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: KULANI CAMP 79, HI **COOP ID: 515011**

Climate Division: HI 6 **NWS Call Sign:** **Elevation: 5,170 Feet** **Lat: 19˚33N** **Lon: 155˚18W**

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 >= 90	Max >= 70	Max >= 50	Max <= 32	Min <= 32	Min <= 0
Jan	62.9	42.9	52.9	79	1995	31	56.5	1986	31+	1998	20	50.6	1998	375	0	.0	2.0	30.8	.0	.2	.0
Feb	62.3	43.2	52.8	77	1977	1	58.5	1986	31	1970	8	49.4	1973	343	0	.0	1.7	28.1	.0	.2	.0
Mar	60.9	44.6	52.8	76	1972	9	57.0	1986	28	1982	25	50.6	1987	363	0	.0	1.0	30.9	.0	@	.0
Apr	61.3	46.2	53.8	90	1968	30	56.6	1986	32	1970	20	51.6	1994	337	0	.0	.6	29.9	.0	.0	.0
May	62.4	47.1	54.8	82	1971	13	58.2	1980	36	1952	20	51.5	1998	318	0	.0	1.0	31.0	.0	.0	.0
Jun	63.9	48.7	56.3	81+	1981	10	59.7	1981	36	1970	1	53.9	1998	261	0	.0	1.2	30.0	.0	.0	.0
Jul	65.1	50.4	57.8	81	1973	1	60.5	1982	35+	1970	31	55.0	1998	226	0	.0	2.3	31.0	.0	.0	.0
Aug	65.8	50.6	58.2	83	1983	27	62.4	1986	30	1983	6	56.1	1983	211	0	.0	4.2	31.0	.0	.1	.0
Sep	66.0	50.3	58.2	84	1981	15	61.4	1986	37	1961	17	55.2	1975	205	0	.0	3.8	30.0	.0	.0	.0
Oct	65.7	49.8	57.8	89	1979	7	60.6	1984	35	1959	18	55.8	1971	225	0	.0	3.6	31.0	.0	.0	.0
Nov	63.9	48.0	56.0	78	1984	1	58.6	1981	34	1961	2	52.7	1971	272	0	.0	2.7	29.9	.0	.0	.0
Dec	62.7	44.8	53.8	83	1981	22	57.5	1980	30	1997	27	50.2	1997	349	0	.0	2.0	30.8	.0	.1	.0
Ann	63.6	47.2	55.4	90	Apr 1968	30	62.4	Aug 1986	28	Mar 1982	25	49.4	Feb 1973	3485	0	.0	26.1	364.4	.0	.6	.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: 1949-2001

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

Issue Date: May 2005

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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	9.94	8.17	12.00	1975	8	41.68	1975	.10	1998
Feb	7.32	4.97	7.65	1979	21	32.15	1979	.14	1998
Mar	15.08	10.74	14.25	1980	24	86.34	1980	.51	1983
Apr	10.49	8.85	8.60	1963	16	36.75	1986	2.45	1997
May	5.98	5.92	5.48	1964	24	13.45	1989	1.39	2000
Jun	4.73	4.23	4.73	1997	27	24.72	1997	.64	1998
Jul	8.46	6.29	12.30	1997	30	24.32	1997	.40	1998
Aug	7.60	6.00	12.43	1970	26	26.43	1982	1.26	1987
Sep	7.04	5.78	11.48	1994	20	28.40	1994	.67	1998
Oct	6.34	5.97	4.30	1961	29	13.32	1990	1.38	1984
Nov	13.77	10.10	22.00	2000	2	46.07	1994	1.04	1989
Dec	11.18	7.71	16.00	1999	12	51.82	1999	1.32	1985
Ann	107.93	103.10	22.00	Nov 2000	2	86.34	Mar 1980	.10	Jan 1998

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	17.7	9.7	4.2	2.5
Feb	15.9	8.9	4.0	2.2
Mar	22.5	16.1	7.2	4.1
Apr	26.0	18.6	6.5	2.9
May	25.2	16.4	3.7	1.0
Jun	22.2	11.8	2.8	.8
Jul	24.8	13.7	4.1	1.9
Aug	23.0	12.6	3.8	2.0
Sep	23.0	12.4	3.7	1.6
Oct	25.1	15.1	3.9	1.3
Nov	23.6	14.9	6.7	3.8
Dec	20.6	12.2	5.2	2.6
Ann	269.6	162.4	55.8	26.7

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	.31	.72	1.73	2.98	4.49	6.35	8.69	11.77	16.21	23.95	31.81
Feb	.19	.47	1.18	2.07	3.18	4.55	6.30	8.61	11.96	17.85	23.85
Mar	.69	1.45	3.17	5.16	7.49	10.26	13.67	18.10	24.37	35.14	45.95
Apr	2.66	3.65	5.17	6.52	7.85	9.26	10.82	12.68	15.10	18.94	22.53
May	2.17	2.74	3.55	4.23	4.87	5.54	6.26	7.09	8.16	9.81	11.32
Jun	.57	.94	1.60	2.26	2.96	3.74	4.65	5.78	7.30	9.82	12.26
Jul	.87	1.50	2.66	3.84	5.11	6.54	8.23	10.33	13.20	17.96	22.61
Aug	1.22	1.87	2.97	4.02	5.10	6.28	7.63	9.28	11.48	15.06	18.49
Sep	1.16	1.77	2.80	3.77	4.76	5.85	7.09	8.60	10.61	13.88	17.01
Oct	2.26	2.86	3.72	4.45	5.14	5.85	6.63	7.53	8.68	10.46	12.09
Nov	1.86	2.98	4.95	6.86	8.87	11.09	13.66	16.82	21.09	28.07	34.81
Dec	.72	1.40	2.80	4.32	6.04	8.04	10.46	13.54	17.84	25.13	32.35
Ann	58.71	67.28	78.78	87.86	96.16	104.38	113.06	122.86	135.03	153.17	169.28

+ 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: 1949-2001
(3) Derived from 1971-2000 daily data

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Snow (inches)

Snow Totals

Means/Medians (1)

Extremes (2)

Mean Number of Days (1)

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	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Feb	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Mar	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Apr	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
May	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.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	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Dec	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Ann	.0	.0	N/A	N/A	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.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	4/04	3/21	3/11	3/03	2/22	2/14	2/04	1/21	0/00
32	2/09	12/20	0/00	0/00	0/00	0/00	0/00	0/00	0/00
28	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
24	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
20	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
16	0/00	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	10/25	11/15	11/30	12/13	12/26	1/09	1/25	2/19	0/00
32	12/04	1/27	0/00	0/00	0/00	0/00	0/00	0/00	0/00
28	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
24	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
20	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
16	0/00	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	>365	>365	>365	346	316	293	271	248	218
32	>365	>365	>365	>365	>365	>365	>365	>365	>365
28	>365	>365	>365	>365	>365	>365	>365	>365	>365
24	>365	>365	>365	>365	>365	>365	>365	>365	>365
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)

Heating Degree Days (1)

Base Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	375	343	363	337	318	261	226	211	205	225	272	349	3485
60	223	205	225	187	167	118	89	80	75	80	130	199	1778
57	138	128	138	105	89	53	36	31	28	26	65	120	957
55	92	86	89	60	53	24	14	12	10	7	35	80	562
50	19	19	15	5	5	1	0	0	0	0	3	16	83
32	0	0	0	0	0	0	0	0	0	0	0	0	0

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	648	581	643	653	705	729	798	812	785	798	718	674	8544
55	27	23	19	23	44	63	99	111	105	92	63	41	710
57	11	10	7	7	19	32	59	69	63	49	33	19	378
60	3	2	0	0	4	6	18	24	20	10	8	5	100
65	0	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0	0

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	403	377	409	421	466	500	560	571	558	556	484	438	403	780	1189	1610	2076	2576	3136	3707	4265	4821	5305	5743
45	248	232	254	271	311	350	405	416	408	401	334	283	248	480	734	1005	1316	1666	2071	2487	2895	3296	3630	3913
50	102	97	102	123	157	200	250	265	258	246	188	133	102	199	301	424	581	781	1031	1296	1554	1800	1988	2121
55	16	19	19	27	35	64	100	113	108	95	58	33	16	35	54	81	116	180	280	393	501	596	654	687
60	0	0	0	0	0	2	10	18	17	9	0	1	0	0	0	0	0	2	12	30	47	56	56	57
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	207	190	183	178	210	236	267	285	275	272	230	213	207	397	580	758	968	1204	1471	1756	2031	2303	2533	2746

(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.
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 were calculated from a serially complete daily data set. A serial dataset was not available for precipitation,
To ensure that a station's data was adequate to estimate these statistics, the following criteria were used:
1. A station must have 80% of its data for the 1971-2000 time period.
2. Only months with at least 21 days are used.
3. There must be a least 21 months (meeting criteria 2.) in the sample.

g. Snowfall and snow depth statistics were derived daily values quality controlled to be consistent with 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 differences 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. Other inconsistencies may appear from comparing statistically modeled values such as degree days to observed temperatures.

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. 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