

FEDERAL CLIMATE COMPLEX

DATA DOCUMENTATION

FOR

INTEGRATED SURFACE DATA

August 20, 2015

National Climatic Data Center
14th 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, NCEI 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. NCEI 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 NCEI's Climate Data Online system (cdo.NCEI.noaa.gov), FTP (<ftp://ftp.NCEI.noaa.gov/pub/data/noaa/>), GIS services (gis.NCEI.noaa.gov), and by calling NCEI 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.

Control Data Section

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 NCEI 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 NCEI'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-N.

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

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

3 = USAF SURFACE HOURLY/NCEI SURFACE HOURLY merged observation

4 = USAF SURFACE HOURLY observation

5 = NCEI SURFACE HOURLY observation

6 = ASOS/AWOS observation from NCEI

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

8 = MAPSO observation (NCEI)
 A = USAF SURFACE HOURLY/NCEI HOURLY PRECIPITATION merged observation, candidate for merge with
 NCEI SURFACE HOURLY (not yet merged, failed element cross-checks)
 B = NCEI SURFACE HOURLY/NCEI HOURLY PRECIPITATION merged observation, candidate for merge with
 USAF SURFACE HOURLY (not yet merged, failed element cross-checks)
 C = USAF SURFACE HOURLY/NCEI SURFACE HOURLY/NCEI HOURLY PRECIPITATION merged observation
 D = USAF SURFACE HOURLY/NCEI HOURLY PRECIPITATION merged observation
 E = NCEI SURFACE HOURLY/NCEI 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 / NCEI cooperative effort (various national datasets)
 O = Summary observation created by NCEI using hourly observations that may not share the same data source flag
 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
 MESOH = Hydrological observations from MESONET operated civilian or government agency
 MESOS = MESONET operated civilian or government agency
 MESOW = Snow observations from 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.

Mandatory Data Section

Bold type below indicates that the element may include data originating from NCEI's NCEI 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 NCEI'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 NCEI 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 NCEI data source

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

6 = Suspect, data originate from an NCEI data source

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

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-CONDTION-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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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

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 NCEI data source

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

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI 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 NCEI data source

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

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI data source

9 = Passed gross limits check if element is present

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 NCEI data source
 - 5 = Passed all quality control checks, data originate from an NCEI data source
 - 6 = Suspect, data originate from an NCEI data source
 - 7 = Erroneous, data originate from an NCEI 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 NCEI 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 NCEI data source
 - 5 = Passed all quality control checks, data originate from an NCEI data source
 - 6 = Suspect, data originate from an NCEI data source
 - 7 = Erroneous, data originate from an NCEI 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 NCEI software
 - U = Data value replaced with edited value
-

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

Additional Data Section

Bold type below indicates that the element may include data originating from NCEI's NCEI SURFACE HOURLY/ASOS/AWOS, NCEI 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 NCEI'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 NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI 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 NCEI data source
 - 5 = Passed all quality control checks, data originate from an NCEI data source
 - 6 = Suspect, data originate from an NCEI data source
 - 7 = Erroneous, data originate from an NCEI 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 NCEI 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 NCEI 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 NCEI data source
 5 = Passed all quality control checks, data originate from an NCEI data source
 6 = Suspect, data originate from an NCEI data source
 7 = Erroneous, data originate from an NCEI 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 NCEI 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 NCEI data source
 5 = Passed all quality control checks, data originate from an NCEI data source
 6 = Suspect, data originate from an NCEI data source
 7 = Erroneous, data originate from an NCEI 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 NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI 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 NCEI data source

5 = Passed all quality control checks, data originate from an NCEI data source
 6 = Suspect, data originate from an NCEI data source
 7 = Erroneous, data originate from an NCEI 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 NCEI 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: 045 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 NCEI data source

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

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI 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 NCEI software

U = Data value replaced with edited value

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.

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-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: 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 NCEI data source

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

6 = Suspect, data originate from an NCEI data source

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

FLD LEN: 3

SNOW-ACCUMULATION FOR THE DAY/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 (usually 024 for daily, 744 for monthly)

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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI ASOS/AWOS
 - 5 = Passed all quality control checks, from DSI-3260 or NCEI ASOS/AWOS
 - 6 = Suspect, from DSI-3260 or NCEI ASOS/AWOS
 - 7 = Erroneous, from DSI-3260 or NCEI ASOS/AWOS
 - 9 = Passed gross limits check if element is present
-

FLD LEN: 3

15 Minute 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.

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-PRECIPITATION depth dimension

LIQUID-PRECIPITATION condition code

LIQUID-PRECIPITATION 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 NCEI data source

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

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI data source

9 = Passed gross limits check if element is present

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.

AT1 – AT8 An indicator of up to 8 repeating fields of the following items:

DAILY-PRESENT-WEATHER-OBSERVATION source element

DAILY-PRESENT-WEATHER-OBSERVATION weather type

DAILY-PRESENT-WEATHER-OBSERVATION weather type abbreviation

DAILY-PRESENT-WEATHER-OBSERVATION quality code

FLD LEN: 2

DAILY-PRESENT-WEATHER-OBSERVATION source element

The code that denotes the source of the daily present weather observation.

DOM: A specific domain comprised of the ASCII characters.

AU = sourced from automated ASOS/AWOS sensors

AW = sourced from automated sensors

MW = sourced from manually reported present weather

FLD LEN: 2

DAILY-PRESENT-WEATHER-OBSERVATION weather type

The numeric code that denotes the type of daily present weather being reported.

DOM: A specific domain comprised of the ASCII characters.

01 = Fog, ice fog or freezing fog (may include heavy fog)

02 = Heavy fog or heavy freezing fog (not always distinguished from fog)

03 = Thunder

04 = Ice pellets, sleet, snow pellets or small hail

05 = Hail (may include small hail)

06 = Glaze or rime

07 = Dust, volcanic ash, blowing dust, blowing sand or blowing obstruction

08 = Smoke or haze

09 = Blowing or drifting snow

10 = Tornado, water spout or funnel cloud

11 = High or damaging winds

12 = Blowing spray

13 = Mist

14 = Drizzle

15 = Freezing drizzle

16 = Rain

17 = Freezing rain

18 = Snow, snow pellets, snow grains or ice crystals

19 = Unknown precipitation

21 = Ground fog

22 = Ice fog or freezing fog

FLD LEN: 4

DAILY-PRESENT-WEATHER-OBSERVATION weather type abbreviation

The abbreviation that denotes the type of daily present weather being reported. These abbreviations correspond to the Daily Present Weather Observation weather type.

DOM: A specific domain comprised of the ASCII characters.

FG = Fog, ice fog or freezing fog (may include heavy fog)

FG+ = Heavy fog or heavy freezing fog (not always distinguished from fog)

TS = Thunder

PL = Ice pellets, sleet, snow pellets or small hail

GR = Hail (may include small hail)

GL = Glaze or rime

DU = Dust, volcanic ash, blowing dust, blowing sand or blowing obstruction

HZ = Smoke or haze

BLSN = Blowing or drifting snow

FC = Tornado, water spout or funnel cloud

WIND = High or damaging winds

BLPY = Blowing spray

BR = Mist

DZ = Drizzle

FZDZ = Freezing drizzle

RA = Rain

FZRA = Freezing rain

SN = Snow, snow pellets, snow grains or ice crystals

UP = Unknown precipitation

MIFG = Ground fog

FZFG = Ice fog or freezing fog

FLD LEN: 1

DAILY-PRESENT-WEATHER-OBSERVATION quality code

The code that denotes a quality status of the reported DAILY-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 NCEI data source
5 = Passed all quality control checks, data originate from an NCEI data source
6 = Suspect, data originate from an NCEI data source
7 = Erroneous, data originate from an NCEI 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

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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI data source
 5 = Passed all quality control checks, data originate from an NCEI data source
 6 = Suspect, data originate from an NCEI data source
 7 = Erroneous, data originate from an NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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

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

Network Metadata

FLD LEN: 3

US-NETWORK-METADATA identifier

The identifier that indicates the occurrence of US Network metadata, used in NCEI 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 code

The 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 code

The 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

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

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 NCEI SURFACE HOURLY
5 = Passed all quality control checks, from NCEI SURFACE HOURLY
6 = Suspect, from NCEI SURFACE HOURLY
7 = Erroneous, from NCEI 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 NCEI SURFACE HOURLY
- 5 = Passed all quality control checks, from NCEI SURFACE HOURLY
- 6 = Suspect, from NCEI SURFACE HOURLY
- 7 = Erroneous, from NCEI 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: 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, 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 NCEI SURFACE HOURLY
- 5 = Passed all quality control checks, from NCEI SURFACE HOURLY
- 6 = Suspect, from NCEI SURFACE HOURLY
- 7 = Erroneous, from NCEI 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 oktas.

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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 cumulogenitus (or cumulonimbogenitus)
- 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 of 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 NCEI data source

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

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI 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 NCEI data source

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

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI 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 NCEI data source
 - 5 = Passed all quality control checks, data originate from an NCEI data source
 - 6 = Suspect, data originate from an NCEI data source
 - 7 = Erroneous, data originate from an NCEI 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/m²) 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_t, K_n, or K_d
- 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

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/m²) 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 K_t , K_n , or K_d
 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/m²) 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 K_t, K_n, or K_d

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/m²) 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/m²). 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/m²). 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/m²). 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/m²), 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/m²). 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/m²). 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/m²).

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/m²) 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/m²) 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/m²) 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/m²) 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/m²) 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: Loose 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 NCEI Data source

5 = Passed all quality control checks, from NCEI Data source

6 = Suspect, from NCEI Data source

7 = Erroneous, from NCEI 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 NCEI Data source
5 = Passed all quality control checks, from NCEI Data source
6 = Suspect, from NCEI Data source
7 = Erroneous, from NCEI 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 NCEI Data source
5 = Passed all quality control checks, from NCEI Data source
6 = Suspect, from NCEI Data source
7 = Erroneous, from NCEI 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 NCEI Data source
 5 = Passed all quality control checks, from NCEI Data source
 6 = Suspect, from NCEI Data source
 7 = Erroneous, from NCEI Data source
 9 = Passed gross limits check if element is present

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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI data source
 - 5 = Passed all quality control checks, data originate from an NCEI data source
 - 6 = Suspect, data originate from an NCEI data source
 - 7 = Erroneous, data originate from an NCEI 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 NCEI data source

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

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source

- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI data source

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

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI 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 NCEI ASOS/AWOS

5 = Passed all quality control checks, from NCEI ASOS/AWOS

6 = Suspect, from NCEI ASOS/AWOS

7 = Erroneous, from NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI ASOS/AWOS
5 = Passed all quality control checks, from NCEI ASOS/AWOS
6 = Suspect, from NCEI ASOS/AWOS
7 = Erroneous, from NCEI 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 NCEI data source
5 = Passed all quality control checks, data originate from an NCEI data source
6 = Suspect, data originate from an NCEI data source
7 = Erroneous, from NCEI 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 NCEI data source

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

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI 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 NCEI data source

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

6 = Suspect, data originate from an NCEI data source

7 = Erroneous, data originate from an NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI data source
 5 = Passed all quality control checks, data originate from an NCEI data source
 6 = Suspect, data originate from an NCEI data source
 7 = Erroneous, data originate from an NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI data source
5 = Passed all quality control checks, data originate from an NCEI data source
6 = Suspect, data originate from an NCEI data source
7 = Erroneous, data originate from an NCEI 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 NCEI data source
- 5 = Passed all quality control checks, data originate from an NCEI data source
- 6 = Suspect, data originate from an NCEI data source
- 7 = Erroneous, data originate from an NCEI 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 NCEI ASOS/AWOS

5 = Passed all quality control checks, from NCEI ASOS/AWOS

6 = Suspect, from NCEI ASOS/AWOS

7 = Erroneous, from NCEI 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 NCEI Data source
5 = Passed all quality control checks, from NCEI Data source
6 = Suspect, from NCEI Data source
7 = Erroneous, from NCEI 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 NCEI Data source
5 = Passed all quality control checks, from NCEI Data source
6 = Suspect, from NCEI Data source
7 = Erroneous, from NCEI 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 NCEI Data source
5 = Passed all quality control checks, from NCEI Data source
6 = Suspect, from NCEI Data source
7 = Erroneous, from NCEI 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 NCEI Data source
5 = Passed all quality control checks, from NCEI Data source
6 = Suspect, from NCEI Data source
7 = Erroneous, from NCEI Data source
9 = Passed gross limits check if element is present

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 NCEI HOURLY PRECIPITATION or NCEI 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 NCEI 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 NCEI 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

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 NCEI NCEI 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 NCEI 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 | KSKnots 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. |

Original Observation Data Section

FLD LEN: 3

ORIGINAL-OBSERVATION-NCEI SURFACE HOURLY identifier

The identifier that denotes the existence of ORIGINAL-OBSERVATION-NCEI 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 NCEI.

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

QNN: The following may be occur from 0 to 99 times, for NCEI NCEI SURFACE HOURLY:

ORIGINAL-OBSERVATION-NCEI SURFACE HOURLY original source codes and flags

FLD LEN: 5

ORIGINAL-OBSERVATION-NCEI SURFACE HOURLY source codes and flags

The original source codes and flags from NCEI SURFACE HOURLY, for possible future use in ISH database quality control.

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

For each original NCEI 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-NCEI SURFACE HOURLY data value

The original data value from NCEI 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: NCEI.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: NCEI.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, NCEI DS3280 Surface Hourly, NCEI DS3240 Hourly Precipitation. AFCCC USAF SURFACE HOURLY includes over 100 source datasets, while NCEI 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 (NCEI), 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.