

Climatography of the United States No. 20

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

Station: HAY SPRINGS 12 S, NE

1971-2000

COOP ID: 253715

Climate Division: NE 1

NWS Call Sign:

Elevation: 3,805 Feet Lat: 42° 31N

Lon: 102° 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	34.2	7.5	20.9	69+	1989	31	33.1	1990	-34	1979	1	4.1	1979	1369	0	.0	.0	5.4	11.2	30.8	8.2
Feb	39.9	12.3	26.1	73	1972	28	36.5	1999	-31	1996	3	13.3	1978	1089	0	.0	.0	8.8	6.5	27.6	4.4
Mar	48.5	20.5	34.5	83	1978	30	40.8	1986	-21	1989	5	28.4	1975	945	0	.0	.0	16.5	3.4	28.6	1.2
Apr	58.1	29.7	43.9	93	1992	30	51.6	1981	-15	1975	2	36.7	1997	633	0	.0	.1	23.1	.5	19.1	.1
May	69.1	41.3	55.2	96	1969	26	60.0	1985	17	1983	12	49.1	1995	314	10	.0	.7	29.9	.0	4.5	.0
Jun	79.7	50.7	65.2	104	1989	20	71.3	1988	27	1969	2	60.2	1998	86	93	.3	5.9	29.9	.0	@	.0
Jul	86.3	56.4	71.4	108	1990	2	75.0	1974	37	1997	4	66.1	1992	12	210	1.2	12.9	31.0	.0	.0	.0
Aug	84.4	54.6	69.5	102	1988	16	74.0	2000	33	1965	31	64.5	1992	29	169	.2	11.1	31.0	.0	.0	.0
Sep	75.5	43.8	59.7	99	1998	4	66.3	1998	14	1984	29	55.3	1993	199	37	.0	3.9	29.4	.0	3.5	.0
Oct	62.9	30.7	46.8	93	1989	1	50.3	1999	-9	1991	31	42.9	1982	564	0	.0	.1	26.9	.4	17.7	.1
Nov	44.9	17.6	31.3	82+	1999	9	41.8	1999	-18	1986	13	16.8	1985	1012	0	.0	.0	12.9	5.0	28.4	1.3
Dec	36.7	9.2	23.0	71	1994	1	32.0	1999	-42	1989	22	5.6	1983	1304	0	.0	.0	6.5	9.3	30.7	5.5
Ann	60.0	31.2	45.6	108	Jul 1990	2	75.0	Jul 1974	-42	Dec 1989	22	4.1	Jan 1979	7556	519	1.7	34.7	251.3	36.3	190.9	20.8

+ 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: 1951-2001

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

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Climate Division: NE 1

NWS Call Sign:

Elevation: 3,805 Feet Lat: 42°31N

Lon: 102°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	.31	.21	.90+	1994	16	2.04	1994	.00+	2000	3.3	.8	.1	.0	.00	.02	.06	.11	.16	.22	.29	.38	.50	.70	.90
Feb	.31	.24	.70	1953	10	1.05	1987	.00+	1996	3.2	1.2	.0	.0	.00	.00	.06	.11	.17	.23	.31	.39	.51	.71	.90
Mar	.83	.80	1.86	2000	7	2.42	1998	.00+	1981	4.9	2.2	.3	.1	.00	.10	.26	.39	.52	.67	.84	1.04	1.31	1.75	2.17
Apr	1.87	1.93	1.84	2000	19	3.86	2000	.40	1980	7.8	4.7	1.0	.2	.49	.66	.94	1.18	1.41	1.66	1.93	2.26	2.69	3.36	3.99
May	2.98	2.78	3.33	1978	28	5.96	1982	.60	1994	9.4	6.2	1.7	.5	.86	1.15	1.57	1.94	2.30	2.68	3.09	3.58	4.22	5.21	6.13
Jun	2.88	2.50	2.47	1965	25	6.62	1993	.50	2000	9.2	6.2	1.9	.6	.65	.92	1.34	1.72	2.10	2.50	2.95	3.49	4.20	5.33	6.39
Jul	2.56	2.45	3.15	1968	17	5.22	1977	.42	1974	8.0	5.6	1.8	.4	.95	1.19	1.53	1.82	2.10	2.38	2.68	3.04	3.49	4.18	4.82
Aug	1.98	1.63	3.87	1963	27	6.34	1982	.21	1973	6.4	4.2	1.2	.4	.31	.48	.77	1.04	1.33	1.63	1.99	2.42	3.00	3.93	4.83
Sep	1.40	1.15	1.82	1973	11	5.22	1973	.11	1976	5.1	3.5	.6	.3	.13	.23	.42	.61	.82	1.06	1.35	1.70	2.19	3.01	3.80
Oct	1.05	.78	1.64	1993	8	3.27	1998	.00	1999	4.1	2.7	.6	.1	.04	.12	.26	.42	.58	.77	1.00	1.28	1.68	2.33	2.98
Nov	.49	.38	1.04	1993	12	1.51	1985	.00+	1997	3.2	1.6	.2	@	.00	.04	.12	.19	.28	.37	.48	.61	.79	1.10	1.40
Dec	.29	.23	.41	1993	16	.89	1987	.00+	1991	2.8	1.0	.0	.0	.00	.02	.07	.12	.16	.22	.28	.36	.47	.66	.83
Ann	16.95	16.65	3.87	Aug 1963	27	6.62	Jun 1993	.00+	Jan 2000	67.4	39.9	9.4	2.6	11.05	12.15	13.59	14.69	15.68	16.65	17.65	18.77	20.13	22.13	23.88

+ 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: 1951-2001

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

Complete documentation available from:
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Station: HAY SPRINGS 12 S, NE

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Climate Division: NE 1

NWS Call Sign:

Elevation: 3,805 Feet

Lat: 42°31N

Lon: 102°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	4.8	3.0	2	1	15.0	1974	21	18.2	1974	15+	1979	15	12	1979	2.8	2.4	.5	.1	@	8.5	5.6	2.2	.0
Feb	5.2	3.2	2	1	8.0	1987	26	17.1	1987	12	1979	9	9	1979	2.6	2.2	.6	.1	.0	8.1	4.4	2.8	.6
Mar	7.3	3.6	1	#	10.0	1975	27	23.0	1975	14	1989	4	3	1989	2.8	2.5	.9	.3	@	4.3	2.4	1.3	.4
Apr	4.1	3.0	#	#	12.0	1972	14	12.0	1988	12	1975	1	2+	1997	1.7	1.6	.7	.3	@	1.4	.7	.4	.1
May	.5	.0	#	0	4.0	1979	10	7.0	1979	#+	1990	9	#+	1990	.2	.2	.1	.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	.5	.0	#	0	8.0	1995	20	9.0	1995	6	1995	20	#+	1995	.2	.2	.1	@	.0	.1	.1	.1	.0
Oct	2.2	2.0	#	0	6.0	1981	21	7.0	1982	6+	1991	28	1	1982	.8	.8	.3	.1	.0	.7	.3	@	.0
Nov	6.9	5.0	1	#	12.0	1972	1	25.0	1985	14	1985	30	5	1985	2.2	1.9	.8	.4	@	5.5	3.4	2.0	.3
Dec	5.3	5.0	2	1	8.0	1987	27	15.6	1994	18	1978	3	13	1978	2.2	1.9	.7	.3	.0	7.3	3.5	.8	.0
Ann	36.8	24.8	N/A	N/A	15.0	Jan 1974	21	25.0	Nov 1985	18	Dec 1978	3	13	Dec 1978	15.5	13.7	4.7	1.6	@	35.9	20.4	9.6	1.4

+ 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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Climatography of the United States

No. 20 1971-2000

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Climate Division: NE 1

NWS Call Sign:

Elevation: 3,805 Feet

Lat: 42° 31N

Lon: 102° 42W

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	6/11	6/06	6/03	5/31	5/28	5/25	5/22	5/19	5/14
32	5/29	5/24	5/21	5/18	5/15	5/13	5/10	5/06	5/01
28	5/15	5/11	5/09	5/07	5/05	5/03	5/01	4/29	4/25
24	5/09	5/05	5/01	4/28	4/25	4/23	4/20	4/16	4/12
20	5/01	4/25	4/20	4/17	4/13	4/10	4/06	4/02	3/27
16	4/18	4/12	4/09	4/05	4/02	3/30	3/27	3/23	3/18
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	9/05	9/09	9/11	9/13	9/15	9/17	9/19	9/21	9/25
32	9/10	9/14	9/17	9/19	9/21	9/23	9/26	9/28	10/02
28	9/14	9/19	9/22	9/25	9/27	9/30	10/02	10/05	10/10
24	9/24	9/29	10/02	10/05	10/08	10/11	10/14	10/18	10/23
20	10/02	10/08	10/12	10/15	10/18	10/21	10/24	10/28	11/02
16	10/14	10/19	10/23	10/26	10/28	10/31	11/03	11/07	11/12
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	126	120	116	113	109	106	102	98	92
32	148	141	136	132	128	124	120	115	108
28	160	155	151	147	144	141	138	134	128
24	184	178	173	169	165	161	157	152	145
20	214	204	198	192	187	182	176	169	160
16	230	223	217	213	209	204	200	194	187

* 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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1971-2000**

Station: HAY SPRINGS 12 S, NE

COOP ID: 253715

Climate Division: NE 1 NWS Call Sign: Elevation: 3,805 Feet Lat: 42°31N Lon: 102°42W

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	1369	1089	945	633	314	86	12	29	199	564	1012	1304	7556
60	1214	949	790	485	188	31	1	6	102	410	862	1149	6187
57	1121	865	697	399	128	14	0	2	61	318	772	1056	5433
55	1059	809	635	344	95	7	0	1	40	260	712	994	4956
50	906	679	481	220	38	1	0	0	10	134	574	842	3885
32	413	267	77	9	0	0	0	0	0	2	176	358	1302

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	67	102	155	366	720	997	1221	1163	828	461	154	77	6311
55	0	0	0	11	102	314	508	451	178	6	0	0	1570
57	0	0	0	7	73	261	446	390	139	2	0	0	1318
60	0	0	0	2	40	188	354	301	91	0	0	0	976
65	0	0	0	0	10	93	210	169	37	0	0	0	519
70	0	0	0	0	1	34	97	73	11	0	0	0	216

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	22	75	213	504	783	989	943	616	282	47	9	2	24	99	312	816	1599	2588	3531	4147	4429	4476	4485
45	0	3	30	117	355	633	834	788	469	162	19	0	0	3	33	150	505	1138	1972	2760	3229	3391	3410	3410
50	0	0	8	58	225	485	679	633	334	76	2	0	0	0	8	66	291	776	1455	2088	2422	2498	2500	2500
55	0	0	0	22	123	337	524	479	212	27	0	0	0	0	0	22	145	482	1006	1485	1697	1724	1724	1724
60	0	0	0	4	53	205	373	325	115	3	0	0	0	0	0	4	57	262	635	960	1075	1078	1078	1078
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	14	36	97	187	336	493	626	595	416	246	69	24	14	50	147	334	670	1163	1789	2384	2800	3046	3115	3139

(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.

- 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