

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: HELENA 1 SSE, OK

1971-2000

COOP ID: 344019

Climate Division: OK 2

NWS Call Sign:

Elevation: 1,350 Feet Lat: 36° 32N

Lon: 98° 17W

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	44.4	21.3	32.9	82	1967	23	40.3	1990	-14	1988	8	19.6	1979	998	0	.0	.0	11.9	6.5	28.5	1.1
Feb	50.4	25.8	38.1	92	1962	13	48.6	1976	-15	1982	6	25.3	1978	754	0	.0	@	15.3	4.4	21.4	.8
Mar	60.0	34.7	47.4	91	1967	12	52.0	1972	1	1967	8	42.4	1984	547	0	.0	@	23.7	.7	12.9	.0
Apr	69.8	43.7	56.8	99	1972	13	64.3	1981	18	1975	3	50.1	1983	270	23	.0	.5	28.7	.0	2.9	.0
May	79.0	54.2	66.6	105	1985	31	72.6	1996	30	1967	2	61.2	1976	76	126	.1	3.1	30.9	.0	.0	.0
Jun	89.2	64.1	76.7	112	1980	26	81.3	1990	46	1964	1	71.7	1989	5	355	2.0	15.1	30.0	.0	.0	.0
Jul	95.1	69.0	82.1	113	1986	30	86.9	1980	50	1990	14	79.0	1972	0	529	7.8	25.0	31.0	.0	.0	.0
Aug	93.8	67.6	80.7	112	1964	7	86.3	1983	48	1988	29	74.1	1992	1	487	7.0	23.0	31.0	.0	.0	.0
Sep	84.8	59.3	72.1	108+	2000	4	80.0	1998	31	1984	30	64.1	1974	27	239	1.6	10.9	29.9	.0	@	.0
Oct	73.2	46.7	60.0	98+	1979	1	64.5	1979	12	1993	31	54.6	1976	186	29	.0	1.3	30.4	.0	1.9	.0
Nov	57.7	33.8	45.8	88	1980	9	53.8	1999	5+	1975	26	40.2	1991	578	0	.0	.0	21.7	.7	14.1	.0
Dec	47.1	24.4	35.8	78	1966	8	40.1	1991	-15	1989	23	22.1	1983	907	0	.0	.0	13.6	4.2	26.2	.8
Ann	70.4	45.4	57.9	113	Jul 1986	30	86.9	Jul 1980	-15+	Dec 1989	23	19.6	Jan 1979	4349	1788	18.5	78.9	298.1	16.5	107.9	2.7

+ 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

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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Lon: 98°17W

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	.96	.77	2.47	1949	12	2.68	1973	.00+	1986	4.1	2.2	.6	.1	.00	.09	.26	.41	.57	.74	.94	1.19	1.53	2.08	2.62
Feb	1.29	.77	2.55	1997	21	3.61	1997	.00+	1988	4.1	2.8	.9	.2	.00	.07	.26	.46	.67	.92	1.22	1.58	2.10	2.97	3.83
Mar	2.89	2.23	4.90	1988	3	10.10	1973	.03	1971	6.4	4.5	1.7	.9	.18	.35	.70	1.10	1.54	2.06	2.69	3.49	4.62	6.53	8.43
Apr	2.79	2.33	3.03	1970	18	6.83	1999	.11	1996	7.0	4.9	1.9	.7	.38	.61	1.01	1.40	1.81	2.26	2.77	3.41	4.27	5.68	7.03
May	4.59	4.00	4.37	1960	29	11.12	1993	.69	1984	8.4	6.7	3.3	1.4	.90	1.31	1.99	2.61	3.23	3.91	4.67	5.59	6.81	8.76	10.62
Jun	3.86	3.88	5.45	1963	23	7.91	1995	.59	1998	7.6	5.9	2.6	1.1	.78	1.13	1.70	2.22	2.74	3.30	3.93	4.70	5.71	7.32	8.86
Jul	3.20	2.50	6.55	1997	20	10.06	1979	.00	1983	6.1	4.8	2.1	.9	.25	.59	1.10	1.57	2.06	2.59	3.21	3.95	4.96	6.60	8.17
Aug	3.04	1.59	3.34	1995	3	8.92	1989	.00	1973	6.7	4.8	2.0	1.0	.06	.24	.62	1.04	1.52	2.09	2.79	3.68	4.94	7.08	9.22
Sep	3.04	2.79	4.00	1997	23	7.50	1973	.04	2000	6.8	4.5	1.7	1.0	.38	.62	1.05	1.47	1.92	2.42	3.00	3.72	4.69	6.28	7.83
Oct	2.65	2.18	5.00	1986	3	8.67	1998	.00	1978	5.7	3.9	1.6	.7	.06	.22	.56	.94	1.36	1.85	2.45	3.22	4.30	6.13	7.94
Nov	2.04	1.72	4.10	1974	3	6.35	1992	.00	1989	5.5	3.4	1.2	.5	.10	.28	.58	.88	1.20	1.56	1.98	2.51	3.23	4.42	5.58
Dec	1.29	1.05	1.60	1960	11	3.66	1997	.03	1976	4.6	2.8	.8	.3	.12	.22	.39	.57	.76	.98	1.24	1.57	2.01	2.75	3.48
Ann	31.64	31.76	6.55	Jul 1997	20	11.12	May 1993	.00+	Nov 1989	73.0	51.2	20.4	8.8	21.94	23.79	26.19	28.01	29.63	31.21	32.83	34.64	36.83	40.02	42.78

+ 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

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Station: HELENA 1 SSE, OK

COOP ID: 344019

Climate Division: OK 2

NWS Call Sign:

Elevation: 1,350 Feet

Lat: 36°32N

Lon: 98°17W

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	4.6	3.0	1	#	8.0	1988	6	19.0	1979	14	1988	11	7	1988	1.9	1.7	.6	.1	.0	6.3	3.4	2.2	.5
Feb	5.0	1.0	1	#	19.0	1971	22	27.0	1971	24	1971	22	8	1982	1.4	1.4	.7	.3	@	4.6	3.6	2.6	.6
Mar	3.1	.0	#	#	12.0	1994	9	18.0	1988	13+	1999	14	2	1988	.8	.8	.4	.2	.1	1.3	.7	.3	.2
Apr	.6	.0	#	0	6.0	1973	8	12.0	1973	10	1973	9	1	1973	.1	.1	.1	.1	.0	.1	.1	.1	@
May	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.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	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.1	.0	#	0	2.0	1991	31	2.0	1991	2	1991	31	#	1991	.1	@	.0	.0	.0	@	.0	.0	.0
Nov	1.5	.0	#	0	8.0	1972	19	16.0	1972	10	1972	21	2	1972	.4	.4	.3	.1	.0	.9	.5	.2	.1
Dec	4.4	4.0	1	#	10.0	1974	11	21.0	1987	16	1987	17	5	1987	1.7	1.5	.6	.2	.1	4.2	2.3	1.1	.2
Ann	19.3	8.0	N/A	N/A	19.0	Feb 1971	22	27.0	Feb 1971	24	Feb 1971	22	8	Feb 1982	6.4	5.9	2.7	1.0	.2	17.4	10.6	6.5	1.6

+ 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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Climate Division: OK 2

NWS Call Sign:

Elevation: 1,350 Feet

Lat: 36°32N

Lon: 98°17W

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	5/02	4/28	4/25	4/23	4/20	4/18	4/16	4/13	4/09
32	4/19	4/15	4/13	4/11	4/08	4/06	4/04	4/01	3/29
28	4/14	4/10	4/06	4/04	4/01	3/30	3/27	3/24	3/20
24	4/04	3/29	3/24	3/21	3/17	3/13	3/10	3/05	2/27
20	3/28	3/20	3/15	3/11	3/07	3/02	2/26	2/21	2/13
16	3/14	3/06	2/28	2/23	2/18	2/14	2/08	2/02	1/24
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	10/02	10/07	10/11	10/14	10/17	10/20	10/23	10/26	10/31
32	10/14	10/19	10/22	10/25	10/28	10/31	11/03	11/07	11/12
28	10/21	10/28	11/01	11/05	11/09	11/12	11/16	11/21	11/27
24	10/27	11/03	11/08	11/12	11/16	11/20	11/24	11/29	12/06
20	11/07	11/14	11/18	11/22	11/26	11/30	12/04	12/09	12/15
16	11/16	11/23	11/29	12/03	12/08	12/12	12/17	12/23	12/31
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	198	191	186	182	179	175	171	166	160
32	222	215	210	206	202	198	194	189	183
28	246	237	231	226	221	216	210	204	195
24	268	259	253	248	243	238	233	227	219
20	292	282	275	269	264	258	252	245	236
16	339	319	308	299	291	284	276	267	254

* 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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Climate Division: OK 2

NWS Call Sign:

Elevation: 1,350 Feet Lat: 36° 32N Lon: 98° 17W

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	998	754	547	270	76	5	0	1	27	186	578	907	4349
60	844	624	395	161	28	0	0	0	7	87	432	752	3330
57	752	547	309	109	12	0	0	0	2	48	349	660	2788
55	692	496	255	80	7	0	0	0	0	30	297	601	2458
50	547	379	143	30	1	0	0	0	0	7	184	458	1749
32	148	97	5	0	0	0	0	0	0	0	10	93	353

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	172	268	481	743	1073	1340	1552	1510	1202	866	421	209	9837
55	4	23	18	133	367	650	839	797	512	183	19	4	3549
57	2	18	10	102	310	590	777	735	454	139	11	1	3149
60	0	11	3	63	233	500	684	642	369	85	3	0	2593
65	0	0	0	23	126	355	529	487	239	29	0	0	1788
70	0	0	0	6	54	222	374	338	137	7	0	0	1138

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	46	122	279	511	831	1102	1311	1263	962	625	226	66	46	168	447	958	1789	2891	4202	5465	6427	7052	7278	7344
45	13	62	172	373	676	952	1156	1108	813	475	131	24	13	75	247	620	1296	2248	3404	4512	5325	5800	5931	5955
50	1	26	95	245	521	802	1001	953	666	331	70	8	1	27	122	367	888	1690	2691	3644	4310	4641	4711	4719
55	0	5	43	142	370	652	846	798	521	208	27	0	0	5	48	190	560	1212	2058	2856	3377	3585	3612	3612
60	0	0	13	67	233	502	691	643	379	111	6	0	0	0	13	80	313	815	1506	2149	2528	2639	2645	2645
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	51	102	192	323	531	731	854	828	625	394	154	63	51	153	345	668	1199	1930	2784	3612	4237	4631	4785	4848

(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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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
- 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">a. Temperature/ Precipitation Tables<ol style="list-style-type: none">1. 1971-2000 Monthly Normals2. Cooperative Summary of the Day3. National Weather Service station records4. 1971-2000 serially complete daily datab. Degree Day Table<ol style="list-style-type: none">1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data | <ol style="list-style-type: none">c. Snow Tables<ol style="list-style-type: none">1. Snow Climatology2. Cooperative Summary of the Dayd. Freeze Data Table
1971-2000 serially complete daily data |
|---|---|

References

U.S. Climate Normals 1971-2000, www.ncdc.noaa.gov/normal.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html
Snow Climatology Project Description, 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