

I. Description - Annual/Seasonal Normals

The 1991-2020 U.S. Climate Normals are conventional 30-year normals of many weather and climate variables. Normals are organized into hourly, daily, monthly, seasonal and annual normals. This document describes the elements of the seasonal and annual normals. These observations are compiled from many surface weather station records, predominantly from National Weather Service (NWS) and Federal Aviation Administration stations at airports, the NWS Cooperative Observer Network, and other sources. For the first time, 1991-2020 normals include precipitation from the USDA Snow Telemetry (SNOTEL) network and the citizen science Community Collaborative Rain, Hail and Snow (CoCoRaHS) Network. These records were merged and then subjected to a suite of quality assurance reviews at NOAA's National Centers for Environmental Information (NCEI).

The 1991-2020 U.S. seasonal and annual normals provide a suite of descriptive statistics based on daily and monthly observations at more than 15,000 stations from across the United States and its Pacific and Caribbean territories that have at least precipitation normals, and more than 7300 have temperature normals. Statistics are provided as 30-year averages and frequencies of occurrence. At the annual scope, an additional set of statistics describing the seasonal cycle and its probabilities has also been provided.

Seasonal and annual normals are based on both monthly and daily observations of temperature and precipitation that in the end yield more than 500 different variables based on averages and statistics of both modified and raw values. Seasonal and annual normals are calculated directly from monthly normals. Statistics within a seasonal or annual context can go back to modified daily values, serially complete temperature time series, or threshold exceedance counts that are based on the raw temperature measurements. The numerous variables are based on each season and annual value having separate variable nomenclature. These are the prefixes for the variable names:

MAM - March, April, May (Spring)

JJA - June, July, August (Summer)

SON - September, October, November (Autumn)

DJF - December, January, February (Winter)

ANN - January to December (Annual)

The data for seasonal and annual normals are from the Global Historical Climatology Network (GHCN) Daily dataset (<https://www.ncdc.noaa.gov/ghcn-daily-description>), GHCN Monthly dataset (<https://www.ncdc.noaa.gov/ghcn-monthly>), and the North American monthly homogenized maximum and minimum data set (<https://www.ncei.noaa.gov/data/NorthAmerica>), all compiled at NCEI. Normals are “standard” above 80% data availability (24 of 30 month-years), and will be calculated with 30 years if the station has at least 10 years of valid observations (considered “representative”), with the remaining years estimated using surrounding stations with more complete values. If a station does not have reliable surrounding neighbors to fill its 30-year period, a normal is still calculated and is flagged as “provisional”. Below this 10-year criteria, temperature and precipitation averages will be estimated statistically from relationships with surrounding stations if at least two full years of data are available for all months. Observations for February 29 have been included in monthly averages and statistics.

II. Format/Element (Value) Definitions

(Note: the term ‘element’ is used throughout this document and refers to an individual meteorological / climatological measurement or statistical value such as temperature, precipitation, snowfall, etc.)

A. Initial section

Each record represents all selected elements available for a given station-month. The initial section of each record is ordered as follows with the following definitions:

STATION ID (11 characters) is the station identification code. Please see for a complete station metadata record the NCEI Historical Observing Metadata Repository at <https://www.ncdc.noaa.gov/homr/>.

STATION_NAME (max 50 characters) is the name of the station (usually city/airport name).

GEOGRAPHIC_LOCATION is the latitude (decimal degrees w/northern hemisphere values > 0, southern hemisphere values < 0), longitude (decimal degrees w/western hemisphere values < 0, eastern hemisphere values > 0) and elevation above mean sea level.

DATE there is no date field beyond the 3-letter season or annual code in the variable names.

B. Elements (values) and flags (attributes)

Following this initial section of the record, all selected elements and flags are given in the following order:

1st Element, Measurement Flag, Completeness Flag, Number of Years, 2nd Element, Measurement Flag, Completeness Flag, Number of Years, 3rd Element...etc., for all elements selected.

Element(s)/Value(s) is/are defined in **Table 2** below. Please note only elements selected by user will appear in the specific output.

Measurement Flag (Attribute) is defined in **Table 1** below

Completeness Flag (Attribute) is defined in **Table 1** below

Flags accompany every Normals value and indicate certain measurement conditions (if necessary only, blank otherwise) and the completeness of the data record used to compute each value, accounting for methodological differences for different product classes. The flag options are described in **Table 1** below. Due to methodological differences, the flags are applied somewhat differently between the temperature-based normals and the precipitation-based normals. For the precipitation-based normals, the following flags were assigned independently for each normals value reported based on number of years available for that individual calculation. For temperature-based normals, strong precedence is given to the monthly normals of maximum and minimum temperature or derived from the flags for these two variables.

Table 1 (Flags)

Measurement Flags:

- M Missing
- V Year-round risk of frost-freeze; "too cold to compute"
- W Not used
- X Nonzero value has rounded to zero
- Y Insufficient values to perform computation
- Z Computed valued created logical inconsistency with other values

Completeness Flags:

- S Standard - meets WMO standards for data availability for 24 or more years (missing months are filled with estimates based on surrounding stations)
- R Representative - meets WMO standards for data availability for 10 or more years (missing months are filled with estimates based on surrounding stations)
- P Provisional - meets WMO standards for data availability for 10 or more years (missing months cannot be filled due to lack of surrounding stations)
- E Estimated - meets WMO standards for data availability for 2 or more years for all months (nearby stations with standard normals are available to estimate normals statistically)
- Blank - the data value is reported as a special missing value such as -9999 when other values in the column are available

Table 2 (Elements/Values)

mam-tavg-normal	Long-term averages of spring average temperature
mam-tmax-normal	Long-term averages of spring maximum temperature
mam-tmin-normal	Long-term averages of spring minimum temperature
mam-dutr-normal	Long-term spring mean of daily temperature range
mam-cldd-base40	Long-term averages of spring cooling degree days with base 40F
mam-cldd-base45	Long-term averages of spring cooling degree days with base 45F
mam-cldd-base50	Long-term averages of spring cooling degree days with base 50F
mam-cldd-base55	Long-term averages of spring cooling degree days with base 55F
mam-cldd-base57	Long-term averages of spring cooling degree days with base 57F
mam-cldd-base60	Long-term averages of spring cooling degree days with base 60F
mam-cldd-base70	Long-term averages of spring cooling degree days with base 70F
mam-cldd-base72	Long-term averages of spring cooling degree days with base 72F
mam-cldd-normal	Long-term averages of spring cooling degree days with base 65F
mam-grdd-base40	Long-term averages of spring growing degree days with base 40F
mam-grdd-base45	Long-term averages of spring growing degree days with base 45F
mam-grdd-base50	Long-term averages of spring growing degree days with base 50F

mam-grdd-base55	Long-term averages of spring growing degree days with base 55F
mam-grdd-base57	Long-term averages of spring growing degree days with base 57F
mam-grdd-base60	Long-term averages of spring growing degree days with base 60F
mam-grdd-base65	Long-term averages of spring growing degree days with base 65F
mam-grdd-base70	Long-term averages of spring growing degree days with base 70F
mam-grdd-base72	Long-term averages of spring growing degree days with base 72F
mam-grdd-tb4886	Long-term avg's of spring growing degree days with base 48F limit 86F
mam-grdd-tb5086	Long-term avg's of spring growing degree days with base 50F limit 86F
mam-htdd-base40	Long-term averages of spring heating degree days with base 40F
mam-htdd-base45	Long-term averages of spring heating degree days with base 45F
mam-htdd-base50	Long-term averages of spring heating degree days with base 50F
mam-htdd-base55	Long-term averages of spring heating degree days with base 55F
mam-htdd-base57	Long-term averages of spring heating degree days with base 57F
mam-htdd-base60	Long-term averages of spring heating degree days with base 60F
mam-htdd-normal	Long-term averages of spring heating degree days with base 65F
mam-prcp-normal	Long-term averages of spring precipitation total
mam-prcp-avgnds-ge001hi	Spring number of days with precipitation >= 0.01 inches
mam-prcp-avgnds-ge010hi	Spring number of days with precipitation >= 0.10 inches
mam-prcp-avgnds-ge025hi	Spring number of days with precipitation >= 0.25 inches
mam-prcp-avgnds-ge050hi	Spring number of days with precipitation >= 0.50 inches
mam-prcp-avgnds-ge100hi	Spring number of days with precipitation >= 1.00 inches
mam-prcp-avgnds-ge200hi	Spring number of days with precipitation >= 2.00 inches
mam-prcp-avgnds-ge400hi	Spring number of days with precipitation >= 4.00 inches
mam-prcp-avgnds-ge600hi	Spring number of days with precipitation >= 6.00 inches
mam-snow-normal	Long-term averages of spring snowfall total
mam-snow-avgnds-ge001ti	Spring number of days with snowfall >= 0.1 inch
mam-snow-avgnds-ge010ti	Spring number of days with snowfall >= 1.0 inch
mam-snow-avgnds-ge020ti	Spring number of days with snowfall >= 2.0 inches
mam-snow-avgnds-ge030ti	Spring number of days with snowfall >= 3.0 inches
mam-snow-avgnds-ge040ti	Spring number of days with snowfall >= 4.0 inches
mam-snow-avgnds-ge050ti	Spring number of days with snowfall >= 5.0 inches
mam-snow-avgnds-ge100ti	Spring number of days with snowfall >= 10 inches
mam-snow-avgnds-ge200ti	Spring number of days with snowfall >= 20 inches
mam-snwd-avgnds-ge001wi	Spring number of days with snow depth >= 1 inch
mam-snwd-avgnds-ge002wi	Spring number of days with snow depth >= 2 inches
mam-snwd-avgnds-ge003wi	Spring number of days with snow depth >= 3 inches
mam-snwd-avgnds-ge004wi	Spring number of days with snow depth >= 4 inches
mam-snwd-avgnds-ge005wi	Spring number of days with snow depth >= 5 inches
mam-snwd-avgnds-ge010wi	Spring number of days with snow depth >= 10 inches
mam-snwd-avgnds-ge020wi	Spring number of days with snow depth >= 20 inches
mam-tmin-avgnds-lsth000	Spring number of days with minimum temperature <= 0F
mam-tmin-avgnds-lsth010	Spring number of days with minimum temperature <= 10F
mam-tmin-avgnds-lsth020	Spring number of days with minimum temperature <= 20F
mam-tmin-avgnds-lsth032	Spring number of days with minimum temperature <= 32F
mam-tmin-avgnds-lsth040	Spring number of days with minimum temperature <= 40F
mam-tmin-avgnds-lsth050	Spring number of days with minimum temperature <= 50F
mam-tmin-avgnds-lsth060	Spring number of days with minimum temperature <= 60F
mam-tmin-avgnds-lsth070	Spring number of days with minimum temperature <= 70F

mam-tmax-avgnds-grth032	Spring number of days with maximum temperature >= 32F
mam-tmax-avgnds-grth040	Spring number of days with maximum temperature >= 40F
mam-tmax-avgnds-grth050	Spring number of days with maximum temperature >= 50F
mam-tmax-avgnds-grth060	Spring number of days with maximum temperature >= 60F
mam-tmax-avgnds-grth070	Spring number of days with maximum temperature >= 70F
mam-tmax-avgnds-grth080	Spring number of days with maximum temperature >= 80F
mam-tmax-avgnds-grth090	Spring number of days with maximum temperature >= 90F
mam-tmax-avgnds-grth100	Spring number of days with maximum temperature >= 100F
mam-tmax-avgnds-lsth032	Spring number of days with maximum temperature <= 32F
jja-tavg-normal	Long-term averages of summer average temperature
jja-tmax-normal	Long-term averages of summer maximum temperature
jja-tmin-normal	Long-term averages of summer minimum temperature
jja-dutr-normal	Long-term summer mean of daily temperature range
jja-cldd-base40	Long-term averages of summer cooling degree days with base 40F
jja-cldd-base45	Long-term averages of summer cooling degree days with base 45F
jja-cldd-base50	Long-term averages of summer cooling degree days with base 50F
jja-cldd-base55	Long-term averages of summer cooling degree days with base 55F
jja-cldd-base57	Long-term averages of summer cooling degree days with base 57F
jja-cldd-base60	Long-term averages of summer cooling degree days with base 60F
jja-cldd-base70	Long-term averages of summer cooling degree days with base 70F
jja-cldd-base72	Long-term averages of summer cooling degree days with base 72F
jja-cldd-normal	Long-term averages of summer cooling degree days with base 65F
jja-grdd-base40	Long-term averages of summer growing degree days with base 40F
jja-grdd-base45	Long-term averages of summer growing degree days with base 45F
jja-grdd-base50	Long-term averages of summer growing degree days with base 50F
jja-grdd-base55	Long-term averages of summer growing degree days with base 55F
jja-grdd-base57	Long-term averages of summer growing degree days with base 57F
jja-grdd-base60	Long-term averages of summer growing degree days with base 60F
jja-grdd-base65	Long-term averages of summer growing degree days with base 65F
jja-grdd-base70	Long-term averages of summer growing degree days with base 70F
jja-grdd-base72	Long-term averages of summer growing degree days with base 72F
jja-grdd-tb4886	Long-term avg of summer growing degree days with base 48F limit 86F
jja-grdd-tb5086	Long-term avg of summer growing degree days with base 50F limit 86F
jja-htdd-base40	Long-term averages of summer heating degree days with base 40F
jja-htdd-base45	Long-term averages of summer heating degree days with base 45F
jja-htdd-base50	Long-term averages of summer heating degree days with base 50F
jja-htdd-base55	Long-term averages of summer heating degree days with base 55F
jja-htdd-base57	Long-term averages of summer heating degree days with base 57F
jja-htdd-base60	Long-term averages of summer heating degree days with base 60F
jja-htdd-normal	Long-term averages of summer heating degree days with base 65F
jja-prcp-normal	Long-term averages of summer precipitation total
jja-prcp-avgnds-ge001hi	Summer number of days with precipitation >= 0.01 inches
jja-prcp-avgnds-ge010hi	Summer number of days with precipitation >= 0.10 inches
jja-prcp-avgnds-ge025hi	Summer number of days with precipitation >= 0.25 inches
jja-prcp-avgnds-ge050hi	Summer number of days with precipitation >= 0.50 inches
jja-prcp-avgnds-ge100hi	Summer number of days with precipitation >= 1.00 inches
jja-prcp-avgnds-ge200hi	Summer number of days with precipitation >= 2.00 inches
jja-prcp-avgnds-ge400hi	Summer number of days with precipitation >= 4.00 inches

jja-prcp-avgnds-ge600hi	Summer number of days with precipitation >= 6.00 inches
jja-snow-normal	Long-term averages of summer snowfall total
jja-snow-avgnds-ge001ti	Summer number of days with snowfall >= 0.1 inch
jja-snow-avgnds-ge010ti	Summer number of days with snowfall >= 1.0 inch
jja-snow-avgnds-ge020ti	Summer number of days with snowfall >= 2.0 inches
jja-snow-avgnds-ge030ti	Summer number of days with snowfall >= 3.0 inches
jja-snow-avgnds-ge040ti	Summer number of days with snowfall >= 4.0 inches
jja-snow-avgnds-ge050ti	Summer number of days with snowfall >= 5.0 inches
jja-snow-avgnds-ge100ti	Summer number of days with snowfall >= 10 inches
jja-snow-avgnds-ge200ti	Summer number of days with snowfall >= 20 inches
jja-snwd-avgnds-ge001wi	Summer number of days with snow depth >= 1 inch
jja-snwd-avgnds-ge002wi	Summer number of days with snow depth >= 2 inches
jja-snwd-avgnds-ge003wi	Summer number of days with snow depth >= 3 inches
jja-snwd-avgnds-ge004wi	Summer number of days with snow depth >= 4 inches
jja-snwd-avgnds-ge005wi	Summer number of days with snow depth >= 5 inches
jja-snwd-avgnds-ge010wi	Summer number of days with snow depth >= 10 inches
jja-snwd-avgnds-ge020wi	Summer number of days with snow depth >= 20 inches
jja-tmin-avgnds-lsth000	Summer number of days with minimum temperature <= 0F
jja-tmin-avgnds-lsth010	Summer number of days with minimum temperature <= 10F
jja-tmin-avgnds-lsth020	Summer number of days with minimum temperature <= 20F
jja-tmin-avgnds-lsth032	Summer number of days with minimum temperature <= 32F
jja-tmin-avgnds-lsth040	Summer number of days with minimum temperature <= 40F
jja-tmin-avgnds-lsth050	Summer number of days with minimum temperature <= 50F
jja-tmin-avgnds-lsth060	Summer number of days with minimum temperature <= 60F
jja-tmin-avgnds-lsth070	Summer number of days with minimum temperature <= 70F
jja-tmax-avgnds-grth032	Summer number of days with maximum temperature >= 32F
jja-tmax-avgnds-grth040	Summer number of days with maximum temperature >= 40F
jja-tmax-avgnds-grth050	Summer number of days with maximum temperature >= 50F
jja-tmax-avgnds-grth060	Summer number of days with maximum temperature >= 60F
jja-tmax-avgnds-grth070	Summer number of days with maximum temperature >= 70F
jja-tmax-avgnds-grth080	Summer number of days with maximum temperature >= 80F
jja-tmax-avgnds-grth090	Summer number of days with maximum temperature >= 90F
jja-tmax-avgnds-grth100	Summer number of days with maximum temperature >= 100F
jja-tmax-avgnds-lsth032	Summer number of days with maximum temperature <= 32F
son-tavg-normal	Long-term averages of autumn average temperature
son-tmax-normal	Long-term averages of autumn maximum temperature
son-tmin-normal	Long-term averages of autumn minimum temperature
son-dutr-normal	Long-term autumn mean of daily temperature range
son-cldd-base40	Long-term averages of autumn cooling degree days with base 40F
son-cldd-base45	Long-term averages of autumn cooling degree days with base 45F
son-cldd-base50	Long-term averages of autumn cooling degree days with base 50F
son-cldd-base55	Long-term averages of autumn cooling degree days with base 55F
son-cldd-base57	Long-term averages of autumn cooling degree days with base 57F
son-cldd-base60	Long-term averages of autumn cooling degree days with base 60F
son-cldd-base70	Long-term averages of autumn cooling degree days with base 70F
son-cldd-base72	Long-term averages of autumn cooling degree days with base 72F
son-cldd-normal	Long-term averages of autumn cooling degree days with base 65F
son-grdd-base40	Long-term averages of autumn growing degree days with base 40F

son-grdd-base45	Long-term averages of autumn growing degree days with base 45F
son-grdd-base50	Long-term averages of autumn growing degree days with base 50F
son-grdd-base55	Long-term averages of autumn growing degree days with base 55F
son-grdd-base57	Long-term averages of autumn growing degree days with base 57F
son-grdd-base60	Long-term averages of autumn growing degree days with base 60F
son-grdd-base65	Long-term averages of autumn growing degree days with base 65F
son-grdd-base70	Long-term averages of autumn growing degree days with base 70F
son-grdd-base72	Long-term averages of autumn growing degree days with base 72F
son-grdd-tb4886	Long-term avg's of autumn growing degree days with base 48F limit 86F
son-grdd-tb5086	Long-term avg's of autumn growing degree days with base 50F limit 86F
son-htdd-base40	Long-term averages of autumn heating degree days with base 40F
son-htdd-base45	Long-term averages of autumn heating degree days with base 45F
son-htdd-base50	Long-term averages of autumn heating degree days with base 50F
son-htdd-base55	Long-term averages of autumn heating degree days with base 55F
son-htdd-base57	Long-term averages of autumn heating degree days with base 57F
son-htdd-base60	Long-term averages of autumn heating degree days with base 60F
son-htdd-normal	Long-term averages of autumn heating degree days with base 65F
son-prcp-normal	Long-term averages of autumn precipitation total
son-prcp-avgnds-ge001hi	Autumn number of days with precipitation >= 0.01 inches
son-prcp-avgnds-ge010hi	Autumn number of days with precipitation >= 0.10 inches
son-prcp-avgnds-ge025hi	Autumn number of days with precipitation >= 0.25 inches
son-prcp-avgnds-ge050hi	Autumn number of days with precipitation >= 0.50 inches
son-prcp-avgnds-ge100hi	Autumn number of days with precipitation >= 1.00 inches
son-prcp-avgnds-ge200hi	Autumn number of days with precipitation >= 2.00 inches
son-prcp-avgnds-ge400hi	Autumn number of days with precipitation >= 4.00 inches
son-prcp-avgnds-ge600hi	Autumn number of days with precipitation >= 6.00 inches
son-snow-normal	Long-term averages of autumn snowfall total
son-snow-avgnds-ge001ti	Autumn number of days with snowfall >= 0.1 inch
son-snow-avgnds-ge010ti	Autumn number of days with snowfall >= 1.0 inch
son-snow-avgnds-ge020ti	Autumn number of days with snowfall >= 2.0 inches
son-snow-avgnds-ge030ti	Autumn number of days with snowfall >= 3.0 inches
son-snow-avgnds-ge040ti	Autumn number of days with snowfall >= 4.0 inches
son-snow-avgnds-ge050ti	Autumn number of days with snowfall >= 5.0 inches
son-snow-avgnds-ge100ti	Autumn number of days with snowfall >= 10 inches
son-snow-avgnds-ge200ti	Autumn number of days with snowfall >= 20 inches
son-snwd-avgnds-ge001wi	Autumn number of days with snow depth >= 1 inch
son-snwd-avgnds-ge002wi	Autumn number of days with snow depth >= 2 inches
son-snwd-avgnds-ge003wi	Autumn number of days with snow depth >= 3 inches
son-snwd-avgnds-ge004wi	Autumn number of days with snow depth >= 4 inches
son-snwd-avgnds-ge005wi	Autumn number of days with snow depth >= 5 inches
son-snwd-avgnds-ge010wi	Autumn number of days with snow depth >= 10 inches
son-snwd-avgnds-ge020wi	Autumn number of days with snow depth >= 20 inches
son-tmin-avgnds-lsth000	Autumn number of days with minimum temperature <= 0F
son-tmin-avgnds-lsth010	Autumn number of days with minimum temperature <= 10F
son-tmin-avgnds-lsth020	Autumn number of days with minimum temperature <= 20F
son-tmin-avgnds-lsth032	Autumn number of days with minimum temperature <= 32F
son-tmin-avgnds-lsth040	Autumn number of days with minimum temperature <= 40F
son-tmin-avgnds-lsth050	Autumn number of days with minimum temperature <= 50F

son-tmin-avgnds-lsth060	Autumn number of days with minimum temperature <= 60F
son-tmin-avgnds-lsth070	Autumn number of days with minimum temperature <= 70F
son-tmax-avgnds-grth032	Autumn number of days with maximum temperature >= 32F
son-tmax-avgnds-grth040	Autumn number of days with maximum temperature >= 40F
son-tmax-avgnds-grth050	Autumn number of days with maximum temperature >= 50F
son-tmax-avgnds-grth060	Autumn number of days with maximum temperature >= 60F
son-tmax-avgnds-grth070	Autumn number of days with maximum temperature >= 70F
son-tmax-avgnds-grth080	Autumn number of days with maximum temperature >= 80F
son-tmax-avgnds-grth090	Autumn number of days with maximum temperature >= 90F
son-tmax-avgnds-grth100	Autumn number of days with maximum temperature >= 100F
son-tmax-avgnds-lsth032	Autumn number of days with maximum temperature <= 32F
djf-tavg-normal	Long-term averages of winter average temperature
djf-tmax-normal	Long-term averages of winter maximum temperature
djf-tmin-normal	Long-term averages of winter minimum temperature
djf-dutr-normal	Long-term winter mean of daily temperature range
djf-cldd-base40	Long-term averages of winter cooling degree days with base 40F
djf-cldd-base45	Long-term averages of winter cooling degree days with base 45F
djf-cldd-base50	Long-term averages of winter cooling degree days with base 50F
djf-cldd-base55	Long-term averages of winter cooling degree days with base 55F
djf-cldd-base57	Long-term averages of winter cooling degree days with base 57F
djf-cldd-base60	Long-term averages of winter cooling degree days with base 60F
djf-cldd-base70	Long-term averages of winter cooling degree days with base 70F
djf-cldd-base72	Long-term averages of winter cooling degree days with base 72F
djf-cldd-normal	Long-term averages of winter cooling degree days with base 65F
djf-grdd-base40	Long-term averages of winter growing degree days with base 40F
djf-grdd-base45	Long-term averages of winter growing degree days with base 45F
djf-grdd-base50	Long-term averages of winter growing degree days with base 50F
djf-grdd-base55	Long-term averages of winter growing degree days with base 55F
djf-grdd-base57	Long-term averages of winter growing degree days with base 57F
djf-grdd-base60	Long-term averages of winter growing degree days with base 60F
djf-grdd-base65	Long-term averages of winter growing degree days with base 65F
djf-grdd-base70	Long-term averages of winter growing degree days with base 70F
djf-grdd-base72	Long-term averages of winter growing degree days with base 72F
djf-grdd-tb4886	Long-term avg's of winter growing degree days with base 48F limit 86F
djf-grdd-tb5086	Long-term avg's of winter growing degree days with base 50F limit 86F
djf-htdd-base40	Long-term averages of winter heating degree days with base 40F
djf-htdd-base45	Long-term averages of winter heating degree days with base 45F
djf-htdd-base50	Long-term averages of winter heating degree days with base 50F
djf-htdd-base55	Long-term averages of winter heating degree days with base 55F
djf-htdd-base57	Long-term averages of winter heating degree days with base 57F
djf-htdd-base60	Long-term averages of winter heating degree days with base 60F
djf-htdd-normal	Long-term averages of winter heating degree days with base 65F
djf-prcp-normal	Long-term averages of winter precipitation total
djf-prcp-avgnds-ge001hi	Winter number of days with precipitation >= 0.01 inches
djf-prcp-avgnds-ge010hi	Winter number of days with precipitation >= 0.10 inches
djf-prcp-avgnds-ge025hi	Winter number of days with precipitation >= 0.25 inches
djf-prcp-avgnds-ge050hi	Winter number of days with precipitation >= 0.50 inches
djf-prcp-avgnds-ge100hi	Winter number of days with precipitation >= 1.00 inches

djf-prcp-avgnds-ge200hi	Winter number of days with precipitation >= 2.00 inches
djf-prcp-avgnds-ge400hi	Winter number of days with precipitation >= 4.00 inches
djf-prcp-avgnds-ge600hi	Winter number of days with precipitation >= 6.00 inches
djf-snow-normal	Long-term averages of winter snowfall total
djf-snow-avgnds-ge001ti	Winter number of days with snowfall >= 0.1 inch
djf-snow-avgnds-ge010ti	Winter number of days with snowfall >= 1.0 inch
djf-snow-avgnds-ge020ti	Winter number of days with snowfall >= 2.0 inches
djf-snow-avgnds-ge030ti	Winter number of days with snowfall >= 3.0 inches
djf-snow-avgnds-ge040ti	Winter number of days with snowfall >= 4.0 inches
djf-snow-avgnds-ge050ti	Winter number of days with snowfall >= 5.0 inches
djf-snow-avgnds-ge100ti	Winter number of days with snowfall >= 10 inches
djf-snow-avgnds-ge200ti	Winter number of days with snowfall >= 20 inches
djf-snwd-avgnds-ge001wi	Winter number of days with snow depth >= 1 inch
djf-snwd-avgnds-ge002wi	Winter number of days with snow depth >= 2 inches
djf-snwd-avgnds-ge003wi	Winter number of days with snow depth >= 3 inches
djf-snwd-avgnds-ge004wi	Winter number of days with snow depth >= 4 inches
djf-snwd-avgnds-ge005wi	Winter number of days with snow depth >= 5 inches
djf-snwd-avgnds-ge010wi	Winter number of days with snow depth >= 10 inches
djf-snwd-avgnds-ge020wi	Winter number of days with snow depth >= 20 inches
djf-tmin-avgnds-lsth000	Winter number of days with minimum temperature <= 0F
djf-tmin-avgnds-lsth010	Winter number of days with minimum temperature <= 10F
djf-tmin-avgnds-lsth020	Winter number of days with minimum temperature <= 20F
djf-tmin-avgnds-lsth032	Winter number of days with minimum temperature <= 32F
djf-tmin-avgnds-lsth040	Winter number of days with minimum temperature <= 40F
djf-tmin-avgnds-lsth050	Winter number of days with minimum temperature <= 50F
djf-tmin-avgnds-lsth060	Winter number of days with minimum temperature <= 60F
djf-tmin-avgnds-lsth070	Winter number of days with minimum temperature <= 70F
djf-tmax-avgnds-grth032	Winter number of days with maximum temperature >= 32F
djf-tmax-avgnds-grth040	Winter number of days with maximum temperature >= 40F
djf-tmax-avgnds-grth050	Winter number of days with maximum temperature >= 50F
djf-tmax-avgnds-grth060	Winter number of days with maximum temperature >= 60F
djf-tmax-avgnds-grth070	Winter number of days with maximum temperature >= 70F
djf-tmax-avgnds-grth080	Winter number of days with maximum temperature >= 80F
djf-tmax-avgnds-grth090	Winter number of days with maximum temperature >= 90F
djf-tmax-avgnds-grth100	Winter number of days with maximum temperature >= 100F
djf-tmax-avgnds-lsth032	Winter number of days with maximum temperature <= 32F
ann-tavg-normal	Long-term averages of annual average temperature
ann-tmax-normal	Long-term averages of annual maximum temperature
ann-tmin-normal	Long-term averages of annual minimum temperature
ann-dutr-normal	Long-term annual mean of daily temperature range
ann-cldd-base40	Long-term averages of annual cooling degree days with base 40F
ann-cldd-base45	Long-term averages of annual cooling degree days with base 45F
ann-cldd-base50	Long-term averages of annual cooling degree days with base 50F
ann-cldd-base55	Long-term averages of annual cooling degree days with base 55F
ann-cldd-base57	Long-term averages of annual cooling degree days with base 57F
ann-cldd-base60	Long-term averages of annual cooling degree days with base 60F
ann-cldd-base70	Long-term averages of annual cooling degree days with base 70F
ann-cldd-base72	Long-term averages of annual cooling degree days with base 72F

ann-cldd-normal	Long-term averages of annual cooling degree days with base 65F
ann-grdd-base40	Long-term averages of annual growing degree days with base 40F
ann-grdd-base45	Long-term averages of annual growing degree days with base 45F
ann-grdd-base50	Long-term averages of annual growing degree days with base 50F
ann-grdd-base55	Long-term averages of annual growing degree days with base 55F
ann-grdd-base57	Long-term averages of annual growing degree days with base 57F
ann-grdd-base60	Long-term averages of annual growing degree days with base 60F
ann-grdd-base65	Long-term averages of annual growing degree days with base 65F
ann-grdd-base70	Long-term averages of annual growing degree days with base 70F
ann-grdd-base72	Long-term averages of annual growing degree days with base 72F
ann-grdd-tb4886	Long-term avg's of annual growing degree days with base 48F limit 86F
ann-grdd-tb5086	Long-term avg's of annual growing degree days with base 50F limit 86F
ann-htdd-base40	Long-term averages of annual heating degree days with base 40F
ann-htdd-base45	Long-term averages of annual heating degree days with base 45F
ann-htdd-base50	Long-term averages of annual heating degree days with base 50F
ann-htdd-base55	Long-term averages of annual heating degree days with base 55F
ann-htdd-base57	Long-term averages of annual heating degree days with base 57F
ann-htdd-base60	Long-term averages of annual heating degree days with base 60F
ann-htdd-normal	Long-term averages of annual heating degree days with base 65F
ann-prcp-normal	Long-term averages of annual precipitation total
ann-prcp-avgnds-ge001hi	Annual number of days with precipitation >= 0.01 inches
ann-prcp-avgnds-ge010hi	Annual number of days with precipitation >= 0.10 inches
ann-prcp-avgnds-ge025hi	Annual number of days with precipitation >= 0.25 inches
ann-prcp-avgnds-ge050hi	Annual number of days with precipitation >= 0.50 inches
ann-prcp-avgnds-ge100hi	Annual number of days with precipitation >= 1.00 inches
ann-prcp-avgnds-ge200hi	Annual number of days with precipitation >= 2.00 inches
ann-prcp-avgnds-ge400hi	Annual number of days with precipitation >= 4.00 inches
ann-prcp-avgnds-ge600hi	Annual number of days with precipitation >= 6.00 inches
ann-snow-normal	Long-term averages of annual snowfall total
ann-snow-avgnds-ge001ti	Annual number of days with snowfall >= 0.1 inch
ann-snow-avgnds-ge010ti	Annual number of days with snowfall >= 1.0 inch
ann-snow-avgnds-ge020ti	Annual number of days with snowfall >= 2.0 inches
ann-snow-avgnds-ge030ti	Annual number of days with snowfall >= 3.0 inches
ann-snow-avgnds-ge040ti	Annual number of days with snowfall >= 4.0 inches
ann-snow-avgnds-ge050ti	Annual number of days with snowfall >= 5.0 inches
ann-snow-avgnds-ge100ti	Annual number of days with snowfall >= 10 inches
ann-snow-avgnds-ge200ti	Annual number of days with snowfall >= 20 inches
ann-snwd-avgnds-ge001wi	Annual number of days with snow depth >= 1 inch
ann-snwd-avgnds-ge002wi	Annual number of days with snow depth >= 2 inches
ann-snwd-avgnds-ge003wi	Annual number of days with snow depth >= 3 inches
ann-snwd-avgnds-ge004wi	Annual number of days with snow depth >= 4 inches
ann-snwd-avgnds-ge005wi	Annual number of days with snow depth >= 5 inches
ann-snwd-avgnds-ge010wi	Annual number of days with snow depth >= 10 inches
ann-snwd-avgnds-ge020wi	Annual number of days with snow depth >= 20 inches
ann-tmin-avgnds-lsth000	Annual number of days with minimum temperature <= 0F
ann-tmin-avgnds-lsth010	Annual number of days with minimum temperature <= 10F
ann-tmin-avgnds-lsth020	Annual number of days with minimum temperature <= 20F
ann-tmin-avgnds-lsth032	Annual number of days with minimum temperature <= 32F

ann-tmin-avgnds-lsth040
ann-tmin-avgnds-lsth050
ann-tmin-avgnds-lsth060
ann-tmin-avgnds-lsth070
ann-tmax-avgnds-grth032
ann-tmax-avgnds-grth040
ann-tmax-avgnds-grth050
ann-tmax-avgnds-grth060
ann-tmax-avgnds-grth070
ann-tmax-avgnds-grth080
ann-tmax-avgnds-grth090
ann-tmax-avgnds-grth100
ann-tmax-avgnds-lsth032
ann-tmin-prbfst-t16fp10
ann-tmin-prbfst-t16fp20
ann-tmin-prbfst-t16fp30
ann-tmin-prbfst-t16fp40
ann-tmin-prbfst-t16fp50
ann-tmin-prbfst-t16fp60
ann-tmin-prbfst-t16fp70
ann-tmin-prbfst-t16fp80
ann-tmin-prbfst-t16fp90
ann-tmin-prbfst-t20fp10
ann-tmin-prbfst-t20fp20
ann-tmin-prbfst-t20fp30
ann-tmin-prbfst-t20fp40
ann-tmin-prbfst-t20fp50
ann-tmin-prbfst-t20fp60
ann-tmin-prbfst-t20fp70
ann-tmin-prbfst-t20fp80
ann-tmin-prbfst-t20fp90
ann-tmin-prbfst-t24fp10
ann-tmin-prbfst-t24fp20
ann-tmin-prbfst-t24fp30
ann-tmin-prbfst-t24fp40
ann-tmin-prbfst-t24fp50
ann-tmin-prbfst-t24fp60
ann-tmin-prbfst-t24fp70
ann-tmin-prbfst-t24fp80
ann-tmin-prbfst-t24fp90
ann-tmin-prbfst-t28fp10
ann-tmin-prbfst-t28fp20
ann-tmin-prbfst-t28fp30
ann-tmin-prbfst-t28fp40
ann-tmin-prbfst-t28fp50
ann-tmin-prbfst-t28fp60
ann-tmin-prbfst-t28fp70
ann-tmin-prbfst-t28fp80

Annual number of days with minimum temperature <= 40F
Annual number of days with minimum temperature <= 50F
Annual number of days with minimum temperature <= 60F
Annual number of days with minimum temperature <= 70F
Annual number of days with maximum temperature >= 32F
Annual number of days with maximum temperature >= 40F
Annual number of days with maximum temperature >= 50F
Annual number of days with maximum temperature >= 60F
Annual number of days with maximum temperature >= 70F
Annual number of days with maximum temperature >= 80F
Annual number of days with maximum temperature >= 90F
Annual number of days with maximum temperature >= 100F
Annual number of days with maximum temperature <= 32F
10% probability date of first 16F occurrence or earlier
20% probability date of first 16F occurrence or earlier
30% probability date of first 16F occurrence or earlier
40% probability date of first 16F occurrence or earlier
50% probability date of first 16F occurrence or earlier
60% probability date of first 16F occurrence or earlier
70% probability date of first 16F occurrence or earlier
80% probability date of first 16F occurrence or earlier
90% probability date of first 16F occurrence or earlier
10% probability date of first 20F occurrence or earlier
20% probability date of first 20F occurrence or earlier
30% probability date of first 20F occurrence or earlier
40% probability date of first 20F occurrence or earlier
50% probability date of first 20F occurrence or earlier
60% probability date of first 20F occurrence or earlier
70% probability date of first 20F occurrence or earlier
80% probability date of first 20F occurrence or earlier
90% probability date of first 20F occurrence or earlier
10% probability date of first 24F occurrence or earlier
20% probability date of first 24F occurrence or earlier
30% probability date of first 24F occurrence or earlier
40% probability date of first 24F occurrence or earlier
50% probability date of first 24F occurrence or earlier
60% probability date of first 24F occurrence or earlier
70% probability date of first 24F occurrence or earlier
80% probability date of first 24F occurrence or earlier
90% probability date of first 24F occurrence or earlier
10% probability date of first 28F occurrence or earlier
20% probability date of first 28F occurrence or earlier
30% probability date of first 28F occurrence or earlier
40% probability date of first 28F occurrence or earlier
50% probability date of first 28F occurrence or earlier
60% probability date of first 28F occurrence or earlier
70% probability date of first 28F occurrence or earlier
80% probability date of first 28F occurrence or earlier

III. Additional Information

A. Units

Degrees Fahrenheit to the nearest tenth (or Celsius if user specifies metric output option) for maximum, minimum, and average air temperatures, heating and cooling degree day normals, and standard deviations, e.g., 70.3.

Tenths of days for the number of days per month above or below certain threshold, such as days above 90 °F, e.g., 25.6 days.

Inches or millimeters for average monthly/seasonal/annual precipitation, month-to-date/year-to-date precipitation, and percentiles of precipitation days depending on user specification between standard or metric units.

Inches or millimeters for average monthly/seasonal/annual snowfall, month-to-date/year-to-date snowfall, and percentiles of snowfall days depending on user specification between standard or metric units.

Inches or millimeters for percentiles of snow depth days depending on user specification between standard or metric units.

Tenths of percent for probabilities of temperature, precipitation, snowfall, or snow depth exceeding a specific threshold, as well as cloud and wind percentages, e.g., 20.7 F.

B. Special values

-9999: missing or insufficient data (*.csv data)

blank: missing or insufficient data (pdf only)

C. Summary

1991-2020 U.S. Climate Normals averages, percentiles, and frequencies of occurrence of the above at monthly time scales are available at more than 15,000 locations for precipitation and more than 7,300 locations for temperature in the U.S. and its territories. Seasonal and annual normals summarize conditions overall for a location. For hourly, daily, and monthly values, please use the normals products created for those timescales.

For more detailed information, view complete documentation of normals calculations are at:

https://www.ncei.noaa.gov/data/normals-annualseasonal/1991-2020/doc/Normals_Calculation_Methodology_2020.pdf

For information on reading archive and access *.csv file versions of normals:

https://www.ncei.noaa.gov/data/normals-annualseasonal/1991-2020/doc/Readme_By-Variable_By-Station_Normals_Files.txt