

# Climatology of the United States

## No. 20

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801  
www.ncdc.noaa.gov

**Station: VALENTINE LKS GAME REF, NE**

**1971-2000**

**COOP ID: 258755**

**Climate Division: NE 2**

**NWS Call Sign:**

**Elevation: 2,930 Feet Lat: 42° 34N**

**Lon: 100° 42W**

Temperature (°F)																					
Mean (1)				Extremes										Degree Days (1) Base Temp 65		Mean Number of Days (3)					
Month	Daily Max	Daily Min	Mean	Highest Daily(2)	Year	Day	Highest Month(1) Mean	Year	Lowest Daily(2)	Year	Day	Lowest Month(1) Mean	Year	Heating	Cooling	Max >= 100	Max >= 90	Max >= 50	Max <= 32	Min <= 32	Min <= 0
Jan	34.8	12.2	23.5	69	1989	31	35.4	1990	-29	1949	21	8.0	1979	1287	0	.0	.0	4.7	11.9	29.5	7.1
Feb	40.7	17.1	28.9	76	1982	22	38.3	1992	-29	1996	2	16.8	1978	1011	0	.0	.0	8.5	8.0	25.7	3.9
Mar	49.0	24.5	36.8	82+	1978	30	45.0	1986	-30	1980	1	26.7	1996	876	0	.0	.0	15.9	4.2	24.2	1.1
Apr	60.0	34.8	47.4	97	1992	30	55.2	1981	5	1975	3	38.6	1995	533	4	.0	.1	23.5	.6	12.8	.0
May	70.7	45.8	58.3	97	1962	11	64.3	1977	11	1954	3	49.6	1995	244	34	.0	.3	30.2	.0	1.6	.0
Jun	81.0	54.8	67.9	107	1952	12	76.7	1988	30	1998	3	60.0	1998	80	165	.6	4.9	29.9	.0	@	.0
Jul	86.8	60.1	73.5	109+	1990	2	79.0	1974	40	1959	1	66.1	1993	19	281	1.2	12.1	31.0	.0	.0	.0
Aug	85.3	58.6	72.0	104+	1952	26	78.2	1983	39	1992	27	66.0	1992	24	239	.3	9.5	31.0	.0	.0	.0
Sep	76.7	48.5	62.6	100	1960	3	69.3	1990	23	1995	22	56.7	1993	143	71	.0	3.5	29.5	.0	1.2	.0
Oct	64.0	37.2	50.6	92+	1990	5	54.1	1974	4	1991	31	46.9	1995	448	0	.0	.2	26.9	.4	9.0	.0
Nov	46.1	24.1	35.1	83	1999	8	45.4	1999	-15	1959	14	20.9	1985	898	0	.0	.0	12.3	5.4	23.4	1.0
Dec	37.5	15.2	26.4	73	1990	10	35.1	1979	-29	1989	22	7.4	1983	1198	0	.0	.0	6.3	10.0	29.2	4.4
Ann	61.1	36.1	48.6	109+	Jul 1990	2	79.0	Jul 1974	-30	Mar 1980	1	7.4	Dec 1983	6761	794	2.1	30.6	249.7	40.5	156.6	17.5

+ Also occurred on an earlier date(s)

@ Denotes mean number of days greater than 0 but less than .05

Complete documentation available from: [www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1948-2001

(3) Derived from 1971-2000 serially complete daily data

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**Elevation: 2,930 Feet Lat: 42°34N**

**Lon: 100°42W**

Precipitation (inches)																								
	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution										
Month	Mean	Med- ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	.38	.34	1.66	1988	19	1.84	1988	.00	1989	3.8	1.2	.1	@	.02	.05	.10	.16	.22	.29	.37	.47	.61	.83	1.06
Feb	.49	.44	1.13	1987	27	1.75	1987	.01	1983	3.9	1.6	.2	@	.03	.06	.12	.19	.26	.35	.46	.59	.77	1.09	1.40
Mar	1.23	.92	2.10	1949	31	4.16	1977	.10	1978	6.7	3.0	.6	.1	.16	.26	.43	.60	.78	.98	1.21	1.50	1.89	2.52	3.13
Apr	2.36	1.97	3.03	1970	12	5.20	1971	.40	1980	8.6	5.3	1.6	.3	.47	.69	1.03	1.35	1.67	2.01	2.40	2.87	3.48	4.47	5.41
May	3.62	3.26	3.74	1955	26	8.96	1982	.71	1992	10.7	6.7	2.4	.8	1.08	1.42	1.94	2.38	2.82	3.27	3.77	4.35	5.11	6.29	7.39
Jun	3.15	2.69	2.79	1992	14	9.27	1983	.55	1989	9.1	5.5	2.0	1.0	.82	1.12	1.58	1.98	2.38	2.79	3.25	3.80	4.52	5.64	6.70
Jul	3.97	3.55	3.07	1962	1	9.89	1981	1.03	1980	9.4	6.4	2.8	1.1	.94	1.31	1.89	2.41	2.92	3.47	4.08	4.80	5.76	7.27	8.69
Aug	2.52	2.46	3.48	1985	12	5.73	1985	.26	2000	7.8	4.5	1.7	.6	.68	.92	1.28	1.60	1.92	2.25	2.61	3.04	3.61	4.49	5.32
Sep	1.83	1.21	3.44	1948	22	7.00	1973	.24	1976	6.3	3.8	1.3	.4	.23	.38	.64	.89	1.16	1.46	1.81	2.23	2.81	3.76	4.67
Oct	1.45	1.04	2.42	1995	5	3.97	1998	.14	1999	5.5	3.0	.7	.3	.17	.28	.48	.69	.90	1.14	1.42	1.77	2.24	3.02	3.77
Nov	1.00	.72	2.25	1984	9	3.31	1987	.10	1989	4.4	2.4	.6	.2	.10	.17	.30	.44	.59	.76	.97	1.22	1.57	2.15	2.72
Dec	.47	.33	1.38	1987	27	2.27	1987	.00+	1991	3.3	1.4	.1	@	.00	.03	.10	.17	.25	.34	.44	.58	.76	1.08	1.39
Ann	22.47	23.56	3.74	May 1955	26	9.89	Jul 1981	.00+	Dec 1991	79.5	44.8	14.1	4.8	13.56	15.18	17.31	18.96	20.45	21.92	23.46	25.18	27.30	30.42	33.17

+ Also occurred on an earlier date(s)

# Denotes amounts of a trace

@ Denotes mean number of days greater than 0 but less than .05

\*\* Statistics not computed because less than six years out of thirty had measurable precipitation

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1948-2001

(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:  
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**Climate Division: NE 2**

**NWS Call Sign:**

**Elevation: 2,930 Feet**

**Lat: 42° 34N**

**Lon: 100° 42W**

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										Snow Fall ≥ Thresholds					Snow Depth ≥ Thresholds			
Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year	0.1	1.0	3.0	5.0	10.0	1	3	5	10
Jan	5.3	4.5	2	1	16.0	1988	19	18.0	1988	26	1988	19	14	1988	3.0	1.9	.5	.2	@	10.5	5.8	3.7	1.8
Feb	6.1	4.8	2	1	11.0	1987	27	15.8	1987	15	1988	7	10	1988	2.8	2.2	.9	.3	@	9.6	6.1	4.1	1.3
Mar	9.2	7.4	1	#	14.0	1977	11	37.0	1977	18	1977	12	5	1977	3.1	2.5	.9	.5	.1	5.2	2.7	1.7	.4
Apr	5.4	2.8	#	#	14.2	1995	18	27.5	1995	14	1995	18	2	1995	1.4	1.1	.7	.4	.1	1.6	1.1	.9	.2
May	.1	.0	#	0	2.0	1979	10	2.0	1979	1	1979	10	#	1979	@	@	.0	.0	.0	@	.0	.0	.0
Jun	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jul	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Aug	.0	.0	#	0	.0	0	0	.0	0	#	1995	4	#	1995	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	.7	.0	0	0	12.5	1985	28	13.5	1985	13	1985	28	1	1985	.2	.2	.1	@	@	.1	.1	@	@
Oct	1.4	.0	#	0	11.0	1995	23	11.6	1995	10	1979	31	1	1995	.7	.5	.2	@	@	.5	.2	.1	.0
Nov	9.3	8.5	1	1	15.0	1972	2	21.0	1998	17	1972	2	6	1985	2.5	2.1	1.1	.7	.1	7.4	5.6	3.4	.6
Dec	5.6	3.5	1	#	16.0	1987	27	21.0	1987	21	1987	27	10	1978	2.6	1.7	.6	.1	@	7.5	2.9	1.6	.7
Ann	43.1	31.5	N/A	N/A	16.0+	Jan 1988	19	37.0	Mar 1977	26	Jan 1988	19	14	Jan 1988	16.3	12.2	5.0	2.2	.3	42.4	24.5	15.5	5.0

+ Also occurred on an earlier date(s) #Denotes trace amounts

@ Denotes mean number of days greater than 0 but less than .05

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

(1) Derived from Snow Climatology and 1971-2000 daily data

(2) Derived from 1971-2000 daily data

Complete documentation available from:

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**Elevation: 2,930 Feet**

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Freeze Data									
Spring Freeze Dates (Month/Day)									
Temp (F)	Probability of later date in spring (thru Jul 31) than indicated(*)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	6/04	5/29	5/24	5/20	5/17	5/13	5/09	5/05	4/28
32	5/20	5/15	5/12	5/10	5/07	5/05	5/02	4/29	4/25
28	5/09	5/05	5/01	4/29	4/26	4/24	4/21	4/18	4/14
24	5/01	4/26	4/22	4/19	4/17	4/14	4/11	4/08	4/03
20	4/18	4/13	4/10	4/07	4/04	4/01	3/29	3/25	3/20
16	4/13	4/08	4/04	3/31	3/28	3/25	3/21	3/17	3/12
Fall Freeze Dates (Month/Day)									
Temp (F)	Probability of earlier date in fall (beginning Aug 1) than indicated(*)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	9/10	9/14	9/16	9/18	9/19	9/21	9/23	9/25	9/28
32	9/18	9/22	9/24	9/27	9/29	10/01	10/03	10/06	10/10
28	9/21	9/27	10/01	10/05	10/08	10/12	10/15	10/19	10/25
24	10/02	10/08	10/12	10/15	10/18	10/22	10/25	10/29	11/03
20	10/12	10/17	10/21	10/24	10/27	10/30	11/02	11/06	11/11
16	10/27	11/01	11/04	11/07	11/09	11/12	11/15	11/18	11/23
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	146	139	133	129	125	121	116	111	104
32	160	154	150	147	144	140	137	133	128
28	182	176	171	168	164	160	157	152	146
24	205	198	193	188	184	180	176	170	163
20	226	219	214	210	206	202	197	192	185
16	245	238	233	229	226	222	218	213	207

\* Probability of observing a temperature as cold, or colder, later in the spring or earlier in the fall than the indicated date.

**0/00** Indicates that the probability of occurrence of threshold temperature is less than the indicated probability.

Derived from 1971-2000 serially complete daily data

Complete documentation available from:

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Degree Days to Selected Base Temperatures (°F)													
Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1287	1011	876	533	244	80	19	24	143	448	898	1198	6761
60	1132	871	721	394	141	32	4	6	66	297	748	1043	5455
57	1039	787	629	317	93	17	1	2	35	217	667	950	4754
55	979	739	570	271	68	11	0	1	22	168	611	889	4329
50	836	608	428	171	26	2	0	0	5	78	476	745	3375
32	372	228	79	9	0	0	0	0	0	1	135	295	1119

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	108	141	226	471	813	1076	1285	1238	918	577	227	120	7200
55	2	8	4	42	168	397	572	525	249	31	13	2	2013
57	0	0	1	29	132	343	511	465	203	17	9	0	1710
60	0	0	0	16	86	268	422	375	144	5	0	0	1316
65	0	0	0	4	34	165	281	239	71	0	0	0	794
70	0	0	0	0	10	89	166	131	27	0	0	0	423

Growing Degree Units (2)																								
Base	Growing Degree Units (Monthly)												Growing Degree Units (Accumulated Monthly)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
40	15	36	101	269	575	845	1046	996	689	362	86	21	15	51	152	421	996	1841	2887	3883	4572	4934	5020	5041
45	2	8	49	169	426	695	891	841	545	237	40	5	2	10	59	228	654	1349	2240	3081	3626	3863	3903	3908
50	0	1	14	95	283	545	736	686	404	136	12	0	0	1	15	110	393	938	1674	2360	2764	2900	2912	2912
55	0	0	2	46	168	399	581	532	275	62	1	0	0	0	2	48	216	615	1196	1728	2003	2065	2066	2066
60	0	0	0	16	79	262	427	381	165	22	0	0	0	0	0	16	95	357	784	1165	1330	1352	1352	1352
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	14	35	90	184	352	539	681	652	441	241	67	23	14	49	139	323	675	1214	1895	2547	2988	3229	3296	3319

(1) Derived from the 1971-2000 Monthly Normals

(2) Derived from 1971-2000 serially complete daily data

**Note:** For corn, temperatures below 50 are set to 50, and temperatures above 86 are set to 86

Complete documentation available from:  
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## Notes

- a. The monthly means are simple arithmetic averages computed by summing the monthly values for the period 1971-2000 and dividing by thirty. Prior to averaging, the data are adjusted if necessary to compensate for data quality issues, station moves or changes in station reporting practices. Missing months are replaced by estimates based on neighboring stations.
- b. The median is defined as the middle value in an ordered set of values. The median is being provided for the snow and precipitation elements because the mean can be a misleading value for precipitation normals.
- c. Only observed validated values were used to select the extreme daily values.
- d. Extreme monthly temperature/precipitation means were selected from the monthly normals data.  
Monthly snow extremes were calculated from daily values quality controlled to be consistent with the Snow Climatology.
- e. Degree Days were derived using the same techniques as the 1971-2000 normals.  
Complete documentation for the 1971-2000 Normals is available on the internet from:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)
- f. Mean "number of days statistics" for temperature and precipitation were calculated from a serially complete daily data set.  
Documentation of the serially complete data set is available from the link below:
- g. Snowfall and snow depth statistics were derived from the Snow Climatology.  
Documentation for the Snow Climatology project is available from the link under references.

## Data Sources for Tables

Several different data sources were used to create the Clim20 climate summaries. In some cases the daily extremes appear inconsistent with the monthly extremes and or the mean number of days statistics. For example, a high daily extreme value may not be reflected in the highest monthly value or the mean number of days threshold that is less than and equal to the extreme value. Some of these difference are caused by different periods of record. Daily extremes are derived from the station's entire period of record while the serial data and normals data were for the 1971-2000 period. Therefore extremes observed before 1971 would not be included in the 1971-2000 normals or the 1971-2000 serial daily data set. Inconsistencies can also occur when monthly values are adjusted to reflect the current observing conditions or were replaced during the 1971-2000 Monthly Normals processing and are not reconciled with the Summary of the Day data.

- |   |   |
|---|---|
| <ol style="list-style-type: none"><li>a. Temperature/ Precipitation Tables<ol style="list-style-type: none"><li>1. 1971-2000 Monthly Normals</li><li>2. Cooperative Summary of the Day</li><li>3. National Weather Service station records</li><li>4. 1971-2000 serially complete daily data</li></ol></li><li>b. Degree Day Table<ol style="list-style-type: none"><li>1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals</li><li>2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data</li></ol></li></ol> | <ol style="list-style-type: none"><li>c. Snow Tables<ol style="list-style-type: none"><li>1. Snow Climatology</li><li>2. Cooperative Summary of the Day</li></ol></li><li>d. Freeze Data Table<br/>1971-2000 serially complete daily data</li></ol> |
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## References

U.S. Climate Normals 1971-2000, [www.ncdc.noaa.gov/normal.html](http://www.ncdc.noaa.gov/normal.html)  
U.S. Climate Normals 1971-2000-Products Clim20, [www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html)  
Snow Climatology Project Description, [www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html](http://www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html)  
Eischeid, J. K., P. Pasteris, H. F. Diaz, M. Plantico, and N. Lott, 2000: Creating a serially complete, national daily time series of temperature and precipitation for the Western United States. J. Appl. Meteorol., 39, 1580-1591,  
[www1.ncdc.noaa.gov/pub/data/special/serialcomplete\\_jam\\_0900.pdf](http://www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf)