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: HAWAII VOLCNS NP HQ 54, HI **COOP ID: 511303**

Climate Division: HI 6 **NWS Call Sign:** **Elevation: 3,971 Feet** **Lat: 19˚26N** **Lon: 155˚16W**

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	67.5	49.6	58.6	79	1980	12	61.1	1974	34	1978	18	56.6	1972	199	0	.0	10.8	31.0	.0	.0	.0
Feb	67.5	49.6	58.6	81	1970	7	61.5	1980	35	1977	15	55.4	1990	182	0	.0	10.9	28.3	.0	.0	.0
Mar	67.1	50.5	58.8	78+	1986	10	62.9	1986	38+	1983	3	56.4	1975	179	1	.0	9.7	31.0	.0	.0	.0
Apr	67.3	51.7	59.5	79	1980	20	62.2	1996	42+	1983	21	56.9	1976	165	1	.0	9.2	30.0	.0	.0	.0
May	69.0	52.7	60.9	81	1992	28	63.7	1996	42+	1985	17	58.0	1975	138	8	.0	14.2	31.0	.0	.0	.0
Jun	70.4	54.2	62.3	93	1983	13	64.4	1996	45	1982	1	59.5	1976	90	8	@	18.4	30.0	.0	.0	.0
Jul	71.5	55.2	63.4	87	1999	23	65.8	1994	45	1990	4	60.9	1975	68	16	.0	23.0	31.0	.0	.0	.0
Aug	73.0	55.5	64.3	81+	1987	22	66.6	1986	41+	1977	14	61.9	1975	49	26	.0	27.1	31.0	.0	.0	.0
Sep	72.9	55.2	64.1	85	1960	30	66.4	1992	45+	1981	9	61.5	1975	52	24	.0	26.1	30.0	.0	.0	.0
Oct	72.0	55.0	63.5	81	2001	10	66.0	1992	45+	1971	19	61.2	1975	66	18	.0	23.7	31.0	.0	.0	.0
Nov	69.6	53.7	61.7	80	2001	23	63.6	1991	41	1949	20	59.8	1974	104	4	.0	15.6	30.0	.0	.0	.0
Dec	67.6	51.2	59.4	89	2000	15	61.5	1980	31	1983	6	56.7	1971	175	1	.0	10.8	31.0	.0	@	.0
Ann	69.6	52.8	61.3	93	Jun 1983	13	66.6	Aug 1986	31	Dec 1983	6	55.4	Feb 1990	1467	107	@	199.5	365.3	.0	@	.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	10.78	6.17	10.64	1990	20	34.64	1975	.63	1998
Feb	9.13	5.93	16.75	1979	20	54.62	1979	.72	1983
Mar	14.10	12.03	12.02	1989	3	70.36	1980	1.02	1983
Apr	10.38	8.26	10.28	1986	11	33.91	1986	2.90	1992
May	6.29	5.79	4.82	1965	4	14.84	1989	2.16	1992
Jun	5.23	4.77	3.57	1968	14	17.96	1997	1.32	1971
Jul	7.21	5.75	9.30	1997	30	20.98	1989	1.36	1999
Aug	6.31	5.33	11.02	1970	26	19.85	1982	1.79	1973
Sep	6.01	5.17	12.26	1994	19	24.82	1994	1.63	1984
Oct	6.83	6.64	10.00	1951	28	14.70	1989	2.99	1984
Nov	14.06	11.06	11.74	1966	5	46.70	1990	2.14	1989
Dec	11.01	10.36	12.96	1987	13	28.41	1987	2.13	1989
Ann	107.34	99.63	16.75	Feb 1979	20	70.36	Mar 1980	.63	Jan 1998

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	20.7	11.1	4.3	2.5
Feb	18.3	10.1	4.5	2.4
Mar	23.3	16.3	6.8	3.7
Apr	26.3	17.6	6.3	2.3
May	26.2	16.1	3.7	.6
Jun	23.4	13.1	2.4	.9
Jul	25.0	14.2	3.8	1.1
Aug	23.7	11.9	2.9	1.3
Sep	22.0	11.7	3.0	1.2
Oct	24.5	14.4	4.2	1.1
Nov	24.0	14.6	6.4	3.5
Dec	23.5	14.3	5.3	2.7
Ann	280.9	165.4	53.6	23.3

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	.65	1.29	2.61	4.07	5.73	7.67	10.03	13.04	17.25	24.41	31.52
Feb	.34	.76	1.75	2.92	4.32	6.02	8.13	10.89	14.83	21.65	28.54
Mar	1.21	2.17	4.04	6.00	8.15	10.59	13.50	17.17	22.21	30.66	38.96
Apr	3.15	4.14	5.61	6.88	8.11	9.38	10.79	12.44	14.58	17.91	21.00
May	2.47	3.05	3.88	4.57	5.22	5.88	6.59	7.42	8.47	10.07	11.54
Jun	1.30	1.79	2.55	3.23	3.90	4.60	5.39	6.33	7.55	9.50	11.32
Jul	1.27	1.90	2.96	3.94	4.95	6.04	7.28	8.79	10.80	14.04	17.13
Aug	1.55	2.14	3.06	3.88	4.69	5.54	6.50	7.64	9.12	11.48	13.69
Sep	1.40	1.96	2.84	3.63	4.41	5.24	6.17	7.28	8.74	11.05	13.22
Oct	3.46	4.03	4.80	5.42	5.99	6.56	7.16	7.84	8.69	9.97	11.11
Nov	2.13	3.31	5.35	7.29	9.31	11.52	14.07	17.18	21.36	28.15	34.68
Dec	1.45	2.33	3.90	5.43	7.05	8.83	10.90	13.45	16.90	22.55	28.01
Ann	69.20	76.30	85.56	92.69	99.09	105.33	111.83	119.08	127.94	140.94	152.30

\+ 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

Complete documentation available from:
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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	12/28	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
32	0/00	0/00	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	1/24	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
32	0/00	0/00	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	>365	>365	>365	>365	>365	>365
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)

Base — Heating Degree Days (1)

Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	199	182	179	165	138	90	68	49	52	66	104	175	1467
60	60	65	67	46	38	11	5	3	3	5	14	51	368
57	14	23	23	10	10	1	0	0	0	0	1	13	95
55	3	8	8	3	3	0	0	0	0	0	0	4	29
50	0	0	0	0	0	0	0	0	0	0	0	0	0
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	824	743	830	826	893	909	971	1000	962	975	890	850	10673
55	114	107	126	138	183	219	258	287	272	262	200	140	2306
57	63	66	78	86	128	160	196	225	212	200	141	87	1642
60	16	24	30	32	63	80	109	134	126	112	64	33	823
65	0	0	1	1	8	8	16	26	24	18	4	1	107
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	581	541	589	589	649	670	731	756	726	732	653	605	581	1122	1711	2300	2949	3619	4350	5106	5832	6564	7217	7822
45	426	396	434	439	494	520	576	601	576	577	503	450	426	822	1256	1695	2189	2709	3285	3886	4462	5039	5542	5992
50	271	251	279	289	339	370	421	446	426	422	353	295	271	522	801	1090	1429	1799	2220	2666	3092	3514	3867	4162
55	116	112	125	141	185	220	266	291	276	267	203	142	116	228	353	494	679	899	1165	1456	1732	1999	2202	2344
60	16	19	19	30	45	74	111	138	128	112	62	30	16	35	54	84	129	203	314	452	580	692	754	784
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	302	279	292	297	343	370	421	447	427	422	354	314	302	581	873	1170	1513	1883	2304	2751	3178	3600	3954	4268

(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