

Hourly Precipitation Data Documentation (text and csv version)

February 2016

I. Description

Hourly Precipitation Data (labeled Precipitation Hourly in Climate Data Online system) is a database that gives time-sequenced hourly precipitation amounts for a network of over 7000 reporting station located primarily in the United States. Data is collected from a variety of sources including National Weather Service reporting stations, volunteer cooperative observers, Federal Aviation Administration (FAA), utility companies, etc.

Concerning rain gages/data processing: Data from weighing rain gages, Fischer-Porter gages, Universal rain gages and in recent years, more modern measuring equipment in conjunction with automated recording sites, etc. have been used in this dataset over the period. Precipitation values have been checked and edited as necessary by both automated and manual methods. Because of some inconsistencies identified with the earlier data (prior to 1996), historical data were reprocessed in 1997. This rehabilitated data covered 53 million observations between 1900 and 1995. Similar quality control checks are in place that maintain consistency between the historical and operationally received data.

II. Format/Record Layout

Data is output in a choice of two formats - text file (with .dat file extension) or as a spreadsheet ready file (with .csv extension). The .csv output uses the comma (",") as the delimiter.

Each observational element within the record is described below in order of appearance:

STATION: Cooperative identification number (i.e. COOP ID) identifying station. Each COOP ID is prefixed with "COOP ID: " and this is followed by the stations six-digit numeric identifier. The first two digits correspond to the state where the station is located (see table 1 below). A complete listing of station COOP IDs is located at <ftp://ftp.ncdc.noaa.gov/pub/data/inventories/COOP.TXT>.

STATION_NAME: Optional field. A name identifying the station location (usually a city/airport name).

ELEVATION: Optional field given as part of geographic location output option. The elevation above mean seal level of the reporting site given to the nearest tenth of a meter or nearest tenth of a foot depending on user's specification of standard or metric units.

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LATITUDE: Optional field given as part of geographic location output option. This value

is given in decimated degrees to 4 decimal places. Northern hemisphere values are greater than 0. The maximum number of characters for this field is 10.

LONGITUDE: Optional field given as part of geographic location output option. This value is given in decimated degrees to 4 decimal places. Western hemisphere values are less than 0. The maximum number of characters for this field is 10.

DATE: This is the year of the record (4 digits), followed by month (2 digits), followed by day of the month (2 digits), followed by a space and ending with a time of observation that is a two digit indication of the local time hour, followed by a colon (:) followed by a two digit indication of the minute which for this dataset will always be 00. Note: The subsequent data value will be for the hour ending at the time specified here. Hour 00:00 will be listed as the first hour of each date, however since this data is by definition an accumulation of the previous 60 minutes, it actually occurred on the previous day.

HPCP: The amount of precipitation recorded at the station for the hour ending at the time specified for DATE above given in hundredths of inches or tenths of millimeters depending on user's specification of standard or metric units. The values 99999 means the data value is missing. Hours with no precipitation are not shown.

Note that observational elements listed above that are identified as optional (station name, geographic location and flags) must be added to the data output by means of selecting the appropriate checkbox for them (seen when using the Climate Data Online interface).

Measurement Flag (Attribute): defined in Table 2 below.

Quality Flag (Attribute): defined in Table 3 below.

Units Flag (Attribute): defined in Table 4 below

III. Tables

Table 1 - State Code Table

01 Alabama
02 Arizona
03 Arkansas
04 California
05 Colorado
06 Connecticut
07 Delaware
08 Florida
09 Georgia
10 Idaho
11 Illinois

12 Indiana
13 Iowa
14 Kansas
15 Kentucky
16 Louisiana
17 Maine
18 Maryland
19 Massachusetts
20 Michigan
21 Minnesota
22 Mississippi
23 Missouri
24 Montana
25 Nebraska
26 Nevada
27 New Hampshire
28 New Jersey
29 New Mexico
30 New York
31 North Carolina
32 North Dakota
33 Ohio
34 Oklahoma
35 Oregon
36 Pennsylvania
37 Rhode Island
38 South Carolina
39 South Dakota
40 Tennessee
41 Texas
42 Utah
43 Vermont
44 Virginia
45 Washington
46 West Virginia
47 Wisconsin
48 Wyoming
49 Not used
50 Alaska
51 Hawaii
66 Puerto Rico
67 Virgin Islands
91 Pacific Islands

Table 2 - Data Measurement Flag (Attribute)

Note: This field is left blank when no flag is needed.

a: Begin accumulation. A data value of 99999 accompanies this flag. It indicates that the accumulation has begun at some time during the hour.

A: End accumulation (an amount is associated with this flag). It indicates that accumulation has ended sometime during the hour. Accumulated period indicates that the precipitation amount is correct, but only the exact beginning and ending times are known. A data value of 99999 occurring on the last day and hour of a month indicates the accumulation continues into the next month.

, (comma): Used at the beginning of a data month when an accumulation is in progress from the previous month. A data value of 99999 always accompanies this flag. This flag is used prior to 1984.

{ : Begin deleted period during the hour (inclusive). The original data were received, but were unreadable or clearly recognized as noise. A value of 99999 accompanies this flag. Primarily used since 1984. Also used in Alaska for 1976-1978.

}: End deleted period during the hour (inclusive). The original data were received, but were unreadable or clearly recognized as noise. A value of 99999 accompanies this flag. Primarily used since 1984. Also used in Alaska for 1976-1978.

[: Begin missing period during the hour (inclusive). A value of 99999 accompanies this flag.

] : End missing period during the hour (inclusive). A value of 99999 accompanies this flag. Prior to 1984 if precipitation occurred during the last hour of the missing period, the ending missing value appears with a non-zero value. Beginning in 1984, the beginning and ending hours of the missing period are recorded as "99999[" and "99999]," respectively.. A missing flag indicates that the data were not received. The flag appears on the first and last day of each month for which data were not received or not processed by NCDC.

E: Evaporation may have occurred. Data may or may not be reliable. This flag was used during the period 1984-1993.

g: Only used for day 1, hour 0100, when precipitation amount is zero.

T: Indicates a "trace" amount. Data value with this will be zero. "T" flags appear on National Weather Service data only since July 1996.

M: Missing data. No data available for this period.

Table 3 - Data Quality Flag (Attribute)

Z: Indicates probable amounts as a result of melting frozen precipitation. This flag may be used to identify those sites that are deficient in the manner the snow shields are employed. Used since January 1996.

R: This data value failed one of the NCDC's quality control tests.

Q: Pre 1996 usage - Indicates value failed an extreme value test (value will be present). Data are to be used with caution.

Extreme tests used are 1) value was not an accumulated amount and was higher than the one-hour statewide 100 year return period precipitation amount or 2) if they value was an accumulated amount and was higher than the 24 hour statewide extreme precipitation total.

Q: 1996 to present usage - A single erroneous value (value will be present). Rarely used since 1996.

q: An hourly value excludes one or more 15 minute periods. Lowest data resolution is 15 minutes. Used since January 1996.

Table 4 – Units Flag (Attribute)

HI: Data values are in hundredths of inches. Values are observed to the same accuracy.

HT: Data values are in hundredths of inches but observed to tenths of inches only.

Note: Since these attributes represent the source date, if user has specified metric unit output in millimeters, this attribute will still be HT or HI.