

NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION  
GLOBAL SURFACE SUMMARY OF DAY DATA (GSOD)  
(OVER 9000 WORLDWIDE STATIONS)

10/28/2020

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## SPECIAL NOTES

The data summaries provided here are based on data exchanged under the World Meteorological Organization (WMO) World Weather Watch Program according to WMO Resolution 40 (Cg-XII). This allows WMO member countries to place restrictions on the use or re-export of their data for commercial purposes outside of the receiving country. Data for selected countries may, at times, not be available through this system.

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To determine off-line availability of any country's data, please contact NCEI at

ncei.orders@noaa.gov  
828-271-4800

See our contact page at:  
[www.ncei.noaa.gov/contact](http://www.ncei.noaa.gov/contact)

The data are available via:

Web Accessible Folder -- <https://www.ncei.noaa.gov/data/global-summary-of-the-day/>  
Common Access -- <https://www.ncei.noaa.gov/access/search/data-search/global-summary-of-the-day>

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## OVERVIEW

The following is a description of the global surface summary of day product produced by the National Centers for Environmental Information (NCEI) in Asheville, NC. The input data used in

building these daily summaries are the Integrated Surface Data (ISD), which includes global data obtained from the USAF Climatology Center, located in the Federal Climate Complex with NCEI. The latest daily summary data are normally available a few days after the date-time of the observations used in the daily summaries. The online data files begin with 1929. Over 9000 stations' data are typically available.

The headers used in csv files and definition of each daily element included in the dataset (as available from each station) are as follows:

TEMP - Mean temperature (.1 Fahrenheit)  
DEWP - Mean dew point (.1 Fahrenheit)  
SLP - Mean sea level pressure (.1 mb)  
STP - Mean station pressure (.1 mb)  
VISIB - Mean visibility (.1 miles)  
WDSP - Mean wind speed (.1 knots)  
MXSPD - Maximum sustained wind speed (.1 knots)  
GUST - Maximum wind gust (.1 knots)  
MAX - Maximum temperature (.1 Fahrenheit)  
MIN - Minimum temperature (.1 Fahrenheit)  
PRCP - Precipitation amount (.01 inches)  
SNDP - Snow depth (.1 inches)  
FRSHTT - Indicator for occurrence of:  
    Fog  
    Rain or Drizzle  
    Snow or Ice Pellets  
    Hail  
    Thunder  
    Tornado/Funnel Cloud

For more detailed descriptions of data elements and contents of the dataset, see the format documentation shown below.

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## DETAILS/FORMAT

Global summary of day data for 18 surface meteorological elements are derived from the synoptic/hourly observations contained in USAF DATSAV3 Surface data and Federal Climate Complex Integrated Surface Data (ISD). Historical data are generally available for 1929 to the present, with data from 1973 to the present being the most complete. For some periods, one or more countries' data may not be available due to data restrictions or communications problems. In deriving the summary of

day data, a minimum of 4 observations for the day must be present (allows for stations which report 4 synoptic observations/day). Since the data are converted to constant units (e.g, knots), slight rounding error from the originally reported values may occur (e.g, 9.9 instead of 10.0).

The mean daily values described below are based on the hours of operation for the station. For some stations/countries, the visibility will sometimes 'cluster' around a value (such as 10 miles) due to the practice of not reporting visibilities greater than certain distances. The daily extremes and totals--maximum wind gust, precipitation amount, and snow depth--will only appear if the station reports the data sufficiently to provide a valid value. Therefore, these three elements will appear less frequently than other values. Also, these elements are derived from the stations' reports during the day, and may comprise a 24-hour period which includes a portion of the previous day. The data are reported and summarized based on Greenwich Mean Time (GMT, 0000Z - 2359Z) since the original synoptic/hourly data are reported and based on GMT.

As for quality control (QC), the input data undergo extensive automated QC to correctly 'decode' as much of the synoptic data as possible, and to eliminate many of the random errors found in the original data. Then, these data are QC'ed further as the summary of day data are derived. However, we expect that a very small percent of the errors will remain in the summary of day data.

The data are strictly ASCII, with a mixture of character data, real values, and integer values.

Following is the data format:

All data records are described below.

All 9's in a field (e.g., 99.99 for PRCP) indicates no report or insufficient data.

FIELD	DESCRIPTION
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STATION	- Station number (WMO/DATSAV3 possibly combined w/WBAN number)
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DATE	- Given in mm/dd/yyyy format
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LATITUDE	- Given in decimated degrees (Southern Hemisphere values are negative)
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LONGITUDE	- Given in decimated degrees (Western Hemisphere values are negative)
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ELEVATION - Given in meters

NAME - Name of station/airport/military base

TEMP - Mean temperature for the day in degrees Fahrenheit to tenths. Missing = 9999.9

TEMP\_ATTRIBUTES - Number of observations used in calculating mean temperature.

DEWP - Mean dew point for the day in degrees Fahrenheit to tenths. Missing = 9999.9

DEWP\_ATTRIBUTES - Number of observations used in calculating mean dew point.

SLP - Mean sea level pressure for the day in millibars to tenths. Missing = 9999.9

SLP\_ATTRIBUTES - Number of observations used in calculating mean sea level pressure.

STP - Mean station pressure for the day in millibars to tenths. Missing = 9999.9

STP\_ATTRIBUTES - Number of observations used in calculating mean station pressure.

VISIB - Mean visibility for the day in miles to tenths. Missing = 999.9

VISIB\_ATTRIBUTES - Number of observations used in calculating mean visibility.

WDSP - Mean wind speed for the day in knots to tenths. Missing = 999.9

WDSP\_ATTRIBUTES - Number of observations used in calculating mean wind speed.

MXSPD - Maximum sustained wind speed reported for the day in knots to tenths. Missing = 999.

GUST - Maximum wind gust reported for the day in knots to tenths. Missing = 999.9

MAX - Maximum temperature reported during the day in Fahrenheit to tenths. Missing = 9999.9

Note: Time of maximum temperature report varies by country and region, so this will sometimes not be the maximum for the calendar day.

MAX\_ATTRIBUTES –

Blank indicates maximum temperature was taken from the explicit maximum temperature report and not from the 'hourly' data.

\* indicates maximum temperature was derived from the hourly data (i.e. highest hourly or synoptic-reported temperature).

MIN - Minimum temperature reported during the day in Fahrenheit to tenths. Missing = 9999.9

Note: Time of minimum temperature report varies by country and region, so this will sometimes not be the maximum for the calendar day.

#### MIN\_ATTRIBUTES

Blank indicates minimum temperature was taken from the explicit minimum temperature report and not from the 'hourly' data.

\* indicates minimum temperature was derived from the hourly data (i.e. highest hourly or synoptic-reported temperature).

PRCP - Total precipitation (rain and/or melted snow) reported during the day in inches and hundredths; will usually not end with the midnight observation (i.e. may include latter part of previous day). "0" indicates no measurable precipitation (includes a trace). Missing = 99.99

Note: Many stations do not report "0" on days with no precipitation, therefore "99.99" will often appear on these days. Also, for example, a station may only report a 6-hour amount for the period during which rain fell. See attribute field for source of data.

#### PRCP\_ATTRIBUTES -

A = 1 report of 6-hour precipitation amount.

B = Summation of 2 reports of 6-hour precipitation amount.

C = Summation of 3 reports of 6-hour precipitation amount.

D = Summation of 4 reports of 6-hour precipitation amount.

E = 1 report of 12-hour precipitation amount.

F = Summation of 2 reports of 12-hour precipitation amount.

G = 1 report of 24-hour precipitation amount.

H = Station reported '0' as the amount for the day (eg, from 6-hour reports), but also reported at least one occurrence of precipitation in hourly observations. This could indicate a trace occurred, but should be considered as incomplete data for the day.

I = Station did not report any precipitation data for the day and did not report any occurrences of precipitation in its hourly observations. It's still possible that precipitation occurred but was not reported.

SNDP - Snow depth in inches to tenths. It is the last report for the day if reported more than once. Missing = 999.9

Note: Most stations do not report "0" on days with no snow on the ground, therefore, "999.9" will often appear on these days.

FRSHTT - Indicators (1 = yes, 0 = no/not reported) for the occurrence during the day of:

Fog ('F' - 1st digit).  
Rain or Drizzle ('R' - 2nd digit).  
Snow or Ice Pellets ('S' - 3rd digit).  
Hail ('H' - 4th digit).  
Thunder ('T' - 5th digit).  
Tornado or Funnel Cloud ('T' - 6th digit).

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## REFERENCE

The NCEI Climate Services Branch (CSB) is responsible for distribution of NCEI products to users. NCEI's CSB can be contacted via the following phone number, internet address, or fax number.

Telephone Number: 828-271-4800  
Fax Number: 828-271-4876  
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