52.1	63.4	68.9	70.6	60.8	51.6	22.8	13.9	41.03
1939	8.2	-3.6	19.8	40.0	62.2	64.6	72.8	71.0	59.3	41.6	34.6	24.5	40.62
10-year average	3.91	8.86	24.12	37.16	56.94	65.53	72.11	69.45	58.92	44.43	26.49	13.04	40.08
1940	3.8	13.8	18.9	38.0	54.0	62.0	70.6	66.5	62.8	51.0	23.6	16.4	40.73
1941	9.0	6.5	21.5	45.5	59.0	66.1	72.0	67.6	56.8	45.8	30.2	18.8	41.57
1942	15.8	12.0	32.2	46.2	50.8	61.2	66.8	66.0	52.5	47.6	27.2	6.6	40.41
1943	-2.2	11.0	17.2	42.6	50.2	62.7	72.0	67.2	53.8	48.4	28.4	19.1	39.20
1944	19.3	11.4	19.3	39.8	57.0	63.7	67.8	66.0	56.1	47.2	32.4	15.0	41.25
1945	9.5	13.2	34.6	39.2	47.3	59.2	66.9	66.6	53.4	43.3	26.0	6.0	38.80
1946	6.0	5.8	33.5	46.4	51.4	63.0	70.3	65.7	55.7	42.0	26.6	10.2	39.73
1947	12.4	6.6	22.2	38.2	49.3	60.5	70.0	70.4	54.6	52.4	20.8	9.4	38.99
1948	1.8	4.4	16.8	40.5	54.6	62.6	69.3	68.0	62.2	47.4	29.1	9.6	38.60
1949	3.3	1.2	20.1	44.1	55.2	64.0	69.5	71.1	54.3	45.20	33.0	9.1	39.18
10-year average	7.9	8.54	31.13	37.84	52.88	62.50	69.53	67.51	56.22	47.03	27.73	12.02	39.79
40-year average	5.32	7.95	25.65	41.11	54.53	63.75	69.96	67.31	57.18	44.90	26.90	11.54	39.47
1950	-9.5	5.0	17.9	30.1	49.3	62.1	66.5	63.2	58.9	46.3	22.0	6.3	34.84



Table 7. Maximum, Minimum, and Mean Temperatures in Degrees Fahrenheit, 1910-49

Year	Maximum		Minimum		Mean		Annual
	Degree	Month	Degree	Month	Summer Apr.-Sept.	Winter* Oct.-Mar.	
1910	99	June	-24	Feb.	59.20	18.87	40.42
1911	99	July	-29	Jan.	58.53	18.17	38.02
1912	100	June	-39	Jan.	58.30	18.45	40.01
1913	97	June	-38	Jan.	58.88	19.63	38.75
1914	94	July	-36	Feb.	58.11	20.98	37.86
1915	88	Aug.	-38	Jan.	56.53	15.95	38.82
1916	95	Aug.	-39	Jan.	58.18	14.73	38.13
1917	108	July	-35	Jan.	58.10	18.57	36.08
1918	98	July	-35	Jan.	57.40	22.18	40.13
1919	96	June	-37	Jan.	60.11	14.88	38.08
10-year average	97.4		-33.7		58.33	18.24	38.44
1920	95	Aug.	-32	Jan.	58.41	23.98	39.91
1921	100	June	-24	Dec.	61.21	18.07	40.56
1922	96	Aug.	-35	Jan.	61.60	17.73	40.85
1923	93	June	-31	Feb.	60.05	23.58	40.12
1924	93	Aug.	-36	Jan.	53.77	20.90	36.80
1925	97	Aug.	-36	Feb.	60.40	21.78	40.25
1926	97	May	-25	Dec.	58.90	19.80	39.83
1927	91	Sept.	-32	Jan.	57.67	19.27	38.06
1928	94	May	-23	Jan.	57.77	20.20	41.57
1929	100	July	-33	Jan.	58.35	19.97	37.74
10-year average	95.4		-30.7		58.81	20.53	39.59
1930	99	Aug.	-34	Jan.	61.10	26.67	41.42
1931	101	July	-18	Dec.	61.27	23.53	44.88
1932	101	July	-25	Jan.	61.40	19.15	40.14
1933	101	June	-38	Dec.	62.00	18.87	40.18
1934	100	May	-31	Dec.	60.02	23.05	41.40
1935	98	Aug.	-36	Jan.	58.12	11.48	38.84
1936	105	July	-51	Feb.	61.20	15.65	36.93
1937	96	July	-36	Jan.	54.41	20.66	38.06
1938	94	July	-30	Dec.	62.66	18.78	41.03
1939	101	May	-40	Feb.	61.64	22.86	40.62
10-year average	99.6		-33.9		60.38	20.07	40.08
1940	98	July	-22	Jan.	58.98	21.33	40.73
1941	101	July	-30	Feb.	61.10	25.80	41.57
1942	93	Aug.	-26	Dec.	65.11	17.90	40.41
1943	94	July	-33	Jan.	58.08	24.32	39.20
1944	94	Aug.	-25	Jan.	58.40	25.32	41.25
1945	98	Aug.	-26	Jan.	55.43	20.10	38.80
1946	100	Aug.	-34	Feb.	58.75	20.00	39.73
1947	99	Aug.	-27	Nov.	57.16	17.60	38.99
1948	94	May	-39	Mar.	41.13	18.45	38.06
1949	98	Aug.	-30	Jan. Feb.	59.70	18.53	39.18
10-year average	96.90		-29.20		57.38	20.94	39.79
40-year average	97.30		-31.87		58.68	19.94	39.47
1950	93	June	-36	Feb.	55.01	18.01	34.84

\* Fall of this year and spring of next.

Table 8. Maximum Temperatures for Each Month, 1915-49

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Maximum temperature for each year
1915	33	40	46	80	80	86	87	88	87	68	54	35	88
1916	24	41	44	64	83	79	94	95	88	70	64	52	95
1917	39	37	44	58	88	99	108	97	86	70	67	40	108
1918	30	45	63	72	94	91	98	97	77	76	57	43	98
1919	39	33	42	71	94	96	94	*	91	75	40	39	96
1920	29	32	49	60	82	91	88	95	84	89	54	34	95
1921	28	38	58	77	89	100	99	92	95	71	54	39	100
1922	35	25	45	77	88	92	90	96	95	90	54	39	96
1923	41	34	44	80	87	93	92	88	89	80	60	44	93
1924	37	42	48	72	79	87	87	93	81	71	56	36	93
1925	38	47	62	82	97	85	93	95	89	55	62	45	97
1926	38	43	65	86	97	88	94	95	92	71	54	35	97
1927	41	38	57	72	74	88	90	88	91	76	54	30	91
1928	42	42	62	76	94	85	88	92	82	81	57	47	94
1929	20	30	61	70	87	93	100	96	94	72	50	40	100
1930	35	48	50	75	92	87	98	99	86	80	59	37	99
1931	40	46	46	79	95	96	101	98	99	82	69	37	101
1932	35	49	49	74	92	90	101	96	86	71	49	43	101
1933	38	42	55	74	87	101	99	94	85	79	58	38	101
1934	38	39	50	88	100	86	98	96	85	83	60	39	100
1935	35	42	42	67	80	84	94	98	82	72	37	34	98
1936	23	24	24	62	89	96	105	97	93	80	51	39	105
1937	26	35	41	63	88	92	96	95	92	85	63	38	96
1938	33	40	65	79	75	90	94	92	91	84	64	36	94
1939	30	39	58	82	101	94	100	95	92	68	62	56	101
1940	33	34	37	68	87	92	98	90	89	78	19	38	98
1941	36	33	45	80	87	93	101	98	87	70	60	54	101
1942	47	33	57	83	81	85	91	93	82	81	57	30	93
1943	36	38	58	75	81	89	94	90	81	81	48	45	94
1944	47	36	48	70	87	88	92	94	78	74	61	38	94
1945	34	36	68	65	76	90	96	98	96	78	52	43	98
1946	29	36	78	79	85	81	95	100	83	76	57	39	100
1947	37	35	52	80	81	83	93	99	95	85	51	33	99
1948	35	32	44	74	94	94	94	94	92	71	56	39	94
1949	37	34	43	83	83	88	92	98	82	75	62	40	98
1950	25	35	41	62	86	93	91	90	88	72	58	38	93

\* No data available.



Table 9. Minimum Temperatures for Each Month, 1915-49

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Minimum temperatures for each year
1915	-38	-10	-8	17	18	30	38	30	32	20	-2	-22	-38
1916	-39	-33	-29	9	26	37	55	38	17	5	-1	-36	-39
1917	-35	-35	-30	22	24	26	47	37	22	3	16	-34	-35
1918	-35	-29	-16	11	17	40	41	40	12	25	8	-16	-35
1919	-37	-28	-21	17	27	38	51	*	33	-2	-22	-26	-37
1920	-32	-30	-20	-2	12	35	45	31	25	13	-4	-18	-32
1921	-21	-5	-8	7	25	35	51	39	34	26	-14	-24	-24
1922	-35	-27	-13	24	38	43	41	39	32	13	12	-27	-35
1923	-27	-31	-22	12	20	42	46	34	26	11	7	-24	-31
1924	-36	-22	3	13	23	32	40	39	33	31	3	-31	-36
1925	-27	-36	-15	21	22	40	41	43	33	5	-3	-18	-36
1926	-23	-10	-8	12	14	37	38	40	24	20	-12	-25	-25
1927	-32	-18	-2	21	31	35	43	35	20	26	-2	-22	-32
1928	-23	-11	-12	4	25	29	47	38	24	13	7	-19	-23
1929	-33	-31	-10	19	19	34	41	38	18	20	-19	-29	-33
1930	-34	-26	-6	18	25	35	42	40	23	12	-14	-14	-34
1931	-15	-13	0	15	25	33	45	33	33	25	-3	-18	-18
1932	-25	-24	-11	6	28	47	42	38	31	15	-14	-20	-25
1933	-13	-32	-8	18	28	39	46	42	33	9	-14	-38	-38
1934	-30	-21	-6	19	24	40	43	34	25	21	-9	-31	-31
1935	-36	-12	-12	14	30	30	52	33	24	11	-16	-24	-36
1936	-39	-51	-23	-9	30	33	48	43	25	1	-13	-24	-51
1937	-36	-32	-7	9	30	36	48	45	30	16	-6	-29	-36
1938	-28	-24	-8	8	29	34	48	41	25	13	-15	-30	-30
1939	-29	-40	-21	8	22	38	40	41	25	18	7	-11	-40
1940	-22	-15	-16	7	28	31	41	41	27	23	-10	-21	-22
1941	-26	-30	-17	19	30	37	46	35	29	13	-1	-13	-30
1942	-25	-22	4	19	27	36	42	35	21	12	-6	-26	-26
1943	-33	-30	-20	16	25	40	52	40	29	15	4	-16	-33
1944	-19	-25	-19	0	22	39	41	40	36	18	0	-16	-25
1945	-26	-21	-15	11	22	33	40	39	21	13	0	-31	-26
1946	-28	-34	-15	23	17	32	45	39	32	20	-10	-28	-34
1947	-26	-23	-7	12	24	35	47	43	23	29	-27	-25	-27
1948	-36	-32	-39	1	26	41	34	47	39	14	-1	-28	-39
1949	-30	-30	-17	14	29	35	46	40	22	18	-2	-23	-30
1950	-34	-36	-28	0	27	34	39	35	35	23	-11	-23	-36

\* No data available

Table 10. Prevailing Winds, 1915-49

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1915	NW	N	N	N	E	S	S	S	S	S	S	S
1916	NW	N	N	S	W	SE	SE	NW	N	N	N	N
1917	S	NW	SW	N	NW	SE	S	N	SE	NW	S	NW
1918	NW	S	S	SE	NW	SW	SW	SW	NW	NW	SW	NW
1919	NW	NE	NW	NW	SE	N	*	NW	NW	NW	NW	NW
1920	N	N	S	NW	S	SE	S	SE	S	S	S	NW
1921	S	S	NW	NW	SE	SE	NW	S	W	NW	NW	NW
1922	S	NW	S	S	NW	NW	W & NW	S	SE	N	N	NW
1923	N	W	N	NW	S	SE	S	SW	S	S	S	S
1924	S	S	N	E	N	E	S	NW	S	S	NW	N
1925	S	N	N	SE	NW	NW	NW	S	NW	W	S	NW
1926	N	S	N	W	S	N	NW	S	S	NW	NW	S
1927	S	N	S	E	NW	S	NW	SE	W	N	N	N
1928	S	S	W	NW	N	NW	NW	NW	E	S	N	N
1929	S	S	N	E	N	NW	S	S	NW	E & S	N	N
1930	NW	S	NW	S	NW	NW	S	SE	W	NW	N	S
1931	S	S	N	S	N	S	NW	S	S	NW	S	S
1932	NW	NW	NW	SE	NE	N	S	S	S	S	S	S
1933	S	S	N	S	N	S	SE	NW	NW	NW	N	NW
1934	S	N	NW	N	NW	NW	NE	NW	NW	NW	SE	NW
1935	SE	S	NW	SE	SE	SE	NW	NW	NW	NW	SW	S
1936	N	NW	NW	S	NW	SE	SE	SW	NW	NW	NW	NW
1937	NW	NW	NW	N	NE	SW	SE	SE	NW	N	NW	NW
1938	SE	NW	N	SE	NW	SE	NE	NW	NE	SW	NW	NW
1939	NW	NW	NW	NW	SW	SE	SE	SE	SE	N	S	SW
1940	NW	SE	N	SE	N	N	N	SE	SE	NW	NW	SE
1941	SE	NW	N	NW	SE	E	NE	SE	SE	N	NW	NW
1942	NW	NW	NW	NW	SE	S	SW	S	SE	S	S	N
1943	N	NW	NW	NE	NW	N	E	SE	NW	SE	NW	S
1944	S	NW	NW	NW	E	NE	S	SE	NE	N	NW	NW
1945	N	SE	SE	NW	NW	SW	NW	SE	NW	S	SE	N
1946	S	S	S	NW	NW	SE	SE	NW	NW	SW	NW	NE & NW
1947	S	NW	NW	S	N	SE	S	SE	NW	SW	NW	S
1948	S	SW	S	NW	NE	NW	NW	SE	NW	SW	N & NW	S & SE
1949	NW	NW	S	S	NW	SW	SW	SE	SW	NW	S	S
35-year average	S	NW	NW	NW	NW	SE	NW & S	SE	NW	NW	NW	NW
1950	NW	NW	NW	NW	S	NW	SE	SE	SW	SE	NW	NW

\* No data available.