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: MOLOKAI KAUNAKAKAI AP524, HI **COOP ID: 516534**

Climate Division: HI 3 **NWS Call Sign:** **Elevation: 450 Feet** **Lat: 21˚10N** **Lon: 157˚06W**

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	77.9	63.4	70.7	88	1989	2	73.2	1989	52+	1986	16	68.9	1998	2	177	.0	30.8	31.0	.0	.0	.0
Feb	78.0	62.7	70.4	89+	1991	19	72.9	1977	48	1987	6	66.6	1987	2	152	.0	28.1	28.3	.0	.0	.0
Mar	79.0	63.8	71.4	86+	1986	12	73.7	1977	46	1987	4	68.9	1987	0	198	.0	30.9	31.0	.0	.0	.0
Apr	80.0	65.4	72.7	96	1974	14	75.5	1974	48	1989	5	70.0	1989	0	231	.1	30.0	30.0	.0	.0	.0
May	81.8	66.7	74.3	89	1982	22	76.6	1978	52	1989	20	71.2	1987	0	288	.0	31.0	31.0	.0	.0	.0
Jun	83.4	69.0	76.2	89+	1982	23	78.1	1996	52	1957	15	73.5	1976	0	335	.0	30.0	30.0	.0	.0	.0
Jul	84.6	70.4	77.5	91+	1994	26	79.0	1994	52	1985	8	75.9	1975	0	388	.3	31.0	31.0	.0	.0	.0
Aug	85.8	70.9	78.4	93+	1983	8	80.8	1986	56+	1984	6	76.3	2000	0	413	.9	31.0	31.0	.0	.0	.0
Sep	86.1	70.7	78.4	93+	1979	6	80.3+	1990	60+	1985	30	75.2	2000	0	402	1.8	30.0	30.0	.0	.0	.0
Oct	84.8	69.9	77.4	92+	1973	7	79.5	1984	60	1985	27	74.8	1999	0	383	.9	31.0	31.0	.0	.0	.0
Nov	82.1	67.9	75.0	90	1979	25	77.0	1977	57+	2000	30	72.5	1985	0	300	@	30.0	30.0	.0	.0	.0
Dec	79.4	65.0	72.2	88+	1996	26	74.0+	1992	50	1985	28	70.1+	1985	0	223	.0	31.0	31.0	.0	.0	.0
Ann	81.9	67.2	74.6	96	Apr 1974	14	80.8	Aug 1986	46	Mar 1987	4	66.6	Feb 1987	4	3490	4.0	364.8	365.3	.0	.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: 1957-2001

(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	3.74	2.83	3.96	1959	18	11.63	1982	.63	1978
Feb	3.65	2.87	9.03	1989	12	14.29	1989	.04	2000
Mar	2.51	2.55	3.72	1963	28	6.27	1997	.24	1979
Apr	2.10	1.51	4.68	1965	14	7.22	1989	.33	1975
May	1.41	.59	2.90	1977	13	7.11	1978	.00+	1975
Jun	.66	.44	1.60	1972	4	2.50	1979	.00	1984
Jul	.59	.60	1.17	1968	5	1.34	1985	.02	1971
Aug	.61	.38	1.40	2000	20	1.96	2000	.04	1984
Sep	.76	.48	1.68	1993	27	3.86	1993	.03	1995
Oct	1.78	.91	3.04	1968	2	7.41	1982	.00	1996
Nov	2.83	1.80	6.12	1961	2	13.96	1996	.23	1999
Dec	4.00	3.09	4.35	1987	12	11.80	1987	.02	1975
Ann	24.64	22.60	9.03	Feb 1989	12	14.29	Feb 1989	.00+	Oct 1996

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	10.4	6.4	2.2	1.0
Feb	8.8	5.6	1.7	.7
Mar	10.0	4.9	1.7	.4
Apr	9.7	4.5	1.2	.4
May	6.8	2.5	.6	.3
Jun	6.0	1.7	.2	.1
Jul	7.3	2.2	.1	.0
Aug	6.3	1.8	.2	.1
Sep	5.4	2.3	.3	.1
Oct	6.9	3.0	1.0	.5
Nov	9.6	5.0	1.8	.5
Dec	9.8	5.9	2.2	1.3
Ann	97.0	45.8	13.2	5.4

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	.40	.68	1.20	1.72	2.28	2.91	3.65	4.57	5.83	7.91	9.94
Feb	.28	.52	.99	1.49	2.05	2.69	3.46	4.43	5.78	8.05	10.29
Mar	.42	.64	1.01	1.35	1.70	2.09	2.53	3.06	3.77	4.92	6.01
Apr	.25	.42	.71	1.00	1.31	1.66	2.06	2.56	3.24	4.35	5.43
May	.00	.02	.15	.32	.55	.82	1.18	1.66	2.35	3.57	4.82
Jun	.04	.11	.21	.31	.41	.52	.65	.82	1.04	1.40	1.74
Jul	.11	.17	.26	.34	.42	.50	.60	.72	.88	1.14	1.38
Aug	.04	.07	.15	.23	.32	.43	.56	.73	.97	1.37	1.76
Sep	.06	.11	.22	.32	.44	.57	.73	.93	1.21	1.67	2.13
Oct	.02	.10	.29	.52	.80	1.14	1.57	2.13	2.92	4.30	5.70
Nov	.20	.37	.73	1.12	1.55	2.06	2.66	3.43	4.51	6.32	8.11
Dec	.17	.37	.81	1.34	1.95	2.69	3.60	4.78	6.47	9.36	12.28
Ann	11.14	13.32	16.35	18.80	21.08	23.38	25.84	28.66	32.20	37.57	42.42

\+ 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: 1957-2001
(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	0/00	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	0/00	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	2	2	0	0	0	0	0	0	0	0	0	0	4
60	0	0	0	0	0	0	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0	0	0	0	0	0	0
55	0	0	0	0	0	0	0	0	0	0	0	0	0
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	1198	1074	1221	1221	1311	1325	1411	1436	1392	1406	1290	1246	15531
55	485	430	508	531	598	635	698	723	702	693	600	533	7136
57	423	374	446	471	536	575	636	661	642	631	540	471	6406
60	330	290	353	381	443	485	543	568	552	538	450	378	5311
65	177	152	198	231	288	335	388	413	402	383	300	223	3490
70	54	44	61	93	135	185	233	258	252	228	151	78	1772

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	962	883	980	990	1067	1097	1169	1198	1164	1158	1059	1008	962	1845	2825	3815	4882	5979	7148	8346	9510	10668	11727	12735
45	807	738	825	840	912	947	1014	1043	1014	1003	909	853	807	1545	2370	3210	4122	5069	6083	7126	8140	9143	10052	10905
50	652	593	670	690	757	797	859	888	864	848	759	698	652	1245	1915	2605	3362	4159	5018	5906	6770	7618	8377	9075
55	497	448	515	540	602	647	704	733	714	693	609	543	497	945	1460	2000	2602	3249	3953	4686	5400	6093	6702	7245
60	342	303	360	390	447	497	549	578	564	538	459	388	342	645	1005	1395	1842	2339	2888	3466	4030	4568	5027	5415
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	652	593	671	690	757	797	857	876	847	847	758	698	652	1245	1916	2606	3363	4160	5017	5893	6740	7587	8345	9043

(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 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