

U.S. DEPARTMENT OF COMMERCE, WEATHER BUREAU IN COOPERATION WITH
THE WASHINGTON STATE DEPARTMENT OF COMMERCE AND ECONOMIC DEVELOPMENT
CLIMATOGRAPHY OF THE UNITED STATES 20-45



LATITUDE 47° 34'
LONGITUDE 120° 40'
ELEV. (GROUND) 1128 ft.

CLIMATOLOGICAL SUMMARY

STATION LEAVENWORTH, WASH.

MEANS AND EXTREMES FOR PERIOD 1931-1960

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				
	Daily maximum	Daily minimum	Monthly	Record highest	Year	Record lowest	Year	Mean					Maximum monthly	Year	Greatest daily	Year		90° and above	32° and below	32° and below		0° and below
(a)	30	30	30	30		30		30	30	30		30	30	30	30	30	26	26	26	26		
JAN	33.4	16.4	24.9	60	1948	-24	1957	1231	3.97	2.50	1935	30.0	54.0	1950	16.0	1946	9	0	13	30	4	JAN
FEB	40.7	19.8	30.3	62	1947	-21	1956	966	2.81	1.63	1945	19.9	66.5	1937	12.0	1937	7	0	5	27	2	FEB
MAR	52.5	27.8	40.2	77	1939	-6	1955	725	2.10	1.09	1936	6.7	20.5	1935	9.5	1956	6	0	* 25	*		MAR
APR	64.8	34.1	49.5	88	1934	19	1956+	462	.87	1.29	1937	.5	6.5	1955	6.5	1955	3	0	0	11	0	APR
MAY	73.3	40.9	57.1	99	1939	26	1959+	273	.91	.98	1948						3	1	0	3	0	MAY
JUN	78.8	46.1	62.5	103	1958+	30	1945	90	1.01	1.32	1937						3	4	0	*	0	JUN
JUL	88.6	50.6	69.6	110	1941	35	1955	12	.20	1.36	1951						1	15	0	0	0	JUL
AUG	87.3	49.4	68.9	108	1942	33	1960+	12	.44	.72	1945						1	14	0	0	0	AUG
SEP	79.0	43.7	61.4	104	1944	27	1958	132	.75	1.20	1940						2	4	0	2	0	SEP
OCT	65.5	35.6	49.6	91	1958	18	1949	456	2.21	2.04	1934	.6	5.5	1957	5.5	1957	5	*	0	9	0	OCT
NOV	45.0	28.0	36.5	70	1933	-10	1959	834	4.05	2.73	1933	9.2	30.0	1946	16.0	1958+	8	0	2	20	*	NOV
DEC	35.5	21.8	28.7	62	1938	-11	1948	1116	4.59	2.69	1933	26.6	66.5	1931	24.0	1932	9	0	8	29	1	DEC
Year	61.9	34.5	48.2	110	1941	-24	1957	6309	23.91	2.73	1933	93.5	66.5	1937+	24.0	1932	57	38	28	156	7	Year

(a) Average length of record, years.

+ Also on earlier dates, months, or years.

T Trace, an amount too small to measure.

* Less than one half.

** Base 65°F

NARRATIVE CLIMATOLOGICAL SUMMARY

Leavenworth, located in the foothills along the eastern slope of the Cascade Mountains, is in the Wenatchee River Valley. U.S. Highway No. 2 and a major east-west railroad crossing the Cascade Mountains at Stevens Pass serve this city.

The terrain is very rough with mountains rising to elevations of 5,000 to 8,000 feet within two to ten miles of the valley. The Wenatchee Mountains lie south and the Entiat Mountains north of the city. These ranges extend in a northwest-southeast direction from the summit of the Cascades to the Columbia Basin. As the elevation increases in a westerly direction, the highway and river wind through a narrow scenic canyon. In an easterly direction, the valley widens. Orchards are located in the valleys and along the lower slopes. Rivers are a source of water for irrigation necessary to the growing of orchards and other crops. The city is near the western edge of an important fruit-producing area in the Wenatchee and Columbia river valleys. This is also a winter sports area with ski facilities along the slopes of the mountains and at Stevens Pass. National forest, mountains, streams and lakes offer many opportunities for recreational activities throughout the year.

Some of the factors influencing the climate are terrain, distance and direction from the ocean and the prevailing westerly winds above the summit of the mountains. In a westerly direction, the Cascade Mountains, elevation 5,000 to 8,000 feet, with peaks in excess of 10,000 feet, form a barrier to the easterly movement of moist air from over the ocean. West of the Cascade Range, the prevailing direction of the surface wind varies from southwest in winter to northwest in summer. During fall and winter, moisture-laden air from over the ocean cools as it rises along the western slope of the Cascade Mountains. As the air descends along the eastern slope, it gradually becomes warmer and drier. This process results in heavy precipitation along the windward slope and lighter precipitation along the lee slope of the mountains. Annual precipitation decreases from approximately 90 inches near the summit of the Cascades to 24 inches at Leavenworth and 9 inches at Wenatchee. Precipitation is light in summer, increasing in the fall, reaching a peak in winter, then gradually decreasing in the spring with an increase in June and a sharp drop in July. Annual precipitation has ranged from 14 to 38 inches.

Snow can be expected in the higher elevations of the mountains during the latter half of October and in the valleys by the last of November. Snow generally remains on the ground most of the time from mid-December until after the first of March. In an average winter, snow depths in the valley range from 20 to 30 inches and 40 to 70 inches in heavy snowfall seasons. During the 1955-56 snowfall season, one of the heaviest on record, snow remained on the ground from mid-November until mid-April reaching a depth of 53 inches in December and 76 inches during January. In one of the lightest snowfall winters, snow only remained on the ground 20 days and the greatest depth was 8 inches. Snow depths in the higher elevations of the mountains range from 10 to 20 feet.

Summers are warm, dry and sunny. Afternoon temperatures are in the upper 80's and nighttime readings are near 50°. Maximum temperatures exceed 90° on approximately one-half of the days in July and August, reaching 100° on a few afternoons. A cool breeze down the mountain valleys in late afternoon results in a rapid drop in temperature after sunset. This air drainage down the valleys also reduces the danger of frost in the spring and fall. Within short distances, in the valleys, several days' difference in the length of the growing season can be found.

During the winter season, afternoon temperatures are in the lower 30's and nighttime readings are from 15° to 20°. Maximum temperatures are below freezing on approximately one-half of the days in January. From the latter half of November until after the first of March, most of the minimum temperatures are below freezing. Minimum temperatures -5°F or lower can be expected on at least four nights in 2 years out of 10 and -10° on one or more nights in one out of three winters, and -20° in one out of five winters. The coldest weather generally occurs when an outbreak of cold air from Canada reaches this area. An occasional outbreak of cold air in spring and fall has resulted in extensive damage to fruit.

Hail and heavy showers associated with thunderstorms which develop over the higher ridges during the warmer months occasionally result in a flash flood at the mouth of narrow canyons and hail damage to fruit.

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Total Precipitation (Inches)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann'l
1931	3.73	1.46	2.13	1.18	1.12	1.22	0	.21	.51	1.36	2.94	5.13	18.99
1932	3.56	3.08	2.13	1.16	1.15	1.17	.34	.17	.16	1.18	7.43	4.48	25.05
1933	5.12	1.58	2.29	.33	1.43	.61	.17	.52	1.43	4.60	5.33	16.65	38.06
1934	5.43	2.60	2.33	1.43	.70	.33	0	.33	1.10	7.63	5.83	5.03	29.44
1935	7.74	1.19	2.79	.42	.28	.70	.32	.17	.66	.62	1.64	2.48	19.01
1936	5.40	3.55	4.01	—	—	—	.22	.04	.62	.27	—	—	—
1937	2.20	4.37	2.42	3.33	.18	4.16	—	—	—	.72	6.78	7.26	—
1938	2.01	3.64	3.75	.67	.02	.19	.03	.01	.03	1.48	2.58	2.74	17.15
1939	2.63	2.13	2.13	2.63	.93	—	—	.29	—	.87	3.51	7.22	16.18
1940	2.98	4.15	1.64	1.45	1.08	—	.55	.04	2.21	2.42	3.31	3.84	—
1941	2.66	1.37	.36	1.59	1.45	.48	.08	1.44	1.57	1.05	3.13	6.00	21.18
1942	2.17	2.72	.78	.77	1.21	.41	.06	.02	0	1.37	7.04	4.99	21.54
1943	2.62	1.77	.84	.84	1.27	1.33	.05	.32	0	2.79	1.61	.31	14.07
1944	1.24	2.72	1.26	1.01	.60	2.16	.03	.03	1.24	3.37	4.03	1.64	16.33
1945	3.05	5.08	1.26	.61	1.37	.13	0	.75	1.06	1.58	5.09	3.61	23.39
1946	4.55	2.73	1.30	.27	.65	1.60	.16	.46	1.00	2.23	4.75	3.53	23.23
1947	3.15	2.14	1.12	.51	.04	.59	.46	.20	.46	6.03	2.43	1.92	19.05
1948	3.28	3.40	.87	1.26	5.46	3.13	.76	.94	.97	4.06	5.86	3.14	19.02
1949	.30	5.29	1.82	.12	.10	.12	.11	.23	.80	1.95	5.04	3.14	19.02
1950	5.32	3.30	2.88	.83	.16	1.89	.17	.30	.04	4.17	5.90	3.61	28.57
1951	6.60	—	2.62	.09	2.98	1.91	.23	2.12	.06	3.75	4.74	2.79	—
1952	3.85	2.09	.16	.26	.48	1.97	.01	.04	.22	1.18	1.52	3.18	12.96
1953	6.31	.97	.79	.72	1.95	.84	0	1.20	.24	4.43	2.77	4.30	20.52
1954	6.37	2.39	1.26	.38	.49	.58	.58	.77	1.07	1.07	4.55	2.59	21.90
1955	2.57	2.69	2.46	1.02	.32	.22	1.01	0	.55	4.38	9.01	9.97	34.20
1956	6.84	2.60	4.12	.70	.57	1.38	0	1.32	1.62	2.96	1.39	4.86	28.36
1957	1.97	3.15	4.25	1.40	1.47	.54	.05	.41	.41	3.22	1.00	5.51	23.38
1958	5.03	4.74	2.38	2.72	.30	1.06	.20	.04	.63	2.83	8.23	3.93	32.09
1959	8.72	2.53	2.77	.48	.47	.51	.02	.10	2.89	3.45	5.48	3.68	31.10
1960	1.73	2.93	3.00	1.82	1.61	.12	.05	.36	.16	.63	5.53	1.77	19.71
1961	3.68	5.61	4.03	2.06	1.19	.32	.44	.41	.54	2.24	3.40	5.22	29.14
1962	2.70	2.19	1.83	2.16	1.67	.52	.89	.39	.76	2.89	6.21	1.80	24.01
1963	.69	3.56	2.32	2.55	1.21	.33	.47	.26	.34	1.63	4.41	2.97	20.74

STATION HISTORY

The first cooperative weather station in Leavenworth was established at the residence of Dr. A.G. McKeown who served as observer from 4/1/1914 to 9/16/1920. The station was moved to the town and at an elevation of 1,158 feet. The station was moved to the residence of H.S. Kearnick who served as cooperative weather observer from 9/16/1920-6/30/1929.

7/1/1929, the station was moved to the residence of J.C. Mitchell, who served until 6/30/1932. The elevation was the same as the previous location. The weather equipment was moved to the residence of R.J. Stoult who served from 7/1/32 to 3/31/1936. The elevation of this location was 1,163 feet.

The station was moved to the U.S. Forest Service office located 1/4 mile NE of the Post Office and weather records were kept by U.S. Forest Service personnel from 6/10/1936 to 6/30/1935. This station was at an elevation of 1,163 feet. Then station was moved to the present location at the U.S. Fish and Wildlife Service Hatchery located on Icicle Creek, 3 miles south of the Post Office, on 7/1/1935. Climatological records at this location, elevation 1,128 feet, have been kept by U.S. Fish & Wildlife personnel.

Average Temperature (°F)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann'l
1931	30.0	32.3	40.6	49.2	58.0	61.4	68.8	66.4	58.2	50.0	32.5	24.4	47.6
1932	21.5	27.8	39.2	50.2	54.2	62.8	65.0	68.0	60.0	51.0	39.9	28.8	47.4
1933	29.6	25.0	39.0	48.8	51.8	61.5	69.1	68.8	55.5	50.6	41.0	33.9	47.9
1934	32.8	38.0	45.8	56.0	58.2	64.6	68.0	70.1	58.0	49.8	40.3	30.2	51.0
1935	25.8	—	—	—	—	—	—	—	—	—	32.0	27.9	—
1936	26.8	13.9	38.0	—	—	—	—	71.4	59.0	53.4	40.4	30.8	—
1937	11.2	26.0	41.1	46.6	56.6	—	—	—	67.6	50.5	36.6	31.0	50.5
1938	28.2	29.4	42.2	52.6	58.4	68.2	73.8	68.0	63.5	53.6	42.5	30.8	—
1939	32.8	30.2	44.3	50.0	59.7	61.1	70.4	71.8	66.9	53.7	32.6	30.8	—
1940	28.8	35.3	44.3	50.2	59.7	71.1	71.1	71.2	66.9	51.7	41.5	30.8	—
1941	30.8	33.8	45.8	52.2	56.0	62.8	73.9	67.2	56.6	50.9	40.6	31.8	50.2
1942	24.4	34.2	41.2	51.4	54.6	60.3	71.0	72.9	64.5	51.7	34.2	27.6	49.0
1943	16.4	35.2	36.3	50.8	54.2	59.8	68.2	66.2	63.7	49.6	38.1	28.6	47.1
1944	24.9	31.2	38.9	48.2	55.8	62.6	70.9	67.4	63.4	53.5	37.8	24.6	48.3
1945	30.8	35.6	38.9	45.8	58.4	62.6	71.2	70.9	59.3	51.0	31.4	26.9	48.6
1946	27.4	31.6	41.4	49.1	59.0	60.6	69.2	69.5	60.7	46.0	32.6	28.2	47.9
1947	22.6	33.8	45.0	50.8	61.8	61.8	67.6	66.5	63.2	49.4	38.6	31.9	49.5
1948	23.5	26.8	37.6	45.5	54.6	66.9	66.0	63.8	60.0	46.1	—	—	—
1949	9.5	25.3	39.9	51.1	59.3	63.1	68.4	68.2	62.5	46.4	—	—	—
1950	—	—	39.6	46.7	—	63.2	67.1	70.0	64.0	—	—	—	—
1951	—	—	—	50.9	57.5	63.5	70.5	69.3	—	—	—	—	—
1952	—	30.8	—	49.5	—	70.7	70.1	70.1	63.5	—	—	—	—
1953	—	—	—	53.9	53.9	56.6	68.2	67.7	63.5	49.5	38.3	—	—
1954	—	—	35.6	43.7	—	58.0	66.6	64.9	60.3	47.8	29.0	21.5	—
1955	—	—	—	—	—	63.2	66.4	67.6	—	—	—	—	—
1956	23.0	19.7	33.5	47.8	59.7	60.2	70.8	68.3	59.6	47.1	33.6	28.7	46.0
1957	14.3	29.2	39.0	49.7	61.3	63.2	66.3	64.5	63.7	46.5	35.8	31.4	47.0
1958	30.8	37.7	39.9	47.7	63.0	68.9	74.3	72.5	59.1	49.5	30.2	50.5	—
1959	26.7	34.0	39.5	49.0	54.0	62.0	69.5	66.6	58.4	49.2	34.8	47.6	—
1960	23.0	34.0	39.1	49.0	53.8	63.0	72.7	65.5	59.7	49.2	34.8	25.1	47.4
1961	28.4	35.9	40.6	47.8	55.5	—	71.3	73.0	56.5	45.7	29.8	27.6	—
1962	24.1	33.7	37.9	51.3	52.6	62.2	68.1	66.9	61.9	49.4	39.1	33.2	48.3
1963	23.8	36.5	42.7	47.1	56.0	63.0	66.0	68.3	64.5	51.0	37.1	25.1	48.4

PROBABILITY OF 32°, 28°, 24° AND 16° OCCURRING AS LATE IN THE SPRING OR AS EARLY IN THE FALL AS THE DATES LISTED IN THE FOLLOWING TABLE:

Date	PROBABILITY - SPRING					PROBABILITY - FALL				
	75%	50%	25%	10%	10%	25%	50%	75%		
32° May 3	May 16	May 29	Jun 10	Sep 6	Sep 17	Sep 29	Oct 11	Oct 11		
28° Apr 9	Apr 23	May 7	May 19	Sep 23	Oct 4	Oct 16	Oct 28	Oct 28		
24° Mar 16	Mar 29	Apr 11	Apr 23	Oct 8	Oct 19	Oct 31	Nov 12	Nov 12		
20° Feb 26	Mar 11	Mar 25	Apr 5	Oct 21	Oct 31	Nov 13	Nov 25	Nov 25		
16° Feb 8	Feb 22	Mar 7	Mar 19	Nov 12	Nov 23	Dec 5	Dec 21	Dec 21		

In the above table, the 50% 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:

- 75% - 30 years in 40
- 50% - 20 years in 40
- 25% - 10 years in 40
- 10% - 4 years in 40