

U. S. DEPARTMENT OF COMMERCE, WEATHER BUREAU
 IN COOPERATION WITH Ephrata Chamber of Commerce
 CLIMATOGRAPHY OF THE UNITED STATES NO. 20 - 45

LATITUDE 47° 19'
 LONGITUDE 119° 33'
 ELEV. (GROUND) 1275'

STATION Ephrata, Washington

CLIMATOLOGICAL SUMMARY

MEANS AND EXTREMES FOR PERIOD 1926 - 1955

Month	Temperature (°F)									# Mean degree days	Precipitation Totals (Inches)						Mean number of days						Month	
	Means			Extremes			Mean	Greatest daily	Year		Snow, Sleet,			Precip. .10 inch or more	Temperatures		90° and above	32° and below	32° and below	0° and below				
	Daily maximum	Daily minimum	Monthly	Record highest	Year	Record lowest					Year	Mean	Maximum monthly		Year	Greatest daily					Year	Max.		Min.
(a)	30	30	30	30		30		30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
Jan.	33.0	20.4	26.7	61	1953	-22	1950	1187	0.98	0.70	1948	6.4	15.8	1937	6.0	1937	4	0	14	28	2	Jan.		
Feb.	41.0	25.5	33.3	64	1926	-23	1933	888	0.69	0.75	1940	3.2	9.5	1949	7.0	1930	3	0	4	23	1	Feb.		
Mar.	54.1	33.4	43.8	76	1947+	3	1955	657	0.59	0.58	1951+	0.6	5.8	1951	8.0	1951	2	0	0	14	0	Mar.		
Apr.	65.1	40.7	52.9	93	1926	16	1936	375	0.50	0.61	1951+	*	1.0	1955	1.0	1955	2	0	0	4	0	Apr.		
May	74.5	48.9	61.7	101	1936+	28	1928	167	0.67	0.83	1933	0	0	0	0	0	2	0	0	1	0	May		
June	81.1	55.5	68.3	104	1936+	38	1943+	42	0.92	1.56	1937	0	0	0	0	0	2	5	0	0	0	0	June	
July	90.3	62.3	76.3	113	1939	42	1934	0	0.20	0.68	1951+	0	0	0	0	0	1	17	0	0	0	0	July	
Aug.	88.7	61.0	74.9	106	1942	40	1927+	0	0.27	0.57	1934	0	0	0	0	0	1	15	0	0	0	0	Aug.	
Sept.	79.2	52.8	66.0	102	1938	20	1926	75	0.46	0.90	1948	0	0	0	0	0	1	5	0	*	0	0	Sept.	
Oct.	65.2	42.5	53.9	90	1935	12	1935	344	0.66	0.76	1943	*	1.2	1939	1.3	1939	2	*	0	3	*	0	Oct.	
Nov.	46.5	31.2	38.9	70	1945+	0	1955	783	1.00	0.78	1944	2.4	17.9	1955	6.0	1937+	3	0	2	17	*	0	Nov.	
Dec.	36.9	24.8	30.9	64	1932	-7	1931+	1057	1.09	1.03	1931	5.4	26.5	1931	5.5	1931	4	0	9	26	*	0	Dec.	
Year	63.0	41.6	52.3	July 113	1939	Feb. -23	1933	5575	8.03	1.56	June 1937	18.0	Dec. 26.5	1931	Mar. 8.0	1951	27	44	29	116	3	Year		

(a) Average length of record, years.

+ Also on earlier dates, months or years.

† Trace, an amount too small to measure.

* Less than one half.

Estimated degree data based on a daily mean temperature of 65°.

NARRATIVE CLIMATOLOGICAL SUMMARY

Ephrata, the County Seat of Grant County, is located near the northern edge of the Columbia Basin Project. This area is being developed for irrigation by the U. S. Bureau of Reclamation. The climate of Ephrata is materially influenced by the surrounding terrain. Geological evidence indicates that at some time during the past ages one of the main channels of the Columbia River emptied into the level Quincy Basin near Ephrata.

The terrain south and southeast is very level with a gradual slope towards the southeast. The southern edge of the Waterville plateau begins rising very abruptly within a short distance west of the city and extends westward and northward to the Columbia River. High mountain ranges north of the Columbia River protect the area from the full force of cold air moving south from the Arctic regions during the winter. However, the north-south orientation of the northern mountain ranges permits some flow of cold air into the area.

The Cascade Mountains to the west prevent storms and moist air from the Pacific Ocean from reaching the basin. The moisture-laden air from the Pacific Ocean cools as it rises over the 5000 to 7000 crests of the Cascades, thus condensation takes place and a large amount of the moisture in the air moving eastward from the Pacific Ocean falls as rain or snow on the west slope and near the summit of the Cascade Mountains. The air flowing down the eastern slope of the Cascade Mountains becomes warmer and drier as it moves into the Columbia Basin. Thus the rate of evaporation is high and precipitation very light making it difficult to successfully grow crops without irrigation.

The relative humidity is low throughout most of the year. Fog occasionally forms during the winter season as the result of cold air becoming trapped between the mountain ranges and mixing with the warm moist air reaching the basin from the Pacific Ocean. These conditions are usually of short duration.

There is an abundance of sunshine throughout most of the year.

The average date of the last freezing temperature in the spring is about the middle of April and the first date in the fall is near the middle of October.

Maximum temperatures can be expected to exceed 90° about one-half of the days during July and August with a few days above 100°. Occasionally rather low temperatures are recorded during the winter. The lowest temperature recorded was 23° below zero. However, during the average winter, below zero temperatures can be expected to occur only three to five times. Extremely cold weather usually does not continue for many days.

Most of the precipitation is in the form of snow during the winter months. Although the average annual snowfall is only 18 inches, occasionally the seasonal snowfall amounts to between 30 and 40 inches. The snow depth usually does not exceed over a few inches at any one time due to the chinook winds which are experienced several times each winter.

Precipitation in the summer season is largely of the showery type. Several thunderstorms can be expected each summer. The prevailing direction of the wind in the area varies as the seasons change. The orientation of the mountain valley on the north and west tends to produce a rather high frequency of westerly and northwesterly surface winds.

In general, temperature, precipitation and other climatological data recorded at Ephrata are representative of average conditions to be expected in the level area of the basin south and west of the city. Climatic conditions in the hilly region northwest of Ephrata are somewhat different from those in the lower basin.

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 Weather Bureau
 State Climatologist
 Seattle, Washington

Average Temperature (°F)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann'l
1926	30.4	40.4	49.2	58.6	59.3	70.9	79.5	74.2	58.6	53.6	42.0	28.0	53.7
1927	27.4	34.5	42.6	49.4	57.2	68.9	77.1	73.2	60.4	51.0	38.4	24.3	50.2
1928	28.3	34.5	44.5	48.4	56.8	68.5	78.9	73.2	66.4	52.6	38.8	28.3	50.2
1929	18.6	20.0	44.2	48.4	62.1	66.5	75.0	77.6	64.2	55.8	36.0	22.1	49.9
1930	14.6	36.8	46.2	57.0	61.1	66.0	77.0	77.0	65.4	49.6	36.4	29.4	51.4
1931	22.9	34.8	44.1	53.2	65.4	67.6	77.4	79.5	62.8	52.9	35.6	25.2	52.2
1932	20.7	28.1	42.7	54.0	59.4	69.4	71.5	72.8	67.4	53.2	41.6	27.1	51.1
1933	29.2	22.1	42.4	52.0	52.0	68.2	74.9	75.6	61.0	52.2	47.4	35.4	51.0
1934	36.1	22.8	50.5	61.6	65.4	71.6	77.2	77.2	61.4	53.0	43.4	33.0	56.1
1935	27.5	36.4	40.6	49.4	62.0	67.6	75.0	73.2	69.0	50.2	34.4	30.2	51.3
1936	21.4	18.4	42.0	56.0	66.8	69.7	76.0	75.8	64.4	58.1	34.0	32.0	52.2
1937	11.5	25.6	45.1	50.0	61.8	66.6	77.0	74.9	68.6	58.2	41.9	34.0	50.9
1938	32.4	34.4	43.8	54.6	63.1	72.6	80.8	74.0	73.0	56.4	39.6	32.8	54.7
1939	34.2	31.0	45.1	56.4	64.3	67.2	78.4	79.1	67.5	54.4	42.4	38.2	54.9
1940	33.1	37.2	48.0	54.8	66.1	73.8	76.6	76.9	69.8	56.1	34.0	34.4	55.0
1941	33.0	40.0	50.4	56.0	60.2	67.2	73.3	73.3	60.4	52.2	42.8	34.8	54.3
1942	22.1	35.6	44.5	55.2	58.6	66.6	77.8	79.2	70.4	55.9	35.2	29.9	52.8
1943	30.8	34.4	43.8	55.4	57.6	65.4	76.8	72.8	70.4	53.4	40.1	31.6	51.7
1944	28.2	34.4	41.5	53.3	62.8	68.5	77.7	73.9	69.0	61.0	39.3	27.8	53.1
1945	37.2	47.6	49.8	49.8	62.2	67.6	78.0	77.2	64.8	57.2	37.4	31.4	53.1
1946	31.7	36.0	44.8	52.4	64.2	64.0	73.8	76.0	64.3	49.8	34.6	32.6	53.4
1947	27.2	28.1	42.8	53.5	67.6	67.6	73.0	72.8	60.7	53.6	42.2	22.4	53.9
1948	30.8	31.1	41.8	47.5	58.2	70.2	71.9	72.2	62.2	50.2	38.5	26.8	49.7
1949	11.5	27.4	44.4	55.5	66.4	68.7	74.6	74.6	68.2	49.2	40.2	32.5	51.6
1950	10.2	29.0	40.3	48.3	58.2	66.3	75.4	76.4	66.6	48.8	37.3	32.8	49.3
1951	20.1	32.7	36.3	53.1	59.2	67.7	76.1	76.4	68.0	51.8	38.1	25.3	51.1
1952	22.2	40.1	42.4	55.1	62.8	68.2	77.0	74.5	69.4	60.0	35.6	33.4	54.3
1953	38.6	43.0	45.6	51.0	59.0	64.9	73.5	70.8	67.5	44.0	44.0	36.6	54.3
1954	28.9	36.3	41.1	49.3	63.2	64.9	73.2	70.8	64.8	51.4	43.0	31.9	51.6
1955	28.4	31.4	37.4	46.3	56.1	70.3	72.8	75.0	65.6	52.1	29.2	26.1	49.2

* Ephrata airport data

STATION HISTORY

The first official weather Bureau temperature and precipitation station was established near the railroad station in Ephrata on April 1, 1903. The station remained at this location until May 1907. Agents for the Great Northern Railroad were the observers during this period. The equipment was moved one block west of the railroad station on May 8, 1907. Mr. D. Charles was the observer at this location from May 1907 to October 1909. On December 9, 1909, Mr. T. J. Cook took over the observations at the same location. He continued as the observer until August 31, 1912. The weather equipment was moved to Nappal (now Moses Lake) in September 1912. Ephrata was without an official weather station from September 1912 to June 1920. The station was reestablished six blocks southwest of the railroad station in Ephrata at the residence of Mr. D. C. Thomas on June 21, 1920. Mr. Thomas continued as observer until February 28, 1950. The equipment was moved across the street where Mr. T. B. Brown acted as observer during March, 1950. The station was the same as the cooperative weather observer at the same location where the station had been between 1920 and 1950. Mr. Thomas continued as the observer at this location since that time. The ground is very level in this area, thus the change in elevation between the three locations is negligible.

Temperature and precipitation observations were available from the Civil Aeronautics Station located at the airport during 1950 and 1951 when the climatological station in the city was inactive. Data from the airport records have been included in the summary to complete the records for 1950 and 1951. The airport station is located two miles southeast of the station in the city. There is only 16 feet difference in elevation between the two stations.

There are a few breaks in the early records and data are missing for the following months: January - April 1908; January, October, November, December, 1909; March - December 1910; February - July, September - December 1911; January, March - July 1912; April 1950 - July 1951.

Total Precipitation (Inches)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann'l
1926	0.98	1.39	0.09	0.15	0.21	1.53	0.06	0.38	0.43	0.29	2.40	1.20	9.11
1927	1.50	0.66	0.06	0.06	0.54	0.10	0.22	1.58	0.82	0.82	1.28	0.13	8.28
1928	1.36	0.07	0.75	0.44	0.24	0.26	0.07	0.07	0.20	0.20	1.45	1.04	5.16
1929	0.46	0.00	0.36	0.01	0.45	1.07	0.00	0.00	0.19	0.02	0.00	0.99	3.15
1930	0.47	1.20	0.30	0.08	0.29	1.06	0.01	0.32	0.64	0.22	0.87	3.82	5.74
1931	2.38	0.15	0.26	0.27	0.29	0.93	0.53	0.22	0.15	0.39	0.93	3.82	4.44
1932	0.31	0.12	0.74	0.62	0.92	0.06	0.20	0.00	0.11	0.11	1.45	0.68	5.85
1933	0.72	0.25	1.46	0.27	2.14	0.49	0.27	0.37	0.37	0.27	0.67	2.13	9.44
1934	0.21	0.23	0.31	0.30	0.34	0.08	0.03	0.57	0.39	1.27	1.20	0.88	7.11
1935	0.59	0.55	0.18	0.19	0.10	0.11	0.52	0.03	0.03	0.69	0.52	1.17	4.63
1936	1.72	0.28	0.28	0.37	0.10	2.40	0.07	0.32	1.13	0.03	0.62	1.21	7.92
1937	1.31	0.49	1.06	0.28	0.17	3.47	0.15	0.02	0.43	0.28	2.52	1.22	12.22
1938	0.44	0.42	1.44	0.17	0.05	1.12	0.03	0.03	0.37	0.56	0.57	0.95	5.06
1939	0.72	1.38	0.59	0.12	0.46	0.31	0.10	0.52	0.39	0.52	0.03	1.32	6.27
1940	0.82	3.12	0.59	0.67	0.29	0.11	0.39	0.04	0.69	1.36	1.20	1.77	10.71
1941	1.59	0.59	0.25	1.19	0.86	0.95	0.07	1.06	0.28	0.28	0.61	1.58	10.17
1942	0.87	1.34	0.28	0.53	2.46	0.62	0.66	0.00	0.22	0.22	1.75	1.16	9.80
1943	0.40	0.09	0.52	0.72	0.70	2.05	0.39	0.04	1.48	0.14	0.08	0.81	6.81
1944	0.41	0.95	0.06	1.10	0.39	0.82	0.00	0.21	0.96	0.08	2.47	0.71	7.56
1945	0.87	1.22	0.61	0.38	1.59	0.61	0.08	0.35	0.49	1.45	1.16	1.45	8.82
1946	0.51	1.35	0.32	0.07	0.66	0.76	0.05	0.40	0.22	1.01	0.59	0.12	6.16
1947	0.38	0.40	0.48	0.87	0.69	0.69	0.66	0.19	1.25	2.32	0.19	1.15	8.29
1948	1.18	0.95	0.27	0.73	3.55	2.85	0.44	0.65	0.50	1.62	1.40	1.25	12.25
1949	0.17	0.51	1.08	0.05	0.01	0.01	0.00	0.99	0.27	1.00	0.34	0.51	5.45
1950	0.85	0.77	1.50	0.51	0.39	1.63	0.03	0.03	0.03	1.92	1.44	1.69	10.79
1951	1.08	0.47	0.97	1.20	1.11	1.80	0.82	0.38	1.29	1.43	0.92	0.92	12.43
1952	2.26	0.35	0.17	0.37	0.46	0.98	0.00	0.00	0.00	0.42	1.06	1.06	5.62
1953	2.05	0.27	0.64	1.03	1.08	0.72	0.00	0.64	0.00	0.38	0.81	0.80	8.32
1954	1.38	0.35	0.80	0.22	0.46	0.70	0.38	0.85	0.54	0.10	0.98	0.51	7.27
1955	0.91	0.11	0.16	1.25	0.55	0.23	1.05	0.00	0.91	0.60	1.82	1.77	9.36

* - Ephrata airport data

PROBABILITY OF LIKELIHOOD OF 20°, 28° AND 21° OCCURRING AS LATE IN THE SPRING OR AS EARLY IN THE FALL AS THE DATES LISTED IN THE FOLLOWING TABLES

Year	PROBABILITY OF LIKELIHOOD - SPRING MONTHS						PROBABILITY OF LIKELIHOOD - FALL MONTHS					
	7%	5%	3%	1%	10%	5%	3%	1%	10%	5%	3%	
32°	Apr. 4	Apr. 16	Apr. 27	May 10	Sept. 28	Oct. 10	Oct. 25	Nov. 6	Nov. 15	Nov. 28		
28°	Mar. 17	Mar. 31	Apr. 10	Apr. 25	Oct. 15	Oct. 25	Nov. 2	Nov. 15	Nov. 11			
21°	Feb. 21	Mar. 7	Mar. 17	Apr. 1	Oct. 23	Nov. 6	Nov. 15	Nov. 28				

In the above table, the 50 percent point is the same as the average for each freeze category.

From a statistical viewpoint based on past data, the probabilities could be considered as follows when converted into the number of occurrences to expect in a 40-year period:

7% - 30 years in 40
5% - 20 years in 40
3% - 12 years in 40
1% - 4 years in 40