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: HOUSTON HOBBY AP, TX **COOP ID: 414307**

Climate Division: TX 8 **NWS Call Sign: HOU** **Elevation: 44 Feet** **Lat: 29˚39N** **Lon: 95˚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	63.3	45.2	54.3	85	1972	23	60.3	1998	10	1949	31	45.5	1978	361	15	.0	.0	26.1	@	3.7	.0
Feb	67.1	48.2	57.7	87+	1986	19	63.4	1976	14	1951	2	48.4	1978	228	21	.0	.0	25.9	.2	1.7	.0
Mar	73.6	54.8	64.2	96	1946	30	69.0	1974	22	1943	3	57.9	1996	96	70	.0	.1	30.8	.0	.6	.0
Apr	79.4	60.6	70.0	94	1948	28	74.8	1981	22	1995	4	65.1	1997	20	169	.0	.5	30.0	.0	@	.0
May	85.9	68.1	77.0	100	1998	31	81.1	1998	44	1978	4	73.7	1976	0	372	@	4.9	31.0	.0	.0	.0
Jun	91.0	73.5	82.3	101+	1998	15	86.2	1998	56	1984	1	80.2	1995	0	518	.1	17.8	30.0	.0	.0	.0
Jul	93.6	75.3	84.5	104	1954	26	87.6	1980	64+	1967	16	82.2	1985	0	602	.6	26.0	31.0	.0	.0	.0
Aug	93.4	75.3	84.4	106	1962	13	86.4	1999	64	1967	13	81.4	1992	0	598	.6	24.8	31.0	.0	.0	.0
Sep	89.3	71.6	80.5	108	2000	4	83.8	1980	50	1967	29	76.9	1974	0	464	.2	14.0	30.0	.0	.0	.0
Oct	82.0	62.3	72.2	96	1962	8	75.9	1984	33	1993	31	63.2	1976	15	237	.0	1.9	31.0	.0	.0	.0
Nov	72.5	53.4	63.0	90	1973	3	70.2	1973	25	1976	30	55.0	1976	148	86	.0	@	29.4	.0	.5	.0
Dec	65.4	46.7	56.1	84+	1995	3	65.9	1984	9	1989	23	46.4	1989	306	27	.0	.0	28.0	.2	2.4	.0
Ann	79.7	61.3	70.5	108	Sep 2000	4	87.6	Jul 1980	9	Dec 1989	23	45.5	Jan 1978	1174	3179	1.5	90.0	354.2	.4	8.9	.0

\+ 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: 1941-2001

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

Issue Date: February 2004

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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	4.25	3.72	4.10	1997	27	9.58	1991	.20	1971
Feb	3.01	2.73	3.88	1952	1	7.50	1992	.17	1999
Mar	3.19	2.90	5.00	1957	17	7.93	1979	.26	1996
Apr	3.46	2.91	6.20	1972	27	10.49	1973	.06	1987
May	5.11	5.25	9.48	1981	3	11.13	1981	.01	1998
Jun	6.84	6.11	8.53	2001	5	17.35	1989	1.83	1971
Jul	4.36	3.53	7.07	1973	7	17.26	1979	.16	1996
Aug	4.54	3.56	8.58	1989	1	16.01	1981	.68	1999
Sep	5.62	5.07	8.83	1979	19	15.00	1979	.56	1989
Oct	5.26	3.60	9.95	1949	7	19.40	1994	.00	1978
Nov	4.54	3.10	5.63	1943	2	9.83	2000	.32	1994
Dec	3.78	3.23	4.18	1995	17	8.73	1994	.59	1989
Ann	53.96	52.85	9.95	Oct 1949	7	19.40	Oct 1994	.00	Oct 1978

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	10.0	6.6	2.5	1.3
Feb	7.9	4.6	1.8	1.0
Mar	7.6	4.9	2.0	.9
Apr	6.8	4.0	2.3	1.1
May	7.6	5.5	3.1	1.8
Jun	8.6	6.7	3.6	2.4
Jul	8.5	5.9	2.5	1.3
Aug	9.5	6.5	2.7	1.4
Sep	9.0	6.7	3.3	1.9
Oct	6.7	5.1	2.8	1.7
Nov	8.2	5.2	2.9	1.6
Dec	8.7	5.2	2.3	1.3
Ann	99.1	66.9	31.8	17.7

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	.88	1.27	1.89	2.46	3.03	3.64	4.34	5.17	6.27	8.02	9.69
Feb	.40	.65	1.08	1.50	1.94	2.42	2.99	3.68	4.62	6.15	7.63
Mar	.58	.87	1.34	1.77	2.21	2.69	3.23	3.89	4.77	6.17	7.51
Apr	.21	.41	.83	1.30	1.84	2.46	3.22	4.19	5.55	7.85	10.14
May	.48	.85	1.54	2.25	3.02	3.90	4.93	6.23	8.01	10.98	13.89
Jun	1.37	1.99	3.00	3.91	4.84	5.84	6.97	8.32	10.12	12.99	15.72
Jul	.41	.73	1.32	1.92	2.58	3.33	4.21	5.32	6.83	9.35	11.82
Aug	.73	1.12	1.78	2.40	3.05	3.75	4.56	5.54	6.86	8.99	11.04
Sep	.99	1.48	2.30	3.07	3.86	4.71	5.68	6.85	8.42	10.95	13.37
Oct	.28	.76	1.56	2.34	3.16	4.08	5.15	6.48	8.29	11.28	14.20
Nov	.61	.97	1.62	2.26	2.92	3.65	4.50	5.55	6.97	9.28	11.52
Dec	1.05	1.41	1.96	2.43	2.89	3.38	3.92	4.55	5.37	6.67	7.87
Ann	31.51	35.54	40.87	45.03	48.81	52.53	56.43	60.82	66.23	74.24	81.32

\+ 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: 1941-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
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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	#	.0	0	0
Feb	.0	.0	0	0
Mar	#	.0	0	0
Apr	.0	.0	0	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	.0	.0	0	0
Nov	#	.0	0	0
Dec	#	.0	0	0
Ann	#	.0	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	#	1987	21	#+	1987	#+	1985	12	0	0
Feb	.1	1994	1	.1	1994	#+	1988	10	0	0
Mar	#	1989	5	#	1989	0	0	0	0	0
Apr	.0	0	0	.0	0	0	0	0	0	0
May	.0	0	0	.0	0	0	0	0	#	1988
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	0	0	0	0	0
Sep	.0	0	0	.0	0	0	0	0	0	0
Oct	.0	0	0	.0	0	0	0	0	0	0
Nov	#	1979	23	#+	1979	0	0	0	0	0
Dec	#	1996	18	#+	1996	#+	1989	25	0	0
Ann	.1	Feb 1994	1	.1	Feb 1994	#+	Dec 1989	25	#	May 1988

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	.0	.0	.0	.0	.0
Feb	.1	.0	.0	.0	.0
Mar	.0	.0	.0	.0	.0
Apr	.0	.0	.0	.0	.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	.0	.0	.0	.0	.0
Nov	.0	.0	.0	.0	.0
Dec	.0	.0	.0	.0	.0
Ann	.1	.0	.0	.0	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	.0	.0	.0	.0
Feb	.0	.0	.0	.0
Mar	.0	.0	.0	.0
Apr	.0	.0	.0	.0
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.0	.0	.0	.0
Nov	.0	.0	.0	.0
Dec	.0	.0	.0	.0
Ann	.0	.0	.0	.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	3/26	3/15	3/07	2/28	2/22	2/15	2/08	1/31	1/20
32	3/18	3/05	2/24	2/16	2/08	2/01	1/24	1/15	1/02
28	3/04	2/18	2/08	1/30	1/21	1/10	12/25	0/00	0/00
24	2/20	2/04	1/22	1/07	12/15	0/00	0/00	0/00	0/00
20	1/19	1/04	0/00	0/00	0/00	0/00	0/00	0/00	0/00
16	12/25	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00

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	11/09	11/17	11/22	11/27	12/02	12/06	12/11	12/17	12/25
32	11/17	11/28	12/06	12/13	12/20	12/26	1/02	1/11	1/22
28	12/03	12/17	12/28	1/07	1/17	1/30	2/21	0/00	0/00
24	12/19	1/05	1/20	2/04	3/02	0/00	0/00	0/00	0/00
20	1/06	1/23	0/00	0/00	0/00	0/00	0/00	0/00	0/00
16	1/05	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	320	307	298	290	282	275	267	258	245
32	>365	346	329	317	308	299	290	279	265
28	>365	>365	>365	>365	360	336	321	308	292
24	>365	>365	>365	>365	>365	>365	>365	350	318
20	>365	>365	>365	>365	>365	>365	>365	>365	>365
16	>365	>365	>365	>365	>365	>365	>365	>365	>365

***** 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)

Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	361	228	96	20	0	0	0	0	0	15	148	306	1174
60	244	131	33	3	0	0	0	0	0	3	76	194	684
57	188	87	14	0	0	0	0	0	0	1	46	142	478
55	155	62	7	0	0	0	0	0	0	0	31	111	366
50	83	22	1	0	0	0	0	0	0	0	10	50	166
32	0	0	0	0	0	0	0	0	0	0	0	0	0

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	690	717	998	1139	1395	1508	1625	1621	1454	1245	928	744	14064
55	132	135	291	449	682	818	912	908	764	533	269	142	6035
57	103	104	236	389	620	758	850	846	704	471	224	111	5416
60	65	63	162	302	527	668	757	753	614	380	164	70	4525
65	15	21	70	169	372	518	602	598	464	237	86	27	3179
70	11	6	19	73	223	368	447	443	314	119	34	10	2067

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	431	502	734	885	1138	1257	1363	1359	1203	981	677	491	431	933	1667	2552	3690	4947	6310	7669	8872	9853	10530	11021
45	303	369	580	735	983	1107	1208	1204	1053	826	528	351	303	672	1252	1987	2970	4077	5285	6489	7542	8368	8896	9247
50	194	248	432	585	828	957	1053	1049	903	671	384	225	194	442	874	1459	2287	3244	4297	5346	6249	6920	7304	7529
55	107	145	286	437	673	807	898	894	753	521	261	131	107	252	538	975	1648	2455	3353	4247	5000	5521	5782	5913
60	55	72	167	297	518	657	743	739	603	371	156	70	55	127	294	591	1109	1766	2509	3248	3851	4222	4378	4448
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	245	292	456	593	801	889	959	957	851	668	416	280	245	537	993	1586	2387	3276	4235	5192	6043	6711	7127	7407

(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