

Climatology of the United States No. 20

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801
www.ncdc.noaa.gov

Station: WAIMANALO EXP F 795.1, HI

1971-2000

COOP ID: 519523

Climate Division: HI 2

NWS Call Sign:

Elevation: 60 Feet

Lat: 21° 20N

Lon: 157° 43W

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	78.3	64.8	71.6	85	1970	18	74.0	1984	52	1998	31	68.8	1998	0	202	.0	30.9	31.0	.0	.0	.0
Feb	78.4	64.5	71.5	85+	1993	27	73.8	1988	52+	1981	10	69.2	1993	0	180	.0	28.1	28.3	.0	.0	.0
Mar	78.7	66.2	72.5	85	2001	4	74.8	1984	54	1993	14	70.3	1996	0	231	.0	30.9	31.0	.0	.0	.0
Apr	79.6	68.2	73.9	87	1992	28	75.4	1986	57	1973	7	72.3+	2000	0	267	.0	29.9	30.0	.0	.0	.0
May	81.1	69.4	75.3	86+	1992	31	77.0	1984	58	1995	1	72.6	1987	0	318	.0	31.0	31.0	.0	.0	.0
Jun	82.6	71.6	77.1	89	1983	28	78.4	1992	62	1997	2	75.7	1976	0	364	.0	30.0	30.0	.0	.0	.0
Jul	83.5	72.8	78.2	88+	1993	17	79.7	1984	67	1990	7	76.4	1976	0	407	.0	31.0	31.0	.0	.0	.0
Aug	84.4	73.5	79.0	89+	1998	12	80.1	1986	65	1984	4	77.4	1975	0	432	.0	31.0	31.0	.0	.0	.0
Sep	84.8	73.0	78.9	92	1972	16	80.5	1979	59	1992	30	77.7	1975	0	417	.1	30.0	30.0	.0	.0	.0
Oct	83.7	72.1	77.9	95	1972	14	79.0+	1996	59+	1993	30	76.2	1976	0	400	.1	31.0	31.0	.0	.0	.0
Nov	81.2	69.9	75.6	89+	1991	17	78.2	1991	57	1990	25	72.9	1976	0	317	.0	30.0	30.0	.0	.0	.0
Dec	79.3	66.8	73.1	86+	1980	25	74.9	1974	54+	1983	24	71.2+	1989	0	249	.0	31.0	31.0	.0	.0	.0
Ann	81.3	69.4	75.4	95	Oct 1972	14	80.5	Sep 1979	52+	Jan 1998	31	68.8	Jan 1998	0	3784	.2	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/normal/usnormals.html

Issue Date: May 2005

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1969-2001

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

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Climate Division: HI 2

NWS Call Sign:

Elevation: 60 Feet

Lat: 21°20N

Lon: 157°43W

Precipitation (inches)																								
	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution										
Month	Mean	Med-ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	6.75	4.61	11.15	1988	1	18.81	1982	1.56	1992	17.0	8.7	2.9	1.8	1.04	1.61	2.59	3.53	4.49	5.55	6.76	8.25	10.24	13.47	16.57
Feb	4.64	3.59	5.55	1985	14	15.73	1979	.20	1998	13.3	6.5	2.5	1.4	.38	.69	1.29	1.94	2.64	3.46	4.42	5.64	7.33	10.16	12.94
Mar	3.62	2.94	7.63	1991	20	9.20	1991	.75	1993	15.4	6.0	1.8	.9	.62	.93	1.46	1.96	2.47	3.02	3.65	4.42	5.44	7.10	8.68
Apr	3.18	2.68	6.40	1970	21	12.41	1989	.33	1990	15.3	6.2	1.7	.7	.47	.73	1.19	1.63	2.09	2.59	3.17	3.88	4.84	6.39	7.89
May	3.15	1.76	8.32	1981	7	13.41	1981	.22	2000	14.1	5.2	1.4	.7	.18	.36	.75	1.17	1.66	2.23	2.92	3.80	5.05	7.16	9.27
Jun	1.46	1.10	3.76	1971	16	5.15	1996	.15	1985	13.0	3.5	.4	.1	.17	.28	.49	.69	.91	1.15	1.43	1.78	2.26	3.04	3.80
Jul	1.61	1.28	2.00	1989	21	4.42	1993	.31	1979	15.2	5.2	.3	.1	.36	.51	.75	.96	1.17	1.40	1.65	1.96	2.36	2.99	3.60
Aug	1.48	1.28	2.62	1982	17	4.83	1982	.10	1984	13.4	3.9	.4	.2	.28	.41	.62	.82	1.03	1.25	1.50	1.80	2.20	2.85	3.46
Sep	2.04	1.70	2.52	1993	27	5.03	1993	.30	1984	13.0	5.3	.9	.3	.40	.59	.88	1.16	1.44	1.74	2.08	2.49	3.03	3.90	4.73
Oct	3.73	2.65	7.39	1978	31	11.03	1989	.92	1975	14.2	5.8	1.7	.8	.50	.80	1.33	1.85	2.39	3.00	3.70	4.56	5.72	7.62	9.46
Nov	5.56	4.28	6.26	1993	4	21.31	1996	.42	1994	17.4	8.1	2.7	1.4	.76	1.22	2.01	2.79	3.60	4.49	5.53	6.80	8.51	11.32	14.03
Dec	5.45	4.70	5.28	1987	12	16.16	1987	.32	1974	16.6	7.9	2.8	1.5	.57	.98	1.73	2.49	3.31	4.23	5.31	6.66	8.49	11.54	14.51
Ann	42.67	40.07	11.15	Jan 1988	1	21.31	Nov 1996	.10	Aug 1984	177.9	72.3	19.5	9.9	24.22	27.49	31.84	35.26	38.37	41.43	44.66	48.30	52.79	59.46	65.37

+ 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: 1969-2001

(3) Derived from 1971-2000 daily data

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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Station: WAIMANALO EXP F 795.1, HI

COOP ID: 519523

Climate Division: HI 2

NWS Call Sign:

Elevation: 60 Feet

Lat: 21°20N

Lon: 157°43W

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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

Complete documentation available from:

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Climatography of the United States

No. 20 1971-2000

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Climate Division: HI 2

NWS Call Sign:

Elevation: 60 Feet

Lat: 21° 20N

Lon: 157° 43W

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

Complete documentation available from:
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of the United States
No. 20
1971-2000**

Station: WAIMANALO EXP F 795.1, HI

COOP ID: 519523

Climate Division: HI 2 NWS Call Sign: Elevation: 60 Feet Lat: 21° 20N Lon: 157° 43W

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	0	0	0	0	0	0	0	0	0	0	0	0	0
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	1225	1104	1254	1257	1341	1354	1430	1455	1407	1423	1307	1272	15829
55	512	460	541	567	628	664	717	742	717	710	617	559	7434
57	450	404	479	507	566	604	655	680	657	648	557	497	6704
60	357	320	386	417	473	514	562	587	567	555	467	404	5609
65	202	180	231	267	318	364	407	432	417	400	317	249	3784
70	70	58	86	118	163	214	252	277	267	245	168	99	2017

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	975	910	1009	1018	1094	1118	1188	1212	1175	1178	1067	1026	975	1885	2894	3912	5006	6124	7312	8524	9699	10877	11944	12970
45	820	765	854	868	939	968	1033	1057	1025	1023	917	871	820	1585	2439	3307	4246	5214	6247	7304	8329	9352	10269	11140
50	665	620	699	718	784	818	878	902	875	868	767	716	665	1285	1984	2702	3486	4304	5182	6084	6959	7827	8594	9310
55	510	475	544	568	629	668	723	747	725	713	617	561	510	985	1529	2097	2726	3394	4117	4864	5589	6302	6919	7480
60	355	330	389	418	474	518	568	592	575	558	467	406	355	685	1074	1492	1966	2484	3052	3644	4219	4777	5244	5650
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	665	620	699	718	784	817	878	901	869	868	767	716	665	1285	1984	2702	3486	4303	5181	6082	6951	7819	8586	9302

(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.

Complete 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 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

c. Snow Tables

1. Cooperative Summary of the Day

d. Freeze Data Table

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

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