

Climatology of the United States

No. 20

1971-2000

Station: KEENE 3 S, ND

COOP ID: 324571

Climate Division: ND 4

NWS Call Sign:

Elevation: 2,470 Feet Lat: 47° 50N

Lon: 102° 55W

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	21.0	.5	10.8	55+	1987	12	24.4	1992	-41	1982	10	-5.6	1982	1682	0	.0	.0	.3	21.6	30.9	15.4
Feb	28.9	8.3	18.6	65	1992	29	31.1	1998	-37	1962	28	4.0	1989	1299	0	.0	.0	1.9	15.0	27.7	8.9
Mar	40.8	18.3	29.6	80	1986	28	39.6	1986	-26	1998	11	18.9	1996	1100	0	.0	.0	9.2	8.2	28.4	3.5
Apr	57.0	30.0	43.5	96	1980	21	53.0	1987	-14	1975	1	32.6	1975	647	2	.0	.1	21.4	1.4	18.5	.2
May	69.6	41.4	55.5	101	1980	22	63.5	1977	12	1981	9	49.2	1974	314	19	@	1.0	29.6	.0	5.6	.0
Jun	77.8	50.4	64.1	105	1988	20	76.7	1988	22	1969	20	58.1	1998	129	101	.4	3.1	30.0	.0	.3	.0
Jul	83.9	54.8	69.4	107	1960	20	74.5	1974	27	1967	3	61.9	1993	52	186	1.0	7.0	31.0	.0	.0	.0
Aug	84.3	54.0	69.2	102+	1989	1	74.8	1983	30+	1994	31	62.4	1977	64	191	.6	8.8	31.0	.0	.2	.0
Sep	72.1	43.7	57.9	102+	1978	5	65.0	1998	13	1974	30	50.5	1984	258	45	.2	2.2	28.8	.0	3.3	.0
Oct	58.6	32.6	45.6	93	1963	4	49.1	1974	-7	1991	30	41.3	1976	602	0	.0	.1	23.6	.7	15.8	.1
Nov	37.2	18.0	27.6	80	1999	7	40.1	1999	-24	1985	29	15.5	1985	1122	0	.0	.0	6.1	11.0	27.6	3.1
Dec	25.3	5.5	15.4	58+	1999	28	27.3	1999	-43	1983	23	-1.2	1983	1538	0	.0	.0	.9	19.0	30.8	11.2
Ann	54.7	29.8	42.3	107	Jul 1960	20	76.7	Jun 1988	-43	Dec 1983	23	-5.6	Jan 1982	8807	544	2.2	22.3	213.8	76.9	189.1	42.4

+ 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/normals/usnormals.html

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1950-2001

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

Climatography of the United States

No. 20 1971-2000

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

Station: KEENE 3 S, ND

COOP ID: 324571

Climate Division: ND 4

NWS Call Sign:

Elevation: 2,470 Feet Lat: 47° 50N

Lon: 102° 55W

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	.39	.28	.52	1980	6	1.19	1999	.03+	1978	4.3	1.3	@	.0	.03	.06	.11	.17	.23	.29	.37	.47	.61	.85	1.07
Feb	.37	.26	1.25	1998	25	2.47	1998	.05+	1990	3.8	1.1	@	@	.03	.06	.11	.16	.22	.28	.36	.46	.59	.81	1.02
Mar	.59	.51	1.45	1985	28	1.60	1985	.04	1981	5.5	2.1	@	@	.08	.13	.21	.30	.38	.48	.58	.72	.90	1.19	1.47
Apr	1.26	.92	1.90	1975	28	5.06	1975	.08	1988	6.6	3.2	.7	.2	.12	.21	.38	.56	.75	.96	1.22	1.54	1.98	2.71	3.42
May	2.32	1.79	1.74	1986	23	6.35	1999	.11	1980	8.6	5.6	1.5	.3	.36	.56	.89	1.21	1.54	1.91	2.32	2.83	3.52	4.63	5.69
Jun	3.19	3.04	2.60	1975	9	6.35	1994	.80	1979	10.7	6.8	1.9	.7	1.05	1.36	1.80	2.18	2.54	2.92	3.33	3.81	4.43	5.38	6.27
Jul	2.47	2.08	3.10	1987	18	8.57	1993	.31	1976	8.5	5.2	1.6	.4	.43	.65	1.01	1.35	1.69	2.07	2.50	3.02	3.71	4.83	5.89
Aug	1.51	1.40	2.21	1968	24	3.43	1974	.05	1979	6.1	3.6	.8	.2	.16	.27	.48	.69	.92	1.17	1.47	1.84	2.34	3.18	3.99
Sep	1.68	1.56	1.75	1978	12	5.64	1973	.08	1997	6.9	3.8	1.0	.4	.16	.27	.50	.73	.99	1.27	1.61	2.04	2.63	3.60	4.56
Oct	1.16	.74	2.02	1994	6	4.36	1994	.06	1979	4.6	2.7	.7	.3	.07	.14	.29	.45	.62	.83	1.09	1.41	1.86	2.62	3.38
Nov	.66	.43	2.30	2000	1	4.08	2000	.07	1999	4.7	2.0	.2	@	.07	.12	.21	.30	.40	.51	.64	.80	1.02	1.39	1.74
Dec	.40	.36	.58	1982	2	1.30	1972	.00+	1997	4.7	1.4	.1	.0	.00	.07	.15	.21	.28	.34	.41	.50	.61	.79	.97
Ann	16.00	16.05	3.10	Jul 1987	18	8.57	Jul 1993	.00+	Dec 1997	75.0	38.8	8.5	2.5	9.96	11.07	12.53	13.65	14.66	15.65	16.69	17.85	19.26	21.35	23.18

+ 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: 1950-2001

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

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Station: KEENE 3 S, ND

COOP ID: 324571

Climate Division: ND 4

NWS Call Sign:

Elevation: 2,470 Feet

Lat: 47° 50N

Lon: 102° 55W

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	6.9	6.6	5	3	8.0	1976	1	16.0	1976	21	1976	16	15	1976	3.2	2.4	.9	.3	.0	-9.9	-9.9	-9.9	-9.9
Feb	6.9	5.5	4	2	6.3	1998	27	20.8	1998	20+	1998	28	16	1979	2.8	2.1	.5	.2	.0	-9.9	-9.9	-9.9	-9.9
Mar	6.1	5.0	3	1	9.0	1975	28	27.0	1975	27	1975	31	13	1998	1.8	1.7	.6	.2	.0	5.3	4.8	4.2	3.2
Apr	2.1	.0	1	0	7.0	1975	8	11.0	1979	27	1975	3	8	1975	.6	.5	.2	.1	.0	1.2	.8	.7	.6
May	.1	.0	#	0	3.0	1974	13	3.0	1974	7	1983	12	#+	1983	@	@	@	.0	.0	.0	.0	.0	.0
Jun	.0	.0	#	0	.0	0	0	.0	0	#	1974	10	#	1974	.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	.2	.0	#	0	4.0	1972	26	6.0	1972	#	1984	24	#	1984	.1	.1	@	.0	.0	.0	.0	.0	.0
Oct	.7	.0	#	0	7.0	1996	21	7.0	1996	10	1991	29	1	1991	.4	.4	.2	.1	.0	.3	.1	.1	@
Nov	5.5	4.4	2	1	9.1	2000	2	19.0	1986	13+	1978	30	8+	2000	2.0	1.7	.9	.3	.0	3.8	2.3	.5	.0
Dec	6.4	7.0	3	2	6.0	1992	29	12.5+	1996	18	1978	31	15	1978	2.6	2.4	.5	.2	.0	-9.9	-9.9	-9.9	-9.9
Ann	34.9	28.5	N/A	N/A	9.1	Nov 2000	2	27.0	Mar 1975	27+	Apr 1975	3	16	Feb 1979	13.5	11.3	3.8	1.4	.0	-9.9	-9.9	-9.9	-9.9

+ 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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NWS Call Sign:

Elevation: 2,470 Feet

Lat: 47° 50N

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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	6/18	6/12	6/07	6/04	5/31	5/28	5/24	5/20	5/14
32	6/07	6/01	5/28	5/25	5/21	5/18	5/15	5/11	5/05
28	5/22	5/18	5/14	5/12	5/09	5/06	5/03	4/30	4/25
24	5/13	5/09	5/06	5/04	5/01	4/29	4/26	4/23	4/19
20	5/08	5/03	4/29	4/26	4/23	4/20	4/17	4/13	4/08
16	4/24	4/18	4/14	4/10	4/07	4/04	3/31	3/27	3/21
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	8/18	8/24	8/28	8/31	9/03	9/06	9/10	9/14	9/19
32	8/26	9/01	9/05	9/09	9/12	9/16	9/19	9/24	9/29
28	9/10	9/15	9/18	9/21	9/24	9/27	9/30	10/04	10/09
24	9/17	9/22	9/26	9/30	10/03	10/06	10/10	10/14	10/19
20	9/27	10/03	10/07	10/10	10/14	10/17	10/21	10/25	10/31
16	10/05	10/11	10/16	10/20	10/23	10/27	10/31	11/04	11/11
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	113	107	102	98	94	90	86	82	75
32	136	128	123	118	113	109	104	98	91
28	159	152	146	142	137	133	129	123	116
24	175	168	163	158	154	150	145	140	133
20	195	187	182	177	173	169	164	159	152
16	224	216	209	204	199	193	188	182	173

* 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: ND 4 NWS Call Sign: Elevation: 2,470 Feet Lat: 47° 50N Lon: 102° 55W

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	1682	1299	1100	647	314	129	52	64	258	602	1122	1538	8807
60	1527	1159	945	504	195	61	17	25	157	448	972	1383	7393
57	1434	1075	852	423	138	34	8	13	109	357	882	1290	6615
55	1372	1019	791	372	106	22	3	7	82	299	822	1228	6123
50	1222	891	647	257	47	6	0	1	33	171	682	1074	5031
32	716	454	221	30	0	0	0	0	0	5	251	573	2250

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	57	79	145	375	728	963	1157	1151	776	427	118	58	6034
55	0	0	2	27	121	295	447	445	168	7	0	0	1512
57	0	0	0	18	91	247	390	389	135	4	0	0	1274
60	0	0	0	9	55	184	306	307	94	1	0	0	956
65	0	0	0	2	19	101	186	191	45	0	0	0	544
70	0	0	0	0	4	44	99	106	18	0	0	0	271

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	0	2	34	188	487	723	906	900	537	229	24	0	0	2	36	224	711	1434	2340	3240	3777	4006	4030	4030
45	0	0	8	108	344	573	751	745	395	132	10	0	0	0	8	116	460	1033	1784	2529	2924	3056	3066	3066
50	0	0	2	56	221	424	596	592	270	65	2	0	0	0	2	58	279	703	1299	1891	2161	2226	2228	2228
55	0	0	0	20	122	281	441	438	162	26	0	0	0	0	0	20	142	423	864	1302	1464	1490	1490	1490
60	0	0	0	8	55	163	294	292	82	5	0	0	0	0	0	8	63	226	520	812	894	899	899	899
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	3	35	151	321	455	580	572	347	169	24	0	0	3	38	189	510	965	1545	2117	2464	2633	2657	2657

(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