

**FEDERAL CLIMATE COMPLEX**

**DATA DOCUMENTATION**

**FOR**

**INTEGRATED SURFACE DATA**

**May 21, 2014**

National Climatic Data Center  
14<sup>th</sup> Weather Squadron  
Fleet Numerical Meteorology and Oceanography Detachment  
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**Important notice:** In order to accommodate a growing number of stations in the Integrated Surface Data (ISD), a new methodology for the assignment of station identifiers is being implemented by approximately January 2013. Station identifiers which currently appear as an 11-digit numerical field in positions 5 - 15 of each ISD record in the archive format described in this document will soon include stations that contain an alphabetic character (A-Z) for the leading digit (position 5). These assignments will not affect existing stations unless it becomes necessary to reassign new identifiers to them. This is occasionally necessary due to station moves or various other reasons. It will affect most new stations coming into existence after this implementation occurs. At some point in the future, NCDC will be moving toward a longer station identifier for ISD. This will extend the current record layout of the data files and also influence all existing station identifiers which will be reassigned. NCDC will provide further information on these pending changes as the details are established. You may also keep abreast of these or other changes by referring to the most recent edition of the ISD documentation.

1. **Data Set ID:**

DS3505

2. **Data Set Name:**

INTEGRATED SURFACE DATA (ISD)

3. **Data Set Aliases:**

N/A

4. **Access Method and Sort for Archived Data:**

The data files are derived from surface observational data, and are stored in ASCII character format. Data field definitions for elements transmitted are provided after this preface, providing definition of data fields, position number for mandatory data fields, field lengths for variable data fields, minimum/maximum values of transmitted data, and values for missing data fields. Data are accessible via NCDC's Climate Data Online system ([cdo.ncdc.noaa.gov](http://cdo.ncdc.noaa.gov)), FTP (<ftp://ftp.ncdc.noaa.gov/pub/data/noaa/>), GIS services ([gis.ncdc.noaa.gov](http://gis.ncdc.noaa.gov)), and by calling NCDC for off-line servicing (see section 12 below).

**Data Sequence** - Data will be sequenced using the following data item order:

1. FIXED-WEATHER-STATION identifier
2. GEOPHYSICAL-POINT-OBSERVATION date
3. GEOPHYSICAL-POINT-OBSERVATION time
4. GEOPHYSICAL-POINT-OBSERVATION latitude coordinate
5. GEOPHYSICAL-POINT-OBSERVATION longitude coordinate
6. GEOPHYSICAL-POINT-OBSERVATION type surface report code
7. GEOPHYSICAL-REPORT-TYPE code

**Record Structure** - Each record is of variable length and is comprised of a control and mandatory data section and may also contain additional, remarks, and element quality data sections.

**Maximum record size:** 2,844 characters

**Maximum block length:** 8,192 characters for data provided on tape

**Control Data Section** - The beginning of each record provides information about the report including date, time, and station location information. Data fields will be in positions identified in the applicable data definition. The control data section is fixed length and is 60 characters long.

**Mandatory Data Section** - The mandatory data section contains meteorological information on the basic elements such as winds, visibility, and temperature. These are the most commonly reported parameters and are available most of the time. The mandatory data section is fixed length and is 45 characters long.

**Additional Data Section** - Variable length data are provided after the mandatory data. These additional data contain information of significance and/or which are received with varying degrees of frequency. Identifiers are used to note when data are present in the record. If all data fields in a group are missing, the entire group is usually not reported. If no groups are reported the section will be omitted. The additional data section is variable in length with a minimum of 0 characters and a maximum of 637 (634 characters plus a 3 character section identifier) characters.

Note: Specific information (where applicable) pertaining to each variable group of data elements is provided in the data item definition.

**Remarks Data** - The numeric and character (plain language) remarks are provided if they exist. The data will vary in length and are identified in the applicable data definition. The remarks section has a maximum length of 515 (512 characters plus a 3 character section identifier) characters.

**Element Quality Data Section** - The element quality data section contains information on data that have been determined erroneous or suspect during quality control procedures. Also, some of the original data source codes and flags are stored here. This section is variable in length and contains 16 characters for each erroneous or suspect parameter. The section has a minimum length of 0 characters and a maximum length of 1587 (1584 plus a 3 character section identifier) characters.

**Missing Values** - Missing values for any non-signed item are filled (i.e., 999). Missing values for any signed item are positive filled (i.e., +99999).

**Longitude and Latitude Coordinates** - Longitudes will be reported with negative values representing longitudes west of 0 degrees, and latitudes will be negative south of the equator. Although the data field allows for values to a thousandth of a degree, the values are often only computed to the hundredth of a degree with a 0 entered in the thousandth position.

5. **Access Method and Sort for Supplied Data:** See #4 above.

6. **Element Names and Definitions:** See documentation below.

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## Control Data Section

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POS: 1-4

TOTAL-VARIABLE-CHARACTERS (this includes remarks, additional data, and element quality section)  
The number of characters in the variable data section. The total record length = 105 + the value stored in this field.  
DOM: A general domain comprised of the characters in the ASCII character set.  
MIN: 0000 MAX: 9999

POS: 5-10

FIXED-WEATHER-STATION USAF MASTER STATION CATALOG identifier  
The identifier that represents a FIXED-WEATHER-STATION.  
DOM: A general domain comprised of the characters in the ASCII character set.  
COMMENT: This field includes all surface reporting stations, including ships, buoys, etc.

POS: 11-15

FIXED-WEATHER-STATION NCDC WBAN identifier  
The identifier that represents a FIXED-WEATHER-STATION.  
MIN: 00000 MAX: 99999  
DOM: A general domain comprised of the numeric characters (0-9).  
COMMENT: This field includes all surface reporting stations, including ships, buoys, etc.

**NOTE:**

1) For data files obtained via FTP or from NCDC's archive, the filename convention uses the USAF identifier and the WBAN identifier in the filename—eg, 723150-03812-year (such as 2006).  
2) As additional data sources are integrated into ISD, the 2 station number fields will be used as an 11-digit ID field, with the first 2 digits representing the WMO block number (if applicable).

POS: 16-23

GEOPHYSICAL-POINT-OBSERVATION date  
The date of a GEOPHYSICAL-POINT-OBSERVATION.  
MIN: 00000101 MAX: 99991231  
DOM: A general domain comprised of integer values 0-9 in the format YYYYMMDD.  
YYYY can be any positive integer value; MM is restricted to values 01-12; and DD is restricted to values 01-31.

POS: 24-27

GEOPHYSICAL-POINT-OBSERVATION time  
The time of a GEOPHYSICAL-POINT-OBSERVATION based on Coordinated Universal Time Code (UTC).  
MIN: 0000 MAX: 2359  
DOM: A general domain comprised of integer values 0-9 in the format HHMM.  
HH is restricted to values 00-23; MM is restricted to values 00-59.

POS: 28-28

GEOPHYSICAL-POINT-OBSERVATION data source flag  
The flag of a GEOPHYSICAL-POINT-OBSERVATION showing the source or combination of sources used in creating the observation.  
MIN: 1 MAX: Z  
DOM: A general domain comprised of values 1-9 and A-E.

1 = USAF SURFACE HOURLY observation, candidate for merge with NCDC SURFACE HOURLY (not yet merged, failed element cross-checks)

2 = NCDC SURFACE HOURLY observation, candidate for merge with USAF SURFACE HOURLY (not yet merged, failed element cross-checks)

3 = USAF SURFACE HOURLY/NCDC SURFACE HOURLY merged observation

4 = USAF SURFACE HOURLY observation

5 = NCDC SURFACE HOURLY observation

6 = ASOS/AWOS observation from NCDC

7 = ASOS/AWOS observation merged with USAF SURFACE HOURLY observation

8 = MAPSO observation (NCDC)  
 A = USAF SURFACE HOURLY/NCDC HOURLY PRECIPITATION merged observation, candidate for merge with  
 NCDC SURFACE HOURLY (not yet merged, failed element cross-checks)  
 B = NCDC SURFACE HOURLY/NCDC HOURLY PRECIPITATION merged observation, candidate for merge with  
 USAF SURFACE HOURLY (not yet merged, failed element cross-checks)  
 C = USAF SURFACE HOURLY/NCDC SURFACE HOURLY/NCDC HOURLY PRECIPITATION merged observation  
 D = USAF SURFACE HOURLY/NCDC HOURLY PRECIPITATION merged observation  
 E = NCDC SURFACE HOURLY/NCDC HOURLY PRECIPITATION merged observation  
 F = Form OMR/1001 – Weather Bureau city office (keyed data)  
 G = SAO surface airways observation, pre-1949 (keyed data)  
 H = SAO surface airways observation, 1965-1981 format/period (keyed data)  
 I = Climate Reference Network observation  
 J = Cooperative Network observation  
 K = Radiation Network observation  
 L = Data from Climate Data Modernization Program (CDMP) data source  
 M = Data from National Renewable Energy Laboratory (NREL) data source  
 N = NCAR / NCDC cooperative effort (various national datasets)  
 9 = Missing

**Note: Latitude, longitude, elevation, and call letters for some locations with data from multiple sources (see data source flag above) will sometimes vary within a data file due to differences in the metadata from the originating source. This does not indicate that the station locations differ; only that the metadata have not yet been fully reflected in the data records.**

POS: 29-34

GEOPHYSICAL-POINT-OBSERVATION latitude coordinate  
 The latitude coordinate of a GEOPHYSICAL-POINT-OBSERVATION where southern hemisphere is negative.  
 MIN: -90000 MAX: +90000  
 UNITS: Angular Degrees  
 SCALING FACTOR: 1000  
 DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-).  
 +99999 = Missing

POS: 35-41

GEOPHYSICAL-POINT-OBSERVATION longitude coordinate  
 The longitude coordinate of a GEOPHYSICAL-POINT-OBSERVATION where values west from 000000 to 179999 are signed negative.  
 MIN: -179999 MAX: +180000 UNITS: Angular Degrees  
 SCALING FACTOR: 1000  
 DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-).  
 +999999 = Missing

POS: 42-46

GEOPHYSICAL-REPORT-TYPE code  
 The code that denotes the type of geophysical surface observation.  
 DOM: A specific domain comprised of the characters in the ASCII character set.  
 AERO = Aerological report  
 AUST = Dataset from Australia  
 AUTO = Report from an automatic station  
 BOGUS = Bogus report  
 BRAZ = Dataset from Brazil  
 COOPD = US Cooperative Network summary of day report  
 COOPS = US Cooperative Network soil temperature report  
 CRB = Climate Reference Book data from CDMP  
 CRN05 = Climate Reference Network report, with 5-minute reporting interval  
 CRN15 = Climate Reference Network report, with 15-minute reporting interval  
 FM-12 = SYNOP Report of surface observation from a fixed land station  
 FM-13 = SHIP Report of surface observation from a sea station  
 FM-14 = SYNOP MOBIL Report of surface observation from a mobile land station  
 FM-15 = METAR Aviation routine weather report  
 FM-16 = SPECI Aviation selected special weather report  
 FM-18 = BUOY Report of a buoy observation

GREEN = Dataset from Greenland  
 MESOS – MESONET operated civilian or government agency  
 MEXIC = Dataset from Mexico  
 NSRDB = National Solar Radiation Data Base  
 PCP15 = US 15-minute precipitation network report  
 PCP60 = US 60-minute precipitation network report  
 S-S-A = Synoptic, airways, and auto merged report  
 SA-AU = Airways and auto merged report  
 SAO = Airways report (includes record specials)  
 SAOSP = Airways special report (excluding record specials)  
 SHEF – Standard Hydrologic Exchange Format  
 SMARS = Supplementary airways station report  
 SOD = Summary of day report from U.S. ASOS or AWOS station  
 SOM = Summary of month report from U.S. ASOS or AWOS station  
 SURF = Surface Radiation Network report  
 SY-AE = Synoptic and aero merged report  
 SY-AU = Synoptic and auto merged report  
 SY-MT = Synoptic and METAR merged report  
 SY-SA = Synoptic and airways merged report  
 WBO = Weather Bureau Office  
 WNO = Washington Naval Observatory  
 99999 = Missing

POS: 47-51

GEOPHYSICAL-POINT-OBSERVATION elevation dimension  
 The elevation of a GEOPHYSICAL-POINT-OBSERVATION relative to Mean Sea Level (MSL).  
 MIN: -0400      MAX: +8850      UNITS: Meters  
 SCALING FACTOR: 1  
 DOM: A general domain comprised of the numeric characters (0-9), a minus sign (-), and a plus sign (+).  
 +9999 = Missing

POS: 52-56

FIXED-WEATHER-STATION call letter identifier  
 The identifier that represents the call letters assigned to a FIXED-WEATHER-STATION.  
 DOM: A general domain comprised of the characters in the ASCII character set.  
 99999 = Missing.

POS: 57-60

METEOROLOGICAL-POINT-OBSERVATION quality control process name  
 The name of the quality control process applied to a weather observation.  
 DOM: A general domain comprised of the ASCII character set.

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## Mandatory Data Section

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**Bold type below indicates that the element may include data originating from NCDC's NCDC SURFACE HOURLY/ASOS/AWOS or from AFCCC's USAF SURFACE HOURLY. Otherwise, data originated from USAF SURFACE HOURLY.**

**Note:** For the quality code fields with each data element, the following may appear in data which were processed through NCDC's Interactive QC system (manual interaction), for selected parameters:

**A** – Data value flagged as suspect, but accepted as good value.

**U** – Data value replaced with edited value.

**P** – Data value not originally flagged as suspect, but replaced by validator.

**I** – Data value not originally in data, but inserted by validator.

**M** - Manual change made to value based on information provided by NWS or FAA.

**C** - Temperature and dew point received from Automated Weather Observing Systems (AWOS) are reported in whole degrees Celsius. Automated QC flags these values, but they are accepted as valid.

**R** - Data value replaced with value computed by NCDC software.

### POS: 61-63

#### **WIND-OBSERVATION direction angle**

The angle, measured in a clockwise direction, between true north and the direction from which the wind is blowing.

MIN: 001      MAX: 360      UNITS: Angular Degrees

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).

999 = Missing. If type code (below) = V, then 999 indicates variable wind direction.

### POS: 64-64

#### **WIND-OBSERVATION direction quality code**

The code that denotes a quality status of a reported WIND-OBSERVATION direction angle.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check, data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

9 = Passed gross limits check if element is present

### POS: 65-65

#### **WIND-OBSERVATION type code**

The code that denotes the character of the WIND-OBSERVATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

A: Abridged Beaufort

B: Beaufort

C: Calm

H: 5-Minute Average Speed

N: Normal

R: 60-Minute Average Speed

Q: Squall

T: 180 Minute Average Speed

V: Variable

9 = Missing

NOTE: If a value of 9 appears with a wind speed of 0000, this indicates calm winds.

### POS: 66-69

#### **WIND-OBSERVATION speed rate**

The rate of horizontal travel of air past a fixed point.  
MIN: 0000 MAX: 0900 UNITS: meters per second  
SCALING FACTOR: 10  
DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**POS: 70-70**

**WIND-OBSERVATION speed quality code**

The code that denotes a quality status of a reported WIND-OBSERVATION speed rate.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
  - 1 = Passed all quality control checks
  - 2 = Suspect
  - 3 = Erroneous
  - 4 = Passed gross limits check , data originate from an NCDC data source
  - 5 = Passed all quality control checks, data originate from an NCDC data source
  - 6 = Suspect, data originate from an NCDC data source
  - 7 = Erroneous, data originate from an NCDC data source
  - 9 = Passed gross limits check if element is present
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**POS: 71-75**

**SKY-CONDITION-OBSERVATION ceiling height dimension**

The height above ground level (AGL) of the lowest cloud or obscuring phenomena layer aloft with 5/8 or more summation total sky cover, which may be predominantly opaque, or the vertical visibility into a surface-based obstruction. Unlimited = 22000.

MIN: 00000 MAX: 22000 UNITS: Meters

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).  
99999 = Missing.

**POS: 76-76**

**SKY-CONDITION-OBSERVATION ceiling quality code**

The code that denotes a quality status of a reported ceiling height dimension.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 4 = Passed gross limits check , data originate from an NCDC data source
- 5 = Passed all quality control checks, data originate from an NCDC data source
- 6 = Suspect, data originate from an NCDC data source
- 7 = Erroneous, data originate from an NCDC data source
- 9 = Passed gross limits check if element is present

**POS: 77-77**

**SKY-CONDITION-OBSERVATION ceiling determination code**

The code that denotes the method used to determine the ceiling.

DOM: A specific domain comprised of the characters in the ASCII character set.

- A: Aircraft
- B: Balloon
- C: Statistically derived
- D: Persistent cirriform ceiling (pre-1950 data)
- E: Estimated
- M: Measured
- P: Precipitation ceiling (pre-1950 data)
- R: Radar
- S: ASOS augmented
- U: Unknown ceiling (pre-1950 data)
- V: Variable ceiling (pre-1950 data)
- W: Obscured
- 9: Missing



POS: 78-78

**SKY-CONDITION-OBSERVATION CAVOK code**

The code that represents whether the 'Ceiling And Visibility Okay' (CAVOK) condition has been reported.

DOM: A specific domain comprised of the characters in the ASCII character set.

N: No

Y: Yes

9: missing

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POS: 79-84

**VISIBILITY-OBSERVATION distance dimension**

The horizontal distance at which an object can be seen and identified.

MIN: 000000 MAX: 160000 UNITS: Meters

DOM: A general domain comprised of the numeric characters (0-9).

Missing = 999999

NOTE: Values greater than 160000 are entered as 160000

POS: 85-85

**VISIBILITY-OBSERVATION distance quality code**

The code that denotes a quality status of a reported distance of a visibility observation.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check , data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

9 = Passed gross limits check if element is present

POS: 86-86

**VISIBILITY-OBSERVATION variability code**

The code that denotes whether or not the reported visibility is variable.

DOM: A specific domain comprised of the characters in the ASCII character set.

N: Not variable

V: Variable

9 = Missing

POS: 87-87

**VISIBILITY-OBSERVATION quality variability code**

The code that denotes a quality status of a reported VISIBILITY-OBSERVATION variability code.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check , data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

9 = Passed gross limits check if element is present

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POS: 88-92

**AIR-TEMPERATURE-OBSERVATION air temperature**

The temperature of the air.

MIN: -0932 MAX: +0618 UNITS: Degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus

sign (-).  
+9999 = Missing.

**POS: 93-93**

**AIR-TEMPERATURE-OBSERVATION air temperature quality code**

The code that denotes a quality status of an AIR-TEMPERATURE-OBSERVATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
  - 1 = Passed all quality control checks
  - 2 = Suspect
  - 3 = Erroneous
  - 4 = Passed gross limits check , data originate from an NCDC data source
  - 5 = Passed all quality control checks, data originate from an NCDC data source
  - 6 = Suspect, data originate from an NCDC data source
  - 7 = Erroneous, data originate from an NCDC data source
  - 9 = Passed gross limits check if element is present
  - A = Data value flagged as suspect, but accepted as a good value
  - C = Temperature and dew point received from Automated Weather Observing System (AWOS) are reported in whole degrees Celsius. Automated QC flags these values, but they are accepted as valid.
  - I = Data value not originally in data, but inserted by validator
  - M = Manual changes made to value based on information provided by NWS or FAA
  - P = Data value not originally flagged as suspect, but replaced by validator
  - R = Data value replaced with value computed by NCDC software
  - U = Data value replaced with edited value
- 

**POS: 94-98**

**AIR-TEMPERATURE-OBSERVATION dew point temperature**

The temperature to which a given parcel of air must be cooled at constant pressure and water vapor content in order for saturation to occur.

MIN: -0982    MAX: +0368    UNITS: Degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus

sign (+), and a minus sign (-).

+9999 = Missing.

**POS: 99-99**

**AIR-TEMPERATURE-OBSERVATION dew point quality code**

The code that denotes a quality status of the reported dew point temperature.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
  - 1 = Passed all quality control checks
  - 2 = Suspect
  - 3 = Erroneous
  - 4 = Passed gross limits check , data originate from an NCDC data source
  - 5 = Passed all quality control checks, data originate from an NCDC data source
  - 6 = Suspect, data originate from an NCDC data source
  - 7 = Erroneous, data originate from an NCDC data source
  - 9 = Passed gross limits check if element is present
  - A = Data value flagged as suspect, but accepted as a good value
  - C = Temperature and dew point received from Automated Weather Observing System (AWOS) are reported in whole degrees Celsius. Automated QC flags these values, but they are accepted as valid.
  - I = Data value not originally in data, but inserted by validator
  - M = Manual changes made to value based on information provided by NWS or FAA
  - P = Data value not originally flagged as suspect, but replaced by validator
  - R = Data value replaced with value computed by NCDC software
  - U = Data value replaced with edited value
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**POS: 100-104**

**ATMOSPHERIC-PRESSURE-OBSERVATION sea level pressure**

The air pressure relative to Mean Sea Level (MSL).

MIN: 08600    MAX: 10900    UNITS: Hectopascals

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).  
99999 = Missing.

**POS: 105-105**

**ATMOSPHERIC-PRESSURE-OBSERVATION sea level pressure quality code**

The code that denotes a quality status of the sea level pressure of an

ATMOSPHERIC-PRESSURE-OBSERVATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check , data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

9 = Passed gross limits check if element is present

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## Additional Data Section

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**Bold type below indicates that the element may include data originating from NCDC's NCDC SURFACE HOURLY/ASOS/AWOS, NCDC HOURLY PRECIPITATION/Hourly Precip, or from AFCCC's USAF SURFACE HOURLY. Otherwise, data originated from USAF SURFACE HOURLY.**

**Note: For the quality code fields with each data element, the following may appear in data which were processed through NCDC's Interactive QC system (manual interaction), for selected parameters:**

**A – Data value flagged as suspect, but accepted as good value.**

**U – Data value replaced with edited value.**

**P – Data value not originally flagged as suspect, but replaced by validator.**

**I – Data value not originally in data, but inserted by validator.**

**M – Manual change made to value based on information provided by NWS or FAA**

**C – Temperature and dew point received from Automated Weather Observing Systems (AWOS) are reported in whole degrees Celsius. Automated QC flags these values, but they are accepted as valid.**

**R – Data value replaced with value computed by NCDC software.**

**FLD LEN: 3**

**GEOPHYSICAL-POINT-OBSERVATION additional data identifier**

The identifier that denotes the beginning of the additional data section.

DOM: A specific domain comprised of the ASCII character set.

**ADD Additional Data Section**

## Precipitation Data

**FLD LEN: 3**

**LIQUID-PRECIPITATION occurrence identifier**

The identifier that represents an episode of LIQUID-PRECIPITATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

**AA1 - AA4** An indicator of up to 4 repeating fields of the following items:

LIQUID-PRECIPITATION period quantity

LIQUID-PRECIPITATION depth dimension

LIQUID-PRECIPITATION condition code

LIQUID-PRECIPITATION quality code

**FLD LEN: 2**

**LIQUID-PRECIPITATION period quantity in hours**

The quantity of time over which the LIQUID-PRECIPITATION was measured.

MIN: 00 MAX: 98 UNITS: Hours

SCALING FACTOR: 1

DOM: A specific domain comprised of the characters in the ASCII character set

99 = Missing.

**FLD LEN: 4**

**LIQUID-PRECIPITATION depth dimension**

The depth of LIQUID-PRECIPITATION that is measured at the time of an observation.

MIN: 0000 MAX: 9998 UNITS: millimeters

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing.

**FLD LEN: 1**

**LIQUID-PRECIPITATION condition code**

The code that denotes whether a LIQUID-PRECIPITATION depth dimension was a trace value.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 1: Measurement impossible or inaccurate
- 2: Trace
- 3: Begin accumulated period (precipitation amount missing until end of accumulated period)
- 4: End accumulated period
- 5: Begin deleted period (precipitation amount missing due to data problem)
- 6: End deleted period
- 7: Begin missing period
- 8: End missing period
- E: Estimated data value (eg, from nearby station)
- I: Incomplete precipitation amount, excludes one or more missing reports, such as one or more 15-minute reports not included in the 1-hour precipitation total
- J: Incomplete precipitation amount, excludes one or more erroneous reports, such as one or more 1-hour precipitation amounts excluded from the 24-hour total
- 9: Missing

**FLD LEN: 1**

**LIQUID-PRECIPITATION quality code**

The code that denotes a quality status of the reported LIQUID-PRECIPITATION data.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 4 = Passed gross limits check , data originate from an NCDC data source
- 5 = Passed all quality control checks, data originate from an NCDC data source
- 6 = Suspect, data originate from an NCDC data source
- 7 = Erroneous, data originate from an NCDC data source
- 9 = Passed gross limits check if element is present
- A = Data value flagged as suspect, but accepted as good value
- I = Data value not originally in data, but inserted by validator
- M = Manual change made to value based on information provided by NWS or FAA
- P = Data value not originally flagged as suspect, but replaced by validator
- R = Data value replaced with value computed by NCDC software
- U = Data value replaced with edited value

**FLD LEN: 3**

**LIQUID-PRECIPITATION MONTHLY TOTAL identifier**

The identifier that represents LIQUID-PRECIPITATION MONTHLY TOTAL data.

DOM: A specific domain comprised of the characters in the ASCII character set.

- AB1** An indicator of the following items:
- LIQUID-PRECIPITATION depth dimension
  - LIQUID-PRECIPITATION condition code
  - LIQUID-PRECIPITATION quality code

**FLD LEN: 5**

**LIQUID-PRECIPITATION MONTHLY TOTAL depth dimension**

The depth of LIQUID-PRECIPITATION for the month.

MIN: 00000 MAX: 50000 UNITS: millimeters

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

99999 = Missing.

**FLD LEN: 1**

**LIQUID-PRECIPITATION MONTHLY TOTAL condition code**

The code that denotes whether a LIQUID-PRECIPITATION depth dimension was a trace value.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 1: Measurement impossible or inaccurate
- 2: Trace
- 9: Missing

**FLD LEN: 1**

**LIQUID-PRECIPITATION MONTHLY TOTAL quality code**

The code that denotes a quality status of the reported LIQUID-PRECIPITATION data.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
  - 1 = Passed all quality control checks
  - 2 = Suspect
  - 3 = Erroneous
  - 4 = Passed gross limits check , data originate from an NCDC data source
  - 5 = Passed all quality control checks, data originate from an NCDC data source
  - 6 = Suspect, data originate from an NCDC data source
  - 7 = Erroneous, data originate from an NCDC data source
  - 9 = Passed gross limits check if element is present
  - A = Data value flagged as suspect, but accepted as good value
  - I = Data value not originally in data, but inserted by validator
  - M = Manual change made to value based on information provided by NWS or FAA
  - P = Data value not originally flagged as suspect, but replaced by validator
  - R = Data value replaced with value computed by NCDC software
  - U = Data value replaced with edited value
- 

**FLD LEN: 3**

**PRECIPITATION-OBSERVATION-HISTORY identifier**

The identifier that indicates the occurrence of precipitation history information.

DOM: A specific domain comprised of the characters in the ASCII character set.

**AC1** An indicator of the following items:

- PRECIPITATION-OBSERVATION-HISTORY duration code
- PRECIPITATION-OBSERVATION-HISTORY characteristic code
- PRECIPITATION-OBSERVATION-HISTORY quality code

**FLD LEN: 1**

**PRECIPITATION-OBSERVATION-HISTORY duration code**

The code that denotes the duration of precipitation.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Lasted less than 1 hour
- 1 = Lasted 1 - 3 hours
- 2 = Lasted 3 - 6 hours
- 3 = Lasted more than 6 hours
- 9 = Missing

**FLD LEN: 1**

**PRECIPITATION-OBSERVATION-HISTORY characteristic code**

The code that denotes whether precipitation is continuous or intermittent.

DOM: A specific domain comprised of the characters in the ASCII character set.

- C = Continuous
- I = Intermittent
- 9 = Missing

**FLD LEN: 1**

**PRECIPITATION duration/characteristic quality code**

The code that denotes a quality status of the reported PRECIPITATION duration/characteristic.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 9 = Passed gross limits check if element is present
- A = Data value flagged as suspect, but accepted as good value
- I = Data value not originally in data, but inserted by validator
- M = Manual change made to value based on information provided by NWS or FAA
- P = Data value not originally flagged as suspect, but replaced by validator
- R = Data value replaced with value computed by NCDC software
- U = Data value replaced with edited value

---

**FLD LEN: 3**

**LIQUID-PRECIPITATION GREATEST AMOUNT IN 24 HOURS, FOR THE MONTH identifier**

The identifier that represents LIQUID-PRECIPITATION, GREATEST IN 24 HOURS, data.

DOM: A specific domain comprised of the characters in the ASCII character set.

**AD1** An indicator of the following items:

LIQUID-PRECIPITATION depth dimension

LIQUID-PRECIPITATION condition code

LIQUID-PRECIPITATION dates of occurrence (3 fields)

LIQUID-PRECIPITATION quality code

**FLD LEN: 5**

**LIQUID-PRECIPITATION GREATEST AMOUNT IN 24 HOURS, FOR THE MONTH depth dimension**

The depth of LIQUID-PRECIPITATION for the 24-hour period.

MIN: 00000 MAX: 20000 UNITS: millimeters

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

99999 = Missing.

**FLD LEN: 1**

**LIQUID-PRECIPITATION GREATEST AMOUNT IN 24 HOURS, FOR THE MONTH condition code**

The code that denotes whether a LIQUID-PRECIPITATION depth dimension was a trace value.

DOM: A specific domain comprised of the characters in the ASCII character set.

1: Measurement impossible or inaccurate

2: Trace

3: The amount occurred on other dates in addition to those listed

4: Trace amount occurred on other dates in addition to those listed

9: Missing or N/A

**FLD LEN: 4**

**LIQUID-PRECIPITATION GREATEST AMOUNT IN 24 HOURS, FOR THE MONTH dates of occurrence**

The dates of occurrence of LIQUID-PRECIPITATION, given as the begin-end date for the 24-hour period, for up to 3 occurrences; e.g., 0405 indicates 24-hour period on days 04-05.

MIN: 0101 MAX: 3131

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing.

**FLD LEN: 4**

**LIQUID-PRECIPITATION GREATEST AMOUNT IN 24 HOURS, FOR THE MONTH dates of occurrence**

The dates of occurrence of LIQUID-PRECIPITATION, given as the begin-end date for the 24-hour period, for up to 3 occurrences; e.g., 0405 indicates 24-hour period on days 04-05.

MIN: 0101 MAX: 3131

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing.

**FLD LEN: 4**

**LIQUID-PRECIPITATION GREATEST AMOUNT IN 24 HOURS, FOR THE MONTH dates of occurrence**

The dates of occurrence of LIQUID-PRECIPITATION, given as the begin-end date for the 24-hour period, for up to 3 occurrences; e.g., 0405 indicates 24-hour period on days 04-05.

MIN: 0101 MAX: 3131

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing.

**FLD LEN: 1**

**LIQUID-PRECIPITATION GREATEST AMOUNT IN 24 HOURS, FOR THE MONTH quality code**

The code that denotes a quality status of the reported LIQUID-PRECIPITATION data.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous  
 4 = Passed gross limits check , data originate from an NCDC data source  
 5 = Passed all quality control checks, data originate from an NCDC data source  
 6 = Suspect, data originate from an NCDC data source  
 7 = Erroneous, data originate from an NCDC data source  
 9 = Passed gross limits check if element is present  
 A = Data value flagged as suspect, but accepted as good value  
 I = Data value not originally in data, but inserted by validator  
 M = Manual change made to value based on information provided by NWS or FAA  
 P = Data value not originally flagged as suspect, but replaced by validator  
 R = Data value replaced with value computed by NCDC software  
 U = Data value replaced with edited value

---

**FLD LEN: 3**

**LIQUID-PRECIPITATION, NUMBER OF DAYS WITH SPECIFIC AMOUNTS, FOR THE MONTH identifier**

The identifier that represents NUMBER OF DAYS WITH LIQUID-PRECIPITATION data.

DOM: A specific domain comprised of the characters in the ASCII character set.

**AE1** An indicator of the following items:

LIQUID-PRECIPITATION number of days with .01 inch or more  
 LIQUID-PRECIPITATION quality code  
 LIQUID-PRECIPITATION number of days with .10 inch or more  
 LIQUID-PRECIPITATION quality code  
 LIQUID-PRECIPITATION number of days with .50 inch or more  
 LIQUID-PRECIPITATION quality code  
 LIQUID-PRECIPITATION number of days with 1.00 inch or more  
 LIQUID-PRECIPITATION quality code

**FLD LEN: 2**

**LIQUID-PRECIPITATION, NUMBER OF DAYS WITH SPECIFIC AMOUNTS, FOR THE MONTH**

The number of days with .01 inch (.25 mm) or more precipitation.

MIN: 00 MAX: 31

DOM: A general domain comprised of the numeric characters (0-9).

99 = Missing.

**FLD LEN: 1**

**LIQUID-PRECIPITATION, NUMBER OF DAYS WITH SPECIFIC AMOUNTS, FOR THE MONTH quality code**

The code that denotes a quality status of the reported days with .01 or more.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check  
 1 = Passed all quality control checks  
 2 = Suspect  
 3 = Erroneous  
 4 = Passed gross limits check , data originate from an NCDC data source  
 5 = Passed all quality control checks, data originate from an NCDC data source  
 6 = Suspect, data originate from an NCDC data source  
 7 = Erroneous, data originate from an NCDC data source  
 9 = Passed gross limits check if element is present  
 A = Data value flagged as suspect, but accepted as good value  
 I = Data value not originally in data, but inserted by validator  
 M = Manual change made to value based on information provided by NWS or FAA  
 P = Data value not originally flagged as suspect, but replaced by validator  
 R = Data value replaced with value computed by NCDC software  
 U = Data value replaced with edited value

**FLD LEN: 2**

**LIQUID-PRECIPITATION, NUMBER OF DAYS WITH SPECIFIC AMOUNTS, FOR THE MONTH**

The number of days with .10 inch (2.5 mm) or more precipitation.

MIN: 00 MAX: 31

DOM: A general domain comprised of the numeric characters (0-9).

99 = Missing.



**FLD LEN: 1**

**LIQUID-PRECIPIATION, NUMBER OF DAYS WITH SPECIFIC AMOUNTS, FOR THE MONTH quality code**

The code that denotes a quality status of the reported days with .10 or more.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 4 = Passed gross limits check , data originate from an NCDC data source
- 5 = Passed all quality control checks, data originate from an NCDC data source
- 6 = Suspect, data originate from an NCDC data source
- 7 = Erroneous, data originate from an NCDC data source
- 9 = Passed gross limits check if element is present
- A = Data value flagged as suspect, but accepted as good value
- I = Data value not originally in data, but inserted by validator
- M = Manual change made to value based on information provided by NWS or FAA
- P = Data value not originally flagged as suspect, but replaced by validator
- R = Data value replaced with value computed by NCDC software
- U = Data value replaced with edited value

**FLD LEN: 2**

**LIQUID-PRECIPIATION, NUMBER OF DAYS WITH SPECIFIC AMOUNTS, FOR THE MONTH**

The number of days with .50 inch (12.7 mm) or more precipitation.

MIN: 00 MAX: 31

DOM: A general domain comprised of the numeric characters (0-9).

99 = Missing.

**FLD LEN: 1**

**LIQUID-PRECIPIATION, NUMBER OF DAYS WITH SPECIFIC AMOUNTS, FOR THE MONTH quality code**

The code that denotes a quality status of the reported days with .50 or more.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 4 = Passed gross limits check , data originate from an NCDC data source
- 5 = Passed all quality control checks, data originate from an NCDC data source
- 6 = Suspect, data originate from an NCDC data source
- 7 = Erroneous, data originate from an NCDC data source
- 9 = Passed gross limits check if element is present
- A = Data value flagged as suspect, but accepted as good value
- I = Data value not originally in data, but inserted by validator
- M = Manual change made to value based on information provided by NWS or FAA
- P = Data value not originally flagged as suspect, but replaced by validator
- R = Data value replaced with value computed by NCDC software
- U = Data value replaced with edited value

**FLD LEN: 2**

**LIQUID-PRECIPIATION, NUMBER OF DAYS WITH SPECIFIC AMOUNTS, FOR THE MONTH**

The number of days with 1.00 inch (25 mm) or more precipitation.

MIN: 00 MAX: 31

DOM: A general domain comprised of the numeric characters (0-9).

99 = Missing.

**FLD LEN: 1**

**LIQUID-PRECIPIATION, NUMBER OF DAYS WITH SPECIFIC AMOUNTS, FOR THE MONTH quality code**

The code that denotes a quality status of the reported days with 1.00 or more.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 4 = Passed gross limits check , data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source  
 6 = Suspect, data originate from an NCDC data source  
 7 = Erroneous, data originate from an NCDC data source  
 9 = Passed gross limits check if element is present  
 A = Data value flagged as suspect, but accepted as good value  
 I = Data value not originally in data, but inserted by validator  
 M = Manual change made to value based on information provided by NWS or FAA  
 P = Data value not originally flagged as suspect, but replaced by validator  
 R = Data value replaced with value computed by NCDC software  
 U = Data value replaced with edited value

---

**FLD LEN: 3**

**PRECIPITATION-ESTIMATED-OBSERVATION identifier**

The identifier that represents a PRECIPITATION-ESTIMATED-OBSERVATION, from AFCCC.

DOM: A specific domain comprised of the characters in the ASCII character set.

**AG1** An indicator of the occurrence of the following items:

PRECIPITATION-OBSERVATION discrepancy code

PRECIPITATION-OBSERVATION estimated water depth dimension

**FLD LEN: 1**

**PRECIPITATION-ESTIMATED-OBSERVATION discrepancy code**

The code that denotes the type of discrepancy between a PRECIPITATION-OBSERVATION and other related observations at the same location.

DOM: A specific domain comprised of the characters in the ASCII character set.

0: Reported amount of precipitation and reported weather agree

1: Precipitation missing or not reported and none inferred by weather

2: Precipitation missing, but precipitation inferred by weather

3: Precipitation reported, but none inferred by weather

4: Zero precipitation reported, but precipitation inferred by weather

5: Zero precipitation reported, no precipitation inferred and precipitation not occurring at the reporting station

9: Missing

**FLD LEN: 3**

**PRECIPITATION-ESTIMATED-OBSERVATION estimated water depth dimension**

The estimated depth of precipitation in water depth for a 3-hour synoptic period.

MIN: 000 MAX: 998 UNITS: millimeters

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).

999 = Missing.

---

**FLD LEN: 3**

**LIQUID-PRECIPITATION MAXIMUM SHORT DURATION, FOR THE MONTH identifier**

The identifier that represents MAXIMUM SHORT DURATION PRECIPITATION data.

DOM: A specific domain comprised of the characters in the ASCII character set.

**AH1-AH6:** An indicator of up to 6 repeating fields for the following items:

LIQUID-PRECIPITATION period quantity

LIQUID-PRECIPITATION depth dimension

LIQUID-PRECIPITATION condition code

LIQUID-PRECIPITATION end date

LIQUID-PRECIPITATION end time

LIQUID-PRECIPITATION quality code

**FLD LEN: 3**

**LIQUID-PRECIPITATION MAXIMUM SHORT DURATION, FOR THE MONTH period quantity**

The quantity of time over which the LIQUID-PRECIPITATION was measured.

MIN: 005 MAX: 180 UNITS: Minutes

SCALING FACTOR: 1

DOM: A specific domain comprised of the characters in the ASCII character set

999 = Missing.

**FLD LEN: 4**

**LIQUID-PRECIPIATION MAXIMUM SHORT DURATION, FOR THE MONTH depth dimension**

The depth of LIQUID-PRECIPIATION for the defined time period.

MIN: 0000 MAX: 3000 UNITS: millimeters

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 1**

**LIQUID-PRECIPIATION MAXIMUM SHORT DURATION, FOR THE MONTH condition code**

The code that denotes whether a LIQUID-PRECIPIATION depth dimension was a trace value.

DOM: A specific domain comprised of the characters in the ASCII character set.

1: Measurement impossible or inaccurate

2: Trace

9: Missing

**FLD LEN: 6**

**LIQUID-PRECIPIATION MAXIMUM SHORT DURATION, FOR THE MONTH ending date-time**

The ending date of occurrence of the event , given as the date-time in GMT; e.g., 051010 indicates 1010 Z-time on day 05 of the month.

MIN: 010000 MAX: 312359

DOM: A general domain comprised of the numeric characters (0-9).  
999999 = Missing.

**FLD LEN: 1**

**LIQUID-PRECIPIATION MAXIMUM SHORT DURATION, FOR THE MONTH quality code**

The code that denotes a quality status of the reported LIQUID-PRECIPIATION data.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check , data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

9 = Passed gross limits check if element is present

A = Data value flagged as suspect, but accepted as good value

I = Data value not originally in data, but inserted by validator

M = Manual change made to value based on information provided by NWS or FAA

P = Data value not originally flagged as suspect, but replaced by validator

R = Data value replaced with value computed by NCDC software

U = Data value replaced with edited value

---

**FLD LEN: 3**

**LIQUID-PRECIPIATION MAXIMUM SHORT DURATION, FOR THE MONTH identifier**

The identifier that represents MAXIMUM SHORT DURATION PRECIPITATION data.

DOM: A specific domain comprised of the characters in the ASCII character set.

NOTE: This data group is identical to the AH1-6 group above, for the purpose of allowing up to 12 occurrences of these reports.

**A11-A16:** An indicator of up to 6 repeating fields for the following items:

LIQUID-PRECIPIATION period quantity

LIQUID-PRECIPIATION depth dimension

LIQUID-PRECIPIATION condition code

LIQUID-PRECIPIATION end date

LIQUID-PRECIPIATION end time

LIQUID-PRECIPIATION quality code

**FLD LEN: 3**

**LIQUID-PRECIPITATION MAXIMUM SHORT DURATION, FOR THE MONTH period quantity**

The quantity of time over which the LIQUID-PRECIPITATION was measured.

MIN: 060 MAX: 180 UNITS: Minutes

SCALING FACTOR: 1

DOM: A specific domain comprised of the characters in the ASCII character set  
999 = Missing.

**FLD LEN: 4**

**LIQUID-PRECIPITATION MAXIMUM SHORT DURATION, FOR THE MONTH depth dimension**

The depth of LIQUID-PRECIPITATION for the defined time period.

MIN: 0000 MAX: 3000 UNITS: millimeters

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 1**

**LIQUID-PRECIPITATION MAXIMUM SHORT DURATION, FOR THE MONTH condition code**

The code that denotes whether a LIQUID-PRECIPITATION depth dimension was a trace value.

DOM: A specific domain comprised of the characters in the ASCII character set.

1: Measurement impossible or inaccurate

2: Trace

9: Missing

**FLD LEN: 6**

**LIQUID-PRECIPITATION MAXIMUM SHORT DURATION, FOR THE MONTH ending date-time**

The ending date of occurrence of the event , given as the date-time in GMT; e.g., 051010 indicates 1010 Z-time on day 05 of the month.

MIN: 010000 MAX: 312359

DOM: A general domain comprised of the numeric characters (0-9).  
999999 = Missing.

**FLD LEN: 1**

**LIQUID-PRECIPITATION MAXIMUM SHORT DURATION, FOR THE MONTH quality code**

The code that denotes a quality status of the reported LIQUID-PRECIPITATION data.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check , data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

9 = Passed gross limits check if element is present

A = Data value flagged as suspect, but accepted as good value

I = Data value not originally in data, but inserted by validator

M = Manual change made to value based on information provided by NWS or FAA

P = Data value not originally flagged as suspect, but replaced by validator

R = Data value replaced with value computed by NCDC software

U = Data value replaced with edited value

---

**FLD LEN: 3**

**SNOW-DEPTH identifier**

The identifier that denotes the start of a SNOW-DEPTH data section.

DOM: A specific domain comprised of the characters in the ASCII character set.

**AJ1** An indicator of the occurrence of the following items:

SNOW-DEPTH dimension

SNOW-DEPTH condition code

SNOW-DEPTH quality code

SNOW-DEPTH equivalent water depth dimension  
SNOW-DEPTH equivalent water condition code  
SNOW-DEPTH equivalent water condition quality code

FLD LEN: 4

SNOW-DEPTH dimension  
The depth of snow and ice on the ground.  
MIN: 0000 MAX: 1200 UNITS: centimeters  
SCALING FACTOR: 1  
DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

FLD LEN: 1

SNOW-DEPTH condition code  
The code that denotes specific conditions associated with the measurement of snow in a  
PRECIPITATION-OBSERVATION.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
1: Measurement impossible or inaccurate  
2: Snow cover not continuous  
3: Trace  
4: End accumulated period (data include more than one day)  
5: End deleted period (data eliminated due to quality problems)  
6: End missing period  
E: Estimated data value (eg, from nearby station)  
9: Missing

FLD LEN: 1

SNOW-DEPTH quality code  
The code that denotes a quality status of the reported SNOW-DEPTH data.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
0 = Passed gross limits check  
1 = Passed all quality control checks  
2 = Suspect  
3 = Erroneous  
4 = Passed gross limits check , data originate from an NCDC data source  
5 = Passed all quality control checks, data originate from an NCDC data source  
6 = Suspect, data originate from an NCDC data source  
7 = Erroneous, data originate from an NCDC data source  
9 = Passed gross limits check if element is present  
A = Data value flagged as suspect, but accepted as good value  
I = Data value not originally in data, but inserted by validator  
M = Manual change made to value based on information provided by NWS or FAA  
P = Data value not originally flagged as suspect, but replaced by validator  
R = Data value replaced with value computed by NCDC software  
U = Data value replaced with edited value

FLD LEN: 6

SNOW-DEPTH equivalent water depth dimension  
The depth of the liquid content of solid precipitation that has accumulated on the ground.  
MIN: 000000 MAX: 120000 UNITS: millimeters  
SCALING FACTOR: 10  
DOM: A general domain comprised of the numeric characters (0-9).  
999999 = Missing.

FLD LEN: 1

SNOW-DEPTH equivalent water condition code  
The code that denotes specific conditions associated with the measurement of the SNOW-DEPTH.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
1: Measurement impossible or inaccurate  
2: Trace  
9: Missing (no special code to report)

FLD LEN: 1

SNOW-DEPTH equivalent water condition quality code  
The code that denotes a quality status of the reported SNOW-DEPTH equivalent water condition.  
DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 4 = Passed gross limits check , data originate from an NCDC data source
- 5 = Passed all quality control checks, data originate from an NCDC data source
- 6 = Suspect, data originate from an NCDC data source
- 7 = Erroneous, data originate from an NCDC data source
- 9 = Passed gross limits check if element is present
- A = Data value flagged as suspect, but accepted as good value
- I = Data value not originally in data, but inserted by validator
- M = Manual change made to value based on information provided by NWS or FAA
- P = Data value not originally flagged as suspect, but replaced by validator
- R = Data value replaced with value computed by NCDC software
- U = Data value replaced with edited value

---

**FLD LEN: 3**

**SNOW-DEPTH GREATEST DEPTH ON THE GROUND, FOR THE MONTH identifier**

The identifier that represents SNOW-DEPTH GREATEST SNOW DEPTH ON THE GROUND, data.

DOM: A specific domain comprised of the characters in the ASCII character set.

**AK1** An indicator of the following items:

- SNOW-DEPTH depth dimension
- SNOW-DEPTH condition code
- SNOW-DEPTH dates of occurrence
- SNOW-DEPTH quality code

**FLD LEN: 4**

**SNOW-DEPTH GREATEST DEPTH ON THE GROUND, FOR THE MONTH depth dimension**

The depth of GREATEST SNOW DEPTH FOR THE MONTH.

MIN: 0000 MAX: 1500 UNITS: centimeters

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 1**

**SNOW-DEPTH GREATEST DEPTH ON THE GROUND, FOR THE MONTH condition code**

The code that denotes whether a SNOW-DEPTH dimension was a trace value.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 1: Measurement impossible or inaccurate
- 2: Trace
- 3: The amount occurred on other dates in addition to those listed
- 4: Trace amount occurred on other dates in addition to those listed
- 9: Missing or N/A

**FLD LEN: 6**

**SNOW-DEPTH GREATEST DEPTH ON THE GROUND, FOR THE MONTH dates of occurrence**

The dates of occurrence of SNOW-DEPTH, given as the date for each occurrence, for up to 3 occurrences; e.g., 041016 indicates days 04, 10, and 16.

MIN: 01 MAX: 31

DOM: A general domain comprised of the numeric characters (0-9).  
99 = missing for each of the 3 sub-fields.

**FLD LEN: 1**

**SNOW-DEPTH GREATEST DEPTH ON THE GROUND, FOR THE MONTH quality code**

The code that denotes a quality status of the reported SNOW-DEPTH data.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks

2 = Suspect  
 3 = Erroneous  
 4 = Passed gross limits check , data originate from an NCDC data source  
 5 = Passed all quality control checks, data originate from an NCDC data source  
 6 = Suspect, data originate from an NCDC data source  
 7 = Erroneous, data originate from an NCDC data source  
 9 = Passed gross limits check if element is present

---

**FLD LEN: 3**

SNOW-ACCUMULATION occurrence identifier

The identifier that represents an episode of SNOW-ACCUMULATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

**AL1 - AL4** An indicator of up to 4 repeating fields of the following items:

SNOW-ACCUMULATION period quantity  
 SNOW-ACCUMULATION depth dimension  
 SNOW-ACCUMULATION condition code  
 SNOW-ACCUMULATION quality code

**FLD LEN: 2**

SNOW-ACCUMULATION period quantity

The quantity of time over which the SNOW-ACCUMULATION occurred.

MIN: 00 MAX: 72 UNITS: Hours

SCALING FACTOR: 1

DOM: A general domain comprised of the characters in the ASCII character set.

99 = Missing.

**FLD LEN: 3**

SNOW-ACCUMULATION depth dimension

The depth of a SNOW-ACCUMULATION.

MIN: 000 MAX: 500 UNITS: centimeters

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).

999 = Missing.

**FLD LEN: 1**

SNOW-ACCUMULATION condition code

The code that denotes specific conditions associated with the measurement of the depth of a SNOW-ACCUMULATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

1: Measurement impossible or inaccurate  
 2: Snow cover not continuous  
 3: Trace  
 4: End accumulated period (data include more than one day)  
 5: End deleted period (data eliminated due to quality problems)  
 6: End missing period  
 E: Estimated data value (eg, from nearby station)  
 9: Missing

**FLD LEN: 1**

SNOW-ACCUMULATION quality code

The code that denotes a quality status of the reported SNOW-ACCUMULATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check  
 1 = Passed all quality control checks  
 2 = Suspect  
 3 = Erroneous  
 4 = Passed gross limits check , data originate from an NCDC data source  
 5 = Passed all quality control checks, data originate from an NCDC data source  
 6 = Suspect, data originate from an NCDC data source  
 7 = Erroneous, data originate from an NCDC data source  
 M = Manual change made to value based on information provided by NWS or FAA  
 9 = Passed gross limits check if element is present

---

**FLD LEN: 3**

**SNOW-ACCUMULATION GREATEST AMOUNT IN 24 HOURS, FOR THE MONTH identifier**

The identifier that represents SNOW-ACCUMULATION, GREATEST IN 24 HOURS, data.

DOM: A specific domain comprised of the characters in the ASCII character set.

**AM1** An indicator of the following items:

- SNOW-ACCUMULATION depth dimension
- SNOW-ACCUMULATION condition code
- SNOW-ACCUMULATION dates of occurrence (3 fields)
- SNOW-ACCUMULATION quality code

**FLD LEN: 4**

**SNOW-ACCUMULATION GREATEST AMOUNT IN 24 HOURS, FOR THE MONTH depth dimension**

The depth of SNOW-ACCUMULATION for the 24-hour period.

MIN: 0000      MAX: 2000      UNITS: centimeters

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing.

**FLD LEN: 1**

**SNOW-ACCUMULATION GREATEST AMOUNT IN 24 HOURS, FOR THE MONTH condition code**

The code that denotes whether a SNOW-ACCUMULATION depth dimension was a trace value.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 1: Measurement impossible or inaccurate
- 2: Trace
- 3: The amount occurred on other dates in addition to those listed
- 4: Trace amount occurred on other dates in addition to those listed
- 9: Missing

**FLD LEN: 4**

**SNOW-ACCUMULATION GREATEST AMOUNT IN 24 HOURS, FOR THE MONTH dates of occurrence**

The dates of occurrence of SNOW-ACCUMULATION, given as the begin-end date for the 24-hour period, for up to 3 occurrences; e.g., 0405 indicates 24-hour period on days 04-05.

MIN: 0101      MAX: 3131

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing.

**FLD LEN: 4**

**SNOW-ACCUMULATION GREATEST AMOUNT IN 24 HOURS, FOR THE MONTH dates of occurrence**

The dates of occurrence of SNOW-ACCUMULATION, given as the begin-end date for the 24-hour period, for up to 3 occurrences; e.g., 0405 indicates 24-hour period on days 04-05.

MIN: 0101      MAX: 3131

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing.

**FLD LEN: 4**

**SNOW-ACCUMULATION GREATEST AMOUNT IN 24 HOURS, FOR THE MONTH dates of occurrence**

The dates of occurrence of SNOW-ACCUMULATION, given as the begin-end date for the 24-hour period, for up to 3 occurrences; e.g., 0405 indicates 24-hour period on days 04-05.

MIN: 0101      MAX: 3131

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing.

**FLD LEN: 1**

**SNOW-ACCUMULATION GREATEST AMOUNT IN 24 HOURS, FOR THE MONTH quality code**

The code that denotes a quality status of the reported SNOW-ACCUMULATION data.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous



- 4 = Passed gross limits check , data originate from an NCDC data source
- 5 = Passed all quality control checks, data originate from an NCDC data source
- 6 = Suspect, data originate from an NCDC data source
- 7 = Erroneous, data originate from an NCDC data source
- 9 = Passed gross limits check if element is present

**FLD LEN: 3**

**SNOW-ACCUMULATION FOR THE MONTH occurrence identifier**

The identifier that represents SNOW-ACCUMULATION MONTHLY TOTAL.

DOM: A specific domain comprised of the characters in the ASCII character set.

**AN1:** An indicator for the occurrence of the following items:

- SNOW-ACCUMULATION period quantity
- SNOW-ACCUMULATION depth dimension
- SNOW-ACCUMULATION condition code
- SNOW-ACCUMULATION quality code

**FLD LEN: 3**

**SNOW-ACCUMULATION period quantity**

The quantity of time over which the SNOW-ACCUMULATION occurred.

MIN: 001 MAX: 744 UNITS: Hours

SCALING FACTOR: 1

DOM: A general domain comprised of the characters in the ASCII character set.  
999 = Missing.

**FLD LEN: 4**

**SNOW ACCUMULATION FOR THE MONTH depth dimension**

The depth of a SNOW-ACCUMULATION.

MIN: 0000 MAX: 9998 UNITS: centimeters

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 1**

**SNOW-ACCUMULATION FOR THE MONTH condition code**

The code that denotes specific conditions associated with the measurement of the depth of a SNOW-ACCUMULATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 1: Measurement impossible or inaccurate
- 2: Snow cover not continuous
- 3: Trace
- 4: End accumulated period (data may include more than one month)
- 5: End deleted period (data eliminated due to quality problems)
- 6: End missing period
- 7: Data will be included in subsequent observation
- E: Estimated data value (eg, from nearby station)
- 9: Missing

**FLD LEN: 1**

**SNOW-ACCUMULATION FOR THE MONTH quality code**

The code that denotes a quality status of the reported SNOW-ACCUMULATION FOR THE MONTH.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 4 = Passed gross limits check , data originate from an NCDC data source
- 5 = Passed all quality control checks, data originate from an NCDC data source
- 6 = Suspect, data originate from an NCDC data source
- 7 = Erroneous, data originate from an NCDC data source
- M = Manual change made to value based on information provided by NWS or FAA
- 9 = Passed gross limits check if element is present

---

**FLD LEN: 3**

**LIQUID-PRECIPITATION occurrence identifier**

The identifier that represents an episode of LIQUID-PRECIPITATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

**AO1 - AO4** An indicator of up to 4 repeating fields of the following items:

LIQUID-PRECIPITATION period quantity  
LIQUID-PRECIPITATION depth dimension  
LIQUID-PRECIPITATION condition code  
LIQUID-PRECIPITATION quality code

**FLD LEN: 2**

**LIQUID-PRECIPITATION period quantity in minutes**

The quantity of time over which the LIQUID-PRECIPITATION was measured.

MIN: 00 MAX: 98 UNITS: Minutes

SCALING FACTOR: 1

DOM: A specific domain comprised of the characters in the ASCII character set  
99 = Missing.

**FLD LEN: 4**

**LIQUID-PRECIPITATION depth dimension**

The depth of LIQUID-PRECIPITATION that is measured at the time of an observation.

MIN: 0000 MAX: 9998 UNITS: millimeters

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 1**

**LIQUID-PRECIPITATION condition code**

The code that denotes whether a LIQUID-PRECIPITATION depth dimension was a trace value.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 1: Measurement impossible or inaccurate
- 2: Trace
- 3: Begin accumulated period (precipitation amount missing until end of accumulated period)
- 4: End accumulated period
- 5: Begin deleted period (precipitation amount missing due to data problem)
- 6: End deleted period
- 7: Begin missing period
- 8: End missing period
- E: Estimated data value (eg, from nearby station)
- I: Incomplete precipitation amount, excludes one or more missing reports, such as one or more 15-minute reports not included in the 1-hour precipitation total
- J: Incomplete precipitation amount, excludes one or more erroneous reports, such as one or more 1-hour precipitation amounts excluded from the 24-hour total
- 9: Missing

**FLD LEN: 1**

**LIQUID-PRECIPITATION quality code**

The code that denotes a quality status of the reported LIQUID-PRECIPITATION data.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
  - 1 = Passed all quality control checks
  - 2 = Suspect
  - 3 = Erroneous
  - 4 = Passed gross limits check , from DSI-3260 or NCDC ASOS/AWOS
  - 5 = Passed all quality control checks, from DSI-3260 or NCDC ASOS/AWOS
  - 6 = Suspect, from DSI-3260 or NCDC ASOS/AWOS
  - 7 = Erroneous, from DSI-3260 or NCDC ASOS/AWOS
  - 9 = Passed gross limits check if element is present
-

**FLD LEN: 3**

**15 Minute LIQUID-PRECIPIATION occurrence identifier**

The identifier that represents an episode of LIQUID-PRECIPIATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

**IMPORTANT NOTE:** These data are also provided in the AAX section for typical use in applications. The APx data are mainly intended for quality control processing.

**AP1** Indicates HPD gauge value 45 minutes prior to observation time

**AP2** Indicates HPD gauge value 30 minutes prior to observation time

**AP3** Indicates HPD gauge value 15 minutes prior to observation time

**AP4** Indicates HPD gauge value at observation time

LIQUID-PRECIPIATION depth dimension

LIQUID-PRECIPIATION condition code

LIQUID-PRECIPIATION quality code

**FLD LEN: 4**

**HPD (Hourly Precipitation Data network) gauge value**

The HPD Gauge value that is measured at the time indicated.

MIN: 0000 MAX: 9998 UNITS: millimeters

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing

**FLD LEN: 1**

**HPD gauge value condition code**

Not used at this time. Value set to missing.

DOM: A specific domain comprised of the characters in the ASCII character set.

9=Missing

**FLD LEN: 1**

**HPD gauge value quality code**

The code that denotes a quality status of the reported gauge value.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check, data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

9 = Passed gross limits check if element is present

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## Weather Occurrence Data

**FLD LEN: 3**

**PRESENT-WEATHER-OBSERVATION automated occurrence identifier for ASOS/AWOS data**

The identifier that signifies the reporting of present weather.

DOM: A specific domain comprised of the ASCII characters.

**AU1 – AU9** An indicator of up to 9 repeating fields of the following items:

PRESENT-WEATHER-OBSERVATION intensity **code**

PRESENT-WEATHER-OBSERVATION descriptor **code**

PRESENT-WEATHER-OBSERVATION precipitation **code**

PRESENT-WEATHER-OBSERVATION obscuration **code**

PRESENT-WEATHER-OBSERVATION other weather phenomena **code**

PRESENT-WEATHER-OBSERVATION combination indicator **code**

PRESENT-WEATHER-OBSERVATION quality **code**

**FLD LEN: 1**

**PRESENT-WEATHER-OBSERVATION intensity and proximity code**

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Not Reported
- 1 = Light (-)
- 2 = Moderate or Not Reported (no entry in original observation)
- 3 = Heavy (+)
- 4 = Vicinity (VC)
- 9 = Missing

**FLD LEN: 1**

**PRESENT-WEATHER-OBSERVATION descriptor code**

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = No Descriptor
- 1 = Shallow (MI)
- 2 = Partial (PR)
- 3 = Patches (BC)
- 4 = Low Drifting (DR)
- 5 = Blowing (BL)
- 6 = Shower(s) (SH)
- 7 = Thunderstorm (TS)
- 8 = Freezing (FZ)
- 9 = Missing

**FLD LEN: 2**

**PRESENT-WEATHER-OBSERVATION precipitation code**

DOM: A specific domain comprised of the characters in the ASCII character set.

- 00 = No Precipitation
- 01 = Drizzle (DZ)
- 02 = Rain (RA)
- 03 = Snow (SN)
- 04 = Snow Grains (SG)
- 05 = Ice Crystals (IC)
- 06 = Ice Pellets (PL)
- 07 = Hail (GR)
- 08 = Small Hail and/or Snow Pellets (GS)
- 09 = Unknown Precipitation (UP)
- 99 = Missing

**FLD LEN: 1**

**PRESENT-WEATHER-OBSERVATION obscuration code**

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = No Obscuration
- 1 = Mist (BR)
- 2 = Fog (FG)
- 3 = Smoke (FU)
- 4 = Volcanic Ash (VA)
- 5 = Widespread Dust (DU)
- 6 = Sand (SA)
- 7 = Haze (HZ)
- 8 = Spray (PY)
- 9 = Missing

**FLD LEN: 1**

**PRESENT-WEATHER-OBSERVATION other weather phenomena code**

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = None Reported
- 1 = Well-Developed Dust/Sand Whirls (PO)
- 2 = Squalls (SQ)
- 3 = Funnel Cloud, Tornado, Waterspout(FC)
- 4 = Sandstorm (SS)
- 5 = Duststorm (DS)
- 9 = Missing

**FLD LEN: 1**

**PRESENT-WEATHER-OBSERVATION combination indicator code**

DOM: A specific domain comprised of the characters in the ASCII character set.

- 1 = Not part of combined weather elements
- 2 = Beginning element of combined weather elements
- 3 = Combined with previous weather element to form a single weather report
- 9 = Missing

**FLD LEN: 1**

**PRESENT-WEATHER-OBSERVATION quality code**

The code that denotes a quality status of the reported PRESENT-WEATHER-OBSERVATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
  - 1 = Passed all quality control checks
  - 2 = Suspect
  - 3 = Erroneous
  - 4 = Passed gross limits check , data originate from an NCDC data source
  - 5 = Passed all quality control checks, data originate from an NCDC data source
  - 6 = Suspect, data originate from an NCDC data source
  - 7 = Erroneous, data originate from an NCDC data source
  - M = Manual change made to value based on information provided by NWS or FAA
  - 9 = Passed gross limits check if element is present
- 

**FLD LEN: 3**

PRESENT-WEATHER-OBSERVATION automated occurrence identifier

The identifier that signifies the reporting of present weather.

DOM: A specific domain comprised of the ASCII characters.

- AW1** First automated weather report
- AW2** Second automated weather report
- AW3** Third automated weather report
- AW4** Fourth automated weather report

PRESENT-WEATHER-OBSERVATION automated atmospheric condition code

PRESENT-WEATHER-OBSERVATION quality automated atmospheric condition code

**FLD LEN: 2**

PRESENT-WEATHER-OBSERVATION automated atmospheric condition code

The code that denotes a specific type of weather reported by an automated device.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 00: No significant weather observed
- 01: Clouds generally dissolving or becoming less developed
- 02: State of sky on the whole unchanged during the past hour
- 03: Clouds generally forming or developing during the past hour
- 04: Haze, smoke, or dust in suspension in the air, visibility equal to or greater than 1km
- 05: Smoke
- 07: Dust or sand raised by wind at or near the station at the time of observation, but no well-developed dust whirl(s) or sand whirl(s), and no duststorm or sandstorm seen or, in the case of ships, blowing spray at the station
- 10: Mist
- 11: Diamond dust
- 12: Distant lightning
- 18: Squalls

(Code figures 20-26 are used to report precipitation, fog, or thunderstorm at the station during the preceding hour, but not at the time of observation.)

- 20: Fog
- 21: Precipitation
- 22: Drizzle (not freezing) or snow grains
- 23: Rain (not freezing)
- 24: Snow
- 25: Freezing drizzle or freezing rain
- 26: Thunderstorm (with or without precipitation)
- 27: Blowing or drifting snow or sand

28: Blowing or drifting snow or sand, visibility equal to or greater than 1 km  
 29: Blowing or drifting snow or sand, visibility less than 1 km  
 30: Fog  
 31: Fog or ice fog in patches  
 32: Fog or ice fog, has become thinner during the past hour  
 33: Fog or ice fog, no appreciable change during the past hour  
 34: Fog or ice fog, has begun or become thicker during the past hour  
 35: Fog, depositing rime  
 40: Precipitation  
 41: Precipitation, slight or moderate  
 42: Precipitation, heavy  
 43: Liquid precipitation, slight or moderate  
 44: Liquid precipitation, heavy  
 45: Solid precipitation, slight or moderate  
 46: Solid precipitation, heavy  
 47: Freezing precipitation, slight or moderate  
 48: Freezing precipitation, heavy  
 50: Drizzle  
 51: Drizzle, not freezing, slight  
 52: Drizzle, not freezing, moderate  
 53: Drizzle, not freezing, heavy  
 54: Drizzle, freezing, slight  
 55: Drizzle, freezing, moderate  
 56: Drizzle, freezing, heavy  
 57: Drizzle and rain, slight  
 58: Drizzle and rain, moderate or heavy  
 60: Rain  
 61: Rain, not freezing, slight  
 62: Rain, not freezing, moderate  
 63: Rain, not freezing, heavy  
 64: Rain, freezing, slight  
 65: Rain, freezing, moderate  
 66: Rain, freezing, heavy  
 67: Rain or drizzle and snow, slight  
 68: Rain or drizzle and snow, moderate or heavy  
 70: Snow  
 71: Snow, slight  
 72: Snow, moderate  
 73: Snow, heavy  
 74: Ice pellets, slight  
 75: Ice pellets, moderate  
 76: Ice pellets, heavy  
 77: Snow grains  
 78: Ice crystals  
 80: Showers or intermittent precipitation  
 81: Rain showers or intermittent rain, slight  
 82: Rain showers or intermittent rain, moderate  
 83: Rain showers or intermittent rain, heavy  
 84: Rain showers or intermittent rain, violent  
 85: Snow showers or intermittent snow, slight  
 86: Snow showers or intermittent snow, moderate  
 87: Snow showers or intermittent snow, heavy  
 89: Hail  
 90: Thunderstorm  
 91: Thunderstorm, slight or moderate, with no precipitation  
 92: Thunderstorm, slight or moderate, with rain showers and/or snow showers  
 93: Thunderstorm, slight or moderate, with hail  
 94: Thunderstorm, heavy, with no precipitation  
 95: Thunderstorm, heavy, with rain showers and/or snow  
 96: Thunderstorm, heavy, with hail  
 99: Tornado

FLD LEN: 1

PRESENT-WEATHER-OBSERVATION quality automated atmospheric condition code

The code that denotes a quality status of a reported present weather observation from an automated station.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check, data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

M = Manual change made to value based on information provided by NWS or FAA

9 = Passed gross limits check if element is present

---

**FLD LEN: 3**

**PAST-WEATHER-OBSERVATION summary of day occurrence identifier**

The identifier that signifies the reporting of past weather as summarized for the calendar day.

DOM: A specific domain comprised of the characters in the ASCII character set.

**AX1 – AX6** An indicator of up to 6 repeating fields of the following item:

PAST-WEATHER-OBSERVATION atmospheric condition code

PAST-WEATHER-OBSERVATION quality atmospheric condition code

PAST-WEATHER-OBSERVATION period quantity

PAST-WEATHER-OBSERVATION period quality code

**FLD LEN: 2**

**PAST-WEATHER-OBSERVATION atmospheric condition code**

The code that denotes a specific type of past weather observed.

DOM: A specific domain comprised of the characters in the ASCII character set.

00: none to report

01: fog

02: fog reducing visibility to ¼ mile or less

03: thunder

04: ice pellets

05: hail

06: glaze or rime

07: blowing dust or sand, visibility ½ mile or less

08: smoke or haze

09: blowing snow

10: tornado

11: high or damaging winds

99: missing

**FLD LEN: 1**

**PAST-WEATHER-OBSERVATION quality manual atmospheric condition code**

The code that denotes a quality status of a reported past weather observation from a manual station.

DOM: A specific domain comprised of the characters in the ASCII character set.

4 = Passed gross limits check, data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

9 = Passed gross limits check if element is present

**FLD LEN: 2**

**PAST-WEATHER-OBSERVATION period quantity**

The quantity of time over which a PAST-WEATHER-OBSERVATION occurred.

MIN: 24                      MAX: 24                      UNITS: hours

DOM: A general domain comprised of the ASCII characters 0-9.

99 = Missing

**FLD LEN: 1**

**PAST-WEATHER-OBSERVATION period quality code**

The code that denotes a quality status of a reported past weather period.

DOM: A specific domain comprised of the characters in the ASCII character set.

4 = Passed gross limits check, data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

9 = Passed gross limits check if element is present

---

FLD LEN: 3

PAST-WEATHER-OBSERVATION manual occurrence identifier

The identifier that signifies the reporting of past weather.

DOM: A specific domain comprised of the characters in the ASCII character set.

**AY1 - AY2** An indicator of up to 2 repeating fields of the following item:

PAST-WEATHER-OBSERVATION manual atmospheric condition code

PAST-WEATHER-OBSERVATION quality manual atmospheric condition code

PAST-WEATHER-OBSERVATION period quantity

PAST-WEATHER-OBSERVATION period quality code

FLD LEN: 1

PAST-WEATHER-OBSERVATION manual atmospheric condition code

The code that denotes a specific type of past weather observed manually.

DOM: A specific domain comprised of the characters in the ASCII character set.

Domain Value ID: Domain Value Definition Text

0: Cloud covering 1/2 or less of the sky throughout the appropriate period

1: Cloud covering more than 1/2 of the sky during part of the appropriate period and covering 1/2 or less during part of the period

2: Cloud covering more than 1/2 of the sky throughout the appropriate period

3: Sandstorm, duststorm or blowing snow

4: Fog or ice fog or thick haze

5: Drizzle

6: Rain

7: Snow, or rain and snow mixed

8: Shower(s)

9: Thunderstorm(s) with or without precipitation

FLD LEN: 1

PAST-WEATHER-OBSERVATION quality manual atmospheric condition code

The code that denotes a quality status of a reported past weather observation from a manual station.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

9 = Passed gross limits check if element is present

FLD LEN: 2

PAST-WEATHER-OBSERVATION period quantity

The quantity of time over which a PAST-WEATHER-OBSERVATION occurred.

MIN: 01 MAX: 24 UNITS: hours

DOM: A general domain comprised of the ASCII characters 0-9.

99 = Missing

FLD LEN: 1

PAST-WEATHER-OBSERVATION period quality code

The code that denotes a quality status of a reported past weather period.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

9 = Passed gross limits check if element is present



---

FLD LEN: 3

PAST-WEATHER-OBSERVATION automated occurrence identifier

The identifier that signifies the reporting of present weather.

DOM: A specific domain comprised of the characters in the ASCII character set.

**AZ1- AZ2** An indicator of the following item: (this may occur 0 - 2 times)

PAST-WEATHER-OBSERVATION automated atmospheric condition code

PAST-WEATHER-OBSERVATION quality automated atmospheric condition code

PAST-WEATHER-OBSERVATION period quantity

PAST-WEATHER-OBSERVATION period quality code

FLD LEN: 1

PAST-WEATHER-OBSERVATION automated atmospheric condition code

The code that denotes a specific type of past weather reported by an automated device.

DOM: A specific domain comprised of the characters in the ASCII character set.

0: No significant weather observed

1: Visibility reduced

2: Blowing phenomena, visibility reduced

3: Fog

4: Precipitation

5: Drizzle

6: Rain

7: Snow or ice pellets

8: Showers or intermittent precipitation

9: Thunderstorm

FLD LEN: 1

PAST-WEATHER-OBSERVATION quality automated atmospheric condition code

The code that denotes a quality status of a reported past weather observation from an automated station.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

9 = Passed gross limits check if element is present

FLD LEN: 2

PAST-WEATHER-OBSERVATION period quantity

The quantity of time over which a PAST-WEATHER-OBSERVATION occurred.

MIN: 01 MAX: 24 UNITS: hours

DOM: A general domain comprised of the ASCII characters 0-9.

99 = Missing

FLD LEN: 1

PAST-WEATHER-OBSERVATION period quality code

The code that denotes a quality status of a reported past weather period.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

9 = Passed gross limits check if element is present

---

## **Climate Reference Network Unique Data**

FLD LEN: 3

Subhourly Observed Liquid Precipitation Section: Secondary Sensor identifier

The identifier that indicates the presence of a liquid precipitation measurement made by a secondary precipitation sensor.

DOM: A specific domain comprised of the characters in the ASCII character set.

**CB1, CB2** An indicator of the following items:

PERIOD period quantity  
PRECIPITATION liquid depth  
PRECIP\_QC quality code  
PRECIP\_FLAG quality code

**FLD LEN: 2**

**PRECIPITATION** period quantity

The quantity of time for which the gauge depth was measured.

MIN: 05 MAX: 60 UNITS: Minutes

DOM: A specific domain comprised of the characters in the ASCII character set

99 = Missing

**FLD LEN: 6**

**PRECIPITATION** liquid depth

The observed liquid precipitation measurement from the secondary precipitation sensor.

MIN: -99999 MAX: +99998 UNITS: millimeters

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-).

+99999 = Missing.

**FLD LEN: 1**

**QC** quality code

The code that indicates ISD's evaluation of the quality status of the liquid precipitation measurement from the secondary precipitation sensor.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**PRECIP\_FLAG** quality code

The code that indicates the network's internal evaluation of the quality status of the reported LIQUID-PRECIPITATION data. Most users will find the preceding quality code DEPTH\_QC to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks

other – Did not pass all quality checks

---

**FLD LEN: 3**

**Hourly Fan Speed Section** identifier

The identifier that indicates an hourly observation of the fan speed from an aspirated shield housing the temperature sensor. Three instances of this section appear in the last ISD record of the hour.

DOM: A specific domain comprised of the characters in the ASCII character set.

**CF1,CF2,CF3** An indicator of the following items:

FAN speed rate  
FAN\_QC quality code  
FAN\_FLAG quality code

**FLD LEN: 4**

**FAN** The average fan speed for the hour.

MIN: - 0000 MAX: 9998 UNITS: rotations per second

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing.

**FLD LEN: 1**

**FAN\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the average fan speed for the hour.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**FAN\_QC\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status of the average fan speed for the hour. Most users will find the preceding quality code **FAN\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks

other – Did not pass all quality checks

---

**FLD LEN: 3**

**Subhourly Observed Liquid Precipitation Section: Primary Sensor** identifier

The identifier that indicates the presence of three concurrent precipitation depth observations made by co-located sensors on the primary precipitation gauge. Three instances of this section (corresponding to the three precipitation sensors) appear in each of the twelve 5-minute data stream records.

DOM: A specific domain comprised of the characters in the ASCII character set.

**CG1, CG2, CG3** Three indicators preceding three copies of the following items:

DEPTH liquid depth

DEPTH\_QC quality code

DEPTH\_FLAG quality code

**FLD LEN: 6**

**DEPTH** liquid depth

The observed gauge depth.

MIN: -99999 MAX: +99998 UNITS: millimeters

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-).

+99999 = Missing.

**FLD LEN: 1**

**DEPTH\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the observed depth.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**DEPTH\_FLAG** quality code

The code that indicates the network's internal evaluation of the quality status of the observed depth. Most users will find the preceding quality code **DEPTH\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed all quality control checks

other – Did not pass all quality checks

---

**FLD LEN: 3**

**Hourly/Sub-Hourly Relative Humidity/Temperature Section** identifier

The identifier that indicates an observation of relative humidity and temperature **measured at the relative humidity instrument**. This section appears one or more times per hour.

DOM: A specific domain comprised of the characters in the ASCII character set.

**CH1, CH2** An indicator of the following items:

RELATIVE HUMIDITY/TEMPERATURE period quantity

AVG\_RH\_TEMP average air temperature

AVG\_RH\_TEMP\_QC quality code

AVG\_RH\_TEMP\_FLAG quality code

AVG\_RH average relative humidity  
AVG\_RH\_QC quality code  
AVG\_RH\_FLAG quality code

**FLD LEN: 2**

**RELATIVE HUMIDITY/TEMPERATURE period quantity in minutes**

The quantity of time over which the **RELATIVE HUMIDITY/TEMPERATURE** was measured.

MIN: 00 MAX: 60 UNITS: Minutes

SCALING FACTOR: 1

DOM: A specific domain comprised of the characters in the ASCII character set  
99 = Missing.

**FLD LEN: 5**

**AVG\_RH\_TEMP** average air temperature

The average air temperature measured at the relative humidity instrument.

MIN: -9999 MAX: +9998 UNITS: degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-)  
+9999 = Missing.

**FLD LEN: 1**

**AVG\_RH\_TEMP\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the average air temperature measured at the relative humidity instrument.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**AVG\_RH\_TEMP\_FLAG** quality code

The code that indicates the network's internal evaluation of the quality status of the average air temperature measured at the relative humidity instrument. Most users will find the preceding quality code

**AVG\_RH\_TEMP\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed all quality control checks

other – Did not pass all quality checks

**FLD LEN: 4**

**AVG\_RH** average relative humidity

The average relative humidity measured at the relative humidity instrument.

MIN: 0000 MAX: 1000 UNITS: percent

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 1**

**AVG\_RH\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the average relative humidity.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**AVG\_RH\_FLAG** quality code

The code that indicates the network's internal evaluation of the quality status of the average relative humidity.

Most users will find the preceding quality code **AVG\_RH\_QC**

to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed all quality control checks

other – Did not pass all quality checks

---

**FLD LEN: 3**

**Hourly Relative Humidity/Temperature Section identifier**

The identifier that indicates an hourly observation of relative humidity and temperature **measured at the relative humidity instrument**. This section appears in the last ISD record of the hour.

DOM: A specific domain comprised of the characters in the ASCII character set.

**CI1** An indicator of the following items:

- MIN\_RH\_TEMP hourly air temperature
- MIN\_RH\_TEMP\_QC quality code
- MIN\_RH\_TEMP\_FLAG quality code
- MAX\_RH\_TEMP hourly air temperature
- MAX\_RH\_TEMP\_QC quality code
- MAX\_RH\_TEMP\_FLAG quality code
- STD\_RH\_TEMP hourly air temperature standard deviation
- STD\_RH\_TEMP\_QC quality code
- STD\_RH\_TEMP\_FLAG quality code
- STD\_RH hourly relative humidity standard deviation
- STD\_RH\_QC quality code
- STD\_RH\_FLAG quality code

**FLD LEN: 5**

**MIN\_RH\_TEMP** hourly air temperature

The minimum air temperature measured at the relative humidity instrument.

MIN: -9999 MAX: +9999 UNITS: degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-)  
+9999 = Missing.

**FLD LEN: 1**

**MIN\_RH\_TEMP\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the minimum hourly air temperature measured at the relative humidity instrument.

DOM: A specific domain comprised of the numeric characters (0-9).

- 1 = Passed all quality control checks
- 3 = Failed all quality control checks
- 9 = Missing

**FLD LEN: 1**

**MIN\_RH\_TEMP\_FLAG** quality code

The code that indicates the network's internal evaluation of the quality status of the minimum hourly air temperature measured at the relative humidity instrument. Most users will find the preceding quality code

**AVG\_RH\_TEMP\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

- 0 = Passed all quality control checks
- other – Did not pass all quality checks

**FLD LEN: 5**

**MAX\_RH\_TEMP** hourly air temperature

The maximum air temperature measured at the relative humidity instrument.

MIN: -9999 MAX: +9998 UNITS: degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-)  
+9999 = Missing.

**FLD LEN: 1**

**MAX\_RH\_TEMP\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the maximum hourly air temperature measured at the relative humidity instrument.

DOM: A specific domain comprised of the numeric characters (0-9).

- 1 = Passed all quality control checks

3 = Failed all quality control checks  
9 = Missing

**FLD LEN: 1**

**MAX\_RH\_TEMP\_FLAG** quality code

The code that indicates the network's internal evaluation of the quality status of the maximum hourly air temperature measured at the relative humidity instrument. Most users will find the preceding quality code

**AVG\_RH\_TEMP\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed all quality control checks  
other – Did not pass all quality checks

**FLD LEN: 5**

**STD\_RH\_TEMP** hourly air temperature standard deviation

The standard deviation for the hourly air temperature measured at the relative humidity instrument.

MIN: 00000 MAX: 99998

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

99999 = Missing.

**FLD LEN: 1**

**STD\_RH\_TEMP\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the standard deviation for the air temperature measured at the relative humidity instrument.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks  
3 = Failed all quality control checks  
9 = Missing

**FLD LEN: 1**

**STD\_RH\_TEMP\_FLAG** quality code

The code that indicates the network's internal evaluation of the quality status of the standard deviation for the air temperature measured at the relative humidity instrument. Most users will find the preceding quality code

**STD\_RH\_TEMP\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed all quality control checks  
other – Did not pass all quality checks

**FLD LEN: 5**

**STD\_RH** hourly relative humidity standard deviation

The hourly relative humidity standard deviation.

MIN: 00000 MAX: 99998

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

99999 = Missing.

**FLD LEN: 1**

**STD\_RH\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the hourly relative humidity standard deviation.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks  
3 = Failed all quality control checks  
9 = Missing

**FLD LEN: 1**

**STD\_RH\_FLAG** quality code

The code that indicates the network's internal evaluation of the quality status of the hourly relative humidity standard deviation. Most users will find the preceding quality code **STD\_RH\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed all quality control checks  
other – Did not pass all quality checks

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**FLD LEN: 3****Hourly Battery Voltage Section** identifier

The identifier that indicates an hourly observation of battery voltages. This section appears in the last ISD record of the hour.

DOM: A specific domain comprised of the characters in the ASCII character set.

**CN1** An indicator of the following items:

- BATVOL average voltage
- BATVOL\_QC quality code
- BATVOL\_FLAG quality code
- BATVOL\_FL average voltage
- BATVOL\_FL\_QC quality code
- BATVOL\_FL\_FLAG quality code
- BATVOL\_DL average voltage
- BATVOL\_DL\_QC quality code
- BATVOL\_DL\_FLAG quality code

**FLD LEN: 4****BATVOL** average voltage

The hourly average voltage for the batteries powering the sensors and the transmitter.

MIN: 0000      MAX: 9998      UNITS: volts

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 1****BATVOL\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the hourly average station battery voltage.

DOM: A specific domain comprised of the numeric characters (0-9).

- 1 = Passed all quality control checks
- 3 = Failed all quality control checks
- 9 = Missing

**FLD LEN: 1****BATVOL\_QC\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status of the hourly average station battery voltage.

Most users will find the preceding quality code **BATVOL\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

- 0 = Passed all quality control checks
- other – Did not pass all quality checks

**FLD LEN: 4****BATVOL\_FL** average voltage

The voltage for the batteries powering the observing station while the station is transmitting ("full load").

MIN: 0000      MAX: 9998      UNITS: volts

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 1****BATVOL\_FL\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the battery voltage under full load.

DOM: A specific domain comprised of the numeric characters (0-9).

- 1 = Passed all quality control checks
- 3 = Failed all quality control checks
- 9 = Missing

**FLD LEN: 1****BATVOL\_FL\_QC\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status of battery voltage under full load. Most users will find the preceding quality code **BATVOL\_FL\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)  
0 = Passed all quality control checks  
other – Did not pass all quality checks

**FLD LEN: 4**

**BATVOL\_DL** average voltage

The voltage for the batteries powering the datalogger.

MIN: 0000      MAX: 9998      UNITS: volts

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 1**

**BATVOL\_DL\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the datalogger battery voltage.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**BATVOL\_DL\_QC\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status of the datalogger battery voltage. Most users will find the preceding quality code **BATVOL\_DL\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks

other – Did not pass all quality checks

---

**FLD LEN: 3**

**Hourly Diagnostic Section** identifier

The identifier that indicates an hourly observation of miscellaneous diagnostic data. This section appears in the last ISD record of the hour

DOM: A specific domain comprised of the characters in the ASCII character set.

**CN2** An indicator of the following items:

TPANEL equipment temperature

TPANEL\_QC quality code

TPANEL\_FLAG quality code

TINLET\_MAX equipment temperature

TINLET\_MAX\_QC quality code

TINLET\_MAX\_FLAG quality code

OPENDOOR\_TM equipment status

OPENDOOR\_TM\_QC quality code

OPENDOOR\_TM\_FLAG quality code

**FLD LEN: 5**

**TPANEL** equipment temperature

The temperature of the datalogger panel.

MIN: -9999      MAX: +9998      UNITS: degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-).  
+9999 = Missing.

**FLD LEN: 1**

**TPANEL\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the datalogger panel temperature.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**



**TPANEL\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status of the datalogger panel temperature. Most users will find the preceding quality code **TPANEL\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks  
other – Did not pass all quality checks

**FLD LEN: 5****TINLET\_MAX** equipment temperature

The maximum temperature of the Geonor inlet for the hour.

MIN: -9999 MAX: +9998 UNITS: degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-).

+9999 = Missing.

**FLD LEN: 1****TINLET\_MAX\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the maximum temperature of the Geonor inlet for the hour.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks  
3 = Failed all quality control checks  
9 = Missing

**FLD LEN: 1****TINLET\_MAX\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status of the maximum temperature of the Geonor inlet for the hour. Most users will find the preceding quality code **TINLET\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks  
other – Did not pass all quality checks

**FLD LEN: 2****OPENDOOR\_TM** equipment status

The time in minutes the datalogger door was open during the hour.

MIN: 00 MAX: 60 UNITS: minutes

DOM: A general domain comprised of the numeric characters (0-9).

99 = Missing.

**FLD LEN: 1****OPENDOOR\_TM\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the time the datalogger door was open.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks  
3 = Failed all quality control checks  
9 = Missing

**FLD LEN: 1****OPENDOOR\_TM\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status of the time the datalogger door was open. Most users will find the preceding quality code **OPENDOOR\_TM\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks  
other – Did not pass all quality checks

**FLD LEN: 3****Secondary Hourly Diagnostic Section** identifier

The identifier that indicates an hourly observation of miscellaneous diagnostic data. This section appears in the last ISD record of the hour

DOM: A specific domain comprised of the characters in the ASCII character set.

**CN3** An indicator of the following items:

- REFRESAVG resistance
- REFRESAVG\_QC quality code
- REFRESAVG\_FLAG quality code
- DSIGNATURE identifier
- DSIGNATURE\_QC quality code
- DSIGNATURE\_FLAG quality code

**FLD LEN: 6**

**REFRESAVG** resistance

The reference resistor average.

MIN: 000000      MAX: 999998      UNITS: ohms

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

999999 = Missing.

**FLD LEN: 1**

**REFRESAVG\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the datalogger reference resistor average.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**REFRESAVG\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status of the reference resistor average. Most users will find the preceding quality code **REFRESAVG\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks

other – Did not pass all quality checks

**FLD LEN: 6**

**DSIGNATURE** identifier

A signature generated by the datalogger which changes if there is a content or sequence change in the datalogger programs.

MIN: 000000      MAX: 999998

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

999999 = Missing.

**FLD LEN: 1**

**DSIGNATURE\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the datalogger signature.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**DSIGNATURE\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status of the datalogger signature. Most users will find the preceding quality code **DSIGNATURE\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks

other – Did not pass all quality checks

---

**FLD LEN: 3**

**Secondary Hourly Diagnostic Section** identifier

The identifier that indicates another hourly observation of miscellaneous diagnostic data. This section appears in the

last ISD record of the hour

DOM: A specific domain comprised of the characters in the ASCII character set.

**CN4** An indicator of the following items:

LIQUID-PRECIPITATION gauge heater flag bit field

LIQUID-PRECIPITATION gauge flag quality code

LIQUID-PRECIPITATION gauge flag quality code

DOORFLAG field

DOORFLAG quality code

DOORFLAG quality code

FORTTRANS wattage

FORTTRANS wattage quality code

FORTTRANS wattage quality code

REFLTRANS wattage

REFLTRANS wattage quality code

REFLTRANS wattage quality code

**FLD LEN: 1**

LIQUID-PRECIPITATION gauge heater flag bit field

The code that indicates the gauge heater flag bit field setting.

DOM: A specific domain comprised of the numeric characters (0-1).

0 = Off

1 = On

9 = Missing

MIN: 0 MAX: 9

**FLD LEN: 1**

LIQUID-PRECIPITATION gauge heater flag quality code

The code that indicates ISD's evaluation of the quality status of the gauge heater flag code.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

LIQUID-PRECIPITATION gauge heater flag quality code

A flag that indicates the network's internal evaluation of the quality status of the gauge heater flag code. Most users will find the preceding quality code to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks

other – Did not pass all quality checks

**FLD LEN: 1**

DOORFLAG field

The code that indicates the datalogger door bit field setting.

DOM: A specific domain comprised of the numeric characters (0-1).

0 = Off

1 = On

9 = Missing

MIN: 0 MAX: 9

**FLD LEN: 1**

DOORFLAG field quality code

The code that indicates ISD's evaluation of the quality status of the datalogger door bit field setting.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

DOORFLAG field quality code

A flag that indicates the network's internal evaluation of the quality status of the datalogger door bit field setting code. Most users will find the preceding quality code to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks

other – Did not pass all quality checks

**FLD LEN: 3**

FORTTRANS wattage  
Forward transmitter RF power in tenths of watts  
MIN: 000 MAX: 500 UNITS: Watts  
SCALING FACTOR: 10  
DOM: A general domain comprised of the numeric characters (0-9).  
999 = Missing

**FLD LEN: 1**

FORTTRANS wattage quality code  
The code that indicates ISD's evaluation of the quality status of the forward transmitter RF power.  
DOM: A specific domain comprised of the numeric characters (0-9).  
1 = Passed all quality control checks  
3 = Failed all quality control checks  
9 = Missing

**FLD LEN: 1**

FORTTRANS wattage quality code  
A flag that indicates the network's internal evaluation of the quality status of the forward transmitter RF power. Most users will find the preceding quality code to be the simplest and most useful quality indicator.  
DOM: A specific domain comprised of the numeric characters (0-9)  
0 = Passed all quality control checks  
other – Did not pass all quality checks

**FLD LEN: 3**

REFLTRANS wattage  
Reflected transmitter RF power in tenths of watts  
MIN: 000 MAX: 500 UNITS: Watts  
SCALING FACTOR: 10  
DOM: A general domain comprised of the numeric characters (0-9).  
999 = Missing

**FLD LEN: 1**

REFLTRANS wattage quality code  
The code that indicates ISD's evaluation of the quality status of the reflected transmitter RF power.  
DOM: A specific domain comprised of the numeric characters (0-9).  
1 = Passed all quality control checks  
3 = Failed all quality control checks  
9 = Missing

**FLD LEN: 1**

REFLTRANS wattage quality code  
A flag that indicates the network's internal evaluation of the quality status of the reflected transmitter RF power. Most users will find the preceding quality code to be the simplest and most useful quality indicator.  
DOM: A specific domain comprised of the numeric characters (0-9)  
0 = Passed all quality control checks  
other – Did not pass all quality checks

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## **Network Metadata**

**FLD LEN: 3**

US-NETWORK-METADATA identifier  
The identifier that indicates the occurrence of US Network metadata, used in NCDC data processing.  
DOM: A specific domain comprised of the ASCII characters.  
**CO1** An indicator of the following item:  
NETWORK-METADATA climate division number  
NETWORK-METADATA UTC-LST time conversion

FLD LEN: 2

NETWORK-METADATA climate division number

The climate division number, for this station, within the US state that it resides.

MIN: 00            MAX: 09            UNITS: N/A

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).

99 = Missing

FLD LEN: 3

NETWORK-METADATA UTC-LST time conversion

The UTC to LST time conversion for this station.

MIN: -12            MAX: +12            UNITS: hours

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-)

+99 = Missing

---

FLD LEN: 3

US-COOPERATIVE-NETWORK-ELEMENT-TIME-OFFSET identifier

The identifier that indicates a specified element's observation time differs from the time listed in "Control Section".

DOM: A specific domain comprised of the ASCII characters.

**CO2 - CO9** An indicator of up to 8 repeating fields of the following item:

COOPERATIVE-NETWORK-ELEMENT-ID

COOPERATIVE-NETWORK-TIME-OFFSET

FLD LEN: 3

COOPERATIVE-NETWORK-ELEMENT-ID

The element identifier to be offset, based on the identifier as shown in this document.

DOM: A general domain comprised of the characters in the ASCII character set.

999 = Missing

FLD LEN: 5

COOPERATIVE-NETWORK-TIME-OFFSET

The offset in hours. To obtain the actual observation time of the element/parameter indicated, add the value in this field to the date-time value in the "Control Section."

MIN: -9999            MAX: +9998            UNITS: Hours

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-).

+9999 = Missing

---

FLD LEN: 3

**CRN Control Section** identifier

The identifier that indicates an occurrence of datalogger program information.

DOM: A specific domain comprised of the characters in the ASCII character set.

**CR1** An indicator of the following items:

DL\_VN identifier

DL\_VN\_QC quality code

DL\_VN\_FLAG quality code

FLD LEN: 5

**DL\_VN** identifier

The version number which uniquely identifies the datalogger program that produced the CRN observation for this hour. This section appears once in every ISD record.

MIN: 00000            MAX: 99998

SCALING FACTOR: 1000

DOM: A general domain comprised of the numeric characters (0-9).

99999 = missing

**FLD LEN: 1**

**DL\_VN\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the reported datalogger program version number.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**DL\_VN\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status of the reported datalogger program version number. Most users will find the preceding quality code **DL\_VN\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed all quality control checks

other – Did not pass all quality checks

---

**FLD LEN: 3**

**Subhourly Temperature Section** identifier

The identifier that indicates one of three concurrent air temperature observations made by co-located sensors.

Three instances of this section (corresponding to the three temperature sensors) appear in each of the twelve 5-minute data stream records. In the 15-minute data stream, the three instances of this section appear in the last record of the hour, and contain the average temperature for the last 5 minutes of the hour.

DOM: A specific domain comprised of the characters in the ASCII character set.

**CT1, CT2, CT3** Three indicators preceding three copies of the following items:

AVG\_TEMP air temperature

AVG\_TEMP\_QC quality code

AVG\_TEMP\_FLAG quality code

**FLD LEN: 5**

**AVG\_TEMP** air temperature

The average air temperature for a 5-minute period.

MIN: -9999 MAX: +9998 UNITS: degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-).

+9999 = Missing.

**FLD LEN: 1**

**AVG\_TEMP\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the 5-minute air temperature average.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**AVG\_TEMP\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status of the 5-minute air temperature average. Most users will find the preceding quality code **AVG\_TEMP\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks

other – Did not pass all quality checks

---

**FLD LEN: 3**

**Hourly Temperature Section** identifier

The identifier that indicates one of three concurrent air temperature observations made by co-located sensors.

Three instances of this section (corresponding to the three temperature sensors) appear in the last ISD record of the hour.

DOM: A specific domain comprised of the characters in the ASCII character set.

**CU1, CU2, CU3** Three indicators preceding three copies of the following items:

- TEMP\_AVG air temperature
- TEMP\_AVG\_QC quality code
- TEMP\_AVG\_FLAG quality code
- TEMP\_STD air temperature standard deviation
- TEMP\_STD\_QC quality code
- TEMP\_STD\_FLAG quality code

**FLD LEN: 5**

**TEMP\_AVG** air temperature

The average air temperature for an hour.

MIN: -9999      MAX: +9998      UNITS: degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-).

+9999 = Missing.

**FLD LEN: 1**

**TEMP\_AVG\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the hourly temperature average.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**TEMP\_AVG\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status the hourly temperature average. Most users will find the preceding quality code **TEMP\_AVG\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks

other – Did not pass all quality checks

**FLD LEN: 4**

**TEMP\_STD** air temperature standard deviation

The temperature standard deviation.

MIN: 0000      MAX: 9998

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing.

**FLD LEN: 1**

**TEMP\_STD\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the hourly temperature standard deviation.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**TEMP\_STD\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status the hourly temperature standard deviation. Most users will find the preceding quality code **TEMP\_STD\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks

other – Did not pass all quality checks

---

**FLD LEN: 3**

**Hourly Temperature Extreme Section** identifier

The identifier that indicates one of three concurrent air temperature observations made by co-located sensors. Three instances of this section (corresponding to the three temperature sensors) appear in the last ISD record of the hour.

DOM: A specific domain comprised of the characters in the ASCII character set.

**CV1, CV2, CV3** Three indicators preceding three copies of the following items:

- TEMP\_MIN minimum air temperature
- TEMP\_MIN\_QC quality code
- TEMP\_MIN\_FLAG quality code
- TEMP\_MIN\_TIME time of minimum air temperature
- TEMP\_MIN\_TIME\_QC quality code
- TEMP\_MIN\_TIME\_FLAG quality code
- TEMP\_MAX maximum air temperature
- TEMP\_MAX\_QC quality code
- TEMP\_MAX\_FLAG quality code
- TEMP\_MAX\_TIME time of maximum air temperature
- TEMP\_MAX\_TIME\_QC quality code
- TEMP\_MAX\_TIME\_FLAG quality code

**FLD LEN: 5**

**TEMP\_MIN** minimum air temperature

The minimum air temperature for the hour.

MIN: -9999      MAX: +9998      UNITS: degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-).

+9999 = Missing.

**FLD LEN: 1**

**TEMP\_MIN\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the minimum hourly temperature.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**TEMP\_MIN\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status the minimum hourly. Most users will find the preceding quality code **TEMP\_MIN\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks

other – Did not pass all quality checks

**FLD LEN: 4**

**TEMP\_MIN\_TIME** time of minimum air temperature

The time at which the minimum temperature occurred, in z-time HHMM format

MIN: 0000      MAX: 2359

DOM: A specific domain comprised of the numeric characters (0-9)

9999 = Missing.

**FLD LEN: 1**

**TEMP\_MIN\_TIME\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the time of minimum hourly temperature.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**TEMP\_MIN\_TIME\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status of the time of minimum hourly temperature. Most users will find the preceding quality code **TEMP\_MIN\_TIME\_QC** to be the simplest and most useful quality indicator.



DOM: A specific domain comprised of the numeric characters (0-9)  
0 = Passed all quality control checks  
other – Did not pass all quality checks

**FLD LEN: 5**

**TEMP\_MAX** maximum air temperature

The maximum air temperature for an hour.

MIN: -9999 MAX: +9999 UNITS: degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-).  
+9999 = Missing.

**FLD LEN: 1**

**TEMP\_MAX\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the maximum hourly.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**TEMP\_MAX\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status the maximum hourly. Most users will find the preceding quality code **TEMP\_MAX\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks

other – Did not pass all quality checks

**FLD LEN: 4**

**TEMP\_MAX\_TIME** time of maximum air temperature

The time at which the maximum temperature occurred, in z-time HHMM format

MIN: 0000 MAX: 2359

DOM: A specific domain comprised of the numeric characters (0-9)  
9999 = Missing.

**FLD LEN: 1**

**TEMP\_MAX\_TIME\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the time of maximum hourly temperature.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**TEMP\_MAX\_TIME\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status of the time of maximum hourly temperature. Most users will find the preceding quality code **TEMP\_MAX\_TIME\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks

other – Did not pass all quality checks

---

**FLD LEN: 3**

**Subhourly Wetness Section** identifier

The identifier that indicates a subhourly wetness sensor observation.

DOM: A specific domain comprised of the characters in the ASCII character set.

**CW1** An indicator of the following items:

WET1 wetness indicator

WET1\_QC quality code

WET1\_FLAG quality code

WET2 wetness indicator  
WET2\_QC quality code  
WET2\_FLAG quality code

**FLD LEN: 5**

**WET1** wetness indicator

Wetness sensor channel 1 value indicating the existence or non-existence of moisture on the sensor.

MIN: 00000 MAX: 99999

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).  
99999 = Missing.

**FLD LEN: 1**

**WET1\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the wetness sensor channel 1 value.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**WET1\_FLAG** quality code

The code that indicates ISD's evaluation of the quality status of the wetness sensor channel 1 value.

Most users will find the preceding quality code **WET1\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks

other – Did not pass all quality checks

**FLD LEN: 5**

**WET2** wetness indicator

Wetness sensor channel 2 value indicating the existence or non-existence of moisture on the sensor.

MIN: 00000 MAX: 99999

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).  
99999 = Missing.

**FLD LEN: 1**

**WET2\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the wetness sensor channel 2 value.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**WET2\_FLAG** quality code

The code that indicates ISD's evaluation of the quality status of the wetness sensor channel 2 value.

Most users will find the preceding quality code **WET2\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks

other – Did not pass all quality checks

---

**FLD LEN: 3**

**Hourly Geonor Vibrating Wire Summary Section** identifier

The identifier that indicates the presence of summary data for three concurrent precipitation observations made by co-located sensors. It appears in the last ISD record of the hour for the 15-minute data stream only. This section is not present for the 5-minute data stream.

Note: This section contains the frequencies which are the fundamental output from a vibrating wire transducer. They were transmitted as part of datastream versions which held 15 minute precipitation values. When the 5 minute datastream was defined, the decision was made to transmit engineering units such as millimeters which could be reversed to the

fundamental output values using the formulas and coefficients found in the metadata.  
DOM: A specific domain comprised of the characters in the ASCII character set.

**CX1, CX2, CX3** An indicator of the following items:

- PRECIPITATION total hourly precipitation
- PRECIP\_QC quality code
- PRECIP\_FLAG quality code
- FREQ\_AVG hourly average frequency
- FREQ\_AVG\_QC quality code
- FREQ\_AVG\_FLAG
- FREQ\_MIN hourly minimum frequency
- FREQ\_MIN\_QC quality code
- FREQ\_MIN\_FLAG quality code
- FREQ\_MAX hourly maximum frequency
- FREQ\_MAX\_QC quality code
- FREQ\_MAX\_FLAG quality code

**FLD LEN: 6**

**PRECIPITATION** total hourly precipitation

The total hourly precipitation amount for the sensor.

MIN: -99999 MAX: +99999 UNITS: millimeters

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-)  
+99999 = Missing.

**FLD LEN: 1**

**PRECIP\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the hourly precipitation amount.

DOM: A specific domain comprised of the numeric characters (0-9).

- 1 = Passed all quality control checks
- 3 = Failed all quality control checks
- 9 = Missing

**FLD LEN: 1**

**PRECIP\_FLAG** quality code

The code that indicates the network's internal evaluation of the quality status of the hourly precipitation amount. Most users will find the preceding quality code **PRECIP\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

- 0 = Passed all quality control checks
- other – Did not pass all quality checks

**FLD LEN: 4**

**FREQ\_AVG** hourly average frequency

The hourly average frequency for the sensor.

MIN: 0000 MAX: 9999 UNITS: Hertz

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 1**

**FREQ\_AVG\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the hourly average frequency.

DOM: A specific domain comprised of the numeric characters (0-9).

- 1 = Passed all quality control checks
- 3 = Failed all quality control checks
- 9 = Missing

**FLD LEN: 1**

**FREQ\_AVG\_FLAG** quality code

The code that indicates the network's internal evaluation of the quality status of the hourly average frequency. Most users will find the preceding quality code **FREQ\_AVG\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

- 0 = Passed all quality control checks
- other – Did not pass all quality checks

**FLD LEN: 4****FREQ\_MIN** hourly minimum frequency

The minimum frequency during the hour for the sensor.

MIN: 0000 MAX: 9998 UNITS: Hertz

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.**FLD LEN: 1****FREQ\_MIN\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the hourly minimum frequency.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1****FREQ\_MIN\_FLAG** quality codeThe code that indicates the network's internal evaluation of the quality status of the hourly minimum frequency. Most users will find the preceding quality code **FREQ\_MIN\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed all quality control checks

other – Did not pass all quality checks

**FLD LEN: 4****FREQ\_MAX** hourly maximum frequency

The minimum frequency during the hour for the sensor.

MIN: 0000 MAX: 9998 UNITS: Hertz

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.**FLD LEN: 1****FREQ\_MAX\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the hourly maximum frequency.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1****FREQ\_MAX\_FLAG** quality codeThe code that indicates the network's internal evaluation of the quality status of the hourly maximum frequency. Most users will find the preceding quality code **FREQ\_MAX\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed all quality control checks

other – Did not pass all quality checks

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## **Runway Visual Range Data**

**FLD LEN: 3**

RUNWAY-VISUAL-RANGE-OBSERVATION identifier

The identifier that indicates the occurrence of a runway visibility report.

DOM: A specific domain comprised of the ASCII characters.

**ED1** An indicator of the following items:

RUNWAY-VISUAL-RANGE-OBSERVATION direction angle

RUNWAY-VISUAL-RANGE-OBSERVATION runway designator code

RUNWAY-VISUAL-RANGE-OBSERVATION visibility dimension

RUNWAY-VISUAL-RANGE-OBSERVATION quality code

**FLD LEN: 2**

RUNWAY-VISUAL-RANGE-OBSERVATION direction angle  
The angle as measured from magnetic north to the runway along which the visibility is observed.

MIN: 01            MAX: 36            UNITS: Tens of degrees

SCALING FACTOR: 1/10

DOM: A general domain comprised of the numeric characters (0-9).  
99 = Missing

FLD LEN: 1

RUNWAY-VISUAL-RANGE-OBSERVATION runway designator code  
The code that denotes the left, right or center runway as the one to which the visibility applies.

DOM: A specific domain comprised of the ASCII characters:  
L = left  
C = center  
R = right  
U = unknown  
9 = missing

FLD LEN: 4

RUNWAY-VISUAL-RANGE-OBSERVATION visibility dimension  
The dimension of the horizontal distance that can be seen along the runway.

MIN: 0000            MAX: 5000            UNITS: meters

DOM: A general domain comprised of the ASCII characters 0-9.  
9999 = Missing

FLD LEN: 1

RUNWAY-VISUAL-RANGE-OBSERVATION quality code  
The code that denotes a quality status of the reported RUNWAY-VISUAL-RANGE-OBSERVATION.

DOM: A specific domain comprised of the characters in the ASCII character set.  
0 = Passed gross limits check  
1 = Passed all quality control checks  
2 = Suspect  
3 = Erroneous  
9 = Passed gross limits check if element is present

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## Cloud and Solar Data

FLD LEN: 3

**SKY-COVER-LAYER identifier**

The identifier that represents a SKY-COVER-LAYER.

DOM: A specific domain comprised of the characters in the ASCII character set.

**GA1-GA6** An indicator of up to 6 repeating fields of the following items:  
SKY-COVER-LAYER coverage code  
SKY-COVER-LAYER coverage quality code  
SKY-COVER-LAYER base height dimension  
SKY-COVER-LAYER base height quality code  
SKY-COVER-LAYER cloud type code  
SKY-COVER-LAYER cloud type quality code

FLD LEN: 2

SKY-COVER-LAYER coverage code

The code that denotes the fraction of the total celestial dome covered by a SKY-COVER-LAYER.

**Note:** This is for a discrete cloud layer, as opposed to the cloud later summation data in the GD1-GD6 section.

DOM: A specific domain comprised of the characters in the ASCII character set.

00: None, SKC or CLR  
01: One okta - 1/10 or less but not zero  
02: Two oktas - 2/10 - 3/10, or FEW  
03: Three oktas - 4/10  
04: Four oktas - 5/10, or SCT

05: Five oktas - 6/10  
 06: Six oktas - 7/10 - 8/10  
 07: Seven oktas - 9/10 or more but not 10/10, or BKN  
 08: Eight oktas - 10/10, or OVC  
 09: Sky obscured, or cloud amount cannot be estimated  
 10: Partial obscuration  
 99: Missing

**FLD LEN: 1**

**SKY-COVER-LAYER coverage quality code**

The code that denotes a quality status of the reported SKY-COVER-LAYER coverage.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check  
 1 = Passed all quality control checks  
 2 = Suspect  
 3 = Erroneous  
 4 = Passed gross limits check , from NCDC SURFACE HOURLY  
 5 = Passed all quality control checks, from NCDC SURFACE HOURLY  
 6 = Suspect, from NCDC SURFACE HOURLY  
 7 = Erroneous, from NCDC SURFACE HOURLY  
 M = Manual change made to value based on information provided by NWS or FAA  
 9 = Passed gross limits check if element is present

**FLD LEN: 6**

**SKY-COVER-LAYER base height dimension**

The height relative to a VERTICAL-REFERENCE-DATUM of the lowest surface of a cloud.

MIN: -00400 MAX: +35000 UNITS: Meters

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-).  
 +99999 = Missing

**FLD LEN: 1**

**SKY-COVER-LAYER base height quality code**

The code that denotes a quality status of the reported SKY-COVER-LAYER base height.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check  
 1 = Passed all quality control checks  
 2 = Suspect  
 3 = Erroneous  
 4 = Passed gross limits check , from NCDC SURFACE HOURLY  
 5 = Passed all quality control checks, from NCDC SURFACE HOURLY  
 6 = Suspect, from NCDC SURFACE HOURLY  
 7 = Erroneous, from NCDC SURFACE HOURLY  
 M = Manual change made to value based on information provided by NWS or FAA  
 9 = Passed gross limits check if element is present

**FLD LEN: 2**

**SKY-COVER-LAYER cloud type code**

The code that denotes the classification of the clouds that comprise a SKY-COVER-LAYER.

DOM: A specific domain comprised of the characters in the ASCII character set.

00: Cirrus (Ci)  
 01: Cirrocumulus (Cc)  
 02: Cirrostratus (Cs)  
 03: Altcumulus (Ac)  
 04: Altostratus (As)  
 05: Nimbostratus (Ns)  
 06: Stratocumulus (Sc)  
 07: Stratus (St)  
 08: Cumulus (Cu)  
 09: Cumulonimbus (Cb)  
 10: Cloud not visible owing to darkness, fog, duststorm, sandstorm, or other analogous phenomena / sky obscured  
 11: Not used  
 12: Towering Cumulus (Tcu)  
 13: Stratus fractus (Stfra)

14: Stratocumulus Lenticular (Scsl)  
 15: Cumulus Fractus (Cufra)  
 16: Cumulonimbus Mammatus (Cbmam)  
 17: Altocumulus Lenticular (Acsl)  
 18: Altocumulus Castellanus (Accas)  
 19: Altocumulus Mammatus (Acmam)  
 20: Cirrocumulus Lenticular (Ccsl)  
 21: Cirrus and/or Cirrocumulus  
 22: Stratus and/or Fracto-stratus  
 23: Cumulus and/or Fracto-cumulus  
 99: Missing

**FLD LEN: 1**

**SKY-COVER-LAYER cloud type quality code**

The code that denotes a quality status of the reported SKY-COVER-LAYER cloud type.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check  
 1 = Passed all quality control checks  
 2 = Suspect  
 3 = Erroneous  
 4 = Passed gross limits check , from NCDC SURFACE HOURLY  
 5 = Passed all quality control checks, from NCDC SURFACE HOURLY  
 6 = Suspect, from NCDC SURFACE HOURLY  
 7 = Erroneous, from NCDC SURFACE HOURLY  
 M = Manual change made to value based on information provided by NWS or FAA  
 9 = Passed gross limits check if element is present

**FLD LEN: 3**

**SKY-COVER-SUMMATION-STATE identifier**

The identifier that denotes the availability of a SKY-COVER-SUMMATION-STATE.

DOM: A specific domain comprised of the ASCII characters.

**GD1 - GD6** An indicator of up to 6 repeating fields of the following items:  
 SKY-COVER-SUMMATION-STATE coverage code  
 SKY-COVER-SUMMATION-STATE coverage code #2  
 SKY-COVER-SUMMATION-STATE coverage quality code  
 SKY-COVER-SUMMATION-STATE height dimension  
 SKY-COVER-SUMMATION-STATE height dimension quality code  
 SKY-COVER-SUMMATION-STATE characteristic code

**FLD LEN: 1**

**SKY-COVER-SUMMATION-STATE coverage code**

The code that denotes the portion of the total celestial dome covered by all layers of clouds and other obscuring phenomena at or below a given height.

DOM: A specific domain comprised of the ASCII characters

0: Clear - No coverage  
 1: FEW - 2/8 or less coverage (not including zero)  
 2: SCATTERED - 3/8-4/8 coverage  
 3: BROKEN - 5/8-7/8 coverage  
 4: OVERCAST - 8/8 coverage  
 5: OBSCURED  
 6: PARTIALLY OBSCURED  
 9: MISSING

**FLD LEN: 2**

**SKY-COVER-SUMMATION coverage code #2**

The code that denotes the fraction of the total celestial dome covered by a by all layers of clouds and other obscuring phenomena at or below a given height, if reported by the station in octas.

DOM: A specific domain comprised of the characters in the ASCII character set.

00: None, SKC or CLR  
 01: One okta - 1/10 or less but not zero  
 02: Two oktas - 2/10 - 3/10, or FEW  
 03: Three oktas - 4/10

04: Four oktas - 5/10, or SCT  
 05: Five oktas - 6/10  
 06: Six oktas - 7/10 - 8/10  
 07: Seven oktas - 9/10 or more but not 10/10, or BKN  
 08: Eight oktas - 10/10, or OVC  
 09: Sky obscured, or cloud amount cannot be estimated  
 10: Partial Obscuration  
 11: Thin Scattered  
 12: Scattered  
 13: Dark Scattered  
 14: Thin Broken  
 15: Broken  
 16: Dark Broken  
 17: Thin Overcast  
 18: Overcast  
 19: Dark overcast  
 99: Missing

**FLD LEN: 1**

**SKY-COVER-SUMMATION-STATE coverage quality code**

The code that denotes a quality status of the reported SKY-COVER-SUMMATION-STATE coverage.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check  
 1 = Passed all quality control checks  
 2 = Suspect  
 3 = Erroneous  
 4 = Passed gross limits check , data originate from an NCDC data source  
 5 = Passed all quality control checks, data originate from an NCDC data source  
 6 = Suspect, data originate from an NCDC data source  
 7 = Erroneous, data originate from an NCDC data source  
 9 = Passed gross limits check if element is present

**FLD LEN: 6**

**SKY-COVER-SUMMATION-STATE height dimension**

The height above ground level (AGL) of the base of the cloud layer or obscuring phenomena.

MIN: -00400      MAX: +35000      UNITS: meters

SCALING FACTOR: 1

DOM: A general domain comprised of the ASCII characters 0-9, a plus (+) and a minus sign (-).

+99999 = Missing

**FLD LEN: 1**

**SKY-COVER-SUMMATION-STATE height dimension quality code**

The code that denotes a quality status of the reported SKY-COVER-SUMMATION-STATE height dimension.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check  
 1 = Passed all quality control checks  
 2 = Suspect  
 3 = Erroneous  
 4 = Passed gross limits check , data originate from an NCDC data source  
 5 = Passed all quality control checks, data originate from an NCDC data source  
 6 = Suspect, data originate from an NCDC data source  
 7 = Erroneous, data originate from an NCDC data source  
 9 = Passed gross limits check if element is present

**FLD LEN: 1**

**SKY-COVER-SUMMATION-STATE characteristic code**

The code that represents a characteristic of a specific cloud or other obscuring phenomena layer.

DOM: A specific domain comprised of the characters in the ASCII character set.

1: Variable height  
 2: Variable amount  
 3: Thin clouds  
 4: Dark layer (reported in data prior to 1950)  
 9: Missing



---

**FLD LEN: 3****SKY-CONDITION-OBSERVATION identifier**

An indicator that denotes the start of a SKY-CONDITION-OBSERVATION data group.

DOM: A specific domain comprised of the characters in the ASCII character set.

**GE1:** An indicator of the occurrence of the following data items:  
SKY-CONDITION-OBSERVATION convective cloud attribute  
SKY-CONDITION-OBSERVATION vertical datum attribute  
SKY-CONDITION-OBSERVATION base height upper range attribute  
SKY-CONDITION-OBSERVATION base height lower range attribute

**FLD LEN: 1****SKY-CONDITION-OBSERVATION convective cloud attribute**

The code that denotes the convective cloud type in an observation.

DOM: A specific domain comprised of the characters in the ASCII character set.

0: None  
1: ACSL (Alto cumulus Standing Lenticular)  
2: ACCAS (Alto cumulus Castelanus)  
3: TCU (Towering Cumulus)  
4: MDT CU (Moderate Cumulus)  
5: CB/CB MAM DISTANT (Cumulonimbus or Cumulonimbus Mammatus in the distance)  
6: CB/CBMAM (Cumulonimbus or Cumulonimbus Mammatus within 20 nautical miles)  
7: Unknown  
9: missing

**FLD LEN: 6****SKY-CONDITION-OBSERVATION vertical datum attribute**

The code that represents a VERTICAL-REFERENCE-DATUM. Under the stewardship of the FDAD for Intelligence.

DOM: A specific domain comprised of the characters in the ASCII character set.

AGL: Above Ground Level  
ALAT: Approximate lowest astronomical tide  
AP: Apparent  
CFB: Crest of first berm  
CRD: Columbia River datum  
ESLW: Equatorial Spring low water  
GCLWD: Gulf Coast low water datum  
HAT: Highest astronomical tide  
HHW: Higher high water  
HTWW: High tide wave wash  
HW: High water  
HWFC: High water full and change  
IND: Indefinite  
ISLW: Indian Spring low water  
LAT: Lowest astronomical tide  
LLW: Lowest low water  
LNLW: Lowest normal low water  
LRLW: Lower low water  
LSD: Land survey datum  
LW: Low water  
LWD: Low water datum  
LWFC: Low water full and charge  
MHHW: Mean higher high water  
MHLW: Mean higher low water  
MHW: Mean high water  
MHWN: Mean high water neap  
MHWS: Mean high water spring  
MLHW: Mean lower high water  
MLLW: Mean lower low water  
MLLWS: Mean lower low water springs  
MLWN: Mean low water neap  
MLW: Mean low water  
MLWS: Mean low water spring

MSL: Mean sea level  
 MTL: Mean tide level  
 NC: No correction  
 NT: Neap tide  
 ST: Spring tide  
 SWA: Storm wave action  
 TLLW: Tropic lower low water  
 UD: Undetermined  
 UK: Unknown  
 WGS84E: WGS84 Ellipsoid  
 WGS84G: WGS84 GEOID  
 999999: missing

**FLD LEN: 6**

**SKY-CONDITION-OBSERVATION base height upper range attribute**

The height relative to a VERTICAL-REFERENCE-DATUM for cloud bases reported in a range or the highest height for a variable cloud height report. The concept of a range is to accommodate the WMO practice of reporting a cloud layer by a range of heights.

MIN: -0400                      MAX: +15000                      UNITS: meters  
 DOM: A general domain comprised of the ASCII characters 0-9, a plus (+) and a minus sign (-).  
 +99999 = Missing

**FLD LEN: 6**

**SKY-CONDITION-OBSERVATION base height lower range attribute**

The height relative to a VERTICAL-REFERENCE-DATUM for cloud bases reported in a range or lowest height for a variable cloud height report. The concept of a range is to accommodate the WMO practice of reporting a cloud layer by a range of heights.

MIN: -0400                      MAX: +15000                      UNITS: meters  
 DOM: A general domain comprised of the ASCII characters 0-9, a plus (+) and a minus sign (-).  
 +99999 = Missing

**FLD LEN: 3**

**SKY-CONDITION-OBSERVATION identifier**

An indicator that denotes the start of a SKY-CONDITION-OBSERVATION data group.

DOM: A specific domain comprised of the characters in the ASCII character set.

**GF1:** An indicator of the occurrence of the following data items:  
 SKY-CONDITION-OBSERVATION total coverage code  
 SKY-CONDITION-OBSERVATION total opaque coverage code  
 SKY-CONDITION-OBSERVATION quality total coverage code  
 SKY-CONDITION-OBSERVATION total lowest cloud cover code  
 SKY-CONDITION-OBSERVATION quality total lowest cloud cover code  
 SKY-CONDITION-OBSERVATION low cloud genus code  
 SKY-CONDITION-OBSERVATION quality low cloud genus code  
 SKY-CONDITION-OBSERVATION lowest cloud base height dimension  
 SKY-CONDITION-OBSERVATION lowest cloud base height quality code  
 SKY-CONDITION-OBSERVATION mid cloud genus code  
 SKY-CONDITION-OBSERVATION quality mid cloud genus code  
 SKY-CONDITION-OBSERVATION high cloud genus code  
 SKY-CONDITION-OBSERVATION quality high cloud genus code

**FLD LEN: 2**

**SKY-CONDITION-OBSERVATION total coverage code**

The code that denotes the fraction of the total celestial dome covered by clouds or other obscuring phenomena.

DOM: A specific domain comprised of the characters in the ASCII character set.  
 00: None, SKC or CLR

- 01: One okta - 1/10 or less but not zero
- 02: Two oktas - 2/10 - 3/10, or FEW
- 03: Three oktas - 4/10
- 04: Four oktas - 5/10, or SCT
- 05: Five oktas - 6/10
- 06: Six oktas - 7/10 - 8/10
- 07: Seven oktas - 9/10 or more but not 10/10, or BKN
- 08: Eight oktas - 10/10, or OVC
- 09: Sky obscured, or cloud amount cannot be estimated
- 10: Partial obscuration
- 11: Thin scattered
- 12: Scattered
- 13: Dark scattered
- 14: Thin broken
- 15: Broken
- 16: Dark broken
- 17: Thin overcast
- 18: Overcast
- 19: Dark overcast
- 99: Missing

**FLD LEN: 2**

**SKY-CONDITION-OBSERVATION total opaque coverage code**

The code that denotes the fraction of the total celestial dome covered by opaque clouds or other obscuring phenomena. Only reported by selected U.S. stations during selected periods.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 00: None, SKC or CLR
- 01: One okta - 1/10 or less but not zero
- 02: Two oktas - 2/10 - 3/10, or FEW
- 03: Three oktas - 4/10
- 04: Four oktas - 5/10, or SCT
- 05: Five oktas - 6/10
- 06: Six oktas - 7/10 - 8/10
- 07: Seven oktas - 9/10 or more but not 10/10, or BKN
- 08: Eight oktas - 10/10, or OVC
- 09: Sky obscured, or cloud amount cannot be estimated
- 10: Partial obscuration
- 12: Scattered
- 13: Dark scattered
- 15: Broken
- 16: Dark broken
- 18: Overcast
- 19: Dark overcast
- 99: Missing

**FLD LEN: 1**

**SKY-CONDITION-OBSERVATION quality total coverage code**

The code that denotes a quality status of a reported total sky coverage code.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 4 = Passed gross limits check , data originate from an NCDC data source
- 5 = Passed all quality control checks, data originate from an NCDC data source
- 6 = Suspect, data originate from an NCDC data source
- 7 = Erroneous, data originate from an NCDC data source
- 9 = Passed gross limits check if element is present

**FLD LEN: 2**

**SKY-CONDITION-OBSERVATION total lowest cloud cover code**

The code that represents the fraction of the celestial dome covered by all low clouds present. If no low clouds are present; the code denotes the fraction covered by all middle level clouds present.

DOM: A specific domain comprised of the characters in the ASCII character set.

00: None  
 01: One okta or 1/10 or less but not zero  
 02: Two oktas or 2/10 - 3/10  
 03: Three oktas or 4/10  
 04: Four oktas or 5/10  
 05: Five oktas or 6/10  
 06: Six oktas or 7/10 - 8/10  
 07: Seven oktas or 9/10 or more but not 10/10  
 08: Eight oktas or 10/10  
 09: Sky obscured, or cloud amount cannot be estimated  
 10: Partial obscuration  
 11: Thin Scattered  
 12: Scattered  
 13: Dark Scattered  
 14: Thin Broken  
 15: Broken  
 16: Dark Broken  
 17: Thin Overcast  
 18: Overcast  
 19: Dark overcast  
 99: Missing

FLD LEN: 1

SKY-CONDITION-OBSERVATION quality total lowest cloud cover code  
 The code that denotes a quality status of a reported total lowest cloud cover code.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 4 = Passed gross limits check , data originate from an NCDC data source
- 5 = Passed all quality control checks, data originate from an NCDC data source
- 6 = Suspect, data originate from an NCDC data source
- 7 = Erroneous, data originate from an NCDC data source
- 9 = Passed gross limits check if element is present

FLD LEN: 2

SKY-CONDITION-OBSERVATION low cloud genus code  
 The code that denotes a type of low cloud.

DOM: A specific domain comprised of the characters in the ASCII Character set.

- 00: No low clouds
- 01: Cumulus humilis or Cumulus fractus other than of bad weather or both
- 02: Cumulus mediocris or congestus, with or without Cumulus of species fractus or humilis or Stratocumulus all having bases at the same level
- 03: Cumulonimbus calvus, with or without Cumulus, Stratocumulus or Stratus
- 04: Stratocumulus cumulogenitus
- 05: Stratocumulus other than Stratocumulus cumulogenitus
- 06: Stratus nebulosus or Stratus fractus other than of bad weather, or both
- 07: Stratus fractus or Cumulus fractus of bad weather, or both (pannus) usually below Altostratus or Nimbostratus
- 08: Cumulus and Stratocumulus other than Stratocumulus cumulogenitus, with bases at different levels
- 09: Cumulonimbus capillatus (often with an anvil), with or without Cumulonimbus calvus, Cumulus, Stratocumulus, Stratus or pannus
- 99: Missing

FLD LEN: 1

SKY-CONDITION-OBSERVATION quality low cloud genus code  
 The code that denotes a quality status of a reported low cloud type.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous

- 4 = Passed gross limits check , data originate from an NCDC data source
- 5 = Passed all quality control checks, data originate from an NCDC data source
- 6 = Suspect, data originate from an NCDC data source
- 7 = Erroneous, data originate from an NCDC data source
- 9 = Passed gross limits check if element is present

FLD LEN: 5

SKY-CONDITION-OBSERVATION lowest cloud base height dimension  
The height, above ground level (AGL), of the base of the lowest cloud.

MIN: -0400 MAX: 15000 UNITS: Meters

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).  
99999 = Missing.

FLD LEN: 1

SKY-CONDITION-OBSERVATION lowest cloud base height quality code  
The code that denotes a quality status of a lowest cloud base height.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 4 = Passed gross limits check , data originate from an NCDC data source
- 5 = Passed all quality control checks, data originate from an NCDC data source
- 6 = Suspect, data originate from an NCDC data source
- 7 = Erroneous, data originate from an NCDC data source
- 9 = Passed gross limits check if element is present

FLD LEN: 2

SKY-CONDITION-OBSERVATION mid cloud genus code

The code that denotes a type of middle level cloud.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 00: No middle clouds
- 01: Altostratus translucidus
- 02: Altostratus opacus or Nimbostratus
- 03: Altocumulus translucidus at a single level
- 04: Patches (often lenticular) of Altocumulus translucidus, continually changing and occurring at one or more levels
- 05: Altocumulus translucidus in bands, or one or more layers of Altocumulus translucidus or opacus, progressively invading the sky; these Altocumulus clouds generally thicken as a whole
- 06: Altocumulus cumulogentis (or cumulonimbogentus)
- 07: Altocumulus translucidus or opacus in two or more layers, or Altocumulus opacus in a single layer, not progressively invading the sky, or Altocumulus with Altostratus or Nimbostratus
- 08: Altocumulus castellanus or floccus
- 09: Altocumulus of a chaotic sky; generally at several levels
- 99: Missing

FLD LEN: 1

SKY-CONDITION-OBSERVATION quality mid cloud genus code

The code that denotes a quality status of a reported mid cloud type.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 4 = Passed gross limits check , data originate from an NCDC data source
- 5 = Passed all quality control checks, data originate from an NCDC data source
- 6 = Suspect, data originate from an NCDC data source
- 7 = Erroneous, data originate from an NCDC data source
- 9 = Passed gross limits check if element is present

FLD LEN: 2

SKY-CONDITION-OBSERVATION high cloud genus code

The code that denotes a type of high cloud.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 00: No High Clouds
- 01: Cirrus fibratus, sometimes uncinus, not progressively invading the sky
- 02: Cirrus spissatus, in patches or entangled sheaves, which usually do not increase and sometimes seem to be the remains of the upper part of a Cumulonimbus; or Cirrus castellanus or floccus
- 03: Cirrus spissatus cumulonimbogenitus
- 04: Cirrus uncinus or fibratus, or both, progressively invading the sky; they generally thicken as a whole
- 05: Cirrus (often in bands) and Cirrostratus, or Cirrostratus alone, progressively invading the sky; they generally thicken as a whole, but the continuous veil does not reach 45 degrees above the horizon
- 06: Cirrus (often in bands) and Cirrostratus, or Cirrostratus alone, progressively invading the sky; they generally thicken as a whole; the continuous veil extends more than 45 degrees above the horizon, without the sky being totally covered.
- 07: Cirrostratus covering the whole sky
- 08: Cirrostratus not progressively invading the sky and not entirely covering it
- 09: Cirrocumulus alone, or Cirrocumulus predominant among the High clouds
- 99: Missing

FLD LEN: 1

SKY-CONDITION-OBSERVATION quality high cloud genus code

The code that denotes a quality status of a reported high cloud type.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 4 = Passed gross limits check , data originate from an NCDC data source
- 5 = Passed all quality control checks, data originate from an NCDC data source
- 6 = Suspect, data originate from an NCDC data source
- 7 = Erroneous, data originate from an NCDC data source
- 9 = Passed gross limits check if element is present

FLD LEN: 3

BELOW-STATION-CLOUD-LAYER identifier

The identifier that represents a BELOW-STATION-CLOUD-LAYER.

DOM: A specific domain comprised of the characters in the ASCII character set.

- GG1-GG6** An indicator of up to 6 repeating fields of the following items:
- BELOW-STATION-CLOUD-LAYER coverage code
  - BELOW-STATION-CLOUD-LAYER coverage quality code
  - BELOW-STATION-CLOUD-LAYER top height dimension
  - BELOW-STATION-CLOUD-LAYER top height dimension quality code
  - BELOW-STATION-CLOUD-LAYER type code
  - BELOW-STATION-CLOUD-LAYER type quality code
  - BELOW-STATION-CLOUD-LAYER top code
  - BELOW-STATION-CLOUD-LAYER top quality code

FLD LEN: 2

BELOW-STATION-CLOUD-LAYER coverage code

The code that denotes the extent of coverage of a BELOW-STATION-CLOUD-LAYER.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 00: None
- 01: One okta - 1/10 or less but not zero
- 02: Two oktas - 2/10 - 3/10
- 03: Three oktas - 4/10
- 04: Four oktas - 5/10
- 05: Five oktas - 6/10
- 06: Six oktas - 7/10 - 8/10
- 07: Seven oktas - 9/10 or more but not 10/10

08: Eight oktas - 10/10  
09: Sky obscured, or cloud amount cannot be estimated  
10: Partial obscuration  
99: Missing

FLD LEN: 1

BELOW-STATION-CLOUD-LAYER coverage quality code

The code that denotes a quality status of the reported BELOW-STATION-CLOUD-LAYER coverage.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check  
1 = Passed all quality control checks  
2 = Suspect  
3 = Erroneous  
9 = Passed gross limits check if element is present

FLD LEN: 5

BELOW-STATION-CLOUD-LAYER top height dimension

The height above mean sea level (MSL) of the top of a BELOW-STATION-CLOUD-LAYER.

MIN: 00000 MAX: 35000 UNITS: Meters

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).

99999 = Missing

FLD LEN: 1

BELOW-STATION-CLOUD-LAYER top height dimension quality code

The code that denotes a quality status of the reported BELOW-STATION-CLOUD-LAYER top height dimension.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check  
1 = Passed all quality control checks  
2 = Suspect  
3 = Erroneous  
9 = Passed gross limits check if element is present

FLD LEN: 2

BELOW-STATION-CLOUD-LAYER type code

The code that denotes the classification of the clouds that comprise a BELOW-STATION-CLOUD-LAYER.

DOM: A specific domain comprised of the characters in the ASCII character set.

00: Cirrus (Ci)  
01: Cirrocumulus (Cc)  
02: Cirrostratus (Cs)  
03: Altocumulus (Ac)  
04: Altostratus (As)  
05: Nimbostratus (Ns)  
06: Stratocumulus (Sc)  
07: Stratus (St)  
08: Cumulus (Cu)  
09: Cumulonimbus (Cb)  
10: Cloud not visible owing to darkness, fog, dust storm, sandstorm, or other analogous phenomena  
99: Missing

FLD LEN: 1

BELOW-STATION-CLOUD-LAYER type quality code

The code that denotes a quality status of the reported BELOW-STATION-CLOUD-LAYER type.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check  
1 = Passed all quality control checks  
2 = Suspect  
3 = Erroneous  
9 = Passed gross limits check if element is present

FLD LEN: 2

BELOW-STATION-CLOUD-LAYER top code

The code that denotes the characteristics of the upper surface of a BELOW-STATION-CLOUD-LAYER

DOM: A specific domain comprised of the characters in the ASCII character set.

- 00: Isolated cloud or fragments of clouds
- 01: Continuous flat tops
- 02: Broken cloud - small breaks, flat tops
- 03: Broken cloud - large breaks, flat tops
- 04: Continuous cloud, undulation tops
- 05: Broken cloud - small breaks, undulating tops
- 06: Broken cloud - large breaks, undulating tops
- 07: Continuous or almost continuous with towering clouds above the top of the layer
- 08: Groups of waves with towering clouds above the top of the layer
- 09: Two or more layers at different levels
- 99: Missing

FLD LEN: 1

BELOW-STATION-CLOUD-LAYER top quality code

The code that denotes a quality status of the reported BELOW-STATION-CLOUD-LAYER top.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 9 = Passed gross limits check if element is present

---

FLD LEN: 3

**Hourly Solar Radiation Section** identifier

The identifier that indicates an hourly observation of solar radiation. This section appears in the last ISD record of the hour.

DOM: A specific domain comprised of the characters in the ASCII character set.

- GH1** An indicator of the following items:
  - SOLARAD hourly average solar radiation
  - SOLARAD\_QC quality code
  - SOLARAD\_FLAG quality code
  - SOLARAD\_MIN minimum solar radiation
  - SOLARAD\_MIN\_QC quality code
  - SOLARAD\_MIN\_FLAG quality code
  - SOLARAD\_MAX maximum solar radiation
  - SOLARAD\_MAX\_QC quality code
  - SOLARAD\_MAX\_FLAG quality code
  - SOLARAD\_STD solar radiation standard deviation
  - SOLARAD\_STD\_QC quality code
  - SOLARAD\_STD\_FLAG quality code

FLD LEN: 5

**SOLARAD** hourly average solar radiation

The hourly average solar radiation.

MIN: 0000 MAX: 99998 UNITS: watts per square meter

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

99999 = Missing.

FLD LEN: 1

**SOLARAD\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the hourly average solar radiation.

DOM: A specific domain comprised of the numeric characters (0-9).

- 1 = Passed all quality control checks
- 3 = Failed all quality control checks
- 9 = Missing

FLD LEN: 1

**SOLARAD\_FLAG** quality code



The code that indicates the network's internal evaluation of the quality status of the hourly average solar radiation. Most users will find the preceding quality code **SOLARAD\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed all quality control checks  
other – Did not pass all quality checks

**FLD LEN: 5**

**SOLARAD\_MIN** minimum solar radiation

The minimum 10 second solar radiation for the hour.

MIN: 00000 MAX: 99998 UNITS: watts per square meter

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

99999 = Missing.

**FLD LEN: 1**

**SOLARAD\_MIN\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the hourly minimum solar radiation.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks  
3 = Failed all quality control checks  
9 = Missing

**FLD LEN: 1**

**SOLARAD\_MIN\_FLAG** quality code

The code that indicates the network's internal evaluation of the quality status of the hourly minimum solar radiation. Most users will find the preceding quality code **SOLARAD\_MIN\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed all quality control checks  
other – Did not pass all quality checks

**FLD LEN: 5**

**SOLARAD\_MAX** maximum solar radiation

The maximum 10 second solar radiation for the hour.

MIN: 00000 MAX: 99998 UNITS: watts per square meter

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

99999 = Missing.

**FLD LEN: 1**

**SOLARAD\_MAX\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the hourly maximum solar radiation.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks  
3 = Failed all quality control checks  
9 = Missing

**FLD LEN: 1**

**SOLARAD\_MAX\_FLAG** quality code

The code that indicates the network's internal evaluation of the quality status of the hourly maximum solar radiation. Most users will find the preceding quality code **SOLARAD\_MAX\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed all quality control checks  
other – Did not pass all quality checks

**FLD LEN: 5**

**SOLARAD\_STD** solar radiation standard deviation

The hourly 10 second hourly solar radiation standard deviation.

MIN: 00000 MAX: 99998

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

99999 = Missing.

**FLD LEN: 1**

**SOLARAD\_STD\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the hourly solar radiation standard deviation.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**SOLARAD\_STD\_FLAG** quality code

The code that indicates the network's internal evaluation of the quality status of hourly solar radiation standard deviation. Most users will find the preceding quality code **SOLARAD\_STD\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed all quality control checks

other – Did not pass all quality checks

---

**FLD LEN: 3**

**SUNSHINE-OBSERVATION** identifier

The identifier that denotes the availability of sunshine information.

DOM: A specific domain comprised of the ASCII characters

**GJ1** An indicator of the occurrence of the following items:

SUNSHINE-OBSERVATION sunshine duration quantity

SUNSHINE-OBSERVATION sunshine duration quality code

**FLD LEN: 4**

**SUNSHINE-OBSERVATION** sunshine duration quantity

The quantity of time sunshine occurred over the reporting period.

MIN: 0000 MAX: 6000 UNITS: minutes

DOM: A general domain comprised of the ASCII characters 0-9.

9999 = Missing

**FLD LEN: 1**

**SUNSHINE-OBSERVATION** sunshine duration quality code

The code that denotes a quality status of the reported SUNSHINE-OBSERVATION sunshine duration.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check, data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

M = Manual change made to value based on information provided by NWS or FAA

9 = Passed gross limits check if element is present

---

**FLD LEN: 3**

**SUNSHINE-OBSERVATION** identifier

The identifier that denotes the availability of percent of possible sunshine information.

DOM: A specific domain comprised of the ASCII characters

**GK1** An indicator of the occurrence of the following items:

SUNSHINE-OBSERVATION percent of possible sunshine quantity

SUNSHINE-OBSERVATION percent of possible sunshine quality code

**FLD LEN: 3**

**SUNSHINE-OBSERVATION percent of possible sunshine quantity**

The percent of possible sunshine that occurred over the previous 24-hour period.

MIN: 000 MAX: 100 UNITS: percentage

DOM: A general domain comprised of the ASCII characters 0-9.  
999 = Missing.

**FLD LEN: 1**

**SUNSHINE-OBSERVATION percent of possible sunshine quality code**

The code that denotes a quality status of the reported SUNSHINE-OBSERVATION percent of possible sunshine.

DOM: A specific domain comprised of the characters in the ASCII character set.

4 = Passed gross limits check, data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

M = Manual change made to value based on information provided by NWS or FAA

9 = Passed gross limits check if element is present

---

**FLD LEN: 3**

**SUNSHINE-OBSERVATION FOR THE MONTH identifier**

The identifier that denotes the availability of sunshine information.

DOM: A specific domain comprised of the ASCII characters

**GL1** An indicator of the occurrence of the following items:

SUNSHINE-OBSERVATION sunshine duration quantity

SUNSHINE-OBSERVATION sunshine duration quality code

**FLD LEN: 5**

**SUNSHINE-OBSERVATION FOR THE MONTH sunshine duration quantity**

The quantity of time sunshine occurred over the reporting period.

MIN: 00000 MAX: 30000 UNITS: minutes

DOM: A general domain comprised of the ASCII characters 0-9.  
99999 = Missing

**FLD LEN: 1**

**SUNSHINE-OBSERVATION FOR THE MONTH sunshine duration quality code**

The code that denotes a quality status of the reported SUNSHINE-OBSERVATION sunshine duration.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check, data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

9 = Passed gross limits check if element is present

---

**FLD LEN: 3**

**Solar Irradiance Section identifier**

The identifier that indicates an observation of solar irradiance data integrated over the specified time period.

DOM: A specific domain comprised of the characters in the ASCII character set.

**GM1** An indicator of the following items:

Solar irradiance data time period

Global irradiance

Global irradiance data flag

Global irradiance quality code

Direct beam irradiance

Direct beam irradiance data flag

Direct beam irradiance quality code  
 Diffuse irradiance  
 Diffuse irradiance data flag  
 Diffuse irradiance quality code  
 UVB global irradiance  
 UVB global irradiance data flag  
 UVB global irradiance quality code

**FLD LEN: 4**

Time period in minutes, for which the data in this section (GM1) pertains—eg, 0060 = 60 minutes (1 hour).  
 MIN: 0001      MAX: 9998      UNITS: Minutes  
 DOM: A general domain comprised of the numeric characters (0-9).  
 9999 = Missing.

**FLD LEN: 4**

**Global irradiance**

Global horizontal irradiance measured using a pyranometer. Unit is watts per square meter (W/m<sup>2</sup>) in whole values. Waveband ranges from 0.4 - 2.3 micrometers.  
 MIN: 0000      MAX: 9998      UNITS: watts per square meter  
 SCALING FACTOR: 1  
 DOM: A general domain comprised of the numeric characters (0-9).  
 9999 = Missing.

**FLD LEN: 2**

**Global irradiance data flag**

The code that provides additional information regarding the global irradiance data.  
 DOM: A specific domain comprised of the numeric characters (00-99).  
 00 = Untested (raw data)  
 01 = Passed one-component test; data fall within max-min limits of K<sub>t</sub>, K<sub>n</sub>, or K<sub>d</sub>  
 02 = Passed two-component test; data fall within 0.03 of the Gompertz boundaries  
 03 = Passed three-component test; data come within + 0.03 of satisfying K<sub>t</sub> = K<sub>n</sub> + K<sub>d</sub>  
 04 = Passed visual inspection: not used by SERI\_QC1  
 05 = Failed visual inspection: not used by SERI\_QC1  
 06 = Value estimated; passes all pertinent SERI\_QC tests  
 07 = Failed one-component test; lower than allowed minimum  
 08 = Failed one-component test; higher than allowed maximum  
 09 = Passed three-component test but failed two-component test by 0.05  
 10-93 = Failed two- or three- component tests in one of four ways.  
 94-97 = Data fails into physically impossible region where K<sub>n</sub> > K<sub>t</sub> by K-space distances of 0.05 to 0.10 (94), 0.10 to 0.15 (95), 0.15 to 0.20 (96), and > 0.20 (97).  
 98 = Not used  
 99 = Missing data

**FLD LEN: 1**

**Global irradiance quality code**

The code that denotes a quality status of the reported global irradiance value.  
 DOM: A specific domain comprised of the numeric characters (0-9).  
 0 = Passed gross limits check  
 1 = Passed all quality control checks  
 2 = Suspect  
 3 = Erroneous  
 9 = Missing

**FLD LEN: 4**

**Direct beam irradiance**

Direct beam irradiance measured using a pyrheliometer or other instrument. Unit is watts per square meter (W/m<sup>2</sup>) in whole values. Waveband ranges from 0.4 - 2.3 micrometers.  
 MIN: 0000      MAX: 9998      UNITS: watts per square meter  
 SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 2**

**Direct beam irradiance data flag**

The code that provides additional information regarding the direct beam irradiance data.

DOM: A specific domain comprised of the numeric characters (00-99).

- 00 = Untested (raw data)
- 01 = Passed one-component test; data fall within max-min limits of Kt, Kn, or Kd
- 02 = Passed two-component test; data fall within 0.03 of the Gompertz boundaries
- 03 = Passed three-component test; data come within + 0.03 of satisfying  $K_t = K_n + K_d$
- 04 = Passed visual inspection: not used by SERI\_QC1
- 05 = Failed visual inspection: not used by SERI\_QC1
- 06 = Value estimated; passes all pertinent SERI\_QC tests
- 07 = Failed one-component test; lower than allowed minimum
- 08 = Failed one-component test; higher than allowed maximum
- 09 = Passed three-component test but failed two-component test by 0.05
- 10-93 = Failed two- or three- component tests in one of four ways.
- 94-97 = Data fails into physically impossible region where  $K_n > K_t$  by K-space distances of 0.05 to 0.10 (94), 0.10 to 0.15 (95), 0.15 to 0.20 (96), and > 0.20 (97).
- 98 = Not used
- 99 = Missing data

**FLD LEN: 1**

**Direct beam irradiance quality code**

The code that denotes a quality status of the reported direct beam irradiance value.

DOM: A specific domain comprised of the numeric characters (0-9).

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 9 = Missing

**FLD LEN: 4**

**Diffuse irradiance**

Diffuse irradiance measured using a pyranometer under a shading device. Unit is watts per square meter (W/m<sup>2</sup>) in whole values. Waveband ranges from 0.4 - 2.3 micrometers. Instrument is mounted under a shadowband.

MIN: 0000 MAX: 9998 UNITS: watts per square meter

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing.

**FLD LEN: 2**

**Diffuse irradiance data flag**

The code that provides additional information regarding the diffuse irradiance data.

DOM: A specific domain comprised of the numeric characters (00-99).

- 00 = Untested (raw data)
- 01 = Passed one-component test; data fall within max-min limits of Kt, Kn, or Kd
- 02 = Passed two-component test; data fall within 0.03 of the Gompertz boundaries
- 03 = Passed three-component test; data come within + 0.03 of satisfying  $K_t = K_n + K_d$
- 04 = Passed visual inspection: not used by SERI\_QC1
- 05 = Failed visual inspection: not used by SERI\_QC1
- 06 = Value estimated; passes all pertinent SERI\_QC tests
- 07 = Failed one-component test; lower than allowed minimum
- 08 = Failed one-component test; higher than allowed maximum
- 09 = Passed three-component test but failed two-component test by

0.05  
 10-93 = Failed two- or three- component tests in one of four ways.  
 94-97 = Data fails into physically impossible region where  $K_n > K_t$   
 by K-space distances of 0.05 to 0.10 (94), 0.10 to 0.15  
 (95), 0.15 to 0.20 (96), and  $> 0.20$  (97).  
 98 = Not used  
 99 = Missing data

**FLD LEN: 1**

**Diffuse irradiance quality code**

The code that denotes a quality status of the reported diffuse irradiance value.

DOM: A specific domain comprised of the numeric characters (0-9).

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 9 = Missing

**FLD LEN: 4**

**UVB global irradiance**

Ultra-violet global irradiance measured using a Ultra-violet Biometer (Solar Light). Unit is milli-watts per square meter (mW/m<sup>2</sup>) of erythema effective irradiance in whole values. Waveband ranges from 290-320 nanometers.

MIN: 0000 MAX: 9998 UNITS: milli-watts per square meter

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).  
 9999 = Missing.

**FLD LEN: 1**

**UVB global irradiance quality code**

The code that denotes a quality status of the reported UVB global irradiance value.

DOM: A specific domain comprised of the numeric characters (0-9).

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 9 = Missing

**FLD LEN: 3**

**Solar Radiation Section identifier**

The identifier that indicates an observation of solar radiation data.

DOM: A specific domain comprised of the characters in the ASCII character set.

**GN1** An indicator of the following items:

- Solar radiation data time period
- Upwelling global solar radiation
- Upwelling global solar radiation quality code
- Downwelling thermal infrared radiation
- Downwelling thermal infrared radiation quality code
- Upwelling thermal infrared radiation
- Upwelling thermal infrared radiation quality code
- Photosynthetically active radiation
- Photosynthetically active radiation quality code
- Solar zenith angle
- Solar zenith angle quality code

**FLD LEN: 4**

Time period in minutes, for which the data in this section (GN1) pertains—eg, 0060 = 60 minutes (1 hour).

MIN: 0001 MAX: 9998 UNITS: Minutes

DOM: A general domain comprised of the numeric characters (0-9).  
 9999 = Missing.

**FLD LEN: 4****Upwelling global solar radiation**

Global radiation measured using an Epply Precision Spectral Pyranometer mounted upside down ten meters above the surface on a meteorological tower. Unit is milli-watts per square meter (mW/m<sup>2</sup>). Waveband ranges from 270 to 3000 nanometers.

MIN: 0000      MAX: 9998      UNITS: milli-watts per square meter

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 1****Upwelling global solar radiation quality code**

The code that denotes a quality status of the reported upwelling global solar radiation value.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

9 = Missing

**FLD LEN: 4****Downwelling thermal infrared radiation**

Infrared radiation measured using an Epply Precision Infrared Radiometer mounted upright ten meters above the surface on a meteorological tower. Unit is milli-watts per square meter (mW/m<sup>2</sup>). Waveband ranges from 3000 to 50,000 nanometers.

MIN: 0000      MAX: 9998      UNITS: milli-watts per square meter

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 1****Downwelling thermal infrared radiation quality code**

The code that denotes a quality status of the reported downwelling thermal infrared radiation value.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

9 = Missing

**FLD LEN: 4****Upwelling thermal infrared radiation**

Infrared radiation measured using an Epply Precision Infrared Radiometer mounted upside-down ten meters above the surface on a meteorological tower. Unit is Watts per meter per meter (mW/m<sup>2</sup>). Waveband ranges from 3000 to 50,000 nanometers.

MIN: 0000      MAX: 9998      UNITS: watts per square meter

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 1****Upwelling thermal infrared radiation quality code**

The code that denotes a quality status of the reported upwelling thermal infrared radiation value.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

9 = Missing

**FLD LEN: 4****Photosynthetically active radiation**

The PAR sensor measures global solar radiation from 400 to 700 nm in Watts per square meter (mW/m<sup>2</sup>), which

approximates the spectral band active in photosynthesis.  
MIN: 0000 MAX: 9998 UNITS: watts per square meter  
SCALING FACTOR: 1  
DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 1**

**Photosynthetically active radiation quality code**

The code that denotes a quality status of the reported photosynthetically active radiation value.

DOM: A specific domain comprised of the numeric characters (0-9).

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 9 = Missing

**FLD LEN: 3**

**Solar zenith angle**

The Solar Zenith Angle is the angle in degrees between the sun and the perpendicular to the earth's surface. At sunrise it is 90 degrees, at noon it is a function of latitude, and at sunset it is again 90 degrees. Below the horizon value is 100. Values are reported to the nearest tens of degrees (eg, 090).

MIN: 000 MAX: 998 UNITS: angular degrees

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).  
999 = Missing.

**FLD LEN: 1**

**Solar zenith angle quality code**

The code that denotes a quality status of the reported solar zenith angle value.

DOM: A specific domain comprised of the numeric characters (0-9).

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 9 = Missing

---

**FLD LEN: 3**

**Net Solar Radiation Section identifier**

The identifier that indicates an observation of net solar radiation data.

DOM: A specific domain comprised of the characters in the ASCII character set.

- GO1** An indicator of the following items:
- Net solar radiation data time period
  - Net solar radiation
  - Net solar radiation quality code
  - Net infrared radiation
  - Net infrared radiation quality code
  - Net radiation
  - Net radiation quality code

**FLD LEN: 4**

Time period in minutes, for which the data in this section (GO1) pertains—eg, 0060 = 60 minutes (1 hour).

MIN: 0001 MAX: 9998 UNITS: Minutes

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 4**

**Net solar radiation**

The difference between global radiation and upwelling global radiation measured in Watts per square meter (W/m<sup>2</sup>). If negative, left most position contains a "-" sign.

MIN: -999 MAX: 9998 UNITS: watts per square meter



SCALING FACTOR: 1  
DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 1**

**Net solar radiation quality code**

The code that denotes a quality status of the reported net solar radiation value.

DOM: A specific domain comprised of the numeric characters (0-9).

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 9 = Missing

**FLD LEN: 4**

**Net infrared radiation**

The difference between downwelling infrared and upwelling infrared measured in Watts per square meter (W/m<sup>2</sup>). If negative, left most position contains a "-" sign.

MIN: -999 MAX: 9998 UNITS: watts per square meter

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 1**

**Net infrared radiation quality code**

The code that denotes a quality status of the reported net infrared radiation value.

DOM: A specific domain comprised of the numeric characters (0-9).

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 9 = Missing

**FLD LEN: 4**

**Net radiation**

The total of Net Solar and Net Infrared radiation measured in Watts per square meter (W/m<sup>2</sup>).

MIN: -999 MAX: 9998 UNITS: watts per square meter

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 1**

**Net radiation quality code**

The code that denotes a quality status of the reported net radiation value.

DOM: A specific domain comprised of the numeric characters (0-9).

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 9 = Missing

---

**FLD LEN: 3**

**Modeled Solar Irradiance Section identifier**

The identifier that indicates modeled broadband solar irradiance data integrated over the specified time period.

DOM: A specific domain comprised of the characters in the ASCII character set.

**GP1** An indicator of the following items:

- Modeled solar irradiance data time period
- Modeled global horizontal
- Modeled global horizontal source flag
- Modeled global horizontal uncertainty
- Modeled direct normal

Modeled direct normal source flag  
Modeled direct normal uncertainty  
Modeled diffuse horizontal  
Modeled diffuse horizontal source flag  
Modeled diffuse horizontal uncertainty

**FLD LEN: 4**

Time period in minutes, for which the data in this section pertains—eg, 0060 = 60 minutes (1 hour).  
MIN: 0001      MAX: 9998      UNITS: Minutes  
DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 4**

**Modeled global horizontal**

Total amount of direct and diffuse solar radiation (modeled) received on a horizontal surface. Unit is watts per square meter (W/m<sup>2</sup>) in whole values.

MIN: 0000      MAX: 9998      UNITS: watts per square meter  
SCALING FACTOR: 1  
DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 2**

**Modeled global horizontal source flag**

The code that provides source information regarding the global horizontal data.

DOM: A specific domain comprised of the numeric characters (00-99).

01 = Value modeled from METSTAT model  
02 = Value time-shifted from SUNY satellite model  
03 = Value time-shifted from SUNY satellite model, adjusted to a minimum low-diffuse envelope  
99 = Missing data

**FLD LEN: 3**

**Modeled global horizontal uncertainty**

The uncertainty values are based on model type and quality of input data.

MIN: 000      MAX: 100      UNITS: Percent  
SCALING FACTOR: 1  
DOM: A general domain comprised of the numeric characters (0-9).  
999 = Missing data

**FLD LEN: 4**

**Modeled direct normal**

The amount of solar radiation (modeled) on a surface normal to the sun. Unit is watts per square meter (W/m<sup>2</sup>) in whole values.

MIN: 0000      MAX: 9998      UNITS: watts per square meter  
SCALING FACTOR: 1  
DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing.

**FLD LEN: 2**

**Modeled direct normal source flag**

The code that provides source information regarding the direct normal data.

DOM: A specific domain comprised of the numeric characters (00-99).

01 = Value modeled from METSTAT model  
02 = Value time-shifted from SUNY satellite model  
03 = Value time-shifted from SUNY satellite model, adjusted to a minimum low-diffuse envelope  
99 = Missing data

**FLD LEN: 3**

**Modeled direct normal uncertainty**

The uncertainty values are based on model type and quality of input data.

MIN: 000      MAX: 100      UNITS: Percent  
SCALING FACTOR: 1  
DOM: A general domain comprised of the numeric characters (0-9).  
999 = Missing data

**FLD LEN: 4****Modeled diffuse horizontal**

The amount of solar radiation (modeled) received from the sky (excluding the solar disk) on a horizontal surface.

Unit is watts per square meter (W/m<sup>2</sup>) in whole values. Waveband ranges from 0.4 - 2.3 micrometers.

MIN: 0000 MAX: 9998 UNITS: watts per square meter

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing.

**FLD LEN: 2****Modeled diffuse horizontal source flag**

The code that provides source information regarding the diffuse horizontal data.

DOM: A specific domain comprised of the numeric characters (00-99).

01 = Value modeled from METSTAT model

02 = Value time-shifted from SUNY satellite model

03 = Value time-shifted from SUNY satellite model, adjusted to a minimum low-diffuse envelope

99 = Missing data

**FLD LEN: 3****Modeled diffuse horizontal uncertainty**

The uncertainty values are based on model type and quality of input data.

MIN: 000 MAX: 100 UNITS: Percent

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9)

999 = Missing data

---

**FLD LEN: 3****Hourly Solar Angle Section identifier**

The identifier that denotes the start of the Hourly Solar angle data section.

DOM: A specific domain comprised of the characters in the ASCII character set.

**GQ1** An indicator of the occurrence of the following items:

Hourly solar angle time period

Hourly mean zenith angle

Hourly mean zenith angle quality code

Hourly mean azimuth angle

Hourly mean azimuth angle quality code

**FLD LEN: 4**

Time period in minutes, for which the data in this section pertains—eg, 0060 = 60 minutes (1 hour).

MIN: 0001 MAX: 9998 UNITS: Minutes

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing data

**FLD LEN: 4****Hourly mean zenith angle (for sunup periods)**

The angle between sun and the zenith as the mean of all 1-minute sunup zenith angle values.

MIN: 0000 MAX: 3600 UNITS: Angular Degrees

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing data

**FLD LEN: 1****Hourly mean zenith angle quality code**

The code that denotes a quality status of the hourly mean zenith angle.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

9 = Missing

**FLD LEN: 4**

**Hourly mean azimuth angle (for sunup periods)**

The angle between sun and north as the mean of all 1-minute sunup azimuth angle values.

MIN: 0000 MAX: 3600 UNITS: Angular Degrees

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing data

**FLD LEN: 1**

**Hourly mean azimuth angle quality code**

The code that denotes a quality status of the hourly mean azimuth angle.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

9 = Missing

---

**FLD LEN: 3**

**Hourly Extraterrestrial Radiation Section identifier**

The identifier that denotes the start of the Hourly Extraterrestrial radiation data section.

DOM: A specific domain comprised of the characters in the ASCII character set.

**GR1** An indicator of the occurrence of the following items:

Hourly extraterrestrial radiation time period

Hourly extraterrestrial radiation on a horizontal surface

Hourly extraterrestrial radiation on a horizontal surface quality code

Hourly extraterrestrial radiation normal to the sun

Hourly extraterrestrial radiation normal to the sun quality code

**FLD LEN: 4**

Time period in minutes, for which the data in this section pertains—eg, 0060 = 60 minutes (1 hour).

MIN: 0001 MAX: 9998 UNITS: Minutes

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing data

**FLD LEN: 4**

**Hourly extraterrestrial radiation on a horizontal surface**

The amount of solar radiation received (modeled) on a horizontal surface at the top of the atmosphere. Unit is watts per square meter (W/m<sup>2</sup>) in whole values.

MIN: 0000 MAX: 9998 UNITS: watts per square meter

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing data

**FLD LEN: 1**

**Hourly extraterrestrial radiation on a horizontal surface quality code**

The code that denotes a quality status of the hourly extraterrestrial radiation on a horizontal surface value.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

9 = Missing

**FLD LEN: 4**

**Hourly extraterrestrial radiation normal to the sun**

The amount of solar radiation received (modeled) on a surface normal to the sun at the top of the atmosphere. Unit is watts per square meter (W/m<sup>2</sup>) in whole values.

MIN: 0000      MAX: 9998      UNITS: watts per square meter  
SCALING FACTOR: 1  
DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing data

**FLD LEN: 1**

**Hourly extraterrestrial radiation normal to the sun quality code**

The code that denotes a quality status of the hourly extraterrestrial radiation normal to the sun value.

DOM: A specific domain comprised of the numeric characters (0-9).

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 9 = Missing

---

## **Hail Data**

**FLD LEN: 3**

HAIL identifier

The identifier that denotes the start of a HAIL data section.

DOM: A specific domain comprised of the characters in the ASCII character set.

**HL1** An indicator of the occurrence of the following item:

Hail size

Hail size quality code

**FLD LEN: 3**

HAIL size

The diameter of the largest hailstone observed.

MIN: 000      MAX: 200      UNITS: Centimeters

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9)

999 = missing

**FLD LEN: 1**

HAIL size quality code

The code that denotes a quality status of the reported HAIL size.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 9 = Passed gross limits check if element is present

---

## **Ground Surface Data**

**FLD LEN: 3**

GROUND-SURFACE-OBSERVATION identifier

The identifier that denotes the availability of a GROUND-SURFACE-OBSERVATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

**IA1:** An indicator of the occurrence of the following data item:

GROUND-SURFACE-OBSERVATION code

GROUND-SURFACE-OBSERVATION quality code

**FLD LEN: 2**

GROUND-SURFACE-OBSERVATION code

The code that denotes the physical condition of the ground's surface.

DOM: A specific domain comprised of the characters in the ASCII character set.

NOTE: Code values 10-19 indicate the state of the ground without snow or measurable ice cover.

- 00 : Surface of ground dry (no appreciable amount of dust or loose sand)
- 01: Surface of ground dry (without cracks and no appreciable amount of dust or loose sand and without snow or measurable ice cover)
- 02: Extremely dry with cracks (without snow or measurable ice cover)
- 03: Loose dry dust or sand not covering ground completely (without snow or measurable ice cover)
- 04: Loose dry dust or sand covering more than one-half of ground (but not completely)
- 05: Loose dry dust or sand covering ground completely
- 06: Thin cover of loose dry dust or sand covering ground completely (without snow or measurable ice cover)
- 07: Moderate or thick cover of loose dry dust or sand covering ground completely (without snow or measurable ice cover)
- 08: Surface of ground moist
- 09: Surface of ground moist (without snow or measurable ice cover)
- 10: Surface of ground wet (standing water in small or large pools on surface)
- 11: Surface of ground wet (standing water in small or large pools on surface without snow or measurable ice cover)
- 12: Flooded (without snow or measurable ice cover)
- 13: Surface of ground frozen
- 14: Surface of ground frozen (without snow or measurable ice cover)
- 15: Glaze or ice on ground, but no snow or melting snow
- 16: Glaze on ground (without snow or measurable ice cover)
- 17: Ground predominantly covered by ice
- 18: Snow or melting snow (with or without ice) covering less than one-half of the ground
- 19: Snow or melting snow (with or without ice) covering more than one-half of the ground but ground not completely covered
- 20: Snow or melting snow (with or without ice) covering ground completely
- 21: Loose dry snow covering less than one-half of the ground
- 22: Loose dry snow covering at least one half of the ground (but not completely)
- 23: Even layer of loose dry snow covering ground completely
- 24: Uneven layer of loose dry snow covering ground completely
- 25: Compact or wet snow (with or without ice) covering less than one-half of the ground
- 26: Compact or wet snow (with or without ice) covering at least one-half of the ground but ground not completely covered
- 27: Even layer of compact or wet snow covering ground completely
- 28: Uneven layer of compact or wet snow covering ground completely
- 29: Snow covering ground completely; deep drifts
- 30: Lose dry dust or sand covering one-half of the ground (but not completely)
- 31: Loose dry snow, dust or sand covering ground completely
- 99: Missing

FLD LEN: 1

GROUND-SURFACE-OBSERVATION code quality code

The code that denotes a quality status of the reported GROUND-SURFACE-OBSERVATION code.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 9 = Passed gross limits check if element is present

---

FLD LEN: 3

GROUND-SURFACE-OBSERVATION minimum-temperature identifier

The identifier that denotes the availability of GROUND-SURFACE-OBSERVATION minimum temperature data.

DOM: A specific domain comprised of the characters in the ASCII character set.

**IA2:** An indicator of the occurrence of the following data item:

GROUND-SURFACE-OBSERVATION minimum-temperature period quantity

GROUND-SURFACE-OBSERVATION minimum temperature

GROUND-SURFACE-OBSERVATION minimum temperature quality code

FLD LEN: 3

GROUND-SURFACE-OBSERVATION minimum-temperature period quantity

The quantity of time over which the ground temperature was sampled to determine the minimum temperature.

MIN: 001            MAX: 480            UNITS: hours

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

999 = Missing

FLD LEN: 5

GROUND-SURFACE-OBSERVATION minimum temperature

The minimum temperature of the ground's surface recorded during the observation period.

MIN: -1100    MAX: +1500    UNITS: Degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign(-).

+9999 = Missing

FLD LEN: 1

GROUND-SURFACE-OBSERVATION minimum temperature quality code

The code that denotes a quality status of the reported GROUND-SURFACE-OBSERVATION minimum temperature.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

9 = Passed gross limits check if element is present

---

FLD LEN: 3

**Hourly Surface Temperature Section** identifier

The identifier that indicates an hourly observation of surface temperature as measured by a radiation sensor for the ground surface. This section appears in the last ISD record of the hour.

DOM: A specific domain comprised of the characters in the ASCII character set.

**IB1** An indicator of the following items:

SURFTEMP hourly average surface temperature

SURFTEMP\_QC quality code

SURFTEMP\_FLAG quality code

SURFTEMP\_MIN minimum surface temperature

SURFTEMP\_MIN\_QC quality code

SURFTEMP\_MIN\_FLAG quality code

SURFTEMP\_MAX maximum surface temperature

SURFTEMP\_MAX\_QC quality code

SURFTEMP\_MAX\_FLAG quality code

SURFTEMP\_STD surface temperature standard deviation for the hour

SURFTEMP\_STD\_QC quality code

SURFTEMP\_STD\_FLAG quality code

FLD LEN: 5

**SURFTEMP** hourly average surface temperature

The hourly average surface temperature.  
MIN: -9999 MAX: +9998 UNITS: degrees Celsius  
SCALING FACTOR: 10  
DOM: A general domain comprised of the numeric characters (0-9) a plus sign (+), and a minus sign (-).  
+9999 = Missing.

**FLD LEN: 1**

**SURFTEMP\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the hourly average surface temperature.

DOM: A specific domain comprised of the numeric characters (0-9).

- 1 = Passed all quality control checks
- 3 = Failed all quality control checks
- 9 = Missing

**FLD LEN: 1**

**SURFTEMP\_FLAG** quality code

The code that indicates the network's internal evaluation of the quality status of the hourly average surface temperature. Most users will find the preceding quality code **SURFTEMP\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

- 0 = Passed all quality control checks
- other – Did not pass all quality checks

**FLD LEN: 5**

**SURFTEMP\_MIN** hourly minimum surface temperature

The minimum 10 second surface temperature for the hour.

MIN: -9999 MAX: +9998 UNITS: degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9) a plus sign (+), and a minus sign (-)  
+9999 = Missing.

**FLD LEN: 1**

**SURFTEMP\_MIN\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the hourly minimum surface temperature.

DOM: A specific domain comprised of the numeric characters (0-9).

- 1 = Passed all quality control checks
- 3 = Failed all quality control checks
- 9 = Missing

**FLD LEN: 1**

**SURFTEMP\_MIN\_FLAG** quality code

The code that indicates the network's internal evaluation of the quality status of the hourly minimum surface temperature. Most users will find the preceding quality code **SURFTEMP\_MIN\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

- 0 = Passed all quality control checks
- other – Did not pass all quality checks

**FLD LEN: 5**

**SURFTEMP\_MAX** hourly maximum surface temperature

The maximum 10 second surface temperature for the hour.

MIN: -9999 MAX: +9998 UNITS: degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-)  
+9999 = Missing.

**FLD LEN: 1**

**SURFTEMP\_MAX\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the hourly maximum surface temperature.

DOM: A specific domain comprised of the numeric characters (0-9).

- 1 = Passed all quality control checks
- 3 = Failed all quality control checks



9 = Missing

**FLD LEN: 1**

**SURFTEMP\_MAX\_FLAG** quality code

The code that indicates the network's internal evaluation of the quality status of the hourly maximum surface temperature. Most users will find the preceding quality code **SURFTEMP\_MAX\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed all quality control checks

other – Did not pass all quality checks

**FLD LEN: 4**

**SURFTEMP\_STD** hourly surface temperature standard deviation

The hourly surface temperature standard deviation.

MIN: 0000 MAX: 9998

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing.

**FLD LEN: 1**

**SURFTEMP\_STD\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the hourly surface temperature standard deviation.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**SURFTEMP\_STD\_FLAG** quality code

The code that indicates the network's internal evaluation of the quality status of hourly surface temperature standard deviation. Most users will find the preceding quality code **SURFTEMP\_STD\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed all quality control checks

other – Did not pass all quality checks

---

**FLD LEN: 3**

**Hourly Surface Temperature Sensor Section** identifier

The identifier that indicates an hourly observation of the equipment temperature for the sensor used to measure ground surface temperature. This section appears in the last ISD record of the hour.

DOM: A specific domain comprised of the characters in the ASCII character set.

**IB2** An indicator of the following items:

SURFTEMP\_SB equipment temperature

SURFTEMP\_SB\_QC quality code

SURFTEMP\_SB\_FLAG quality code

SURFTEMP\_SB\_STD equipment temperature standard deviation for the hour

SURFTEMP\_SB\_STD\_QC quality code

SURFTEMP\_SB\_STD\_FLAG quality code

**FLD LEN: 5**

**SURFTEMP\_SB** equipment temperature

The average temperature of the surface temperature sensor housing (sensor body) for the hour.

MIN: -9999 MAX: +9998 UNITS: degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-)

+9999 = Missing.

**FLD LEN: 1**

**SURFTEMP\_SB\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the surface temperature sensor housing temperature.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**SURFTEMP\_SB\_FLAG** quality code

The code that indicates the network's internal evaluation of the quality status of the surface temperature sensor housing temperature. Most users will find the preceding quality code **SURFTEMP\_SB\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed all quality control checks

other – Did not pass all quality checks

**FLD LEN: 4**

**SURFTEMP\_SB\_STD** hourly sensor housing temperature standard deviation for the hour

The hourly 10 second hourly surface temperature standard deviation.

MIN: 0000 MAX: 9998

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing.

**FLD LEN: 1**

**SURFTEMP\_SB\_STD\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the hourly sensor housing temperature standard deviation.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**SURFTEMP\_SB\_STD\_FLAG** quality code

The code that indicates the network's internal evaluation of the quality status of sensor housing temperature standard deviation.. Most users will find the preceding quality code **SURFTEMP\_SB\_STD\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9).

0 = Passed all quality control checks

other – Did not pass all quality checks

---

**FLD LEN: 3**

GROUND-SURFACE-OBSERVATION pan evaporation data identifier

The identifier that denotes the availability of GROUND-SURFACE-OBSERVATION evaporation data.

DOM: A specific domain comprised of the characters in the ASCII character set.

**IC1:** An indicator of the occurrence of the following data item:

GROUND-SURFACE-OBSERVATION time period in hours

GROUND-SURFACE-OBSERVATION wind movement

GROUND-SURFACE-OBSERVATION wind movement condition code

GROUND-SURFACE-OBSERVATION wind movement quality code

GROUND-SURFACE-OBSERVATION evaporation data

GROUND-SURFACE-OBSERVATION evaporation condition code

GROUND-SURFACE-OBSERVATION evaporation quality code

GROUND-SURFACE-OBSERVATION maximum pan water temperature

GROUND-SURFACE-OBSERVATION maximum water temperature condition code

GROUND-SURFACE-OBSERVATION maximum water temperature quality code

GROUND-SURFACE-OBSERVATION minimum pan water temperature

GROUND-SURFACE-OBSERVATION minimum water temperature condition code

GROUND-SURFACE-OBSERVATION minimum water temperature quality code

FLD LEN: 2

GROUND-SURFACE-OBSERVATION time period in hours  
The quantity of time over which the evaporation and related data were sampled.  
MIN: 01      MAX: 98      UNITS: hours  
SCALING FACTOR: 1  
DOM: A general domain comprised of the numeric characters (0-9).  
99 = Missing

FLD LEN: 4

GROUND-SURFACE-OBSERVATION wind movement  
The wind movement over the evaporation pan during the time period of the observation.  
MIN: 0000    MAX: 9998    UNITS: Statute Miles  
SCALING FACTOR: 1  
DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing

FLD LEN: 1

GROUND-SURFACE-OBSERVATION wind movement condition code  
The code that denotes certain conditions or flags which describe the data.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
1: No special conditions  
2: Data will be included in subsequent observation  
3: Data are accumulated from previous observation(s), so cover a longer than typical time period  
9: Missing

FLD LEN: 1

GROUND-SURFACE-OBSERVATION wind movement quality code  
The code that denotes a quality status of the reported wind movement data.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
4 = Passed gross limits check, from NCDC Data source  
5 = Passed all quality control checks, from NCDC Data source  
6 = Suspect, from NCDC Data source  
7 = Erroneous, from NCDC Data source  
9 = Passed gross limits check if element is present

FLD LEN: 3

GROUND-SURFACE-OBSERVATION evaporation data  
The total evaporation which was measured during the time period of the observation.  
MIN: 000    MAX: 998    UNITS: Inches  
SCALING FACTOR: 100  
DOM: A general domain comprised of the numeric characters (0-9).  
999 = Missing

FLD LEN: 1

GROUND-SURFACE-OBSERVATION evaporation condition code  
The code that denotes certain conditions or flags which describe the data.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
1: No special conditions  
2: Data will be included in subsequent observation  
3: Data are accumulated from previous observation(s), so cover a longer than typical time period  
9: Missing

FLD LEN: 1

GROUND-SURFACE-OBSERVATION evaporation quality code  
The code that denotes a quality status of the reported evaporation data.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
4 = Passed gross limits check, from NCDC Data source  
5 = Passed all quality control checks, from NCDC Data source  
6 = Suspect, from NCDC Data source  
7 = Erroneous, from NCDC Data source  
9 = Passed gross limits check if element is present

FLD LEN: 4

GROUND-SURFACE-OBSERVATION maximum pan water temperature  
The maximum temperature in the evaporation pan during the time period of the observation.  
MIN: -100 MAX: +500 UNITS: Degrees Celsius  
SCALING FACTOR: 10  
DOM: A general domain comprised of the numeric characters (0-9), as a signed field.  
+999 = Missing

FLD LEN: 1

GROUND-SURFACE-OBSERVATION maximum pan water temperature condition code  
The code that denotes certain conditions or flags which describe the data.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
1: No special conditions  
2: Data will be included in subsequent observation  
3: Data are accumulated from previous observation(s), so cover a longer than typical time period  
9: Missing

FLD LEN: 1

GROUND-SURFACE-OBSERVATION maximum pan water temperature quality code  
The code that denotes a quality status of the reported maximum water temperature data.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
4 = Passed gross limits check, from NCDC Data source  
5 = Passed all quality control checks, from NCDC Data source  
6 = Suspect, from NCDC Data source  
7 = Erroneous, from NCDC Data source  
9 = Passed gross limits check if element is present

FLD LEN: 4

GROUND-SURFACE-OBSERVATION minimum pan water temperature  
The maximum temperature in the evaporation pan during the time period of the observation.  
MIN: -100 MAX: +500 UNITS: Degrees Celsius  
SCALING FACTOR: 10  
DOM: A general domain comprised of the numeric characters (0-9), as a signed field.  
+999 = Missing

FLD LEN: 1

GROUND-SURFACE-OBSERVATION minimum pan water temperature condition code  
The code that denotes certain conditions or flags which describe the data.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
1: No special conditions  
2: Data will be included in subsequent observation  
3: Data are accumulated from previous observation(s), so cover a longer than typical time period  
9: Missing

FLD LEN: 1

GROUND-SURFACE-OBSERVATION minimum pan water temperature quality code  
The code that denotes a quality status of the reported minimum water temperature data.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
4 = Passed gross limits check, from NCDC Data source  
5 = Passed all quality control checks, from NCDC Data source  
6 = Suspect, from NCDC Data source  
7 = Erroneous, from NCDC Data source  
9 = Passed gross limits check if element is present

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## Temperature Data

FLD LEN: 3

EXTREME-AIR-TEMPERATURE identifier  
The identifier that denotes the start of an EXTREME-AIR-TEMPERATURE data section.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
**KA1-KA4** An indicator of up to 4 repeating fields of the following items:

EXTREME-AIR-TEMPERATURE period quantity  
EXTREME-AIR-TEMPERATURE code  
EXTREME-AIR-TEMPERATURE air temperature  
EXTREME-AIR-TEMPERATURE temperature quality code

**FLD LEN: 3**

EXTREME-AIR-TEMPERATURE period quantity  
The quantity of time over which temperatures were sampled to determine the  
EXTREME-AIR-TEMPERATURE.  
MIN: 001 MAX: 480 UNITS: Hours  
SCALING FACTOR: 10  
DOM: A general domain comprised of the numeric characters (0-9)  
999 = Missing

**FLD LEN: 1**

EXTREME-AIR-TEMPERATURE code  
The code that denotes an EXTREME-AIR-TEMPERATURE as a maximum or a minimum.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
N: Minimum temperature  
M: Maximum temperature  
O: Estimated minimum temperature  
P: Estimated maximum temperature  
9: Missing

**FLD LEN: 5**

EXTREME-AIR-TEMPERATURE temperature  
The temperature of the high or low air temperature for a given period.  
MIN: -0932 MAX: +0618 UNITS: Degrees Celsius  
SCALING FACTOR: 10  
DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus  
sign (-).  
+9999 = Missing

**FLD LEN: 1**

EXTREME-AIR-TEMPERATURE temperature quality code  
The code that denotes a quality status of the reported EXTREME-AIR-TEMPERATURE temperature.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
0 = Passed gross limits check  
1 = Passed all quality control checks  
2 = Suspect  
3 = Erroneous  
4 = Passed gross limits check , data originate from an NCDC data source  
5 = Passed all quality control checks, data originate from an NCDC data source  
6 = Suspect, data originate from an NCDC data source  
7 = Erroneous, data originate from an NCDC data source  
M = Manual change made to value based on information provided by NWS or FAA  
9 = Passed gross limits check if element is present

---

**FLD LEN: 3**

**AVERAGE-AIR-TEMPERATURE identifier**  
The identifier that denotes the start of an AVERAGE-AIR-TEMPERATURE data section.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
**KB1-KB3** An indicator of up to 3 repeating fields for the following items:  
AVERAGE-AIR-TEMPERATURE period quantity  
AVERAGE-AIR-TEMPERATURE type code  
AVERAGE-AIR-TEMPERATURE air temperature  
AVERAGE-AIR-TEMPERATURE temperature quality code

**FLD LEN: 3**

**AVERAGE-AIR-TEMPERATURE period quantity**  
The quantity of time over which temperatures were sampled to determine the  
AVERAGE-AIR-TEMPERATURE.

MIN: 001    MAX: 744    UNITS: Hours  
SCALING FACTOR: 1  
DOM: A general domain comprised of the numeric characters (0-9)  
999 = Missing

**FLD LEN: 1**

**AVERAGE-AIR-TEMPERATURE code**

The code that denotes an AVERAGE-AIR-TEMPERATURE as a mean, an average maximum, or an average minimum.

DOM: A specific domain comprised of the characters in the ASCII character set.

N: Minimum temperature average  
M: Maximum temperature average  
A: Mean temperature  
9: Missing

**FLD LEN: 5**

**AVERAGE-AIR-TEMPERATURE temperature**

The mean air temperature for a given period, typically for the day or month, as reported by the station (ie, not derived from other data fields).

MIN: -9900    MAX: +6300    UNITS: Degrees Celsius

SCALING FACTOR: 100

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-).  
+9999 = Missing

**FLD LEN: 1**

**AVERAGE-AIR-TEMPERATURE temperature quality code**

The code that denotes a quality status of the reported AVERAGE-AIR-TEMPERATURE temperature.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check  
1 = Passed all quality control checks  
2 = Suspect  
3 = Erroneous  
4 = Passed gross limits check, data originate from an NCDC data source  
5 = Passed all quality control checks, data originate from an NCDC data source  
6 = Suspect, data originate from an NCDC data source  
7 = Erroneous, data originate from an NCDC data source  
9 = Passed gross limits check if element is present

---

**FLD LEN: 3**

**EXTREME AIR-TEMPERATURE FOR THE MONTH identifier**

The identifier that denotes the start of an EXTREME AIR-TEMPERATURE data section.

DOM: A specific domain comprised of the characters in the ASCII character set.

**KC1-KC2** An indicator of up to 2 repeating fields for the following items:

EXTREME AIR-TEMPERATURE code  
EXTREME AIR-TEMPERATURE condition code  
EXTREME AIR-TEMPERATURE temperature  
EXTREME AIR-TEMPERATURE date of occurrence  
EXTREME AIR-TEMPERATURE temperature quality code

**FLD LEN: 1**

**EXTREME AIR-TEMPERATURE FOR THE MONTH code**

The code that denotes an EXTREME AIR-TEMPERATURE FOR THE MONTH as a maximum or a minimum.

DOM: A specific domain comprised of the characters in the ASCII character set.

N: Minimum temperature  
M: Maximum temperature  
9: Missing

**FLD LEN: 1**

**EXTREME AIR-TEMPERATURE FOR THE MONTH condition code**

The code for EXTREME AIR-TEMPERATURE FOR THE MONTH

DOM: A specific domain comprised of the characters in the ASCII character set.

1: The value occurred on other dates in addition to those listed  
9: Missing or not applicable

**FLD LEN: 5**

**EXTREME AIR-TEMPERATURE FOR THE MONTH temperature**

The extremes air temperature for the month, as reported by the station (ie, not derived from other data fields).

MIN: -1100 MAX: +0630 UNITS: Degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-).  
+9999 = Missing

**FLD LEN: 6**

**EXTREME AIR-TEMPERATURE FOR THE MONTH dates of occurrence**

The dates of occurrence of **EXTREME AIR-TEMPERATURE**, given as the date for each occurrence, for up to 3 occurrences; e.g., 041016 indicates days 04, 10, and 16.

MIN: 01 MAX: 31

DOM: A general domain comprised of the numeric characters (0-9).  
99 = missing for each of the 3 sub-fields.

**FLD LEN: 1**

**EXTREME AIR-TEMPERATURE FOR THE MONTH temperature quality code**

The code that denotes a quality status of the reported **EXTREME AIR-TEMPERATURE FOR THE MONTH**.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check, data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

M = Manual change made to value based on information provided by NWS or FAA

9 = Passed gross limits check if element is present

---

**FLD LEN: 3**

**HEATING-COOLING-DEGREE-DAYS identifier**

The identifier that denotes the start of an **HEATING-COOLING-DEGREE-DAYS** data section.

DOM: A specific domain comprised of the characters in the ASCII character set.

**KD1-KD2** An indicator of up to 2 repeating fields of the following items:

HEATING-COOLING-DEGREE-DAYS period quantity

HEATING-COOLING-DEGREE-DAYS code

HEATING-COOLING-DEGREE-DAYS value

HEATING-COOLING-DEGREE-DAYS quality code

**FLD LEN: 3**

**HEATING-COOLING-DEGREE-DAYS period quantity**

The quantity of time over which temperatures were sampled to determine the

**HEATING-COOLING-DEGREE-DAYS**.

MIN: 001 MAX: 744 UNITS: Hours

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).  
999 = Missing

**FLD LEN: 1**

**HEATING-COOLING-DEGREE-DAYS code**

The code that denotes the value as being heating degree days or cooling degree days.

DOM: A specific domain comprised of the characters in the ASCII character set.

H: Heating Degree Days

C: Cooling Degree Days

**FLD LEN: 4****HEATING-COOLING-DEGREE-DAYS value**

The total heating or cooling degree days for a given period, typically for the day or month, as reported by the station (ie, not derived from other data fields). These data use the 65-degree Fahrenheit base as traditionally used for degree days.

MIN: 0000 MAX: 5000 UNITS: Heating or Cooling Degree Days

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing

**FLD LEN: 1****HEATING-COOLING-DEGREE-DAYS quality code**

The code that denotes a quality status of the reported HEATING-COOLING-DEGREE-DAYS data.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check, data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

9 = Passed gross limits check if element is present

**FLD LEN: 3****EXTREME TEMPERATURES, NUMBER OF DAYS EXCEEDING CRITERIA, FOR THE MONTH identifier**

The identifier that represents NUMBER OF DAYS EXCEEDING CRITERIA data.

DOM: A specific domain comprised of the characters in the ASCII character set.

**KE1** An indicator of the following items:

EXTREME TEMPERATURE, NUMBER OF DAYS with maximum temperature 32 F or lower

EXTREME TEMPERATURE, NUMBER OF DAYS quality code

EXTREME TEMPERATURE, NUMBER OF DAYS with maximum temperature 90 F or higher

EXTREME TEMPERATURE, NUMBER OF DAYS quality code

EXTREME TEMPERATURE, NUMBER OF DAYS with minimum temperature 32 F or lower

EXTREME TEMPERATURE, NUMBER OF DAYS quality code

EXTREME TEMPERATURE, NUMBER OF DAYS with minimum temperature 0 F or lower

EXTREME TEMPERATURE, NUMBER OF DAYS quality code

**FLD LEN: 2****EXTREME TEMPERATURES, NUMBER OF DAYS EXCEEDING CRITERIA, FOR THE MONTH**

The number of days with maximum temperature 32 F (0.0 C) or lower.

MIN: 00 MAX: 31

DOM: A general domain comprised of the numeric characters (0-9).  
99 = Missing.

**FLD LEN: 1****EXTREME TEMPERATURES, NUMBER OF DAYS EXCEEDING CRITERIA, FOR THE MONTH quality code**

The code that denotes a quality status of the reported days with max temperature 32 F (0.0 C) or lower.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check, data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

9 = Passed gross limits check if element is present

**FLD LEN: 2****EXTREME TEMPERATURES, NUMBER OF DAYS EXCEEDING CRITERIA, FOR THE MONTH**



The number of days with maximum temperature 90 F (32.2 C) or higher, except for Alaska—70 F (21.1 C) or higher.  
MIN: 00    MAX: 31  
DOM: A general domain comprised of the numeric characters (0-9).  
99 = Missing.

**FLD LEN: 1**

**EXTREME TEMPERATURES, NUMBER OF DAYS EXCEEDING CRITERIA, FOR THE MONTH quality code**

The code that denotes a quality status of the reported days with max temperature 90 F (32.2 C) or higher (70 F for Alaska).

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 4 = Passed gross limits check, data originate from an NCDC data source
- 5 = Passed all quality control checks, data originate from an NCDC data source
- 6 = Suspect, data originate from an NCDC data source
- 7 = Erroneous, data originate from an NCDC data source
- 9 = Passed gross limits check if element is present

**FLD LEN: 2**

**EXTREME TEMPERATURES, NUMBER OF DAYS EXCEEDING CRITERIA, FOR THE MONTH**

The number of days with minimum temperature 32 F (0.0 C) or lower.

MIN: 00    MAX: 31

DOM: A general domain comprised of the numeric characters (0-9).  
99 = Missing.

**FLD LEN: 1**

**EXTREME TEMPERATURES, NUMBER OF DAYS EXCEEDING CRITERIA, FOR THE MONTH quality code**

The code that denotes a quality status of the reported days with min temperature 32 F (0.0 C) or lower.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 4 = Passed gross limits check, data originate from an NCDC data source
- 5 = Passed all quality control checks, data originate from an NCDC data source
- 6 = Suspect, data originate from an NCDC data source
- 7 = Erroneous, data originate from an NCDC data source
- 9 = Passed gross limits check if element is present

**FLD LEN: 2**

**EXTREME TEMPERATURES, NUMBER OF DAYS EXCEEDING CRITERIA, FOR THE MONTH**

The number of days with minimum temperature 0 F (-17.8 C) or lower.

MIN: 00    MAX: 31

DOM: A general domain comprised of the numeric characters (0-9).  
99 = Missing.

**FLD LEN: 1**

**EXTREME TEMPERATURES, NUMBER OF DAYS EXCEEDING CRITERIA, FOR THE MONTH quality code**

The code that denotes a quality status of the reported days with min temperature 0 F (-17.8 C) or lower.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 4 = Passed gross limits check, data originate from an NCDC data source
- 5 = Passed all quality control checks, data originate from an NCDC data source
- 6 = Suspect, data originate from an NCDC data source
- 7 = Erroneous, data originate from an NCDC data source
- 9 = Passed gross limits check if element is present

**FLD LEN: 3****Hourly Calculated Temperature Section identifier**

The identifier that indicates a calculated hourly average air temperature derived by an algorithm whose inputs are hourly temperature averages from each of the 3 co-located temperature sensors. This section appears in the last ISD record of the hour for the 15-minute data stream only. Unlike the temperature value found in the mandatory data section which is produced using 5-minute values, this value is calculated using an hourly average.

DOM: A specific domain comprised of the characters in the ASCII character set.

**KF1** An indicator of the following items:  
 TEMP derived air temperature  
 TEMP\_QC quality code

**FLD LEN: 5****TEMP** derived air temperature

The calculated hourly average air temperature.

MIN: -9999 MAX: +9998 UNITS: degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-).  
 +9999 = Missing.

**FLD LEN: 1****TEMP\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the calculated hourly average air temperature.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks  
 3 = Failed all quality control checks  
 9 = missing

**FLD LEN: 3****AVERAGE DEW POINT AND WET BULB TEMPERATURE occurrence identifier**

The identifier that denotes the start of an AVERAGE-DEW-POINT-AND-WET-BULB-TEMPERATURE.

DOM: A specific domain comprised of the characters in the ASCII character set.

**KG1-KG2** An indicator of up to two repeating fields of the following items:  
 AVERAGE-DEW-POINT-AND-WET-BULB-TEMPERATURE period quantity  
 AVERAGE-DEW-POINT-AND-WET-BULB-TEMPERATURE code  
 AVERAGE-DEW-POINT-AND-WET-BULB-TEMPERATURE temperature  
 AVERAGE-DEW-POINT-AND-WET-BULB-TEMPERATURE derived code  
 AVERAGE-DEW-POINT-AND-WET-BULB-TEMPERATURE quality code

**FLD LEN: 3****AVERAGE-DEW-POINT-AND-WET-BULB-TEMPERATURE period quantity**

The quantity of time over which temperature were averaged to determine the AVERAGE-DEW-POINT-AND-WET-BULB-TEMPERATURE

MIN: 001 MAX: 744 UNITS: hours

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).  
 999 = Missing.

**FLD LEN: 1****AVERAGE-DEW-POINT-AND-WET-BULB-TEMPERATURE code**

The code that denotes an AVERAGE-DEW-POINT-AND-AVERAGE-WET-BULB-TEMPERATURE as an average

DOM: A specific domain comprised of the characters in the ASCII character set.

D = Average dew point temperature  
 W = Average wet bulb temperature  
 9 = missing

**FLD LEN: 5****AVERAGE-DEW-POINT-AND-WET-BULB-TEMPERATURE temperature**

The average dew point or average wet bulb temperature for a given period, typically for the day or month, derived from other

data fields  
MIN: -9900      MAX: +6300      UNITS: degrees Celsius  
SCALING FACTOR: 100  
DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-).  
+9999 = missing

**FLD LEN: 1**

**AVERAGE-DEW-POINT-AND-WET-BULB-TEMPERATURE derived code**

The code that denotes a quality status of the reported AVERAGE-DEW-POINT-AND-AVERAGE-WET-BULB-TEMPERATURE

DOM: A specific domain comprised of the characters in the ASCII character set.  
D = Derived from hourly values  
9 = missing

**FLD LEN: 1**

**AVERAGE-DEW-POINT-AND-WET-BULB-TEMPERATURE quality code**

The code that denotes a quality status of the reported AVERAGE-DEW-POINT-AND-AVERAGE-WET-BULB-TEMPERATURE

DOM: A specific domain comprised of the characters in the ASCII character set.  
0 = Passed gross limits check  
1 = Passed all quality control checks  
2 = Suspect  
3 = Erroneous  
4 = Passed gross limits check, from NCDC ASOS/AWOS  
5 = Passed all quality control checks, from NCDC ASOS/AWOS  
6 = Suspect, from NCDC ASOS/AWOS  
7 = Erroneous, from NCDC ASOS/AWOS  
9 = Missing

---

## **Pressure Data**

**FLD LEN: 3**

**ATMOSPHERIC-PRESSURE-OBSERVATION identifier**

The identifier that denotes the start of an ATMOSPHERIC-PRESSURE-OBSERVATION data section.

DOM: A specific domain comprised of the characters in the ASCII character set.

**MA1** An indicator of the occurrence of the following items:  
ATMOSPHERIC-PRESSURE-OBSERVATION altimeter setting rate  
ATMOSPHERIC-PRESSURE-OBSERVATION altimeter quality code  
ATMOSPHERIC-PRESSURE-OBSERVATION station pressure rate  
ATMOSPHERIC-PRESSURE-OBSERVATION station pressure quality code

**FLD LEN: 5**

**ATMOSPHERIC-PRESSURE-OBSERVATION altimeter setting rate**

The pressure value to which an aircraft altimeter is set so that it will indicate the altitude relative to mean sea level of an aircraft on the ground at the location for which the value was determined.

MIN: 08635      MAX: 10904      UNITS: Hectopascals

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).  
Missing = 99999

**FLD LEN: 1**

**ATMOSPHERIC-PRESSURE-OBSERVATION altimeter quality code**

The code that denotes a quality status of an altimeter setting rate.

DOM: A specific domain comprised of the characters in the ASCII character set.  
0 = Passed gross limits check  
1 = Passed all quality control checks  
2 = Suspect  
3 = Erroneous

- 4 = Passed gross limits check , data originate from an NCDC data source
- 5 = Passed all quality control checks, data originate from an NCDC data source
- 6 = Suspect, data originate from an NCDC data source
- 7 = Erroneous, data originate from an NCDC data source
- M = Manual change made to value based on information provided by NWS or FAA
- 9 = Passed gross limits check if element is present

**FLD LEN: 5**

**ATMOSPHERIC-PRESSURE-OBSERVATION station pressure rate**

The atmospheric pressure at the observation point.

MIN: 04500 MAX: 10900 UNITS: Hectopascals

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

99999 = Missing.

**FLD LEN: 1**

**ATMOSPHERIC-PRESSURE-OBSERVATION station pressure quality code**

The code that denotes a quality status of the station pressure of an

ATMOSPHERIC-PRESSURE-OBSERVATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check , data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

M = Manual change made to value based on information provided by NWS or FAA

9 = Passed gross limits check if element is present

**FLD LEN: 3**

**ATMOSPHERIC-PRESSURE-CHANGE identifier**

The identifier that denotes the start of an ATMOSPHERIC-PRESSURE-CHANGE data section.

DOM: A specific domain comprised of the characters in the ASCII character set.

Domain Value ID: Domain Value Definition Text

**MD1** An indicator of the occurrence of the following items:

ATMOSPHERIC-PRESSURE-CHANGE tendency code

ATMOSPHERIC-PRESSURE-CHANGE quality tendency code

ATMOSPHERIC-PRESSURE-CHANGE three hour quantity

ATMOSPHERIC-PRESSURE-CHANGE quality three hour code

ATMOSPHERIC-PRESSURE-CHANGE twenty four hour quantity

ATMOSPHERIC-PRESSURE-CHANGE quality twenty four hour code

**FLD LEN: 1**

**ATMOSPHERIC-PRESSURE-CHANGE tendency code**

The code that denotes the characteristics of an ATMOSPHERIC-PRESSURE-CHANGE that occurs over a period of three hours.

DOM: A specific domain comprised of the characters in the ASCII character set.

Domain Value ID: Domain Value Definition Text

0: Increasing, then decreasing; atmospheric pressure the same or higher than 3 hours ago

1: Increasing then steady; or increasing, then increasing more slowly; atmospheric pressure now higher than 3 hours ago

2: Increasing (steadily or unsteadily); atmospheric pressure now higher than 3 hours ago

3: Decreasing or steady, then increasing; or increasing, then increasing more rapidly; atmospheric pressure now higher than 3 hours ago

4: Steady; atmospheric pressure the same as 3 hours ago

5: Decreasing, then increasing; atmospheric pressure the same or lower than 3 hours ago

6: Decreasing, then steady; or decreasing, then decreasing more slowly; atmospheric pressure now lower than 3 hours ago

7: Decreasing (steadily or unsteadily); atmospheric pressure now lower than 3 hours ago

8: Steady or increasing, then decreasing; or decreasing, then decreasing more rapidly;

atmospheric pressure now lower than 3 hours ago  
9: Missing

FLD LEN: 1

ATMOSPHERIC-PRESSURE-CHANGE quality tendency code  
The code that denotes a quality status of the tendency of an ATMOSPHERIC-PRESSURE-CHANGE.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
0 = Passed gross limits check  
1 = Passed all quality control checks  
2 = Suspect  
3 = Erroneous  
9 = Passed gross limits check if element is present

FLD LEN: 3

ATMOSPHERIC-PRESSURE-CHANGE three hour quantity  
The absolute value of the quantity of change in atmospheric pressure measured at the beginning and end of a three hour period.  
MIN: 000 MAX: 500 UNITS: Hectopascals  
SCALING FACTOR: 10  
DOM: A general domain comprised of the numeric characters (0-9).  
Missing = 999

FLD LEN: 1

ATMOSPHERIC-PRESSURE-CHANGE quality three hour code  
The code that denotes the quality status of the three hour quantity for an ATMOSPHERIC-PRESSURE-CHANGE.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
0 = Passed gross limits check  
1 = Passed all quality control checks  
2 = Suspect  
3 = Erroneous  
9 = Passed gross limits check if element is present

FLD LEN: 4

ATMOSPHERIC-PRESSURE-CHANGE twenty four hour quantity  
The quantity of change in atmospheric pressure measured at the beginning and end of a twenty four hour period.  
MIN: -800 MAX: +800 UNITS: Hectopascals  
SCALING FACTOR: 10  
DOM: A general domain comprised of the numeric characters(0-9), a plus sign (+), and a minus sign (-).  
+999 = Missing

FLD LEN: 1

ATMOSPHERIC-PRESSURE-CHANGE quality twenty four hour code  
The code that denotes a quality status of a reported twenty four hour ATMOSPHERIC-PRESSURE-CHANGE.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
0 = Passed gross limits check  
1 = Passed all quality control checks  
2 = Suspect  
3 = Erroneous  
9 = Passed gross limits check if element is present

---

FLD LEN: 3

GEOPOTENTIAL-HEIGHT-ISOBARIC-LEVEL identifier  
The identifier that denotes the availability of GEOPOTENTIAL-HEIGHT-ISOBARIC-LEVEL data.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
**ME1:** An indicator of the occurrence of the following data items:  
GEOPOTENTIAL-HEIGHT-ISOBARIC-LEVEL code  
GEOPOTENTIAL-HEIGHT-ISOBARIC-LEVEL height dimension

GEOPOTENTIAL-HEIGHT-ISOBARIC-LEVEL height dimension quality code

FLD LEN: 1

**GEOPOTENTIAL-HEIGHT-ISOBARIC-LEVEL code**

The code that denotes the isobaric surface used to represent geopotential height.

DOM: A specific domain comprised of the characters in the ASCII character set.

Domain Value ID: Domain Value Definition Text

- 1: 1000 hectopascals
- 2: 925 hectopascals
- 3: 850 hectopascals
- 4: 700 hectopascals
- 5: 500 hectopascals
- 9: Missing

FLD LEN: 4

**GEOPOTENTIAL-HEIGHT-ISOBARIC-LEVEL height dimension**

The height of a GEOPOTENTIAL-HEIGHT-ISOBARIC-LEVEL

MIN: 0000 MAX: 9998 UNITS: Geopotential Meters

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing

FLD LEN: 1

**GEOPOTENTIAL-HEIGHT-ISOBARIC-LEVEL height dimension quality code**

The code that denotes a quality status of the reported GEOPOTENTIAL-HEIGHT-ISOBARIC-LEVEL height dimension.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 9 = Passed gross limits check if element is present

---

FLD LEN: 3

**ATMOSPHERIC-PRESSURE-OBSERVATION (STP/SLP) occurrence identifier**

The identifier that denotes the start of an ATMOSPHERIC-PRESSURE-OBSERVATION data section.

DOM: A specific domain comprised of the characters in the ASCII character set.

**MF1** An indicator of the following items:

- ATMOSPHERIC-PRESSURE-OBSERVATION (STP/SLP) average station pressure for the day (derived)
- ATMOSPHERIC-PRESSURE-OBSERVATION (STP/SLP) average station pressure quality code
- ATMOSPHERIC-PRESSURE-OBSERVATION (STP/SLP) average sea level pressure for the day (derived)
- ATMOSPHERIC-PRESSURE-OBSERVATION (STP/SLP) average sea level pressure quality code

FLD LEN: 5

**ATMOSPHERIC-PRESSURE-OBSERVATION (STP/SLP) average station pressure for the day**

The average pressure at the observed point for the day derived computationally from other QC'ed elements

MIN: 04500 MAX: 10900 UNITS: hectopascals

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

99999 = Missing.

FLD LEN: 1

**ATMOSPHERIC-PRESSURE-OBSERVATION (STP/SLP) quality code**

The code that denotes a quality status of an average station pressure

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 4 = Passed gross limits check, from NCDC ASOS/AWOS

5 = Passed all quality control checks, from NCDC ASOS/AWOS  
6 = Suspect, from NCDC ASOS/AWOS  
7 = Erroneous, from NCDC ASOS/AWOS  
9 = Missing

**FLD LEN: 5**

**ATMOSPHERIC-PRESSURE-OBSERVATION (STP/SLP) average sea level pressure for the day**

The average sea level pressure at the observed point for the day derived computationally from other QC'ed elements

MIN: 08600      MAX: 10900      UNITS: hectopascals

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

99999 = Missing.

**FLD LEN: 1**

**ATMOSPHERIC-PRESSURE-OBSERVATION (STP/SLP) quality code**

The code that denotes a quality status of an average station pressure

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check, data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, from NCDC ASOS/AWOS

9 = Missing

---

**FLD LEN: 3**

**ATMOSPHERIC-PRESSURE-OBSERVATION identifier**

The identifier that denotes the start of an ATMOSPHERIC-PRESSURE-OBSERVATION data section.

DOM: A specific domain comprised of the characters in the ASCII character set.

**MG1** An indicator of the occurrence of the following items:

ATMOSPHERIC-PRESSURE-OBSERVATION average station pressure for the day

ATMOSPHERIC-PRESSURE-OBSERVATION average station pressure quality code

ATMOSPHERIC-PRESSURE-OBSERVATION minimum sea level pressure for the day

ATMOSPHERIC-PRESSURE-OBSERVATION minimum sea level pressure quality code

**FLD LEN: 5**

**ATMOSPHERIC-PRESSURE-OBSERVATION average station pressure for the day**

The average pressure at the observation point for the day.

MIN: 04500      MAX: 10900      UNITS: Hectopascals

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

99999 = Missing.

**FLD LEN: 1**

**ATMOSPHERIC-PRESSURE-OBSERVATION average station pressure quality code**

The code that denotes the quality status of an average station pressure.

DOM: A specific domain comprised of the characters in the ASCII character set.

4 = Passed gross limits check, data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

M = Manual change made to value based on information provided by NWS or FAA

9 = Passed gross limits check if element is present

**FLD LEN: 5**

**ATMOSPHERIC-PRESSURE-OBSERVATION minimum sea level pressure for the day**

The minimum sea level pressure for the day at the observation point.

MIN: 08600      MAX: 10900      UNITS: Hectopascals

SCALING FACTOR: 10  
DOM: A general domain comprised of the numeric characters (0-9).  
99999 = Missing.

**FLD LEN: 1**

**ATMOSPHERIC-PRESSURE-OBSERVATION minimum sea level pressure for the day quality code**

The code that denotes the quality status of the minimum sea level pressure for the day.

DOM: A specific domain comprised of the characters in the ASCII character set.  
4 = Passed gross limits check, data originate from an NCDC data source  
5 = Passed all quality control checks, data originate from an NCDC data source  
6 = Suspect, data originate from an NCDC data source  
7 = Erroneous, data originate from an NCDC data source  
M = Manual change made to value based on information provided by NWS or FAA  
9 = Passed gross limits check if element is present

---

**FLD LEN: 3**

**ATMOSPHERIC-PRESSURE-OBSERVATION FOR THE MONTH identifier**

The identifier that denotes the start of an ATMOSPHERIC-PRESSURE-OBSERVATION data section.

DOM: A specific domain comprised of the characters in the ASCII character set.

**MH1** An indicator of the occurrence of the following items:

ATMOSPHERIC-PRESSURE-OBSERVATION average station pressure for the month  
ATMOSPHERIC-PRESSURE-OBSERVATION average station pressure quality code  
ATMOSPHERIC-PRESSURE-OBSERVATION average sea level pressure for the month  
ATMOSPHERIC-PRESSURE-OBSERVATION average sea level pressure quality code

**FLD LEN: 5**

**ATMOSPHERIC-PRESSURE-OBSERVATION FOR THE MONTH average station pressure for the month**

The average pressure at the observation point for the month.

MIN: 04500 MAX: 10900 UNITS: Hectopascals

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).  
99999 = Missing.

**FLD LEN: 1**

**ATMOSPHERIC-PRESSURE-OBSERVATION FOR THE MONTH average station pressure quality code**

The code that denotes the quality status of an average station pressure.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check  
1 = Passed all quality control checks  
2 = Suspect  
3 = Erroneous  
4 = Passed gross limits check, data originate from an NCDC data source  
5 = Passed all quality control checks, data originate from an NCDC data source  
6 = Suspect, data originate from an NCDC data source  
7 = Erroneous, data originate from an NCDC data source  
M = Manual change made to value based on information provided by NWS or FAA  
9 = Passed gross limits check if element is present

**FLD LEN: 5**

**ATMOSPHERIC-PRESSURE-OBSERVATION FOR THE MONTH average sea level pressure for the month**

The average sea level pressure for the month at the observation point.

MIN: 08600 MAX: 10900 UNITS: Hectopascals

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).  
99999 = Missing.

**FLD LEN: 1**

**ATMOSPHERIC-PRESSURE-OBSERVATION FOR THE MONTH average sea level pressure for the month quality code**

The code that denotes the quality status of the average sea level pressure for the month.

DOM: A specific domain comprised of the characters in the ASCII character set.



0 = Passed gross limits check  
 1 = Passed all quality control checks  
 2 = Suspect  
 3 = Erroneous  
 4 = Passed gross limits check, data originate from an NCDC data source  
 5 = Passed all quality control checks, data originate from an NCDC data source  
 6 = Suspect, data originate from an NCDC data source  
 7 = Erroneous, data originate from an NCDC data source  
 M = Manual change made to value based on information provided by NWS or FAA  
 9 = Passed gross limits check if element is present

---

**FLD LEN: 3**

**ATMOSPHERIC-PRESSURE-OBSERVATION FOR THE MONTH identifier**

The identifier that denotes the start of an ATMOSPHERIC-PRESSURE-OBSERVATION data section.

DOM: A specific domain comprised of the characters in the ASCII character set.

**MK1** An indicator of the occurrence of the following items:

ATMOSPHERIC-PRESSURE-OBSERVATION maximum sea level pressure for the month  
 ATMOSPHERIC-PRESSURE-OBSERVATION maximum sea level pressure date-time  
 ATMOSPHERIC-PRESSURE-OBSERVATION maximum sea level pressure quality code  
 ATMOSPHERIC-PRESSURE-OBSERVATION minimum sea level pressure for the month  
 ATMOSPHERIC-PRESSURE-OBSERVATION minimum sea level pressure date-time  
 ATMOSPHERIC-PRESSURE-OBSERVATION minimum sea level pressure quality code

**FLD LEN: 5**

**ATMOSPHERIC-PRESSURE-OBSERVATION FOR THE MONTH maximum sea level pressure for the month**

The maximum sea level pressure at the observation point for the month.

MIN: 08600 MAX: 10900 UNITS: Hectopascals

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

99999 = Missing

**FLD LEN: 6**

**ATMOSPHERIC-PRESSURE-OBSERVATION FOR THE MONTH maximum sea level pressure, date-time**

The date-time of occurrence of the pressure value, given as the date-time; e.g., 051500 indicates day 05, time 1500.

MIN: 010000 MAX: 312359

DOM: A general domain comprised of the numeric characters (0-9).

999999 = Missing

**FLD LEN: 1**

**ATMOSPHERIC-PRESSURE-OBSERVATION FOR THE MONTH maximum sea level pressure quality code**

The code that denotes the quality status of an maximum sea level pressure.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check  
 1 = Passed all quality control checks  
 2 = Suspect  
 3 = Erroneous  
 4 = Passed gross limits check, data originate from an NCDC data source  
 5 = Passed all quality control checks, data originate from an NCDC data source  
 6 = Suspect, data originate from an NCDC data source  
 7 = Erroneous, data originate from an NCDC data source  
 M = Manual change made to value based on information provided by NWS or FAA  
 9 = Passed gross limits check if element is present

**FLD LEN: 5**

**ATMOSPHERIC-PRESSURE-OBSERVATION FOR THE MONTH minimum sea level pressure for the month**

The minimum sea level pressure at the observation point for the month.

MIN: 08600 MAX: 10900 UNITS: Hectopascals

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

99999 = Missing

**FLD LEN: 6**

**ATMOSPHERIC-PRESSURE-OBSERVATION FOR THE MONTH minimum sea level pressure, date-time**

The date-time of occurrence of the pressure value, given as the date-time; e.g., 051500 indicates day 05, time 1500.

MIN: 010000      MAX: 312359

DOM: A general domain comprised of the numeric characters (0-9).  
999999 = Missing

**FLD LEN: 1**

**ATMOSPHERIC-PRESSURE-OBSERVATION FOR THE MONTH minimum sea level pressure quality code**

The code that denotes the quality status of a minimum sea level pressure.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check, data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

M = Manual change made to value based on information provided by NWS or FAA

9 = Passed gross limits check if element is present

---

## Weather Occurrence Data

**FLD LEN: 3**

**PRESENT-WEATHER-IN-VICINITY-OBSERVATION occurrence identifier**

The identifier that signifies the reporting of present weather.

DOM: A specific domain comprised of the ASCII characters.

**MV1** = first weather reported

**MV2** = second weather reported

**MV3** = third weather reported

**MV4** = fourth weather reported

**MV5** = fifth weather reported

**MV6** = sixth weather reported

**MV7** = seventh weather reported

An indicator of up to 7 repeating fields of the following items:

PRESENT-WEATHER-OBSERVATION atmospheric condition code.

PRESENT-WEATHER-OBSERVATION quality manual atmospheric condition code

**FLD LEN: 2**

**PRESENT-WEATHER-IN-VICINITY-OBSERVATION atmospheric condition code**

The code that denotes a specific type of weather observed between 5 and 10 statute miles of the station at the time of observation. Observed at selected stations from July 1, 1996 to present.

DOM: A specific domain comprised of the characters in the ASCII character set.

00: No observation

01: Thunderstorm in vicinity

02: Showers in vicinity

03: Sandstorm in vicinity

04: Sand / dust whirls in vicinity

05: Duststorm in vicinity

06: Blowing snow in vicinity

07: Blowing sand in vicinity

08: Blowing dust in vicinity

09: Fog in vicinity

99: Missing

**FLD LEN: 1**

**PRESENT-WEATHER-IN-VICINITY-OBSERVATION quality atmospheric condition code**

The code that denotes a quality status of a reported present weather in vicinity observation from a station.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 4 = Passed gross limits check, data originate from an NCDC data source
- 5 = Passed all quality control checks, data originate from an NCDC data source
- 6 = Suspect, data originate from an NCDC data source
- 7 = Erroneous, data originate from an NCDC data source
- 9 = Passed gross limits check if element is present

---

**FLD LEN: 3**

**PRESENT-WEATHER-OBSERVATION manual occurrence identifier**

The identifier that signifies the reporting of present weather.

DOM: A specific domain comprised of the ASCII characters.

- MW1** = first weather reported
- MW2** = second weather reported
- MW3** = third weather reported
- MW4** = fourth weather reported
- MW5** = fifth weather reported
- MW6** = sixth weather reported
- MW7** = seventh weather reported

An indicator of up to 7 repeating fields of the following items:

PRESENT-WEATHER-OBSERVATION manual atmospheric condition code.

PRESENT-WEATHER-OBSERVATION quality manual atmospheric condition code

**FLD LEN: 2**

**PRESENT-WEATHER-OBSERVATION manual atmospheric condition code**

The code that denotes a specific type of weather observed manually.

DOM: A specific domain comprised of the characters in the ASCII character set.

Note: Lack of an MW1 report normally indicates that the station did not report any present weather data.

-----  
00-49 No precipitation at the station at the time of observation  
-----

00-19 No precipitation, fog, ice fog (except for 11 and 12), duststorm, sandstorm, drifting or blowing snow at the station at the time of observation or, except for 09 and 17, during the preceding hour.  
-----

- 00: Cloud development not observed or not observable
- 01: Clouds generally dissolving or becoming less developed
- 02: State of sky on the whole unchanged
- 03: Clouds generally forming or developing
- 04: Visibility reduced by smoke, e.g. veldt or forest fires, industrial smoke or volcanic ashes
- 05: Haze
- 06: Widespread dust in suspension in the air, not raised by wind at or near the station at the time of observation
- 07: Dust or sand raised by wind at or near the station at the time of observation, but no well-developed dust whirl(s) or sand whirl(s), and no duststorm or sandstorm seen or, in the case of ships, blowing spray at the station
- 08: Well developed dust whirl(s) or sand whirl(s) seen at or near the station during the preceding hour or at the time of observation, but no duststorm or sandstorm
- 09: Duststorm or sandstorm within sight at the time of observation, or at the station during the preceding hour
- 10: Mist
- 11: Patches of shallow fog or ice fog at the station, whether on land or sea, not deeper than about 2 meters on land or 10 meters at sea
- 12: More or less continuous shallow fog or ice fog at the station, whether on land or sea, not deeper than about 2 meters on land or 10 meters at sea
- 13: Lightning visible, no thunder heard
- 14: Precipitation within sight, not reaching the ground or the surface of the sea
- 15: Precipitation within sight, reaching the ground or the surface of the sea, but distant, i.e., estimated to be more than 5 km from the station

- 16: Precipitation within sight, reaching the ground or the surface of the sea, near to, but not at the station
- 17: Thunderstorm, but no precipitation at the time of observation
- 18: Squalls at or within sight of the station during the preceding hour or at the time of observation
- 19: Funnel cloud(s) (Tornado cloud or waterspout) at or within sight of the station during the preceding hour or at the time of observation
- 
- 20-29 Precipitation, fog, ice fog or thunderstorm at the station during the preceding hour, but not at the time of observation.
- 
- 20: Drizzle (not freezing) or snow grains not falling as shower(s)
- 21: Rain (not freezing) not falling as shower(s)
- 22: Snow not falling as shower(s)
- 23: Rain and snow or ice pellets not falling as shower(s)
- 24: Freezing drizzle or freezing rain not falling as shower(s)
- 25: Shower(s) of rain
- 26: Shower(s) of snow or of rain and snow
- 27: Shower(s) of hail (Hail, small hail, snow pellets), or rain and hail
- 28: Fog or ice fog
- 29: Thunderstorm (with or without precipitation)
- 
- 30-39 Dust, sand, or blowing snow in the air, but no precipitation at the time of observation.
- 
- 30: Slight or moderate duststorm or sandstorm has decreased during the preceding hour
- 31: Slight or moderate duststorm or sandstorm no appreciable change during the preceding hour
- 32: Slight or moderate duststorm or sandstorm has begun or has increased during the preceding hour
- 33: Severe duststorm or sandstorm has decreased during the preceding hour
- 34: Severe duststorm or sandstorm no appreciable change during the preceding hour
- 35: Severe duststorm or sandstorm has begun or has increased during the preceding hour
- 36: Slight or moderate drifting snow generally low (below eye level)
- 37: Heavy drifting snow generally low (below eye level)
- 38: Slight or moderate blowing snow generally high (above eye level)
- 39: Heavy blowing snow generally high (above eye level)
- 
- 40-49 Fog or ice fog at the time of observation
- 
- 40: Fog or ice fog at a distance at the time of observation, but not at the station during the preceding hour, the fog or ice fog extending to a level above that of the observer
- 41: Fog or ice fog in patches
- 42: Fog or ice fog, sky visible, has become thinner during the preceding hour
- 43: Fog or ice fog, sky invisible, has become thinner during the preceding hour
- 44: Fog or ice fog, sky visible, no appreciable change during the preceding hour
- 45: Fog or ice fog, sky invisible, no appreciable change during the preceding hour
- 46: Fog or ice fog, sky visible, has begun or has become thicker during the preceding hour
- 47: Fog or ice fog, sky invisible, has begun or has become thicker during the preceding hour
- 48: Fog, depositing rime, sky visible
- 49: Fog, depositing rime, sky invisible
- 
- 50-99 Precipitation at the station at the time of observation
- 
- 50-59 Drizzle
- 
- 50: Drizzle, not freezing, intermittent, slight at time of observation
- 51: Drizzle, not freezing, continuous, slight at time of observation
- 52: Drizzle, not freezing, intermittent, moderate at time of observation
- 53: Drizzle, not freezing, continuous, moderate at time of observation
- 54: Drizzle, not freezing, intermittent, heavy (dense) at time of observation
- 55: Drizzle, not freezing, continuous, heavy (dense) at time of observation
- 56: Drizzle, freezing, slight
- 57: Drizzle, freezing, moderate or heavy (dense)
- 58: Drizzle and rain, slight
- 59: Drizzle and rain, moderate or heavy
- 
- 60-69: Rain

-----  
60: Rain, not freezing, intermittent, slight at time of observation  
61: Rain, not freezing, continuous, slight at time of observation  
62: Rain, not freezing, intermittent, moderate at time of observation  
63: Rain, not freezing, continuous, moderate at time of observation  
64: Rain, not freezing, intermittent, heavy at time of observation  
65: Rain, not freezing, continuous, heavy at time of observation  
66: Rain, freezing, slight  
67: Rain, freezing, moderate or heavy  
68: Rain or drizzle and snow, slight  
69: Rain or drizzle and snow, moderate or heavy  
-----

70-79 Solid precipitation not in showers  
-----

70: Intermittent fall of snowflakes, slight at time of observation  
71: Continuous fall of snowflakes, slight at time of observation  
72: Intermittent fall of snowflakes, moderate at time of observation  
73: Continuous fall of snowflakes, moderate at time of observation  
74: Intermittent fall of snowflakes, heavy at time of observation  
75: Continuous fall of snowflakes, heavy at time of observation  
76: Diamond dust (with or without fog)  
77: Snow grains (with or without fog)  
78: Isolated star-like snow crystals (with or without fog)  
79: Ice pellets  
-----

80-99 Showery precipitation, or precipitation with current or recent thunderstorm  
-----

80: Rain shower(s), slight  
81: Rain shower(s), moderate or heavy  
82: Rain shower(s), violent  
83: Shower(s) of rain and snow mixed, slight  
84: Shower(s) of rain and snow mixed, moderate or heavy  
85: Show shower(s), slight  
86: Snow shower(s), moderate or heavy  
87: Shower(s) of snow pellets or small hail, with or without rain or rain and snow mixed, slight  
88: Shower(s) of snow pellets or small hail, with or without rain or rain and snow mixed,  
moderate or heavy  
89: Shower(s) of hail (hail, small hail, snow pellets), with or without rain or rain and snow  
mixed, not associated with thunder, slight  
90: Shower(s) of hail (hail, small hail, snow pellets), with or without rain or rain and snow  
mixed, not associated with thunder, moderate or heavy  
91: Slight rain at time of observation, thunderstorm during the preceding hour but not at time of  
observation  
92: Moderate or heavy rain at time of observation, thunderstorm during the preceding hour but  
not at time of observation  
93: Slight snow, or rain and snow mixed or hail (Hail, small hail, snow pellets), at time of  
observation, thunderstorm during the preceding hour but not at time of observation  
94: Moderate or heavy snow, or rain and snow mixed or hail(Hail, small hail, snow pellets) at  
time of observation, thunderstorm during the preceding hour but not at time of observation  
95: Thunderstorm, slight or moderate, without hail (Hail, small hail, snow pellets),  
but with rain and/or snow at time of observation, thunderstorm at time of observation  
96: Thunderstorm, slight or moderate, with hail (hail, small hail, snow pellets) at time of  
observation, thunderstorm at time of observation  
97: Thunderstorm, heavy, without hail (Hail, small hail, snow pellets),  
but with rain and/or snow at time of observation, thunderstorm at time of observation  
98: Thunderstorm combined with duststorm or sandstorm at time of observation,  
thunderstorm at time of observation  
99: Thunderstorm, heavy, with hail (Hail, small hail, snow pellets) at time of observation,  
thunderstorm at time of observation

**FLD LEN: 1**

**PRESENT-WEATHER-OBSERVATION quality manual atmospheric condition code**

The code that denotes a quality status of a reported present weather observation from a manual station.

DOM: A specific domain comprised of the characters in the ASCII character set.  
0 = Passed gross limits check  
1 = Passed all quality control checks  
2 = Suspect  
3 = Erroneous  
4 = Passed gross limits check , data originate from an NCDC data source  
5 = Passed all quality control checks, data originate from an NCDC data source  
6 = Suspect, data originate from an NCDC data source  
7 = Erroneous, data originate from an NCDC data source  
M = Manual change made to value based on information provided by NWS or FAA  
9 = Passed gross limits check if element is present

---

## **Wind Data**

FLD LEN: 3

SUPPLEMENTARY-WIND-OBSERVATION identifier

The identifier that denotes the start of a SUPPLEMENTARY-WIND-OBSERVATION data section.

DOM: A specific domain comprised of the characters in the ASCII character set.

**OA1 - OA3:** An indicator of up to 3 occurrences of the following item:

SUPPLEMENTARY-WIND-OBSERVATION type code

SUPPLEMENTARY-WIND-OBSERVATION period quantity

SUPPLEMENTARY-WIND-OBSERVATION speed rate

SUPPLEMENTARY-WIND-OBSERVATION speed rate quality code

FLD LEN: 1

SUPPLEMENTARY-WIND-OBSERVATION type code

The code that denotes a type of SUPPLEMENTARY-WIND-OBSERVATION.

DOM: A specific domain comprised of the ASCII characters.

1 = Average speed of prevailing wind

2 = Mean wind speed

3 = Maximum instantaneous wind speed

4 = Maximum gust speed

5 = Maximum mean wind speed

6 = Maximum 1-minute mean wind speed

9 = Missing

FLD LEN: 2

SUPPLEMENTARY-WIND-OBSERVATION period quantity

The quantity of time over which a SUPPLEMENTARY-WIND-OBSERVATION occurred.

MIN: 01      MAX: 48      UNITS: Hours

DOM: A general domain comprised of the numeric characters (0-9).

99 = Missing

FLD LEN: 4

SUPPLEMENTARY-WIND-OBSERVATION speed rate

The rate of horizontal speed of air reported in the SUPPLEMENTARY-WIND-OBSERVATION.

MIN: 0000      MAX: 2000      UNITS: Meters per Second

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing

FLD LEN: 1

SUPPLEMENTARY-WIND-OBSERVATION speed rate quality code

The code that denotes a quality status of the reported SUPPLEMENTARY-WIND-OBSERVATION speed rate.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

9 = Passed gross limits check if element is present

---

**FLD LEN: 3****Hourly/Sub-Hourly Wind Section identifier**

The identifier that indicates an observation of wind speed at a height of 1.5 meters from the ground, typically used by Climate Reference Network stations.

This section appears one or more time per hour. The wind average value in this section is a duplicate of the wind average value in the mandatory data section. It is included in this section so that all wind values are conveniently available in a single section.

DOM: A specific domain comprised of the characters in the ASCII character set.

OB1, OB2 An indicator of the following items:

- WIND\_AVG time period
- WIND\_MAX maximum gust
- WIND\_MAX\_QC quality code
- WIND\_MAX\_FLAG quality code
- WIND\_MAX direction of the maximum gust
- WIND\_MAX\_QC direction quality code
- WIND\_MAX\_FLAG direction quality code
- WIND\_STD wind speed standard deviation
- WIND\_STD\_QC quality code
- WIND\_STD\_FLAG quality code
- WIND\_DIR\_STD wind direction standard deviation
- WIND\_DIR\_STD\_QC quality code
- WIND\_DIR\_STD\_FLAG quality code

**FLD LEN: 3**

**WIND\_AVG** Time period in minutes, for which the data in this section (OB1) pertains—eg, 060 = 60 minutes (1 hour).

MIN: 001 MAX: 998 UNITS: Minutes

DOM: A general domain comprised of the numeric characters (0-9).

999 = Missing.

**FLD LEN: 4**

**WIND\_MAX** maximum gust

The maximum 10 second wind speed.

MIN: 0000 MAX: 9998 UNITS: meters per second

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing.

**FLD LEN: 1**

**WIND\_MAX\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the maximum gust.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**WIND\_MAX\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status of the maximum gust. Most users will find the preceding quality code **WIND\_MAX\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks

other – Did not pass all quality checks

9 = Missing

**FLD LEN: 3**

**WIND\_MAX direction of the** maximum gust

The direction measured in clockwise angular degrees from which the maximum 10 second wind speed occurred.

MIN: 001 MAX: 360 UNITS: Angular degrees

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).

999 = Missing.

**FLD LEN: 1**

**WIND\_MAX\_QC** direction quality code

The code that indicates ISD's evaluation of the quality status of the maximum gust direction.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**WIND\_MAX\_FLAG** direction quality code

A flag that indicates the network's internal evaluation of the quality status of the maximum gust direction. Most users will find the preceding quality code **WIND\_MAX\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks

other – Did not pass all quality checks

9 = Missing

**FLD LEN: 5**

**WIND\_STD** wind speed standard deviation

The wind speed standard deviation.

MIN: 00000 MAX: 99998

SCALING FACTOR: 100

DOM: A general domain comprised of the numeric characters (0-9).

99999 = Missing.

**FLD LEN: 1**

**WIND\_STD\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the wind speed standard deviation.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**WIND\_STD\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status of the wind speed standard deviation. Most users will find the preceding quality code **WIND\_STD\_QC** to be the simplest and most useful quality indicator.

DOM: A specific domain comprised of the numeric characters (0-9)

0 = Passed all quality control checks

other – Did not pass all quality checks

9 = Missing

**FLD LEN: 5**

**WIND\_DIR\_STD** wind direction standard deviation

The wind direction standard deviation.

MIN: 00000 MAX: 99998

SCALING FACTOR: 100

DOM: A general domain comprised of the numeric characters (0-9).

99999 = Missing.

**FLD LEN: 1**

**WIND\_DIR\_STD\_QC** quality code

The code that indicates ISD's evaluation of the quality status of the wind direction standard deviation.

DOM: A specific domain comprised of the numeric characters (0-9).

1 = Passed all quality control checks

3 = Failed all quality control checks

9 = Missing

**FLD LEN: 1**

**WIND\_DIR\_STD\_FLAG** quality code

A flag that indicates the network's internal evaluation of the quality status of the wind direction standard deviation. Most users will find the preceding quality code **WIND\_STD\_QC** to be the simplest and most useful quality indicator.



DOM: A specific domain comprised of the numeric characters (0-9)  
0 = Passed all quality control checks  
other – Did not pass all quality checks  
9 = Missing

---

FLD LEN: 3

WIND-GUST-OBSERVATION identifier

The identifier that denotes the start of a WIND-GUST-OBSERVATION data section.

DOM: A specific domain comprised of the characters in the ASCII character set.

**OC1:** An indicator of the occurrence of the following item:

WIND-GUST-OBSERVATION speed rate

WIND-GUST-OBSERVATION quality code

FLD LEN: 4

WIND-GUST-OBSERVATION speed rate

The rate of speed of a wind gust.

MIN: 0050 MAX: 1100 UNITS: Meters per second

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing

FLD LEN: 1

WIND-GUST-OBSERVATION quality code

The code that denotes a quality status of a reported WIND-GUST-OBSERVATION speed rate.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check, data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

M = Manual change made to value based on information provided by NWS or FAA

9 = Passed gross limits check if element is present

---

FLD LEN: 3

SUPPLEMENTARY-WIND-OBSERVATION identifier

The identifier that denotes the start of a SUPPLEMENTARY-WIND-OBSERVATION data section.

DOM: A specific domain comprised of the characters in the ASCII character set.

**OD1 - OD3:** An indicator of up to 3 occurrences of the following item:

SUPPLEMENTARY-WIND-OBSERVATION type code

SUPPLEMENTARY-WIND-OBSERVATION period quantity

SUPPLEMENTARY-WIND-OBSERVATION direction quantity

SUPPLEMENTARY-WIND-OBSERVATION speed rate

SUPPLEMENTARY-WIND-OBSERVATION speed rate quality code

FLD LEN: 1

SUPPLEMENTARY-WIND-OBSERVATION type code

The code that denotes a type of SUPPLEMENTARY-WIND-OBSERVATION.

DOM: A specific domain comprised of the ASCII characters.

1 = Average speed of prevailing wind

2 = Mean wind speed

3 = Maximum instantaneous wind speed

4 = Maximum gust speed

5 = Maximum mean wind speed

6 = Maximum 1-minute mean wind speed

9 = Missing

FLD LEN: 2

SUPPLEMENTARY-WIND-OBSERVATION period quantity  
The quantity of time over which a SUPPLEMENTARY-WIND-OBSERVATION occurred.  
MIN: 01      MAX: 48      UNITS: Hours  
DOM: A general domain comprised of the numeric characters (0-9).  
99 = Missing

**FLD LEN: 4**

SUPPLEMENTARY-WIND-OBSERVATION speed rate  
The rate of horizontal speed of air reported in the SUPPLEMENTARY-WIND-OBSERVATION.  
MIN: 0000      MAX: 2000      UNITS: Meters per Second  
SCALING FACTOR: 10  
DOM: A general domain comprised of the numeric characters (0-9).  
9999 = Missing

**FLD LEN: 1**

SUPPLEMENTARY-WIND-OBSERVATION speed rate quality code  
The code that denotes a quality status of the reported SUPPLEMENTARY-WIND-OBSERVATION speed rate.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
0 = Passed gross limits check  
1 = Passed all quality control checks  
2 = Suspect  
3 = Erroneous  
9 = missing

**FLD LEN: 3**

SUPPLEMENTARY-WIND-OBSERVATION direction quantity  
The angle, measured in a clockwise direction, between true north and the direction from which the wind is blowing.  
MIN: 001      MAX: 360      UNITS: Angular Degrees  
SCALING FACTOR: 1  
DOM: A general domain comprised of the numeric characters (0-9).  
999 = Missing  
Note: A direction of 999 with a speed of 0000 indicates calm conditions (0 wind speed).

**FLD LEN: 3**

**SUMMARY-OF-DAY-WIND-OBSERVATION identifier**  
The identifier that denotes the start of a SUMMARY-OF-DAY-WIND-OBSERVATION data section.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
**OE1 - OE3:** An indicator of up to 3 occurrences of the following item:  
SUMMARY-OF-DAY-WIND-OBSERVATION type code  
SUMMARY-OF-DAY-WIND-OBSERVATION period quantity  
SUMMARY-OF-DAY-WIND-OBSERVATION speed rate  
SUMMARY-OF-DAY-WIND-OBSERVATION direction  
SUMMARY-OF-DAY-WIND-OBSERVATION time of occurrence  
SUMMARY-OF-DAY-WIND-OBSERVATION quality code

**FLD LEN: 1**

**SUMMARY-OF-DAY-WIND-OBSERVATION type code**  
The code that denotes a type of SUMMARY-OF-DAY-WIND-OBSERVATION.  
DOM: A specific domain comprised of the ASCII characters.  
1 = Peak wind speed for the day  
2 = Fastest 2-minute wind speed for the day  
3 = Average wind speed for the day  
4 = Fastest 5-minute wind speed for the day  
5 = Fastest mile wind speed for the day

**FLD LEN: 2**

**SUMMARY-OF-DAY-WIND-OBSERVATION period quantity**  
The quantity of time over which a SUMMARY-OF-DAY-WIND-OBSERVATION occurred.  
MIN: 24      MAX: 24      UNITS: Hours  
DOM: A general domain comprised of the ASCII characters.

99 = Missing

**FLD LEN: 5**

**SUMMARY-OF-DAY-WIND-OBSERVATION speed**

The rate of horizontal wind speed of air reported in the SUMMARY-OF-DAY-WIND-OBSERVATION.

MIN: 00000 MAX: 20000 UNITS: Meters per Second

SCALING FACTOR: 100

DOM: A general domain comprised of the numeric characters (0-9).

99999 = Missing

**FLD LEN: 3**

**SUMMARY-OF-DAY-WIND-OBSERVATION direction of wind**

The angle, measured in a clockwise direction, between true north and the direction from which the wind is blowing, for the summary of day wind report.

MIN: 001 MAX: 360 UNITS: Angular Degrees

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).

999 = Missing

Note: A direction of 999 with a speed of 00000 indicates calm conditions (0 wind speed).

**FLD LEN: 4**

**SUMMARY-OF-DAY-WIND-OBSERVATION time of occurrence in Z-time (UTC)**

The time of occurrence of the wind reported in the SUMMARY-OF-DAY-WIND-OBSERVATION.

MIN: 0000 MAX: 2359 UNITS: hours-minutes

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

9999 = Missing

**FLD LEN: 1**

**SUMMARY-OF-DAY-WIND-OBSERVATION quality code**

The code that denotes a quality status of the reported SUMMARY-OF-DAY-WIND-OBSERVATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

4 = Passed gross limits check , data originate from an NCDC data source

5 = Passed all quality control checks, data originate from an NCDC data source

6 = Suspect, data originate from an NCDC data source

7 = Erroneous, data originate from an NCDC data source

M = Manual change made to value based on information provided by NWS or FAA

9 = Passed gross limits check if element is present

**FLD LEN: 3**

**RELATIVE HUMIDITY occurrence identifier**

The identifier that denotes the start of a RELATIVE-HUMIDITY data section

DOM: A specific domain comprised of the characters in the ASCII character set

**RH1 – RH3** An indicator of up to 3 occurrences of the following items

RELATIVE HUMIDITY period quantity

RELATIVE HUMIDITY code

RELATIVE HUMIDITY percentage

RELATIVE HUMIDITY derived code

RELATIVE HUMIDITY quality code

**FLD LEN: 3**

**RELATIVE HUMIDITY period quantity**

The quantity of time over which relative humidity percentages were averaged to determine the RELATIVE HUMIDITY

MIN: 001 MAX: 744 UNITS: Hours

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9)

999 = missing

**FLD LEN: 1**

**RELATIVE HUMIDITY code**

The code that denotes the RELATIVE HUMIDITY as an average, maximum or minimum

DOM: A specific domain comprised of the characters in the ASCII character set

M: Mean relative humidity  
N: Minimum relative humidity  
X: Maximum relative humidity  
9 = missing

**FLD LEN: 3**

**RELATIVE HUMIDITY percentage**

The average maximum or minimum relative humidity for a given period, typically for the day or month, derived from other data fields. Note: Values only take into account hourly observations (not specials or other unscheduled observations).

MIN: 000      MAX: 100      UNITS: percent

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).  
999 = missing

**FLD LEN: 1**

**RELATIVE HUMIDITY derived code**

The code that denotes a derived code of the reported RELATIVE HUMIDITY percentage.

DOM: A specific domain comprised of the characters in the ASCII character set.

D = Derived from hourly values

9 = missing

**FLD LEN: 1**

**RELATIVE HUMIDITY quality code**

The code that denotes a quality status of the reported RELATIVE HUMIDITY percentage

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

4 = Passed gross limits check, from NCDC ASOS/AWOS

5 = Passed all quality control checks, from NCDC ASOS/AWOS

6 = Suspect, from NCDC ASOS/AWOS

7 = Erroneous, from NCDC ASOS/AWOS

9 = Missing

---

## **Sea Surface Temperature Data**

**FLD LEN: 3**

SEA-SURFACE-TEMPERATURE-OBSERVATION identifier

The identifier that denotes the start of a SEA-SURFACE-TEMPERATURE-OBSERVATION temperature data section.

DOM: A specific domain comprised of the characters in the ASCII character.

**SA1:** An indicator of the occurrence of the following item:

SEA-SURFACE-TEMPERATURE-OBSERVATION temperature

SEA-SURFACE-TEMPERATURE-OBSERVATION temperature quality code

**FLD LEN: 4**

SEA-SURFACE-TEMPERATURE-OBSERVATION temperature

The temperature of the water at the surface.

MIN: -050      MAX: +450      UNITS: Degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters(0-9), a plus sign (+), and a minus sign (-).

+999 = Missing

**FLD LEN: 1**

SEA-SURFACE-TEMPERATURE-OBSERVATION temperature quality code

The code that denotes a quality status of the reported SEA-SURFACE-TEMPERATURE-OBSERVATION temperature.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

9 = Passed gross limits check if element is present

---

## **Soil Temperature Data**

FLD LEN: 3

SOIL-TEMPERATURE identifier

The identifier that denotes the start of a SOIL TEMPERATURE data section.

DOM: A specific domain comprised of the characters in the ASCII character set.

ST1: An indicator of fields of the following items:

SOIL-TEMPERATURE Temperature Type

SOIL-TEMPERATURE Soil Temperature

SOIL-TEMPERATURE quality code

SOIL-TEMPERATURE Depth

SOIL-TEMPERATURE quality code

SOIL-TEMPERATURE Soil Cover

SOIL-TEMPERATURE quality code

SOIL-TEMPERATURE Sub Plot

SOIL-TEMPERATURE quality code

FLD LEN: 1

SOIL-TEMPERATURE temperature type

The type of temperature reported.

MIN: 1 MAX: 9

DOM: A specific domain comprised of the characters in the ASCII character set.

1 = Maximum Temperature

2 = Minimum Temperature

3 = AM or Noon Temperature

4 = PM or Midnight Temperature

9 = Missing

FLD LEN: 5

SOIL-TEMPERATURE soil temperature

The temperature of the soil for the previous 24 hours.

MIN: -1100 MAX: +0630 UNITS: Degrees Celsius

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9), a plus sign (+), and a minus sign (-).

+9999 = Missing

FLD LEN: 1

SOIL-TEMPERATURE quality code

The code that denotes a quality status of the reported temperature data.

DOM: A specific domain comprised of the characters in the ASCII character set.

4 = Passed gross limits check, from NCDC Data source

5 = Passed all quality control checks, from NCDC Data source

6 = Suspect, from NCDC Data source

7 = Erroneous, from NCDC Data source

9 = Passed gross limits check if element is present

FLD LEN: 4

SOIL-TEMPERATURE temperature depth

The depth below ground level of the temperature reported.

MIN: 0000 MAX: 9998 UNITS: Centimeters

SCALING FACTOR: 10

9999 = Missing

FLD LEN: 1

SOIL-TEMPERATURE depth quality code

The code that denotes a quality status of the reported temperature depth data.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 4 = Passed gross limits check, from NCDC Data source
- 5 = Passed all quality control checks, from NCDC Data source
- 6 = Suspect, from NCDC Data source
- 7 = Erroneous, from NCDC Data source
- 9 = Passed gross limits check if element is present

FLD LEN: 2

SOIL-TEMPERATURE soil cover

The type of soil cover.

MIN: 01 MAX: 99

DOM: A specific domain comprised of the characters in the ASCII character set.

- 01 = Grass
- 02 = Fallow
- 03 = Bare Ground
- 04 = Brome Grass
- 05 = Sod
- 06 = Straw Mulch
- 07 = Grass Muck
- 08 = Bare Muck
- 99 = Missing

FLD LEN: 1

SOIL-TEMPERATURE soil cover quality code

The code that denotes a quality status of the reported soil cover data.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 4 = Passed gross limits check, from NCDC Data source
- 5 = Passed all quality control checks, from NCDC Data source
- 6 = Suspect, from NCDC Data source
- 7 = Erroneous, from NCDC Data source
- 9 = Passed gross limits check if element is present

FLD LEN: 1

SOIL-TEMPERATURE sub plot

The sub plot number for the reported temperature.

MIN: 0 MAX: 9

9=Missing

FLD LEN: 1

SOIL-TEMPERATURE sub plot quality code

The code that denotes a quality status of the reported sub plot data.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 4 = Passed gross limits check, from NCDC Data source
- 5 = Passed all quality control checks, from NCDC Data source
- 6 = Suspect, from NCDC Data source
- 7 = Erroneous, from NCDC Data source
- 9 = Passed gross limits check if element is present

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## **Marine Data**

FLD LEN: 3

WAVE-MEASUREMENT identifier

The identifier that represents the availability of a WAVE-MEASUREMENT.

DOM: A specific domain comprised of the characters in the ASCII character set.

**UA1:** An indicator of the occurrence of the following data items:

WAVE-MEASUREMENT method code  
 WAVE-MEASUREMENT wave period quantity  
 WAVE-MEASUREMENT wave height dimension  
 WAVE-MEASUREMENT quality code  
 WAVE-MEASUREMENT sea state code  
 WAVE-MEASUREMENT sea state code quality code

FLD LEN: 1

WAVE-MEASUREMENT method code  
 A code that represents the method used to obtain a WAVE-MEASUREMENT.  
 DOM: A specific domain comprised of the ASCII characters  
 M: Manual  
 I: Instrumental  
 9: Missing

FLD LEN: 2

WAVE-MEASUREMENT wave period quantity  
 The quantity of time required for two successive wave crests to pass a fixed point.  
 MIN: 00 MAX: 30 UNITS: Seconds  
 SCALING FACTOR: 1  
 DOM: A general domain comprised of the numeric characters (0-9).  
 99 = Missing.

FLD LEN: 3

WAVE-MEASUREMENT wave height dimension  
 The height of a wave measured from trough to crest.  
 MIN: 000 MAX: 500 UNITS: Meters  
 SCALING FACTOR: 10  
 DOM: A general domain comprised of the numeric characters (0-9).  
 999 = Missing.

FLD LEN: 1

WAVE-MEASUREMENT quality code  
 The code that denotes a quality status of the reported WAVE-MEASUREMENT.  
 DOM: A specific domain comprised of the characters in the ASCII character set.  
 0 = Passed gross limits check  
 1 = Passed all quality control checks  
 2 = Suspect  
 3 = Erroneous  
 9 = Passed gross limits check if element is present

FLD LEN: 2

WAVE-MEASUREMENT sea state code  
 The code that denotes the roughness of the surface of the sea in terms of average wave height.  
 DOM: A specific domain comprised of the ASCII character set.  
 00: Calm, glassy - wave height = 0 meters  
 01: Calm, rippled - wave height = 0-0.1 meters  
 02: Smooth, wavelets - wave height = 0.1-0.5 meters  
 03: Slight, wave height = 0.5-1.25 meters  
 04: Moderate - wave height 1.25-2.5 meters  
 05: Rough - wave height = 2.5-4.0 meters  
 06: Very rough - wave height = 4.0-6.0 meters  
 07: High - wave height = 6.0-9.0 meters  
 08: Very high - wave height 9.0-14.0 meters  
 09: Phenomenal - wave height = over 14.0 meters  
 99: Missing

FLD LEN: 1

WAVE-MEASUREMENT sea state code quality code  
 The code that denotes a quality status of the reported WAVE-MEASUREMENT sea state code.  
 DOM: A specific domain comprised of the characters in the ASCII character set.  
 0 = Passed gross limits check  
 1 = Passed all quality control checks  
 2 = Suspect

3 = Erroneous  
9 = Passed gross limits check if element is present

---

FLD LEN: 3

WAVE-MEASUREMENT primary swell identifier

The identifier that denotes the availability of primary swell data.

DOM: A specific domain comprised of the characters in the ASCII character set.

**UG1:** An indicator of the occurrence of the following data items:

WAVE-MEASUREMENT primary swell period quantity

WAVE-MEASUREMENT primary swell height dimension

WAVE-MEASUREMENT primary swell direction angle

WAVE-MEASUREMENT primary swell quality code

FLD LEN: 2

WAVE-MEASUREMENT primary swell period quantity

The quantity of time required for two successive primary swell wave crests to pass a fixed point.

MIN: 00      MAX: 14      UNITS: Seconds

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).

99 = Missing

FLD LEN: 3

WAVE-MEASUREMENT primary swell height dimension

The height of a primary swell wave measured from the trough to the crest.

MIN: 000      MAX: 500      UNITS: Meters

SCALING FACTOR: 10

DOM: A general domain comprised of the numeric characters (0-9).

999 = Missing

FLD LEN: 3

WAVE-MEASUREMENT primary swell direction angle

The angle measured clockwise from true north to the direction from which primary swell waves are coming.

MIN: 001      MAX: 360      UNITS: Angular Degrees

SCALING FACTOR: 1

DOM: A general domain comprised of the numeric characters (0-9).

999 = Missing

FLD LEN: 1

WAVE-MEASUREMENT primary swell quality code

The code that denotes a quality status of the reported WAVE-MEASUREMENT primary swell.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check

1 = Passed all quality control checks

2 = Suspect

3 = Erroneous

9 = Passed gross limits check if element is present

---

FLD LEN: 3

WAVE-MEASUREMENT secondary swell identifier

An indicator that denotes the start of a WAVE-MEASUREMENT secondary swell group.

DOM: A specific domain comprised of the characters in the ASCII character set.

Domain Value ID: Domain Value Definition Text

**UG2:** An indicator of the occurrence of the following data items:

WAVE-MEASUREMENT secondary swell period quantity

WAVE-MEASUREMENT secondary swell height dimension

WAVE-MEASUREMENT secondary swell direction angle

WAVE-MEASUREMENT secondary swell quality code

FLD LEN: 2



WAVE-MEASUREMENT secondary swell period quantity  
The quantity of time required for two successive secondary swell wave crests to pass a fixed point.  
MIN: 00      MAX: 14      UNITS: Seconds  
SCALING FACTOR: 1  
DOM: A general domain comprised of the numeric characters (0-9).  
99 = Missing

FLD LEN: 3

WAVE-MEASUREMENT secondary swell height dimension  
The height of a secondary swell wave measured from the trough to the crest.  
MIN: 000      MAX: 500      UNITS: Meters  
SCALING FACTOR: 10  
DOM: A general domain comprised of the numeric characters (0-9).  
999 = Missing

FLD LEN: 3

WAVE-MEASUREMENT secondary swell direction angle  
The angle measured clockwise from true north to the direction from which secondary swell waves are coming.  
MIN: 001      MAX: 360      UNITS: Angular Degrees  
SCALING FACTOR: 1  
DOM: A general domain comprised of the numeric characters (0-9).  
999 = Missing

FLD LEN: 1

WAVE-MEASUREMENT secondary swell quality code  
The code that denotes a quality status of the reported WAVE-MEASUREMENT secondary swell.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
0 = Passed gross limits check  
1 = Passed all quality control checks  
2 = Suspect  
3 = Erroneous  
9 = Passed gross limits check if element is present

---

FLD LEN: 3

PLATFORM-ICE-ACCRETION identifier  
The identifier that denotes the availability of PLATFORM-ICE-ACCRETION data.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
**WA1:** An indicator of the occurrence of the following data items:  
PLATFORM-ICE-ACCRETION source code  
PLATFORM-ICE-ACCRETION thickness dimension  
PLATFORM-ICE-ACCRETION tendency code  
PLATFORM-ICE-ACCRETION quality code

FLD LEN: 1

PLATFORM-ICE-ACCRETION source code  
The code that denotes the source of the ice that builds up on a marine platform's structure.  
DOM: A specific domain composed of the following qualitative data values:  
Domain Value ID: Domain Value Definition Text  
1: Icing from ocean spray  
2: Icing from fog  
3: Icing from spray and fog  
4: Icing from rain  
5: Icing from spray and rain  
9: Missing

FLD LEN: 3

PLATFORM-ICE-ACCRETION thickness dimension  
The thickness of the ice that has accumulated on a marine platform.  
MIN: 000      MAX: 998      UNITS: centimeters  
SCALING FACTOR: 10  
DOM: A specific domain composed of the integer values (0 - 9).  
999 = Missing

FLD LEN: 1

PLATFORM-ICE-ACCRETION tendency code

The code that denotes the rate of change of ice thickness on a marine platform.

DOM: A specific domain composed of the following qualitative data values:

Domain Value ID: Domain Value Definition Text

- 0: Ice not building up
- 1: Ice building up slowly
- 2: Ice building up rapidly
- 3: Ice melting or breaking up slowly
- 4: Ice melting or breaking up rapidly
- 9: Missing

FLD LEN: 1

PLATFORM-ICE-ACCRETION quality code

The code that denotes a quality status of the reported PLATFORM-ICE-ACCRETION.

DOM: A specific domain comprised of the characters in the ASCII character set.

- 0 = Passed gross limits check
- 1 = Passed all quality control checks
- 2 = Suspect
- 3 = Erroneous
- 9 = Passed gross limits check if element is present

---

FLD LEN: 3

WATER-SURFACE-ICE-OBSERVATION identifier.

The identifier that denotes the availability of a WATER-SURFACE-ICE-OBSERVATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

**WD1:** An indicator of the occurrence of the following data item:

- OCEAN-ICE-OBSERVATION edge bearing code
- WATER-SURFACE-ICE-OBSERVATION uniform concentration rate
- WATER-SURFACE-ICE-OBSERVATION non-uniform concentration code
- WATER-SURFACE-ICE-OBSERVATION ship relative position code
- WATER-SURFACE-ICE-OBSERVATION ship penetrability code
- WATER-SURFACE-ICE-OBSERVATION ice trend code
- WATER-SURFACE-ICE-OBSERVATION development code
- WATER-SURFACE-ICE-OBSERVATION growler-bergy-bit presence code
- WATER-SURFACE-ICE-OBSERVATION growler-bergy-bit quantity
- WATER-SURFACE-ICE-OBSERVATION iceberg quantity
- WATER-SURFACE-ICE-OBSERVATION quality code

Note: If more than one ice edge can be stated, the nearest or most important shall be reported.

FLD LEN: 2

OCEAN-ICE-OBSERVATION edge bearing code

The code that denotes the true bearing, measured from the reporting platform to the closest point of the principal ice edge.

DOM: A specific domain composed of the following qualitative data values:

- 00: Ship in shore or flaw lead
- 01: Principal ice edge towards NE
- 02: Principal ice edge towards E
- 03: Principal ice edge towards SE
- 04: Principal ice edge towards S
- 05: Principal ice edge towards SW
- 06: Principal ice edge towards W
- 07: Principal ice edge towards NW
- 08: Principal ice edge towards N
- 09: Not determined (ship in ice)
- 10: Unable to report, because of darkness, lack of visibility or because only ice of land origin is visible
- 99: Missing

- COM: 1. If more than one ice edge can be stated, the nearest or most important shall be reported  
2. The bearing shall refer to the true and not to the magnetic north

FLD LEN: 3

WATER-SURFACE-ICE-OBSERVATION uniform concentration rate  
The percent concentration (surface coverage) of ice on the water surface.  
MIN: 000 MAX: 100 UNITS: percent  
DOM: A general domain comprised of the ASCII characters 0-9.  
999 = Missing

FLD LEN: 2

WATER-SURFACE-ICE-OBSERVATION non-uniform concentration code  
The code that denotes the coverage arrangement of non-uniformly distributed ice.  
DOM: A specific domain comprised of the characters in the ASCII character set.  
06: Strips and patches of pack ice with open water between  
07: Strips and patches of close or very close pack ice with areas of lesser concentration between  
08: Fast ice with open water, very open or open pack ice to seaward of the ice boundary  
09: Fast ice with close or very close pack ice to seaward of the ice boundary  
99: Unable to report, because of darkness, lack of visibility, or because ship is more than 0.5 nautical mile away from ice edge

FLD LEN: 1

WATER-SURFACE-ICE-OBSERVATION ship relative position code  
The code that denotes the relative position of the reporting ship to the ice formation.  
DOM: A specific domain comprised of the ASCII characters  
0: Ship in open water with floating ice in sight  
1: In open lead or fast ice  
2: In ice or within 0.5 nautical miles of ice edge  
9: Missing

FLD LEN: 1

WATER-SURFACE-ICE-OBSERVATION ship penetrability code  
The code that denotes the degree of ease with which the reporting ship can proceed through the ice.  
DOM: A specific domain comprised of the ASCII characters.  
1: Easy  
2: Difficult  
3: Beset (Surrounded so closely by sea ice that steering control is lost.)  
9: Missing

FLD LEN: 1

WATER-SURFACE-ICE-OBSERVATION ice trend code  
The code that denotes the trend of ice conditions.  
DOM: A specific domain comprised of the ASCII characters.  
1: Conditions improving  
2: Conditions static  
3: Conditions worsening  
4: Conditions worsening; ice forming and floes freezing together  
5: Conditions worsening; ice under slight pressure  
6: Conditions worsening; ice under moderate or severe pressure  
9: Missing

FLD LEN: 2

WATER-SURFACE-ICE-OBSERVATION development code  
The code that denotes the development stage of the ice.  
DOM: A specific domain comprised of the ASCII characters  
00: New ice only (frazil ice, grease ice, slush, slugs)  
01: Nilas or ice rind, less than 10 cm thick  
02: Young ice (grey ice, grey-white ice), 10 - 30 cm thick  
03: Predominantly new and/or young ice with some first year ice  
04: Predominantly thin first year ice with some new and/or young ice  
05: All thin first year ice (30 - 70 cm thick)  
06: Predominantly medium first year ice (70 - 120 cm thick) and thick first year ice (> 120 cm thick) with some thinner (younger) first year ice

07: All medium and thick first year ice  
 08: Predominantly medium and thick first year ice with some old ice  
       (usually more than 2 m thick)  
 09: Predominantly old ice  
 99: Unable to report, because of darkness, lack of visibility or because only ice of land origin  
       is visible or because ship is more than .5 NM away from ice

FLD LEN: 1

WATER-SURFACE-ICE-OBSERVATION growler-bergy-bit presence code  
 The code that denotes the existence of growler and/or bergy bits.  
 DOM: A specific domain comprised of the ASCII characters  
 0: Not present  
 1: Present  
 2: Unknown  
 9: Missing

FLD LEN: 3

WATER-SURFACE-ICE-OBSERVATION growler-bergy-bit quantity  
 The quantity of growler and bergy bits observed in the area.  
 MIN: 000           MAX: 998  
 DOM: A general domain comprised of the ASCII characters 0-9.  
       999 = Missing

FLD LEN: 3

WATER-SURFACE-ICE-OBSERVATION iceberg quantity  
 The quantity of icebergs observed in the area.  
 MIN: 000           MAX: 998  
 DOM: A general domain comprised of the ASCII characters 0-9.  
       999 = Missing

FLD LEN: 1

WATER-SURFACE-ICE-OBSERVATION quality code  
 The code that denotes a quality status of the reported WATER-SURFACE-ICE-OBSERVATION.  
 DOM: A specific domain comprised of the characters in the ASCII character set.  
       0 = Passed gross limits check  
       1 = Passed all quality control checks  
       2 = Suspect  
       3 = Erroneous  
       9 = Passed gross limits check if element is present

FLD LEN: 3

WATER-SURFACE-ICE-HISTORICAL-OBSERVATION identifier.  
 The identifier that denotes the availability of a WATER-SURFACE-ICE-HISTORICAL-OBSERVATION.  
 DOM: A specific domain comprised of the characters in the ASCII character set.  
       **WG1:** An indicator of the occurrence of the following data item:  
           OCEAN-ICE-OBSERVATION edge bearing code  
           WATER-SURFACE-ICE-HISTORICAL-OBSERVATION edge distance dimension  
           WATER-SURFACE-ICE-HISTORICAL-OBSERVATION edge orientation code  
           WATER-SURFACE-ICE-HISTORICAL-OBSERVATION formation type code  
           WATER-SURFACE-ICE-HISTORICAL-OBSERVATION navigation effect code  
           WATER-SURFACE-ICE-HISTORICAL-OBSERVATION quality code

FLD LEN: 2

OCEAN-ICE-OBSERVATION edge bearing code  
 The code that denotes the true bearing, measured from the reporting platform to the closest  
 point of the principle ice edge.  
 DOM: A specific domain composed of the following qualitative data values:  
       00: Ship in shore or flaw lead  
       01: Principal ice edge towards NE  
       02: Principal ice edge towards E  
       03: Principal ice edge towards SE  
       04: Principal ice edge towards S

05: Principal ice edge towards SW  
 06: Principal ice edge towards W  
 07: Principal ice edge towards NW  
 08: Principal ice edge towards N  
 09: Not determined (ship in ice)  
 10: Unable to report, because of darkness, lack of visibility or because only ice of land origin is visible  
 99: Missing

COM: 1. If more than one ice edge can be stated, the nearest or most important shall be reported  
 2. The bearing shall refer to the true and not to the magnetic north

FLD LEN: 2

WATER-SURFACE-ICE-HISTORICAL-OBSERVATION edge distance dimension  
 The distance from the reporting ship=s location to the nearest point on the ice edge.

MIN: 00            MAX: 98            UNITS: Kilometers

DOM: A general domain comprised of the ASCII characters 0-9  
 99 = Missing

FLD LEN: 2

WATER-SURFACE-ICE-HISTORICAL-OBSERVATION edge orientation code  
 The code that denotes the orientation of the principal ice edge and the direction relative to which the ice lies.

DOM: A specific domain comprised of the ASCII characters

00: Orientation of ice edge impossible to estimate--ship outside the ice  
 01: Ice edge lying in a direction NE to SW with ice situated to the NW  
 02: Ice edge lying in a direction E to W with ice situated to the N  
 03: Ice edge lying in a direction SE to NW with ice situated to the NE  
 04: Ice edge lying in a direction S to N with ice situated to the E  
 05: Ice edge lying in a direction SW to NE with ice situated to the SE

06: Ice edge lying in a direction W to E with ice situated to the S  
 07: Ice edge lying in a direction NW to SE with ice situated to the SW  
 08: Ice edge lying in a direction N to S with ice situated to the W  
 09: Orientation of ice edge impossible to estimate--ship inside the ice  
 99: Missing

FLD LEN: 2

WATER-SURFACE-ICE-HISTORICAL-OBSERVATION formation type code

The code that denotes the type of ice formation reported in the WATER-SURFACE-ICE-HISTORICAL-OBSERVATION.

DOM: A specific domain comprised of the ASCII characters

00: No ice (0 may be used to report ice blink and then a direction must be reported)  
 01: New ice  
 02: Fast ice  
 03: Pack-ice/drift-ice  
 04: Packed (compact) slush or sludge  
 05: Shore lead  
 06: Heavy fast ice  
 07: Heavy pack-ice/drift-ice  
 08: Hummocked ice  
 09: Icebergs-icebergs can be reported in plain language  
 99: Missing

FLD LEN: 2

WATER-SURFACE-ICE-HISTORICAL-OBSERVATION navigation effect code

The code that denotes the effect of ice on navigation.

DOM: A specific domain comprised of the ASCII characters

00: Navigation unobstructed  
 01: Navigation unobstructed for steamers, difficult for sailing ships  
 02: Navigation difficult for low-powered steamers, closed to sailing ships  
 03: Navigation possible only for powerful steamers  
 04: Navigation possible only for steamers constructed to withstand ice pressure  
 05: Navigation possible with the assistance of ice-breakers  
 06: Channel open in the solid ice  
 07: Navigation temporarily closed  
 08: Navigation closed  
 09: Navigation conditions unknown, e.g., owing to bad weather  
 99: Missing

FLD LEN: 1

WATER-SURFACE-ICE-HISTORICAL-OBSERVATION quality code

The code that denotes a quality status of the reported WATER-SURFACE-ICE-HISTORICAL-OBSERVATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Passed gross limits check  
 1 = Passed all quality control checks  
 2 = Suspect  
 3 = Erroneous  
 9 = Passed gross limits check if element is present

FLD LEN: 3

WATER-LEVEL-OBSERVATION identifier.

The identifier that denotes the availability of a WATER-LEVEL-OBSERVATION.

DOM: A specific domain comprised of the characters in the ASCII character set.

**WJ1:** An indicator of the occurrence of the following data item:

WATER-LEVEL-OBSERVATION ice thickness  
 WATER-LEVEL-OBSERVATION discharge rate  
 WATER-LEVEL-OBSERVATION primary ice phenomena  
 WATER-LEVEL-OBSERVATION secondary ice phenomena  
 WATER-LEVEL-OBSERVATION stage height  
 WATER-LEVEL-OBSERVATION under ice slush condition  
 WATER-LEVEL-OBSERVATION water level code

FLD LEN: 3

WATER-LEVEL-OBSERVATION ice thickness

Thickness of ice on water.

MIN: 000 MAX: 998 UNITS: centimeters

DOM: A general domain comprised of the ASCII characters 0-9  
999 = Missing

FLD LEN: 5

WATER-LEVEL-OBSERVATION discharge rate

The rate of water discharge.

MIN: 00000 MAX: 99998 UNITS: cubic meters per second

DOM: A general domain comprised of the ASCII characters 0-9  
99999 = Missing

FLD LEN: 2

WATER-LEVEL-OBSERVATION primary ice phenomena

The code that denotes the primary type of ice phenomena on a river, lake or reservoir.

DOM: A specific domain comprised of the ASCII characters

- 00: Water surface free of ice
- 01: Ice along banks
- 02: Ice crystals
- 03: Ice slush
- 04: Ice flows from tributaries entering near the river, lake or reservoir station
- 10: Floating slush ice covering approximately 1/3 (up to 30%) of the water surface
- 11: Floating slush ice covering about half (40% - 60%) of the water surface
- 12: Floating slush ice covering more than half (70% - 100%) of the water surface
- 20: Floating ice covering 10% of the water surface
- 21: Floating ice covering 20% of the water surface
- 22: Floating ice covering 30% of the water surface
- 23: Floating ice covering 40% of the water surface
- 24: Floating ice covering 50% of the water surface
- 25: Floating ice covering 60% of the water surface
- 26: Floating ice covering 70% of the water surface
- 27: Floating ice covering 80% of the water surface
- 28: Floating ice covering 90% of the water surface
- 29: Floating ice covering 100% of the water surface
- 30: Water surface frozen at station, free upstream
- 31: Water surface frozen at station, free downstream
- 32: Water surface free at station, free upstream
- 33: Water surface free at station, free downstream
- 34: Ice floes near the station, water surface frozen downstream
- 35: Water surface frozen with breaks
- 36: Water surface completely frozen over
- 37: Water surface frozen over with pile-ups
- 40: Ice melting along the banks
- 41: Some water on the ice
- 42: Ice waterlogged
- 43: Water holes in the ice cover
- 44: Ice moving
- 45: Open water in breaks
- 46: Break up (first day of movement of ice on the entire water surface)
- 47: Ice broken artificially
- 50: Ice jam below the station
- 51: Ice jam at the station
- 52: Ice jam above the station
- 53: Scale and position of jam unchanged
- 54: Jam has frozen solid in the same place
- 55: Jam has solidified and expanded upstream
- 56: Jam has solidified and moved downstream

- 57: Jam is weakening
- 58: Jam broken up by explosives or other methods
- 59: Jam broken
- 60: Fractured ice
- 61: Ice piling up against the bank
- 62: Ice carried towards the bank
- 63: Band of ice less than 100 meters wide fixed to banks
- 64: Band of ice less than 100 to 500 meters wide fixed to banks
- 65: Band of ice wider than 500 meters fixed to banks
- 70: Cracks in the ice, mainly across the line of flow
- 71: Cracks along the flow line
- 72: Smooth sheet of ice
- 73: Ice sheet with pile-ups
- 99: Missing

FLD LEN: 2

WATER-LEVEL-OBSERVATION secondary ice phenomena

The code that denotes the secondary type of ice phenomena on a river, lake or reservoir.

DOM: A specific domain comprised of the ASCII characters

- 00: Water surface free of ice
- 01: Ice along banks
- 02: Ice crystals
- 03: Ice slush
- 04: Ice flows from tributaries entering near the river, lake or reservoir station
- 10: Floating slush ice covering approximately 1/3 (up to 30%) of the water surface
- 11: Floating slush ice covering about half (40% - 60%) of the water surface
- 12: Floating slush ice covering more than half (70% - 100%) of the water surface
- 20: Floating ice covering 10% of the water surface
- 21: Floating ice covering 20% of the water surface
- 22: Floating ice covering 30% of the water surface
- 23: Floating ice covering 40% of the water surface
- 24: Floating ice covering 50% of the water surface
- 25: Floating ice covering 60% of the water surface
- 26: Floating ice covering 70% of the water surface
- 27: Floating ice covering 80% of the water surface
- 28: Floating ice covering 90% of the water surface
- 29: Floating ice covering 100% of the water surface
- 30: Water surface frozen at station, free upstream
- 31: Water surface frozen at station, free downstream
- 32: Water surface free at station, free upstream
- 33: Water surface free at station, free downstream
- 34: Ice floes near the station, water surface frozen downstream
- 35: Water surface frozen with breaks
- 36: Water surface completely frozen over
- 37: Water surface frozen over with pile-ups
- 40: Ice melting along the banks
- 41: Some water on the ice
- 42: Ice waterlogged
- 43: Water holes in the ice cover
- 44: Ice moving
- 45: Open water in breaks
- 46: Break up (first day of movement of ice on the entire water surface)
- 47: Ice broken artificially
- 50: Ice jam below the station
- 51: Ice jam at the station
- 52: Ice jam above the station
- 53: Scale and position of jam unchanged
- 54: Jam has frozen solid in the same place
- 55: Jam has solidified and expanded upstream
- 56: Jam has solidified and moved downstream
- 57: Jam is weakening
- 58: Jam broken up by explosives or other methods
- 59: Jam broken
- 60: Fractured ice



- 61: Ice piling up against the bank
- 62: Ice carried towards the bank
- 63: Band of ice less than 100 meters wide fixed to banks
- 64: Band of ice less than 100 to 500 meters wide fixed to banks
- 65: Band of ice wider than 500 meters fixed to banks
- 70: Cracks in the ice, mainly across the line of flow
- 71: Cracks along the flow line
- 72: Smooth sheet of ice
- 73: Ice sheet with pile-ups
- 99: Missing

FLD LEN: 5

WATER-LEVEL-OBSERVATION stage height  
 The height of the stage above zero.  
 MIN: -999      MAX: +9998      UNITS: centimeters  
 DOM: A general domain comprised of the ASCII characters 0-9  
 +9999 = Missing

FLD LEN: 1

WATER-LEVEL-OBSERVATION under ice slush condition  
 The code that denotes the slush condition under an ice layer.  
 DOM: A specific domain comprised of the ASCII characters  
 0: No slush ice  
 1: Slush ice to approximately 1/3 of depth of the river, lake or reservoir  
 2: Slush ice from 1/3 to 2/3 of depth of the river, lake or reservoir  
 3: Slush ice to depth of the river, lake or reservoir greater than 2/3.  
 9: Missing

FLD LEN: 1

WATER-LEVEL-OBSERVATION water level code  
 The code that denotes the state of the water level.  
 DOM: A specific domain comprised of the ASCII characters  
 B: much below normal  
 H: high but not overflowing  
 N: normal  
 O: banks overflowing  
 9: missing

---

## Remarks Data Section

---

FLD LEN 3

GEOPHYSICAL-POINT-OBSERVATION remarks identifier

The identifier that denotes the beginning of the remarks data section.

DOM: A specific domain comprised of the ASCII character set.

**REM** = Remarks Data Section

FLD LEN: 3

GEOPHYSICAL-POINT-OBSERVATION remark identifier

An indicator of the type of surface remarks data contained in the GEOPHYSICAL-POINT-OBSERVATION-REMARK text

DOM: A specific domain composed of the following qualitative data values.

Domain Value ID: Domain Value Definition Text

SYN: Synoptic Remarks

AWY: Airways Remarks

MET: METAR Remarks

SOD: Summary of Day Remarks

SOM: Summary of Month Remarks

HPD: Hourly Precipitation Data Remarks

Indicate the occurrence of the following data items:

GEOPHYSICAL-POINT-OBSERVATION remark length quantity

GEOPHYSICAL-POINT-OBSERVATION remark text

FLD LEN: 3

GEOPHYSICAL-POINT-OBSERVATION remark length quantity

A quantity that indicates the length of an individual GEOPHYSICAL-POINT-OBSERVATION-REMARK text.

MIN: 001            MAX: 999

DOM: A general domain composed of the ASCII characters (0-9).

FLD LEN: 999 (maximum)

GEOPHYSICAL-POINT-OBSERVATION remark text

The text of a GEOPHYSICAL-POINT-OBSERVATION-REMARK.

DOM: A general domain comprised of the characters in the ASCII character set.

---

## Element Quality Data Section

---

FLD LEN: 3

GEOPHYSICAL-POINT-OBSERVATION quality data identifier

The identifier that denotes the beginning of the element quality data section.

DOM: A specific domain comprised of the ASCII character set.

**EQD** = Element Quality Data

FLD LEN: 3

ORIGINAL-OBSERVATION-ELEMENT-QUALITY identifier

The identifier that denotes the existence of ORIGINAL-OBSERVATION-ELEMENT-QUALITY data.

DOM: A specific domain comprised of the ASCII character set.

**Q01 - Q99: The following may be occur from 0 to 99 times, for AFCCC USAF SURFACE HOURLY and for ISH Version**

**2, and**

**P01 - P99: The following may be occur from 0 to 99 times, for ISH Version 2 (P denotes data originated from historical NCDC HOURLY PRECIPITATION or NCDC SURFACE HOURLY data), and**

**R01 - R99: The following may be occur from 0 to 99 times, for ISH Version 2 and 3 (R denotes data originated from an NCDC data source from 2006 forward)**

**C01 - C99: The original value failed due to a table constraint**

**D01 - D99: The original value was replaced using a temporary quality control process after the data was originally loaded to the table**

ORIGINAL-OBSERVATION-ELEMENT-QUALITY original value text

ORIGINAL-OBSERVATION-ELEMENT-QUALITY reason code

ORIGINAL-OBSERVATION-ELEMENT-QUALITY parameter code

FLD LEN: 6

ORIGINAL-OBSERVATION-ELEMENT-QUALITY original value text

The original value text for elements which were rejected or recomputed during validation.

DOM: A general domain comprised of the characters in the ASCII character set

FLD LEN: 1

ORIGINAL-OBSERVATION-ELEMENT-QUALITY reason code

The code that denotes the reason an element was identified as suspect, erroneous or recomputed, or in the case of data originating from NCDC SURFACE HOURLY, the units code for the data are stored in this position, and the data quality flag is stored with the parameter code (see N01-N99 below).

DOM: A specific domain comprised of the characters in the ASCII character set.

0 = Original value missing or corrupted

1 = Gross error checks (range and/or domain check)

2 = Geophysical checks (checking the validity against other parameters)

3 = Consistency checks (checking the validity against the same type of parameter)

4 = Gross error checks and geophysical checks

5 = Gross error checks and consistency checks

6 = Geophysical checks and consistency checks

7 = Gross error checks and geophysical checks and consistency checks

FLD LEN: 6

ORIGINAL-OBSERVATION-ELEMENT-QUALITY parameter code

The code that denotes the type of parameter that the supplemental-level-element-quality applies to.

DOM: A specific domain comprised of the characters in the ASCII character set.

Comment Text:

APC3: ATMOSPHERIC-PRESSURE-CHANGE THREE HOUR CHANGE QUANTITY

ATOLD: AIR-TEMPERATURE-OBSERVATION-LEVEL DEWPOINT TEMPERATURE

WOSPD: WIND-OBSERVATION SPEED RATE

WOLSPD: WIND-OBSERVATION-LEVEL SPEED RATE  
 WOLDIR: WIND-OBSERVATION-LEVEL DIRECTION ANGLE  
 WODIR: WIND-OBSERVATION DIRECTION ANGLE  
 ATOLDS: AIR-TEMPERATURE-OBSERVATION-LEVEL DENSITY RATE  
 ATOLT: AIR-TEMPERATURE-OBSERVATION-LEVEL AIR TEMPERATURE  
 ATOD: AIR-TEMPERATURE-OBSERVATION DEW POINT TEMPERATURE  
 ATOT: AIR-TEMPERATURE-OBSERVATION AIR TEMPERATURE  
 AOSP: ATMOSPHERIC-PRESSURE-OBSERVATION STATION PRESSURE RATE  
 AOSLP: ATMOSPHERIC-PRESSURE-OBSERVATION SEA LEVEL PRESSURE  
 APOLP: ATMOSPHERIC-PRESSURE-OBSERVATION-LEVEL PRESSURE RATE  
 APOLH: ATMOSPHERIC-PRESSURE-OBSERVATION-LEVEL HEIGHT DIMENSION  
 APOA: ATMOSPHERIC-PRESSURE-OBSERVATION ALTIMETER RATE  
 WGOSPD: WIND-GUST-OBSERVATION SPEED RATE  
 APCQ24: ATMOSPHERIC-PRESSURE-CHANGE TWENTY FOUR HOUR QUANTITY  
 APCTEN: ATMOSPHERIC-PRESSURE-CHANGE TENDENCY CODE  
 PRSWOA: PRESENT-WEATHER-OBSERVATION AUTOMATED ATMOSPHERIC  
 CONDITION CODE  
 PRSWM1: PRESENT-WEATHER-OBSERVATION MANUAL ATMOSPHERIC CONDITION  
 CODE  
 PRSWM2: PRESENT-WEATHER-OBSERVATION MANUAL ATMOSPHERIC CONDITION  
 CODE  
 PRSWM3: PRESENT-WEATHER-OBSERVATION MANUAL ATMOSPHERIC CONDITION  
 CODE  
 PRSWM4: PRESENT-WEATHER-OBSERVATION MANUAL ATMOSPHERIC CONDITION  
 CODE  
 PRSWM5: PRESENT-WEATHER-OBSERVATION MANUAL ATMOSPHERIC CONDITION  
 CODE  
 PRSWM6: PRESENT-WEATHER-OBSERVATION MANUAL ATMOSPHERIC CONDITION  
 CODE  
 PRSWM7: PRESENT-WEATHER-OBSERVATION MANUAL ATMOSPHERIC CONDITION  
 CODE  
 PRSWA1: PRESENT-WEATHER-OBSERVATION AUTOMATED ATMOSPHERIC CONDITION  
 CODE  
 PRSWA2: PRESENT-WEATHER-OBSERVATION AUTOMATED ATMOSPHERIC CONDITION  
 CODE  
 PRSWA3: PRESENT-WEATHER-OBSERVATION AUTOMATED ATMOSPHERIC CONDITION  
 CODE  
 PRSWA4: PRESENT-WEATHER-OBSERVATION AUTOMATED ATMOSPHERIC CONDITION  
 CODE  
 PSTWA1: PAST-WEATHER-OBSERVATION AUTOMATED ATMOSPHERIC CONDITION  
 CODE  
 PSTWA2: PAST-WEATHER-OBSERVATION AUTOMATED ATMOSPHERIC CONDITION  
 CODE  
 PSTWM1: PAST-WEATHER-OBSERVATION MANUAL ATMOSPHERIC CONDITION  
 CODE  
 PSTWM2: PAST-WEATHER-OBSERVATION MANUAL ATMOSPHERIC CONDITION  
 CODE  
 PSTWOP: PAST-WEATHER-OBSERVATION PERIOD QUANTITY  
 SCOCIG: SKY-CONDITION-OBSERVATION CEILING HEIGHT DIMENSION  
 SCOHCG: SKY-CONDITION-OBSERVATION HIGH CLOUD GENUS CODE  
 SCOLCB: SKY-CONDITION-OBSERVATION LOWEST CLOUD BASE HEIGHT DIMENSION  
 SCOLCG: SKY-CONDITION-OBSERVATION LOW CLOUD GENUS CODE  
 SCOMCG: SKY-CONDITION-OBSERVATION MID CLOUD GENUS CODE  
 SCOTCV: SKY-CONDITION-OBSERVATION TOTAL COVERAGE CODE  
 SCOTLC: SKY-CONDITION-OBSERVATION TOTAL LOWEST CLOUD COVER CODE  
 VODIS: VISIBILITY-OBSERVATION DISTANCE DIMENSION  
 VOVAR: VISIBILITY-OBSERVATION VARIABILITY CODE  
 PRCP: LIQUID PRECIPITATION DEPTH DIMENSION  
 ATMM: EXTREME AIR TEMPERATURE, MAXIMUM AND MINIMUM  
 ATMN: EXTREME AIR TEMPERATURE, MINIMUM  
 ATMX: EXTREME AIR TEMPERATURE, MAXIMUM  
 SNDP: SNOW DEPTH DIMENSION  
 SNWF: SNOW ACCUMULATION DEPTH DIMENSION

The following parameter codes may occur with the R01 – R99 identifier. They pertain to QC of the Max Short Duration Precipitation fields AH1 - AH6 and AI1 – AI6. The 6 character field will be represented as follows:

First 3 characters:

A01 – A12 -- indicates this pertains to a precipitation amount, which is stored as the EQD original value

D01 – D12 -- indicates this pertains to the ending day field, which is stored as the EQD original value

T01 – T12 -- indicates this pertains to the ending time field, which is stored as the EQD original value

Note: Values of 01-06 indicate that AH1 – AH6, respectively, are flagged. Values of 07-12 indicate that AI1 – AI6, respectively, are flagged.

These codes will be followed by the 3 character flag description number to complete the 6 character definition. These codes are as follows:

001	INVALID MSDP 5 MIN AMT
002	MSDP 5 MIN AMT OUT OF RANGE
003	INVALID MSDP 5 MIN DATE
004	MSDP 5 MIN DATE OUT OF RANGE
005	INVALID MSDP 5 MIN TIME
006	MSDP 5 MIN TIME OUT OF RANGE
007	INVALID MSDP 10 MIN AMT
008	MSDP 10 MIN AMT > 2 X 5 MIN AMT
009	INVALID MSDP 10 MIN DATE
010	MSDP 10 MIN DATE OUT OF RANGE
011	INVALID MSDP 10 MIN TIME
012	MSDP 10 MIN TIME OUT OF RANGE
013	INVALID MSDP 15 MIN AMT
014	MSDP 15 MIN AMT > 5 + 10 MIN AMT
015	INVALID MSDP 15 MIN DATE
016	MSDP 15 MIN DATE OUT OF RANGE
017	INVALID MSDP 15 MIN TIME
018	MSDP 15 MIN TIME OUT OF RANGE
019	INVALID MSDP 20 MIN AMT
020	MSDP 20 MIN AMT > 5 + 15 MIN AMT
021	MSDP 20 MIN AMT > 2 X 10 MIN AMT
022	INVALID MSDP 20 MIN DATE
023	MSDP 20 MIN DATE OUT OF RANGE
024	INVALID MSDP 20 MIN TIME
025	MSDP 20 MIN TIME OUT OF RANGE
026	INVALID MSDP 30 MIN AMT
027	MSDP 30 MIN AMT > 10 + 20 MIN AMT
028	MSDP 30 MIN AMT > 2 X 15 MIN AMT
029	INVALID MSDP 30 MIN DATE
030	MSDP 30 MIN DATE OUT OF RANGE
031	INVALID MSDP 30 MIN TIME
032	MSDP 30 MIN TIME OUT OF RANGE
033	INVALID MSDP 45 MIN AMT
034	MSDP 45 MIN AMT > 15 + 30 MIN AMT
035	INVALID MSDP 45 MIN DATE
036	MSDP 45 MIN DATE OUT OF RANGE
037	INVALID MSDP 45 MIN TIME
038	MSDP 45 MIN TIME OUT OF RANGE
039	INVALID MSDP 60 MIN AMT
040	MSDP 60 MIN AMT > 15 + 45 MIN AMT
041	MSDP 60 MIN AMT > 2 X 30 MIN AMT
042	INVALID MSDP 60 MIN DATE
043	MSDP 60 MIN DATE OUT OF RANGE
044	INVALID MSDP 60 MIN TIME
045	MSDP 60 MIN TIME OUT OF RANGE
046	INVALID MSDP 80 MIN AMT
047	MSDP 80 MIN AMT > 20 + 60 MIN AMT
048	INVALID MSDP 80 MIN DATE
049	MSDP 80 MIN DATE OUT OF RANGE
050	INVALID MSDP 80 MIN TIME
051	MSDP 80 MIN TIME OUT OF RANGE
052	INVALID MSDP 100 MIN AMT
053	MSDP 100 MIN AMT > 20 + 80 MIN AMT

054 INVALID MSDP 100 MIN DATE  
 055 MSDP 100 MIN DATE OUT OF RANGE  
 056 INVALID MSDP 100 MIN TIME  
 057 MSDP 100 MIN TIME OUT OF RANGE  
 058 INVALID MSDP 120 MIN AMT  
 059 MSDP 120 MIN AMT > 20 + 100 MIN AMT  
 060 MSDP 120 MIN AMT > 2 X 60 MIN AMT  
 061 INVALID MSDP 120 MIN DATE  
 062 MSDP 120 MIN DATE OUT OF RANGE  
 063 INVALID MSDP 120 MIN TIME  
 064 MSDP 120 MIN TIME OUT OF RANGE  
 065 INVALID MSDP 150 MIN AMT  
 066 MSDP 150 MIN AMT > 30 + 120 MIN AMT  
 067 INVALID MSDP 150 MIN DATE  
 068 MSDP 150 MIN DATE OUT OF RANGE  
 069 INVALID MSDP 150 MIN TIME  
 070 MSDP 150 MIN TIME OUT OF RANGE  
 071 INVALID MSDP 180 MIN AMT  
 072 MSDP 180 MIN AMT > 60 + 120 MIN AMT  
 073 INVALID MSDP 180 MIN DATE  
 074 MSDP 180 MIN DATE OUT OF RANGE  
 075 INVALID MSDP 180 MIN TIME  
 076 MSDP 180 MIN TIME OUT OF RANGE  
 077 MSDP 60 MIN VAL DISAGREES W/HR  
 078 MSDP 120 MIN VAL DISAGREES W/HR  
 079 MSDP 180 MIN VAL DISAGREES W/HR

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FLD LEN: 3

ORIGINAL-OBSERVATION-ELEMENT-QUALITY identifier

The identifier that denotes the existence of ORIGINAL-OBSERVATION-ELEMENT-QUALITY data. These data will appear after the Q## data described above.

DOM: A specific domain comprised of the ASCII character set.

**N01 - N99: The following may be occur from 0 to 99 times, for NCDC NCDC SURFACE HOURLY:**

ORIGINAL-OBSERVATION-ELEMENT-QUALITY original value text

ORIGINAL-OBSERVATION-ELEMENT-QUALITY units code

ORIGINAL-OBSERVATION-ELEMENT-QUALITY parameter code

FLD LEN: 6

ORIGINAL-OBSERVATION-ELEMENT-QUALITY original value text

The original value text for elements which were rejected or recomputed during validation.

DOM: A general domain comprised of the characters in the ASCII character set

FLD LEN: 1

ORIGINAL-OBSERVATION-ELEMENT-QUALITY units code

The code that denotes the units code for the data are stored in this position, and the data quality flag is stored with the parameter code below.

DOM: A specific domain comprised of the characters in the ASCII character set.

ELEMENT-UNITS TABLE

Value	Equates to this value from original NCDC SURFACE HOURLY
A	DT Wind direction in tens of degrees
B	F Whole degrees Fahrenheit
C	HF Hundreds of feet
D	HM Miles and hundredths
E	IH Inches and hundredths of mercury
F	IT Inches and thousandths of mercury
G	KD knots and direction in tens of degrees
H	KS Knots and direction in 16 point WBAN Code
I	MT Millibars and tenths
J	NA No units applicable (non-dimensional)
K	N1 No units applicable - element to tenths

L	N2	No units applicable - element to hundredths
M	P	Whole percent
O	TC	Degrees Celsius in tenths
P	TF	Degrees Fahrenheit in tenths
Q	IS	Miles per hour and sixteen-point wind compass
R	MS	Meters per second and sixteen-point wind compass

#### FLD LEN: 6

ORIGINAL-OBSERVATION-ELEMENT-QUALITY parameter code

The code that denotes the type of parameter that the supplemental-level-element-quality applies to.

DOM: A specific domain comprised of the characters in the ASCII character set.

First 4 characters = the element name as defined below.

Position 5 = the Flag 1 value as defined below.

Position 6 = Flag 2 value as defined below.

Element names and definitions:

ALC	Sky condition in tenths from ASOS
ALM	Sky condition in eighths from ASOS
ALTP	Altimeter setting
CC51	Sky condition prior to 1951
CLC	Sky condition in tenths
CLM	Sky condition in eighths
CLHT	Ceiling height
CLT	Cloud type and height by layer
C2C3	Total cloud cover by first 2 and first 3 layers
DPTC	Dew point temperature in celsius
DPTP	Dew point temperature in fahrenheit
HZVS	Horizontal visibility
PRES	Station pressure
PWTH	Present weather
PWVC	Present weather in vicinity
RHUM	Relative humidity
SCH	Sky condition (amount and modifier, e.g., thin broken) and height by layer
SLVP	Sea level pressure
TMCD	Dry bulb temperature in celsius
TMPD	Dry bulb temperature in fahrenheit
TMPW	Wet bulb temperature in fahrenheit
TSCE	Total sky cover in eighths
TSKC	Total sky cover in tenths
TSKY	Same as TSKC but expressed in terms of amount and modifier, e.g., thin broken.
WD16	Wind direction and speed in 16 point code
WIND	Wind direction and speed
WND2	Wind direction and speed from ASOS

FLAG-1 (Measurement Value):

A	Wind speed expressed in Beaufort scale, different from the day's given units
C	Ceiling of cirroform clouds at unknown height (Sep 56 - Mar 70)
D	Derived value
E	Estimated value
G	Visibility > or = 100 miles (data value = 10000)
H	Hundredths precision only is indicated in the original observation (except as when found in SLVP with units code MT, this flag means original value is expressed in inches to hundredths, not hundredths of millibars)
I	Wind speed in miles per hour, different from the day's given units
K	Wind speed in knots, different from the day's given units
M	Visibility missing (data value = 99999)
N	Unlimited visibility (data value = 99999)
P	Wind speed in pounds per square foot perpendicular to the wind
R	Dew Point and/or Relative Humidity, originally calculated with respect to ice have been recomputed with respect to water. (DPTP, RHUM)
S	Wind speed in meters per second, different from the day's given units

W	Whole precision only is indicated in the original observation
U	Unlimited ceiling height (DATA-VALUE = 99999). (CLHT)
b	(blank) Flag not needed. (All elements except CC51)

FLAG-2 (Data Quality Flag Value):

0	Observed data has passed all internal consistency checks.
1	Validity indeterminable (primarily for pre-1984 data).
2	Observed data has failed an internal consistency check - subsequent edited value follows observed value.
3	Data beginning January 1, 1984 - observed data has failed a consistency check - No edited value follows. Data prior to 1 Jan 84 - observed data exceeded preselected climatological limits during conversion from historic TD-1440 files. No edited value follows.
4	Observed data value invalid - no edited value follows.
5	Data converted from historic TD-1440 exceeded known climatological extremes - no edited value follows.
6	Complex QA indicates data are erroneous, and an edited value follows.
E	Edited data value passes all system checks - no observed value present.
M	Manually edited data value added to data set after original archival. Automated edit not performed on this item.
S	Manually edited data passes all system checks.

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## Original Observation Data Section

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FLD LEN: 3

ORIGINAL-OBSERVATION-NCDC SURFACE HOURLY identifier

The identifier that denotes the existence of ORIGINAL-OBSERVATION-NCDC SURFACE HOURLY information. This is used in specific instances where the original data from a previous format is stored for quality control purposes. In most cases, this section

is not included, since original input data sources are always maintained/archived at NCDC.

DOM: A specific domain comprised of the ASCII character set.

**QNN: The following may be occur from 0 to 99 times, for NCDC NCDC SURFACE HOURLY:**

ORIGINAL-OBSERVATION-NCDC SURFACE HOURLY original source codes and flags

FLD LEN: 5

ORIGINAL-OBSERVATION-NCDC SURFACE HOURLY source codes and flags

The original source codes and flags from NCDC SURFACE HOURLY, for possible future use in ISH database quality control.

DOM: A specific domain comprised of the ASCII character set.

For each original NCDC SURFACE HOURLY data record, the source code 1 and 2, and flag 1 and 2 original values are stored as follows:

QNN@1234@1234@1234 where:

QNN = indicator for section

@ = element identifier (see below)

1234 = source code 1, source code 2, flag 1, and flag 2 sequentially, for each element as defined in original DSI-3280.

Element Identifiers (@) as mentioned above, with the original DS3280 element that it refers to (eg, A = element ALC):

A ALC  
B ALM  
C ALTP  
D CC51  
E CLC  
F CLM  
G CLHT  
H CLT  
I C2C3  
J DPTC  
K DPTP  
L HZVS  
M PRES  
N PWTH  
O PWVC  
P RHUM  
Q SLVP  
R TMCD  
S TMPD  
T TMPW  
U TSCE  
V TSKC  
W WD16  
X WIND  
Y WND2

FLD LEN: 6

ORIGINAL-OBSERVATION-NCDC SURFACE HOURLY data value

The original data value from NCDC SURFACE HOURLY, as defined for the element above, for possible future use in ISH database quality control.

DOM: A specific domain comprised of the ASCII character set.

7.     **Start Date:**  
  
1900, but the date will vary greatly by station.
8.     **Stop Date:** Present
9.     **Coverage:**
  - a.     Southernmost Latitude:   9000S
  - b.     Northernmost Latitude:   9000N
  - c.     Westernmost Longitude:   18000W
  - d.     Easternmost Longitude:   18000E
10.    **Location:** Global
11.    **Keywords:**
  - a.    Temperature
  - b.     Dew Point
  - c.     Wind Speed
  - d.     Wind Gust
  - e.     Wind Direction
  - f.     Ceiling
  - g.     Sky Cover
  - h.     Cloud Layer Data
  - i.     Visibility
  - j.     Present Weather
  - k.     Past Weather
  - l.     Sea Level Pressure
  - m.     Altimeter Setting
  - n.     Station Pressure
  - o.     3-hour Pressure Change
  - p.     Precipitation Amount
  - q.     Snowfall
  - r.     Snow Depth
  - s.     Maximum Temperature
  - t.     Minimum Temperature
  - u.     US Air Force
  - v.     Clouds
  - w.     Surface
12.    **How to Order Data:**  
  
Order from:  
National Climatic Data Center  
Climate Services Branch  
Federal Building  
151 Patton Avenue  
Asheville, NC 28801-5001  
phone: (828) 271-4800  
email: [ncdc.orders@noaa.gov](mailto:ncdc.orders@noaa.gov)
13.    **Archiving Data Centers:**

Air Force Combat Climatology Center (AFCCC)  
National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, NC 28801-5001

14. **Technical Contact:**

National Climatic Data Center  
Climate Services Branch  
Federal Building  
151 Patton Avenue  
Asheville, NC 28801-5001  
phone: (828) 271-4800  
email: ncdc.info@noaa.gov

15. **Known Uncorrected Problems:**

Minimal number of random errors, decode errors, and reporting errors (by station)--less than .1% of observations affected overall. Most errors corrected/eliminated by quality control software.

16. **Quality Statement:**

Data have undergone extensive automated quality control, and additional manual quality control for US Air Force stations, US Navy stations, and US National Weather Service stations.

17. **Revision Date:** N/A

18. **Source Data Sets:**

AFCCC USAF SURFACE HOURLY Surface Hourly, NCDC DS3280 Surface Hourly, NCDC DS3240 Hourly Precipitation. AFCCC USAF SURFACE HOURLY includes over 100 source datasets, while NCDC DS3280 includes several original input sources; so over 100 original input sources are included in the current ISD archive. Beginning in 2006, additional data sources are being added, and will be documented here as they become available online.

19. **Essential Companion Data Sets:** N/A

20. **Derived Data Sets:** Global summary of day for 1929-present

21. **References:** N/A

22. **Summary:**

The Integrated Surface Database is composed of worldwide surface weather observations from about 20,000 stations, collected and stored from sources such as the Automated Weather Network (AWN), the Global Telecommunications System (GTS), the Automated Surface Observing System (ASOS), and data keyed from paper forms. Most digital observations are decoded either at operational centers and forwarded to the Federal Climate Complex (FCC) in Asheville, NC, or decoded at the FCC. The US Air Force Combat Climatology Center (AFCCC), the National Climatic Data Center (NCDC), and the US Navy's Fleet Numerical Meteorological and Oceanographical Command Detachment (FNMOD), make up the FCC in Asheville, NC. Each agency is responsible for data ingest, quality

control, and customer support for surface climatological data. All data are now stored in a single ASCII format. The database is used in climatological applications by numerous DoD and civilian customers.

ISD (identical to ISH) refers to the digital database and format in which hourly, synoptic (3-hourly), and various other weather/climate observations are stored. The format conforms to Federal Information Processing Standards (FIPS). The database includes data originating from various codes such as synoptic, airways, METAR (Meteorological Routine Weather Report), and SMARS (Supplementary Marine Reporting Station), as well as observations from automatic weather stations. The data are sorted by station-year-month-day-hour-minute. This document provides complete documentation for the database and its format.