1981 – 2010 Monthly Normals Documentation

I. Description

The 1981-2010 Normals comprise all climate normals using the thirty year period of temperature, degree days, precipitation, snowfall, snow depth, wind, etc. Data are organized into hourly, daily, monthly, seasonal and annual. This document describes the elements and layout of the Monthly Normals which are derived from a composite of climate records from numerous sources that were merged and then subjected to a suite of quality assurance reviews.

II. Format/Element (Value) Definitions

(Note: the term 'element' is used throughout this documentation and refers to an individual meteorological/climatological measurement or statistical value such as temperature, precipitation (amount), number of days of snowfall >= 3 inches, etc.)

A. Initial section

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

STATION (17 characters) is the station identification code. Please see

ftp://ftp.ncdc.noaa.gov/pub/data/normals/1981-2010/station-inventories/

for a complete list of stations and their metadata.

STATION_NAME (max 50 characters) is the name of the station (usually city/airport name). This is an optional field on CSV or ASCII text output.

GEOGRAPHIC_LOCATION (31 characters) is the latitude (decimated degrees w/northern hemisphere values > 0, southern hemisphere values < 0), longitude (decimated degrees w/western hemisphere values < 0, eastern hemisphere values > 0) and elevation above mean sea level. This is an optional field given in thousandths of meters on CSV or ASCII text output and included on PDF output in hundredths of feet.

DATE is the year of the record (4 digits) followed by month (2 digits) and day (2 digits). Note: Day will always be coded as 01 (data values represent a complete month).

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 |Completeness Flag | 2nd Element | Completeness Flag| 3rd Element…etc., for all elements selected.

Elements/values are defined in Table 2 below. Please note only elements selected by user will appear in the specific output.

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

Flags accompany every Normals value and indicate the completeness of the data record used to compute each value, accounting for methodological differences for different product classes. There are six flag options described generally 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 and hourly 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 (CompletenessFlag/Attribute)

C = complete (all 30 years used)
S = standard (no more than 5 years missing and no more than 3 consecutive
    years missing among the sufficiently complete years)
R = representative (observed record utilized incomplete, but value was scaled
    or based on filled values to be representative of the full period of record)
P = provisional (at least 10 years used, but not sufficiently complete to be
    labeled as standard or representative). Also used for parameter values on
    February 29 as well as for interpolated daily precipitation, snowfall, and
    snow depth percentiles.
Q = quasi-normal (at least 2 years per month, but not sufficiently complete to
    be labeled as provisional or any other higher flag code. The associated
    value was computed using a pseudonormals approach or derived from monthly
    pseudonormals.
Blank = the data value is reported as a special value such as 9999 (see III. Additional Information, Section B below for more information on Special Values)

Note: Flags Q and R are not applicable for hourly normals. Flags Q and R also aren't applicable to average number of days with different precipitation, snowfall, and snow depth threshold exceedance; precipitation/snowfall/snow probabilities of occurrence; and daily precipitation/snowfall/snow depth percentiles. Further, Q flags are not applicable for standard deviations.

Table 2 (Elements/Values)

mly-cldd-base45	Long-term averages of monthly cooling degree days with base 45F
mly-cldd-base50	Long-term averages of monthly cooling degree days with base 50F
mly-cldd-base55	Long-term averages of monthly cooling degree days with base 55F
mly-cldd-base57	Long-term averages of monthly cooling degree days with base 57F
mly-cldd-base60	Long-term averages of monthly cooling degree days with base 60F
mly-cldd-base70	Long-term averages of monthly cooling degree days with base 70F
mly-cldd-base72	Long-term averages of monthly cooling degree days with base 72F
mly-cldd-normal	Long-term averages of monthly cooling degree days with base 65F
mly-dutr-normal	Long-term averages of monthly diurnal temperature range
mly-dutr-stddev	Long-term standard deviations of monthly diurnal temperature range
mly-htdd-base40	Long-term averages of monthly heating degree days with base 40F
mly-htdd-base45	Long-term averages of monthly heating degree days with base 45F
mly-htdd-base50	Long-term averages of monthly heating degree days with base 50F
mly-htdd-base55	Long-term averages of monthly heating degree days with base 55F
mly-htdd-base57	Long-term averages of monthly heating degree days with base 57F
mly-htdd-base60	Long-term averages of monthly heating degree days with base 60F
mly-htdd-normal	Long-term averages of monthly heating degree days with base 65F
mly-prcp-25pctl	25th percentiles of monthly precipitation totals
mly-prcp-50pctl	50th percentiles of monthly precipitation totals
mly-prcp-75pctl	75th percentiles of monthly precipitation totals
mly-prcp-avgnds-ge001hi	Long-term averages of number of days per month with precipitation >= 0.01 inches
mly-prcp-avgnds-ge010hi	Long-term averages of number of days per month with precipitation >= 0.10 inches
mly-prcp-avgnds-ge050hi	Long-term averages of number of days per month with precipitation >= 0.50 inches
mly-prcp-avgnds-ge100hi	Long-term averages of number of days per month with precipitation >= 1.00 inches
mly-prcp-normal	Long-term averages of monthly precipitation totals
mly-snow-25pctl	25th percentiles of monthly snowfall totals
mly-snow-50pctl	50th percentiles of monthly snowfall totals
mly-snow-75pctl	75th percentiles of monthly snowfall totals
mly-snow-avgnds-ge001ti	Long-term averages of number of days per month with Snowfall >= 0.1 inches
mly-snow-avgnds-ge010ti	Long-term averages of number of days per month with Snowfall >= 1.0 inches
mly-snow-avgnds-ge030ti	Long-term averages of number of days per month with Snowfall >= 3.0 inches
mly-snow-avgnds-ge050ti	Long-term averages of number of days per month with Snowfall >= 5.0 inches
mly-snow-avgnds-ge100ti	Long-term averages of number of days per month with Snowfall >= 10.0 inches
mly-snow-normal	Long-term averages of monthly snowfall totals
mly-snwd-avgnds-	Long-term averages of number of days per month with snow

ge001wi	depth >= 1 inch
mly-snwd-avgnds-ge003wi	Long-term averages of number of days per month with snow depth >= 3 inches
mly-snwd-avgnds-ge005wi	Long-term averages of number of days per month with snow depth >= 5 inches
mly-snwd-avgnds-ge010wi	Long-term averages of number of days per month with snow depth >= 10 inches
mly-tavg-normal	Long-term averages of monthly average temperature
mly-tavg-stddev	Long-term standard deviations of monthly average temperature
mly-tmax-avgnds-grth040	Long-term average number of days per month where tmax is greater than or equal to 40F
mly-tmax-avgnds-grth050	Long-term average number of days per month where tmax is greater than or equal to 50F
mly-tmax-avgnds-grth060	Long-term average number of days per month where tmax is greater than or equal to 60F
mly-tmax-avgnds-grth070	Long-term average number of days per month where tmax is greater than or equal to 70F
mly-tmax-avgnds-grth080	Long-term average number of days per month where tmax is greater than or equal to 80F
mly-tmax-avgnds-grth090	Long-term average number of days per month where tmax is greater than or equal to 90F
mly-tmax-avgnds-grth100	Long-term average number of days per month where tmax is greater than or equal to 100F
mly-tmax-avgnds-lsth032	Long-term average number of days per month where tmax is less than or equal to 32F
mly-tmax-normal	Long-term averages of monthly maximum temperature
mly-tmax-stddev	Long-term standard deviations of monthly maximum temperature
mly-tmin-avgnds-lsth000	Long-term average number of days per month where tmin is less than or equal to 0F
mly-tmin-avgnds-lsth010	Long-term average number of days per month where tmin is less than or equal to 10F
mly-tmin-avgnds-lsth020	Long-term average number of days per month where tmin is less than or equal to 20F
mly-tmin-avgnds-lsth032	Long-term average number of days per month where tmin is less than or equal to 32F
mly-tmin-avgnds-lsth040	Long-term average number of days per month where tmin is less than or equal to 40F
mly-tmin-avgnds-lsth050	Long-term average number of days per month where tmin is less than or equal to 50F
mly-tmin-avgnds-lsth060	Long-term average number of days per month where tmin is less than or equal to 60F
mly-tmin-avgnds-lsth070	Long-term average number of days per month where tmin is less than or equal to 70F
mly-tmin-normal	Long-term averages of monthly minimum temperature
mly-tmin-stddev	Long-term standard deviations of monthly minimum temperature
mtd-prcp-normal	Long-term average month-to-date precipitation totals
mtd-snow-normal	Long-term average month-to-date snowfall totals

III. Additional Information

A.   Units

Degrees Fahrenheit or Celsius for maximum, minimum, average, dew point, heat index, wind chill, and air temperature normals and standard deviations depending on user's preference between standard or metric output.

Days for the number of days per month above or below certain threshold, such as days above 90F.

Whole degrees days for heating and cooling degree days (Fahrenheit base).

Inches or millimeters for average monthly/seasonal/annual precipitation, month-to-date/year-to-date precipitation, and percentiles of precipitation depending on user's preference between standard or metric output.

Inches or millimeters for average monthly/seasonal/annual snowfall, month-to-date/year-to-date snowfall, and percentiles of snowfall depending on user's preference between standard or metric output.

Inches or millimeters for percentiles of snow depth depending on user's preference between standard or metric output.

Percent for probabilities of precipitation, snowfall, or snow depth exceeding a specific threshold, as well as cloud and wind percentages.

Degree hours for heating and cooling degree hours.

Millibars/HectoPascals or Inches of Mercury for mean sea level pressure normals depending on user's preference between standard or metric output.

Percent for prevailing and secondary wind direction percentages.

Prevailing and secondary wind directions are represented by 8 values:
   1=N, 2=NE, 3=E, 4=SE, 5=S, 6=SW, 7=W, 8=NW

Miles per hour or meters per second for wind speeds and vector magnitudes depending on user's preference between standard or metric output.

Special values

-9999: missing or insufficient data (text data)
-7777: a non-zero value that would round to zero

-6666: parameter undefined; insufficient occurrences to compute
-4444: year-round risk of frost-freeze
blank: missing or insufficient data (pdf only)

B.   For further information

For more detailed information, view complete documentation at:
http://www1.ncdc.noaa.gov/pub/data/normals/1981-2010/readme.txt.

Summary Of Monthly Normals (PDF Version)

Data for the Summary of Monthly Normals include temperature and precipitation related long-term means and standard deviations using the specific 30 year period of 1981 through 2010. Data are broken down into monthly categories and summarized into annual values.

The document consists of up to 4 pages with temperature/precipitation/snowfall and degree day variables (some pages will not be included if data is not available). Station identification information is given at the top of each page.

Temperature page: All temperature values are provided in degrees Fahrenheit and the page is divided into four broad headings: Mean, Cooling Degree Days, Heating Degree Days or Mean Number of Days. Each heading is further divided into smaller columns below it for specific observational elements as defined below.

Mean:
Month: A value for the specific month is given (i.e. 1=January, 2=February, etc.) The summations of all months (i.e. annual values) are labeled as Summary. These labels apply across the entire row into the other headings.
Daily Max: Daily maximum temperature
Daily Min: Daily minimum temperature
Mean: Daily mean temperature
Long Term Max Std. Dev.: Standard deviation of daily maximum temperature
Long Term Min Std. Dev. : Standard deviation of daily minimum temperature
Long Term Avg. Std. Dev.: Standard deviation of daily mean temperature

Cooling Degree Days:
55: Mean number of base 55F cooling degree days for the month/year
57: Mean number of base 57F cooling degree days for the month/year
60: Mean number of base 60F cooling degree days for the month/year
65: Mean number of base 65F cooling degree days for the month/year
70: Mean number of base 70F cooling degree days for the month/year
72: Mean number of base 72F cooling degree days for the month/year

Heating Degree Days:
55: Mean number of base 55F heating degree days for the month/year
57: Mean number of base 57F heating degree days for the month/year
60: Mean number of base 60F heating degree days for the month/year
65: Mean number of base 65F heating degree days for the month/year

Mean Number of Days:
Max>=100: Mean number of days that the maximum temperature is equal to or greater than 100 F

Max>=90: Mean number of days that the maximum temperature is equal to or greater than 90 F

Max>=50: Mean number of days that the maximum temperature is equal to or greater than 50 F

Max <=32: Mean number of days that the maximum temperature is equal to or less than 32 F

Min <=32: Mean number of days that the minimum temperature is equal to or less than 32 F

Min <=0: Mean number of days that the minimum temperature is equal to or less than 0 F

Precipitation page: All precipitation values are provided in inches (either tenths or hundredths) and the page is divided into two broad headings: Precipitation or Snow. Each heading is further divided into smaller columns below it for specific observational elements as defined below.

Precipitation section (summation):

Month: A value for the specific month is given (i.e. 1=January, 2=February, etc.). The summations of all months (i.e. annual values) are labeled as Summary. These labels apply across the entire row into the other headings.

Mean: The mean monthly total precipitation in hundredths of inches. The summary row at the bottom gives the annual total.

Mean Number of Days: The mean number of days per month/year that daily precipitation equals or exceeds specific threshold amounts.

>=0.01: Mean number of days that precipitation daily totals equal or exceed 0.01 inches for the month/year

>=0.10: Mean number of days that precipitation daily totals equal or exceed 0.10 inches for the month/year

>=0.50: Mean number of days that precipitation daily totals equal or exceed 0.50 inches for the month/year

>=1.00: Mean number of days that precipitation daily totals equal or exceed 1.00 inches for the month/year

Precipitation Probabilities: Probability levels that the monthly/annual precipitation amounts will be equal or less than the indicated amounts as derived from the incomplete gamma distribution.

.25: Probability (expressed as a percentage) that the monthly/annual precipitation total will be equal to or less than indicated amount.

.50: Probability (expressed as a percentage) that the monthly/annual precipitation total will be equal to or less than indicated amount.

.75: Probability (expressed as a percentage) that the monthly/annual precipitation total will be equal to or less than indicated amount.

@ Denotes mean number of days greater than 0 but less than 0.05; or insufficient data for calculation (if only @ values appear, page will be omitted).

Snow section (summation):

Mean: The mean snowfall total for the month/year to the nearest tenth of an inch. The summary row at the bottom gives the annual total.

Mean Number of Snowfall Days: The mean number of days per month/year that the daily snowfall total equals or exceeds specific threshold amounts.

>=0.1: Mean number of days that snowfall daily totals equal or exceed 0.1 inches for the month/year
>=1.0: Mean number of days that snowfall daily totals equal or exceed 1.0 inch for the month/year
>=3.0: Mean number of days that snowfall daily totals equal or exceed 3.0 inches for the month/year
>=5.0: Mean number of days that snowfall daily totals equal or exceed 5.0 inches for the month/year
>=10.0: Mean number of days that snowfall daily totals equal or exceed 10.0 inches for the month/year

Mean Number of Snow Depth Days: The mean number of days per month/year that the daily snow depth total equals or exceeds for specific threshold amounts.

>=5.0: Mean number of days that daily snow depth equals or exceeds 5.0 inches for the month/year
>=10.0: Mean number of days that daily snow depth equals or exceeds 10.0 inches for the month/year

Snowfall Probabilities: Probability levels that the monthly/annual snowfall totals will be equal or less than the indicated amounts as derived from the incomplete gamma distribution.

.25: Probability (expressed as a percentage) that the monthly/annual snowfall total will be equal to or less than indicated amount.
.50: Probability (expressed as a percentage) that the monthly/annual snowfall total will be equal to or less than indicated amount.

.75: Probability (expressed as a percentage) that the monthly/annual snowfall total will be equal to or less than indicated amount.