U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data,
and Information Service

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: ALBION 1 N, NE **COOP ID: 250070**

Climate Division: NE 3 **NWS Call Sign:** **Elevation: 1,759 Feet** **Lat: 41˚42N** **Lon: 98˚00W**

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	31.2	8.7	20.0	72+	1990	11	30.7	1992	-37	1912	12	5.8	1979	1396	0	.0	.0	3.8	15.3	30.8	8.5
Feb	36.8	13.5	25.2	78	1972	29	34.3	1992	-32	1905	13	10.0	1979	1115	0	.0	.0	6.7	10.6	26.9	4.5
Mar	47.8	23.2	35.5	90+	1986	30	40.8	1986	-24	1962	1	28.1	1996	915	0	.0	@	14.4	4.2	25.1	.7
Apr	60.7	34.0	47.4	100	1910	28	56.8	1981	-2	1936	3	40.8	1997	533	2	.0	.3	24.2	.4	11.9	.0
May	71.5	46.4	59.0	105	1934	29	65.9	1977	21	1973	17	53.2	1995	226	39	.0	.8	30.6	.0	1.8	.0
Jun	81.7	56.3	69.0	108+	1946	16	74.5	1988	33	1917	15	64.7+	1992	38	158	.3	6.1	30.0	.0	.0	.0
Jul	86.2	61.3	73.8	115	1936	24	79.3	1974	31	1895	9	67.1	1992	8	278	1.0	11.5	31.0	.0	.0	.0
Aug	83.8	58.8	71.3	112	1934	5	78.6	1983	32	1915	30	66.3	1992	24	219	.4	8.3	31.0	.0	.0	.0
Sep	76.0	47.8	61.9	106	1931	6	67.4	1998	20	1899	29	57.2	1993	140	48	@	3.6	29.6	.0	1.3	.0
Oct	64.1	35.4	49.8	97+	1947	5	54.5	1971	1	1925	28	44.6	1987	474	0	.0	.3	27.3	.1	10.0	.0
Nov	45.7	22.7	34.2	84	1914	6	43.5	1999	-18	1964	30	24.5	1985	924	0	.0	.0	12.7	4.7	25.3	.9
Dec	34.0	12.6	23.3	78	1939	6	30.9	1979	-29	1919	10	6.1	1983	1294	0	.0	.0	4.5	12.5	30.6	4.7
Ann	60.0	35.1	47.5	115	Jul 1936	24	79.3	Jul 1974	-37	Jan 1912	12	5.8	Jan 1979	7087	744	1.7	30.9	245.8	47.8	163.7	19.3

\+ 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

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1893-2001

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

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Precipitation (inches)

Precipitation Totals

Month	Means/ Medians(1) Mean	Means/ Medians(1) Median	Extremes Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year
Jan	.44	.47	.93	1944	27	1.20	1993	.00+	1998
Feb	.69	.47	2.65	1971	19	3.37	1971	.00	1996
Mar	2.21	1.91	2.31	1979	22	7.52	1973	.00	1994
Apr	2.74	2.35	3.60	1897	9	10.12	1984	.48	1989
May	4.21	4.08	3.78	1960	6	9.25	1982	.40	1994
Jun	3.89	3.19	6.19	1929	18	9.61	1990	1.35	1997
Jul	3.58	3.26	2.93	1948	29	9.54	1994	.44	1974
Aug	3.00	2.87	10.29	1966	13	6.59	1992	.44	1991
Sep	2.51	2.09	4.06	1926	8	6.60	1973	.47	1980
Oct	1.71	1.40	2.71	1968	16	4.41	1984	.00	1996
Nov	1.51	1.34	3.00	1996	16	4.28	1996	.00	1997
Dec	.56	.44	1.78	1913	5	1.30	1972	.05	1976
Ann	27.05	28.43	10.29	Aug 1966	13	10.12	Apr 1984	.00+	Jan 1998

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.6	1.3	.1	.0
Feb	4.1	1.8	.2	@
Mar	6.9	4.2	1.4	.6
Apr	8.3	5.5	2.0	.6
May	10.1	7.6	3.3	1.0
Jun	8.7	6.2	2.7	1.1
Jul	8.5	6.2	2.6	1.0
Aug	7.1	4.8	1.8	.7
Sep	6.6	4.5	1.6	.6
Oct	5.6	3.9	1.1	.3
Nov	4.9	3.1	.9	.4
Dec	4.1	1.6	.3	.0
Ann	78.5	50.7	18.0	6.3

Precipitation Probabilities (1)

Probability that the monthly/annual precipitation will be equal to or less than the indicated amount

Monthly/Annual Precipitation vs Probability Levels
These values were determined from the incomplete gamma distribution

Month	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	.00	.00	.09	.16	.23	.32	.42	.55	.72	1.00	1.29
Feb	.02	.08	.17	.27	.38	.51	.66	.84	1.10	1.53	1.96
Mar	.07	.22	.53	.84	1.20	1.60	2.09	2.71	3.56	5.00	6.42
Apr	.37	.59	.99	1.37	1.77	2.21	2.72	3.34	4.19	5.58	6.91
May	1.35	1.75	2.34	2.85	3.33	3.84	4.39	5.03	5.87	7.16	8.36
Jun	1.04	1.41	1.97	2.46	2.95	3.46	4.02	4.69	5.57	6.94	8.22
Jul	.80	1.13	1.66	2.13	2.60	3.10	3.67	4.34	5.23	6.64	7.97
Aug	.73	1.02	1.45	1.84	2.23	2.64	3.09	3.63	4.34	5.46	6.52
Sep	.45	.68	1.04	1.38	1.73	2.11	2.54	3.06	3.75	4.86	5.92
Oct	.06	.19	.43	.68	.95	1.26	1.63	2.09	2.74	3.82	4.88
Nov	.04	.15	.36	.57	.81	1.09	1.42	1.85	2.43	3.42	4.40
Dec	.07	.11	.19	.27	.35	.44	.55	.68	.86	1.15	1.44
Ann	16.83	18.71	21.17	23.07	24.78	26.46	28.22	30.18	32.58	36.12	39.22

\+ 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: 1893-2001
(3) Derived from 1971-2000 serially complete daily data

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Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	4.1	3.4	2	1
Feb	5.4	4.8	3	1
Mar	5.1	3.5	1	#
Apr	1.7	.0	#	0
May	.0	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	#	0
Sep	.0	.0	#	0
Oct	.2	.0	#	0
Nov	5.0	4.1	#	#
Dec	6.3	5.0	2	1
Ann	27.8	20.8	N/A	N/A

Extremes (2)

Month	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year
Jan	6.0	1982	23	14.0	1979	19	1979	27	11	1979
Feb	10.0	1984	18	18.0	1984	18	1984	20	13	1979
Mar	12.0	1987	24	21.8	1987	16	1978	8	5	1978
Apr	8.0	1997	12	12.0	1984	12	1997	12	1	1997
May	.0	0	0	.0	0	2	1984	1	#	1984
Jun	.0	0	0	.0	0	0	0	0	0	0
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	4	1992	14	#	1992
Sep	.0	0	0	.0	0	#	1995	19	#	1995
Oct	2.1	1991	31	2.1	1991	2+	1997	26	#+	1997
Nov	12.0	1983	28	17.0	1983	10	1975	28	3	1975
Dec	9.0	1972	12	18.0	1972	15	1983	29	12	1983
Ann	12.0+	Mar 1987	24	21.8	Mar 1987	19	Jan 1979	27	13	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	2.7	1.8	.5	.1	.0
Feb	2.9	2.2	.7	.3	@
Mar	2.8	2.0	.7	.4	@
Apr	.8	.6	.2	.1	.0
May	.0	.0	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.0	.0	.0	.0	.0
Oct	.2	.1	.0	.0	.0
Nov	1.9	1.4	.6	.2	@
Dec	3.0	1.8	1.0	.3	.0
Ann	14.3	9.9	3.7	1.4	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	11.9	8.2	4.6	1.3
Feb	10.9	7.8	5.2	2.1
Mar	5.6	2.9	1.8	.6
Apr	.7	.2	@	.0
May	@	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.2	.0	.0	.0
Nov	4.7	1.9	.9	.1
Dec	10.8	6.3	3.1	.8
Ann	44.8	27.3	15.6	4.9

+ 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

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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	5/23	5/18	5/15	5/13	5/10	5/08	5/05	5/02	4/28
32	5/17	5/13	5/09	5/06	5/04	5/01	4/28	4/25	4/20
28	5/10	5/04	5/01	4/27	4/24	4/21	4/18	4/14	4/09
24	4/30	4/24	4/19	4/15	4/12	4/08	4/05	3/31	3/25
20	4/14	4/09	4/06	4/03	3/31	3/29	3/26	3/22	3/18
16	4/08	4/02	3/29	3/25	3/22	3/19	3/15	3/11	3/05

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	9/12	9/16	9/18	9/21	9/23	9/25	9/28	9/30	10/04
32	9/15	9/20	9/24	9/27	9/30	10/03	10/06	10/10	10/15
28	9/23	9/29	10/02	10/06	10/09	10/12	10/15	10/18	10/24
24	10/07	10/11	10/15	10/17	10/20	10/22	10/25	10/28	11/01
20	10/14	10/20	10/24	10/28	10/31	11/03	11/07	11/11	11/17
16	10/19	10/26	10/31	11/04	11/08	11/11	11/15	11/20	11/27

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	151	146	142	138	135	132	128	124	118
32	168	161	156	152	148	144	140	135	129
28	185	179	174	170	167	163	159	154	148
24	211	203	198	194	190	186	181	176	169
20	239	230	223	218	213	208	202	196	187
16	258	249	242	235	230	224	218	211	201

***** 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)

Heating Degree Days (1)

Base Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1396	1115	915	533	226	38	8	24	140	474	924	1294	7087
60	1241	975	760	390	128	9	0	5	59	324	774	1139	5804
57	1148	891	667	311	84	3	0	1	29	241	684	1046	5105
55	1086	840	605	262	61	1	0	0	16	193	624	984	4672
50	935	710	459	158	22	0	0	0	2	95	482	829	3692
32	440	304	88	4	0	0	0	0	0	1	107	339	1283

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	67	113	196	463	836	1110	1294	1218	898	550	173	68	6986
55	0	5	0	32	183	421	581	505	224	29	0	0	1980
57	0	0	0	20	144	363	519	444	177	16	0	0	1683
60	0	0	0	10	95	279	426	355	117	5	0	0	1287
65	0	0	0	2	39	158	278	219	48	0	0	0	744
70	0	0	0	0	11	71	151	115	14	0	0	0	362

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	24	94	285	608	893	1069	1005	696	361	72	5	2	26	120	405	1013	1906	2975	3980	4676	5037	5109	5114
45	0	5	46	176	456	743	914	850	548	234	29	0	0	5	51	227	683	1426	2340	3190	3738	3972	4001	4001
50	0	1	17	100	315	593	759	695	406	132	9	0	0	1	18	118	433	1026	1785	2480	2886	3018	3027	3027
55	0	0	2	47	194	445	604	541	275	61	0	0	0	0	2	49	243	688	1292	1833	2108	2169	2169	2169
60	0	0	0	20	98	302	450	387	164	19	0	0	0	0	0	20	118	420	870	1257	1421	1440	1440	1440
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	11	33	83	202	380	580	707	664	448	251	66	15	11	44	127	329	709	1289	1996	2660	3108	3359	3425	3440

(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.
Compete documentation for the 1971-2000 Normals is available on the internet from:
www.ncdc.noaa.gov/oa/climate/normals/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/normals.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normals/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