

Climatology of the United States

No. 20

1971-2000

Station: AGATE 3 E, NE

COOP ID: 250030

Climate Division: NE 1

NWS Call Sign:

Elevation: 4,670 Feet Lat: 42° 25N

Lon: 103° 44W

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	37.6	7.3	22.5	69	1982	26	30.6	1990	-34	1972	4	6.2	1979	1320	0	.0	.0	4.6	9.5	30.6	8.4
Feb	43.2	12.7	28.0	72	1992	29	35.7	1992	-37	1982	5	14.9	1993	1037	0	.0	.0	8.9	6.3	27.5	4.7
Mar	51.6	20.2	35.9	80+	1997	20	43.5	1986	-27	1989	5	29.6	1996	902	0	.0	.0	17.7	2.7	28.6	1.2
Apr	60.9	28.0	44.5	90+	1992	30	52.2	1981	-17	1975	2	38.2	1997	618	0	.0	.1	23.7	.6	20.9	.1
May	70.8	38.2	54.5	95	1969	26	59.2	1994	13	1983	12	49.1	1983	330	4	.0	.3	29.8	.0	7.3	.0
Jun	81.2	46.7	64.0	106	1990	27	68.8	1988	20	1969	2	58.3	1998	105	75	.2	4.9	29.9	.0	1.3	.0
Jul	88.5	51.9	70.2	108	1989	7	73.7	1980	29	1971	30	66.0	1993	14	176	1.2	14.2	31.0	.0	.1	.0
Aug	87.5	50.1	68.8	103	1969	5	73.8	1983	27	1976	28	64.8	1992	26	143	.4	12.2	31.0	.0	.3	.0
Sep	78.3	39.5	58.9	98+	1998	5	63.1	1998	5	1984	29	53.8	1974	209	26	.0	3.6	29.2	.0	7.3	.0
Oct	65.5	27.6	46.6	90	1992	1	49.5	1974	-11	1991	31	43.7	1976	572	0	.0	@	27.5	.4	22.5	.2
Nov	48.1	16.4	32.3	79	1999	7	39.5	1999	-19	1983	23	18.6	1985	983	0	.0	.0	13.3	4.4	28.8	2.3
Dec	39.3	7.6	23.5	69	1998	1	31.9	1980	-44	1989	22	8.8	1983	1287	0	.0	.0	5.9	8.5	30.7	7.0
Ann	62.7	28.9	45.8	108	Jul 1989	7	73.8	Aug 1983	-44	Dec 1989	22	6.2	Jan 1979	7403	424	1.8	35.3	252.5	32.4	205.9	23.9

+ 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

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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	Median	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	.28	.26	.72	1974	21	.83	1974	.00+	1989	4.6	.7	@	.0	.00	.05	.10	.15	.19	.24	.29	.34	.42	.55	.67	
Feb	.29	.15	1.20	1992	23	1.20	1992	.01+	1983	3.9	.7	@	@	.01	.02	.05	.09	.13	.19	.25	.34	.46	.68	.90	
Mar	.59	.44	1.35	1973	14	2.78	1973	.12	1981	5.1	1.9	.1	@	.10	.15	.24	.32	.41	.50	.60	.72	.89	1.16	1.42	
Apr	1.34	1.42	3.26	2000	19	3.80	2000	.09	1992	7.3	3.5	.6	.2	.20	.32	.51	.69	.89	1.09	1.34	1.63	2.03	2.67	3.29	
May	2.95	2.81	2.25	1991	16	7.09	1991	1.17	1994	10.5	6.1	1.8	.6	1.01	1.29	1.70	2.04	2.37	2.71	3.08	3.51	4.06	4.91	5.70	
Jun	2.20	1.84	2.40	1965	10	5.94	1999	.45	1980	9.1	4.9	1.4	.3	.57	.78	1.10	1.38	1.66	1.95	2.28	2.66	3.17	3.96	4.71	
Jul	2.02	1.84	2.61	1949	29	4.61	1978	.50	1975	8.8	5.0	1.1	.3	.65	.84	1.12	1.37	1.60	1.84	2.10	2.41	2.81	3.42	3.99	
Aug	1.62	1.57	1.76	1953	16	3.75	1982	.37	1971	7.5	4.1	1.1	.2	.44	.59	.82	1.03	1.23	1.44	1.67	1.95	2.31	2.87	3.40	
Sep	1.32	1.05	1.88	1973	11	4.16	1973	.10	1980	6.5	3.0	.8	.1	.14	.23	.41	.60	.79	1.02	1.28	1.61	2.05	2.80	3.52	
Oct	.98	.78	1.72	1948	29	3.09	1994	.06	1988	5.4	2.8	.5	.2	.11	.18	.32	.45	.60	.76	.95	1.19	1.52	2.05	2.58	
Nov	.40	.34	.60	1993	12	1.15	1998	.00	1989	4.1	1.4	.1	.0	.05	.10	.17	.22	.28	.34	.41	.49	.60	.77	.94	
Dec	.25	.19	1.00	1983	22	.86	1994	.01	1999	3.8	.7	.1	@	.02	.04	.07	.11	.14	.19	.24	.31	.40	.55	.69	
Ann	14.24	13.84	3.26	Apr 2000	19	7.09	May 1991	.00+	Nov 1989	76.6	34.8	7.6	1.9	9.52	10.41	11.56	12.44	13.22	13.99	14.78	15.66	16.74	18.31	19.68	

+ 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

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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	4.0	4.1	2	#	10.0	1974	21	13.7	1974	14	1986	2	11	1986	4.0	1.3	.3	@	@	14.5	10.1	6.7	.9
Feb	4.5	3.0	1	1	8.0	1990	13	13.9	1993	16	1986	14	7	1986	3.3	1.7	.4	.1	.0	9.3	4.7	2.5	.8
Mar	5.4	3.2	1	#	10.0	1973	14	18.0	1990	10	1993	3	3	1993	3.3	2.0	.6	.2	@	5.2	2.6	1.4	.2
Apr	4.2	3.3	#	#	7.0	1997	5	15.2	1984	7	1997	11	3	1997	2.1	1.7	.6	.2	.0	1.7	.8	.5	.0
May	1.0	.0	#	0	4.0	1979	9	10.0	1979	2	1979	8	#+	1998	.4	.4	.1	.0	.0	.1	.0	.0	.0
Jun	.0	.0	#	0	.5	1976	14	.5	1976	#	1990	11	#	1990	@	.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	.3	.0	#	0	3.0	1974	12	3.0+	1985	4	1995	20	#+	2000	.1	.1	.1	.0	.0	.1	@	.0	.0
Oct	1.8	1.4	#	#	5.0	1993	8	5.8	1990	5	1997	24	1	1998	1.0	.7	.1	@	.0	.8	.3	.1	.0
Nov	4.1	3.8	1	#	6.0	1983	21	17.1	1985	14	1985	30	5	1985	2.7	1.4	.4	.1	.0	5.1	2.4	1.3	.1
Dec	5.7	3.7	2	1	10.0	1983	22	17.1	1983	17	1985	17	15	1985	3.7	2.0	.5	.1	@	12.4	7.6	4.7	2.0
Ann	31.0	22.5	N/A	N/A	10.0+	Dec 1983	22	18.0	Mar 1990	17	Dec 1985	17	15	Dec 1985	20.6	11.3	3.1	.7	@	49.2	28.5	17.2	4.0

+ 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

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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	7/13	7/05	6/30	6/25	6/21	6/17	6/12	6/07	5/30
32	7/02	6/24	6/19	6/14	6/09	6/05	5/31	5/25	5/17
28	6/06	5/31	5/27	5/23	5/20	5/16	5/12	5/08	5/02
24	5/26	5/20	5/15	5/11	5/08	5/04	4/30	4/26	4/19
20	5/09	5/04	4/30	4/27	4/24	4/21	4/18	4/14	4/09
16	5/02	4/27	4/23	4/19	4/16	4/12	4/09	4/05	3/30
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	8/12	8/18	8/23	8/26	8/30	9/03	9/07	9/11	9/18
32	8/22	8/28	9/02	9/05	9/09	9/12	9/16	9/21	9/27
28	9/06	9/10	9/13	9/15	9/18	9/20	9/22	9/25	9/29
24	9/13	9/17	9/21	9/24	9/26	9/29	10/02	10/05	10/10
20	9/17	9/23	9/27	9/30	10/04	10/07	10/10	10/15	10/20
16	9/28	10/04	10/09	10/13	10/16	10/20	10/24	10/28	11/03
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	100	89	82	75	69	63	57	49	39
32	120	110	103	97	91	85	79	72	62
28	140	133	128	124	120	116	112	107	101
24	162	155	150	145	141	137	132	127	120
20	182	175	170	166	162	158	154	149	142
16	205	197	192	187	183	178	173	168	160

* 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

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Degree Days to Selected Base Temperatures (°F)

Base	Heating Degree Days (1)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Below 65	1320	1037	902	618	330	105	14	26	209	572	983	1287	7403
60	1165	897	747	470	196	41	2	5	106	417	833	1132	6011
57	1072	813	654	385	130	19	0	1	61	325	743	1039	5242
55	1010	757	592	331	94	10	0	0	40	266	683	977	4760
50	856	625	443	209	34	1	0	0	9	135	542	823	3677
32	361	219	64	9	0	0	0	0	0	2	147	333	1135

Cooling Degree Days (1)

Base	Cooling Degree Days (1)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Above 32	64	105	185	381	697	959	1184	1140	806	453	154	69	6197
55	0	0	0	13	78	280	471	427	156	4	0	0	1429
57	0	0	0	7	52	228	409	366	118	1	0	0	1181
60	0	0	0	2	25	160	318	276	73	0	0	0	854
65	0	0	0	0	4	75	176	143	26	0	0	0	424
70	0	0	0	0	0	24	71	51	6	0	0	0	152

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	2	17	65	189	454	723	939	892	575	242	38	7	2	19	84	273	727	1450	2389	3281	3856	4098	4136	4143
45	1	2	24	102	309	573	784	737	431	127	9	0	1	3	27	129	438	1011	1795	2532	2963	3090	3099	3099
50	0	0	3	47	184	424	629	582	296	55	0	0	0	0	3	50	234	658	1287	1869	2165	2220	2220	2220
55	0	0	0	15	92	287	474	428	179	13	0	0	0	0	0	15	107	394	868	1296	1475	1488	1488	1488
60	0	0	0	0	32	162	323	279	88	1	0	0	0	0	0	0	32	194	517	796	884	885	885	885
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	11	36	95	183	327	471	587	572	421	254	72	19	11	47	142	325	652	1123	1710	2282	2703	2957	3029	3048

(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
- 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 are 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.

- a. Temperature/ Precipitation Tables
 1. 1971-2000 Monthly Normals
 2. Cooperative Summary of the Day
 3. National Weather Service station records
 4. 1971-2000 serially complete daily data
- b. Degree Day Table
 1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals
 2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data
- c. Snow Tables
 1. Snow Climatology
 2. Cooperative Summary of the Day
- d. 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