

National Climatic Data Center

DATA DOCUMENTATION

FOR

DATA SET 3206 (DSI-3206)

COOP SUMMARY OF THE DAY - CDMP - PRE 1948

October 11, 2005

National Climatic Data Center
151 Patton Ave.
Asheville, NC 28801-5001 USA

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1. **Abstract:** This file is a compilation of daily observations initially obtained from state universities, state cooperatives, and the National Weather Service. The period of record and number of stations varies among the states. The data set is a compilation of digitized manuscript records that are not included in TD-3200. The records generally date back to the late 1890's and end around 1948.

In 1998, through a congressionally directed economic development partnership, the NCDC began a program to digitize the daily data that was not included in TD-3200. The NCDC sent data to a contractor in an economically underprivileged area of Appalachia, and the contractor keyed the data. The resulting digitized data are now included in a format called TD-3206, COOP Summary Of Day - CDMP - Pre 1948.

Data are available for the 50 states, Puerto Rico and the U.S. Virgin Islands. Parameters included within this dataset are: temperatures at the time of observation and 7 a.m., 2 p.m. and 9 p.m.; daily maximum, minimum and mean temperatures; total precipitation amount, snowfall, and depth of snow on the ground; prevailing wind direction and total wind movement; evaporation; sky condition; and the occurrence of weather and obstructions to vision. The NCDC plans to make the data available on-line from the NCDC website in the near future.

The TD-3206 database for the rescued data is separate from the standard TD-3200 cooperative network database. Although their formats are the same, the two databases have not been compiled in the same manner. Also, there are some overlaps data between the two that have not been examined. Plans call for merging the two databases into one comprehensive database in the future.

More information on the digitization process can be found within [Appendix A](#). [Appendix B](#) documents the problems and changes made to the keyed data. [Appendix C](#) lists each individual station and its identification number, its location and its period of record. [Appendix D](#) reflects the quality control changes made in Version 3.

A revision to this document was made 15 September 2005 and information on this revision can be found below.

Changes from Version 2 to Version 3

1. Additional quality assessment was performed by the Midwest Regional Climate Center using both automated and manual techniques on outlying data (Kunkel et al., 2005). Objective spatial tests were developed for this additional quality assessment and were applied to stations with at least 90% of the daily data values available for the period 1895-2000. If a data record in Version 2 contained both an original and an estimated value, the additional quality assessment was performed on the estimated value. The details of the additional quality assessment are provided in Kunkel et al., 2005 ([Appendix D](#)).

2. Table F (flag 2 codes) now include four additional codes:

V - Data element failed objective spatial tests, manually assessed as valid

W - Data element failed objective spatial tests, manually assessed as plausible

X - Data element failed objective spatial tests, manually assessed as questionable

Y - Data element failed objective spatial tests, manually assessed as invalid

:
:

The presence of these codes identifies a data record which has been subjected to the additional quality assessment, and the specific value of the code indicates the result of the assessment.

In a few instances, the flag 2 codes of F, G and H for an estimated data value that were in Version 2 have been overwritten by the codes of V, W, X or Y. Because the three editing procedures produce markedly different results, it should be readily apparent from a comparison of the original and the estimated data values what estimation procedure was applied to the original value from Version 2. For example, if the original value was -50 and the edited value is 50, clearly a sign change edit occurred.

3. Where keying errors have been identified by users of the data and confirmed by NCDC personnel, these errors have been replaced with the correct values from the original reporting forms. These rare cases are not flagged because the data had been digitized in error and were simply being corrected.

4. Reference: Kunkel, K.E., D.R. Easterling, K. Hubbard, K. Redmond, K. Andsager, M.C. Kruk and M.L. Spinar, 2005: Quality Control of Pre-1948 Cooperative Observer Network Data. Journal of Atmospheric and Oceanic Technology, 22, in press.

2. Element Names and Definitions: Data are archived in a variable length element file structure. The element file structure is designed to allow maximum flexibility in requesting data. Only those elements or groups of elements of particular interest need be ordered. Archived data are currently sorted by Station-ID (excluding the Division Number) as the primary key and year, month, and meteorological element-type as secondary keys.

Access Method and Sort for Archived Data

Provided within this section are information and examples of how to access the **Variable Length** data records, specifically:

- a. COBOL Data Description (1 example)
- b. FORTRAN Data Descriptions (2 examples)
- c. Control Language Notes
- d. List of Variables ("Elements")
- e. Schematic Variable Length Record Format Layout

The following COBOL and FORTRAN statements are to be used as guidelines only. NCDC recognizes the fact that many different types of equipment are used in processing these data. It is impossible to cover all the idiosyncrasies of every system.

COBOL Data Description

This is a typical ANSI Standard COBOL Variable Length Description.

```
FD  INDATA
    LABEL RECORDS ARE STANDARD
    RECORDING MODE D
    BLOCK CONTAINS 12000 CHARACTERS
    DATA RECORD IS DATA-RECORD.
01  DATA-RECORD.
    02 RECORD-TYPE                PIC X(3).
    02 STATION-ID                  PIC X(8).

:
:
:                                4:
```

```

02 ELEMENT-TYPE          PIC X(4).
02 ELEMENT-UNITS-CODE   PIC XX.
02 YEAR                  PIC 9(4).
02 MONTH                 PIC 99.
02 FILLER                PIC 9(4).
02 NUMBER-VALUES        PIC 9(3).
02 DAILY-ENTRY
    OCCURS 1 TO 100 TIMES DEPENDING ON NUMBER-VALUES.
    04 DAY                PIC 99.
    04 HOUR               PIC 99.
    04 DATA-VALUE       PIC S9(5) SIGN LEADING
                          SEPARATE.
    04 D-VAL REDEFINES DATA-VALUE.
    05 SIGN-VAL          PIC X.
    05 DATA-IN          PIC X(5).
    04 FLAG-1            PIC X.
    04 FLAG-2            PIC X.

```

FORTRAN Data Description

(1) FORTRAN 77 Example 1

This description is for those systems that can handle variable blocked records normally.

```

IMPLICIT INTEGER (A-Z)

OPEN (10,FILE = 'FILENAME',ACCESS = 'SEQUENTIAL', STATUS = 'OLD',
+   RFORM = 'VB',MRECL = 1230,TYPE = 'ANSI',BLOCK =
+   12000)
C   LAST 2 lines of OPEN statement are SPERRY UNIQUE

DEFINE FILE 10 (ANSI, VB, 1230, 12000)
CHARACTER*3 RECTYP
CHARACTER*8 STNID
CHARACTER*4 ELMTYP
CHARACTER*2 EUNITS
CHARACTER*1 FLAG1, FLAG2
DIMENSION IDAY(100), IHOURL(100), IVALUE(100), FLAG1(100),
+   FLAG2(100)

10 READ (10,20,END=999,ERR=10) RECTYP, STNID, ELMTYP, EUNITS,
IYEAR,
+   IMON, IFIL, NUMVAL, (IDAY(J), IHOURL(J), IVALUE(J),
+   FLAG1(J), FLAG2(J), J=1, NUMVAL)
20 FORMAT (A3, A8, A4, A2, I4, I2, I4, I3, 100(2I2, I6, 2A1))
(2) FORTRAN 77 Example 2

```

This description is for those systems that can't handle variable blocked records normally.

```

PROGRAM TAPERREAD
IMPLICIT INTEGER (A-Z)
.....
OPEN(1,FILE=TAPE:',ACCESS='SEQUENTIAL',FORM=FORMATTED',
:
:
:
5:

```

```

+ STATUS='OLD',READONLY)

CHARACTER BUFFER*12000      ! YOUR MACHINE MUST SUPPORT
                             ! CHARACTER VARIABLES THIS LARGE

CHARACTER*3 RECTYP
CHARACTER*8 STNID
CHARACTER*4 ELMTYP
CHARACTER*2 EUNITS
CHARACTER*1 FLAG1, FLAG2
DIMENSION IDAY(100), IHOURL(100), IVALUE(100), FLAG1(100)
+      FLAG2(100)
      .....
      NBYTES=0
5      NBEG=1
      READ(1,101,END=99)BUFFER      !READ IN PHYSICAL RECORD (BLOCK)
10     NBEG=NBEG+NBYTES
      READ(BUFFER(NBEG:NBEG+3,102)NBYTES      !READ THE CONTROL WORD
      IF( NBYTES.EQ.0 )GO TO 5
      READ(BUFFER(NBEG+4:NBEG+NBYTES-1),103) RECTYP, STNID, ELMTYP,
+ EUNITS, 1YEAR, IMON, IFIL, NUMVAL, (DAY(J), IHOURL(J),
+ IVALUE(J), FLAG1(J), FLAG2(J), J=1, NUMVAL)
      .....

      .....
      GO TO 10
99     CONTINUE
      .....
      .....
101    STOP 'FINISHED'
102    FORMAT(A)
103    FORMAT(I4)
      FORMAT (A3, A8, A4, A2, I4, I2, I4, I3, 100(2I2, 16, 2A1))
      END

```

Control Language Notes

(1) IBM JCL Notes

For ASCII Variable specify:

```

LRECL   = 1234
RECFM   = DB
OPTCODE = Q

```

For EBCDIC Variable specify:

```

LRECL   = 1234
RECFM   = VB

```

(2) VAX DCL Notes

```

$ MOUNT/FOREIGN/BLOCKSIZE=12000 MT:  tapename TAPE:

```

List of Variables

| ELEMENT | WIDTH | POSITION |
|---------|-------|----------|
| : | | |
| : | 6: | |

| | | | | |
|---------|-----------------------------------------|-------|-----------|---------|
| 001 | RECORD TYPE (= DLY) | 3 | 001-003 | -- |
| 002 | STATION ID | 8 | 004-011 | |
| 003 | METEOROLOGICAL ELEMENT TYPE | 4 | 012-015 | |
| 004 | MET. ELEMENT MEASUREMENT UNITS CODE | 2 | 016-017 | -- ID |
| 005 | YEAR | 4 | 018-021 | |
| PORTION | | | | |
| 006 | MONTH | 2 | 022-023 | |
| 007 | FILLER (= 9999) | 4 | 024-027 | |
| 008 | NUMBER OF DATA PORTIONS THAT FOLLOW | 3 | 028-030 | -- |
| 009 | DAY OF MONTH | 2 | 031-032 | -- |
| 010 | HOUR OF OBSERVATION | 2 | 033-034 | |
| 011 | SIGN OF METEOROLOGICAL ELEMENT VALUE | 1 | 035 | -- DATA |
| | VALUE OF METEOROLOGICAL ELEMENT | 5 | 036-040 | |
| PORTION | | | | |
| | QUALITY CONTROL FLAG 1 | 1 | 041 | |
| | QUALITY CONTROL FLAG 2 | 1 | 042 | -- |
| | DATA GROUPS IN THE SAME FORM AS ELEMENT | 12 | 043-054 | DATA |
| PORTION | | | | |
| | POSITIONS 31-42 REPEATED AS MANY | 12 | 055-066 | DATA |
| PORTION | | | | |
| | TIMES AS NEEDED TO CONTAIN ONE MONTH | 12 | 067-078 | DATA |
| PORTION | | | | |
| | OF RECORDS. | | | |
| 608 | | 12 | 1219-1230 | DATA |
| PORTION | | | | |

Format (Variable Length Record Layout)

1. The first eight elements (positions 001-030) constitute the ID PORTION of the record and describe the characteristics of the entire record. The next six elements, the DATA PORTION of the record contains information about each meteorological element value reported. This portion is repeated for as many values as occur in the monthly record.

2. Each logical record is of variable length with a maximum of 1230 characters. Each logical record contains a station's data for a specific meteorological element over a one-month interval. The form of a record is:

ID PORTION (30 Characters) Fixed length

```

*****
* REC | STATION | ELEM |   |   |   |   | NUM >
* TYP |   ID    | TYPE | UNT | YEAR | MO | FILL | VAL >
*****|*****|*****|*****|*****|*****|*****|*****
* XXX | XXXXXXXX | XXXX | XX  | XXXX | XX  | XXXX | XXX >
*****
ELEMENTS 001      002      003      004      005      006      007      008

```

DATA PORTION (12 Characters, repeated "NUM-VAL" times--up to 100)

:
:

```

*****
< DY | HR | MET. ELEM | FL | FL | DY | HR | MET. ELEM | FL | FL >
< | | | | 1 | 2 | | | | 1 | 2 >
< | | ***** | | | ***** | | >
< | | DATA | | | DATA | | >
< | | S | VALUE | | | S | VALUE | | >

<*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*** >
< XX | XX | X | XXXXX | X | X | XX | XX | X | XXXXX | X | X >
*****
ELEMENTS 009 010 011 012 013 014 015 016 017 018 019 020

```

```

*****
< DY | HR | MET. ELEM | FL | FL *
< | | | | 1 | 2 *
< | | ***** | | | *
< | | DATA | | | *
< | | S | VALUE | | | *
<*****|*****|***|*****|*****|***** >
< XX | XX | X | XXXXX | X | X *
*****
ELEMENTS 603 604 605 606 607 608

```

3. The Number of Data Portions (position 008) for the logical record of type "DLY" ranges from 1 to 62.

Access Method and Sort for Supplied Data:

In addition to a variable length record structure, users may also receive data in a **Fixed Length** record structure as described below. However, the user must specify whether to extract either the original or edited data values. Supplied data are in the same sort as archived data (see topic 4 "Description: Access Method and Sort for Archived Data").

Provided within this section are information and examples of how to access the fixed length data records, specifically:

- a. COBOL Data Description
- b. FORTRAN Data Description
- c. List of Variables ("Elements")
- d. Schematic Fixed Length Record Format Layout

COBOL Data Description

This is a typical ANSI Standard COBOL Fixed Record Length Description

```

FD INDATA
  LABEL RECORDS ARE STANDARD (FOR STD LABEL TAPES)
  RECORDING MODE F
  BLOCK CONTAINS 15 RECORDS
  DATA IS DATA-RECORD
01 DATA RECORD

```

:
:

```

02 RECORD-TYPE          PIC X(3).
02 STATION-ID          PIC X(8).
02 ELEMENT-TYPE        PIC X(4).
02 ELEMENT-UNITS       PIC XX.
02 YEAR                PIC 9(4).
02 MONTH               PIC 99.
02 FILLER              PIC 9(4).
02 NUMBER-VALUES       PIC 9(3).
02 DAILY-ENTRY
   OCCURS 31 TIMES.
   04 DAY                PIC 99.
   04 HOUR               PIC 99.
   04 DATA-VALUE        PIC S9(5) SIGN LEADING SEPARATE.
   04 D-VAL REDEFINES DATA-VALUE.
       05 SIGN-VAL        PIC X.
       05 DATA-IN        PIC X(5).
   04 FLAG-1            PIC X.
   04 FLAG-2            PIC X.

```

FORTRAN Data Description

FORTRAN 77 Example

```

DEFINE FILE 10 (ANSI, FB, 402, 6030)
CHARACTER*3 RECTYP
CHARACTER*8 STNID
CHARACTER*4 ELMTYP
CHARACTER*2 EUNITS
CHARACTER*1 FLAG1, FLAG2
DIMENSION IDAY(31), IHOURL(31),
+ IVALUE(31), FLAG1(31), FLAG2(31)

10 READ (10,20,END=999,ERR=10)RECTYP, STNID, ELMTYP, EUNITS, IYEAR,
+ IMON, IFIL, NUMVAL, (IDAY(J), IHOURL(J), IVALUE(J),
+ FLAG1(J), FLAG2(J), J=1, 31)

20 FORMAT (A3, A8, A4, A2, I4,I2, I4, 13, 31(212, I6, 2A1))

```

List of Variables

| ELEMENT | WIDTH | POSITION |
|----------------------------------------------|-------|-------------------|
| 001 RECORD TYPE (= DLY) | 3 | 001-003-- |
| 002 STATION ID | 8 | 004-011 |
| 003 METEOROLOGICAL ELEMENT TYPE | 4 | 012-015 |
| 004 MET. ELEMENT MEASUREMENT UNITS CODE | 2 | 016-017 --ID |
| 005 YEAR | 4 | 018-021 PORTION |
| 006 MONTH | 2 | 022-023 |
| 007 FILLER (= 9999) | 4 | 024-027 |
| 008 NO. OF DATA PORTIONS THAT FOLLOW (= 031) | 3 | 028-030-- |
| 009 DAY OF MONTH | 2 | 031-032-- |
| 010 HOUR OF OBSERVATION | 2 | 033-034 DATA |
| 011 SIGN OF METEOROLOGICAL ELEMENT VALUE | 1 | 035 --PORTION |
| VALUE OF METEOROLOGICAL ELEMENT | 5 | 036-040 |
| QUALITY CONTROL FLAG 1 | 1 | 041 |
| QUALITY CONTROL FLAG 2 | 1 | 042 -- |

:
:

```

DATA GROUPS IN THE SAME FORM AS ELEMENT 12      043-054 DATA PORTION
POSITIONS 31-42 ARE REPEATED             12      055-066 DATA PORTION
31 TIMES.                                .....
194                                       12      391-402 DATA PORTION

```

Format (Fixed Length Record Layout)

1. The first eight elements (positions 001-030) constitute the ID PORTION of the record and describe the characteristics of the entire record. The next six elements, the DATA PORTION of the record, contain information about each meteorological element value, reported. This portion is repeated 31 times.

2. Each logical record is fixed with 402 characters. Each logical record contains a station's data for a specific meteorological element over a one month interval. The form of a record is:

ID PORTION (30 characters) Fixed Length

```

*****
* REC | STATION | ELEM |      |      |      |      |      | NUM >
* TYP |   ID     | TYPE | UNT | YEAR | MO  | FILL | VAL >
** *** |*****|*****|*****|*****|*****|*****|***** >
* XXX |XXXXXXXXX|XXXX  | XX  |XXXX  | XX  |XXXX  |XXX  >
*****
ELEMENTS 001 002 003 004 005 006 007 008

```

DATA PORTION (12 Characters, repeated 31 Times)

```

*****
< DY | HR | MET. ELEM | FL | FL | DY | HR | MET. ELEM >
<      |      |*****|      |      |      |      |***** >
<      |      | DATA      |      |      |      |      | DATA >
<      |      | S | VALUE    |      |      |      |      | S | VALUE >
< *** |*** |*****|*****|*****|*****|*****|***** >
< XX | XX | X / XXXXX | X | X | XX | XX | X | XXXXX >
*****
ELEMENTS 009 010 011 012 013 014 015 016 017 018

```

```

*****
< DY | HR | MET. ELEM | FL | FL *
<      |      |*****| 1 | 2 *
<      |      | DATA      |      | *
<      |      | S | VALUE    |      | *
< *** |*** |*** |*****|*****|*****
< XX | XX | X | XXXXX | X | X *
*****
ELEMENTS 189 190 191 192 193 194

```

Element Names and Definitions

RECORD TYPE

:
:

The type of data stored in this record. (Value is "DLY"). Each record contains one month of daily values.

STATION-ID

This 8-character alphanumeric station identifier is assigned by the National Climatic Data Center. The first two digits refer to a state code (value range is 01-90; reference Table "A"). The next four digits refer to the Cooperative Network Index number (value range is 0001-9999). The last two digits are the Cooperative Network Division Number (value range is 01-10; 99 = Missing Division Number; reference Table "B").

METEOROLOGICAL ELEMENT-TYPE

The type of meteorological elements stored in this record. Range of values is listed below.

DYSW

The different types of weather occurring that day (reference Table "C"; See topic 46 "Data Quality: Confidence Factors").

EVAP

Daily evaporation (not reported when temperature below freezing). Unit Measurement, Inches & Hundredths of Inches.

OT07

Temperature at 7:00 a.m. Unit Measurement, Whole Degrees Fahrenheit.

OT14

Temperature at 2:00 p.m. Unit Measurement, Whole Degrees Fahrenheit.

OT21

Temperature at 9:00 p.m. Unit Measurement, Whole Degrees Fahrenheit.

PRCP

Daily precipitation. (Precipitation reading for 24 hours ending at time of observation. Trace is less than 0.005 inch. Unit Measurement, Inches to Hundredths.

PWND

Prevailing daily wind direction. Unit Measurement, Whole Degrees.

SKYC

Daily cloudiness (clear, partly cloudy or cloudy). Clear is zero tenths coverage of the sky by clouds, partly cloudy is four tenths coverage, and cloudy is eight tenths coverage. Unit Measurement, Tenths of sky coverage.

SNOW

Daily Snowfall (Snowfall includes sleet). Amount is for 24-hour

:
:

period ending at observation time. Hail was included with snowfall from July 1948 through December 1955. Hail occurring alone was not included with either snowfall or snow depth before and after that period. Trace is less than 0.05 inch. Unit Measurement, Inches to Tenths.

SNWD

Snow depth at observation time. (Snow depth is depth of snow on the ground at time of observation. Trace is depth less than 0.5 inch.) Unit Measurement, Whole Inches.

TAVG

Daily mean temperature. Unit Measurement, Whole Degrees Fahrenheit.

TMAX

Daily maximum temperature. (Maximum temperature reading for 24 hours ending at time of observation.) Unit Measurement, Whole Degrees Fahrenheit.

TMIN

Daily minimum temperature. (Minimum temperature reading for 24 hours ending at time of observation.) Unit Measurement, Whole Degrees Fahrenheit.

TOBS

Temperature at observation time. Unit Measurement, Whole Degrees Fahrenheit.

TRNG

Daily temperature range. (Maximum temperature minus minimum temperature.) Unit Measurement, Whole Degrees Fahrenheit.

WDMV

24-hour wind movement. Unit Measurement, Whole Miles.

METEOROLOGICAL ELEMENT MEASUREMENT UNITS CODE

The units and decimal position (precision) of the data value for this record (reference Table "D").

YEAR

This is the year of the record. Range of values is 1850-current year processed.

MONTH

This is the month of the record. Range of values is 01-12 LST.

:
:

FILLER

Filler value is 9999.

NUMBER OF DATA PORTIONS THAT FOLLOW

This notes the actual number of values reported. Range of values is 01-62.

NOTE: A record may contain fewer or more data values than you might expect. A monthly record of daily values may contain as few as one data value or as many as 62 data values.

A maximum of two DATA PORTIONS are used for each day of the month so as to allow one original meteorological data value and one edited data value. The only exception at this time, is that the "days with weather" element-types (DYSW) of original data values can be reported in multiple logical records (e.g. only one original DYSW Data Portion for each day is given within a single DLY logical record. When more than two types of weather on any given day, a new DLY logical record for the same month will exist until DYSW is exhausted. At most, 62 data values may be contained in any given logical record (e.g., $30 + (62 \times 12) = 774$ characters). Thus, while a maximum of 1,230 characters has been assigned, no more than 774 characters will be used for the daily data record types.

If a particular data value was not taken or is unavailable, there is no entry for it. (For meteorological elements observed once a day, if all the daily observations of a given month are received and pass QC checks, there will be one DATA PORTION for each day. Whereas, if every value were to fail the QC, there may be two DATA PORTIONS for every day of that month.) When two DATA PORTIONS for a daily record are encountered (with the exception of DYSW), the original data values are flagged and the second DATA PORTION is the best possible replacement. (See code definitions for the Flag 2 element).

DAY OF MONTH

Contains the day of the month on which the data element was observed. Range of values is 01-31 LST.

HOOR OF OBSERVATION

This field is filled with 99 for all data since the hour of observation is generally unknown.

SIGN OF METEOROLOGICAL VALUE

The algebraic sign of the meteorological data value is given as either a blank or a minus sign (-). Blank indicates a positive value and a minus sign represents a negative value (see topic 45 "Data Quality: Known Uncorrected Problems").

VALUE OF METEOROLOGICAL ELEMENT

The actual data value is given as a five-digit integer. One major exception does exist however, for the DYSW (days with weather code) element-type values as explained in Table "C". A very small number of data values are known to have non-numeric entries.

:
:

For fixed length records only when a data value is missing, the sign of the data value is set to "-", the data value is set to "99999", flag position 1 is set to "M" and flag position 2 is blank.

Prior to September 1991, when no daily precipitation reading was taken but the amount from that day (if any) is included in a subsequent value, the data value of precipitation is set equal to "00000" and flagged with an "S" in flag position 1. In turn, the successive accumulated amount will be flagged with an "A" in flag position 1. Since September 1991, it has been a practice at NCDC to set the precipitation value to "99999" in this situation; the flagging procedure has not changed.

FLAG1

The Data Measurement FLAG (reference Table "E").

FLAG2

The Data Quality FLAG (reference Table "F").

TABLES

TABLE "A"

State-Code Table

| | |
|------------------|-------------------|
| 01 Alabama | 28 New Jersey |
| 02 Arizona | 29 New Mexico |
| 03 Arkansas | 30 New York |
| 04 California | 31 North Carolina |
| 05 Colorado | 32 North Dakota |
| 06 Connecticut | 33 Ohio |
| 07 Delaware | 34 Oklahoma |
| 08 Florida | 35 Oregon |
| 09 Georgia | 36 Pennsylvania |
| 10 Idaho | 37 Rhode Island |
| 11 Illinois | 38 South Carolina |
| 12 Indiana | 39 South Dakota |
| 13 Iowa | 40 Tennessee |
| 14 Kansas | 41 Texas |
| 15 Kentucky | 42 Utah |
| 16 Louisiana | 43 Vermont |
| 17 Maine | 44 Virginia |
| 18 Maryland | 45 Washington |
| 19 Massachusetts | 46 West Virginia |
| 20 Michigan | 47 Wisconsin |
| 21 Minnesota | 48 Wyoming |
| 22 Mississippi | 49 Not Used |
| 23 Missouri | 50 Alaska |
| 24 Montana | 51 Hawaii |
| 25 Nebraska | 66 Puerto Rico |
| 26 Nevada | 67 Virgin Islands |
| 27 New Hampshire | |

:
:

TABLE "B"

Cooperative Network Division Table

NOTE: The division number for a station may change over time.

HAWAII (STATE 51)*

| ISLAND NAME | DIVISION |
|-------------|----------|
| Kauai | 01 |
| Oahu | 02 |
| Molokai | 03 |
| Lanai | 04 |
| Maui | 05 |
| Hawaii | 06 |

*NOTE: Hawaii (State 51) division numbers were changed during the initial conversion of this file. Divisions within islands no longer exist. Division numbers now represent each island.

TABLE "C"

DYSW - Daily Occurrence of Weather Tables

POR = Period of Record.

- 00 - Day of no occurrence
- 01 - Day with smoke or haze (POR through 1963 and 1982 to Present)
- 02 - Day with fog (POR through 1963 and 1982 to Present)
- 04 - Day with drizzle (POR through 1963 and 1982 to Present)
- 05 - Day with ice pellets (sleet)
- 06 - Day with glaze
- 07 - Day with thunder
- 08 - Day with hail
- 09 - Day with dust or sand storm (POR through 1963 and 1982 to Present)
- 10 - Day with blowing snow
- 11 - Day with high wind (POR through 1963 and 1982 to Present)
- 12 - Day with tornado (POR through 1963 and 1982 to Present)
- 13 - Day with rain (1982 to Present)
- 14 - Day with snow (1982 to Present)

From 1980 forward, these two-character DYSW element-type codes are stored into the rightmost four characters of the data value portion of the meteorological element. Within the four characters used, the weather codes are entered left justified. Thus, if one type of weather occurs during a day, the data values would appear as OXX00, where XX is the appropriate weather code. If two types of weather occur, the data value will contain OXXYY, where XX is value 1 and YY is value 2. If more than two types of weather occur on the same day, they will be stored into additional "DLY" records of the element-type code "DYSW" as needed.

NOTE: Prior to 1980, each weather code for DYSW is written as a unique DATA PORTION. Only the left position (XX) of the DYSW code is used (e.g., appears

:
:

as OXX00).

TABLE "D"

Units of Measurement Table

Range of values where b = Blank:

bF Whole degrees Fahrenheit (right justified)
HI Hundredths of inches
bI Whole inches (right justified)
bM Whole miles (right justified)
NA No units applicable (nondimensional)
TI Tenths of inches
DG whole degrees
TN tenths of sky cover

TABLE "E"

Data Measurement Flag 1

A - Accumulated amount since last measurement.
B - Accumulated amount includes estimated values (since last measurement).
E - Estimated (see Table "G" for estimating method).
J - Value has been manually validated.
M - For fixed length records only.
Flag1 is "M" if the data value is missing. In this case, the sign of the meteorological value is assigned "-" and the value of the meteorological element is assigned "99999".
S - Included in a subsequent value. (data value = "00000" OR "99999").
T - Trace (data value = 00000 for a trace).
(- Expert system edited value, not validated.
) - Expert system approved edited value.
Blank - Flag not needed.

Note: The presence or absence of an "E" in Data Measurement Flag 1 is not a reliable source of indicating that a subsequent value replaces an original value. Users should examine Data Quality Flag 2 for a code "0-5" to indicate whether a replacement value follows an original value.

Flag 1 values of "S" and "A" usually occur in pairs (ie. a daily value will have Flag 1 assigned as "S" and the next daily value will have Flag 1 assigned as "A"). For some daily values these flags do not occur in pairs.

Other values occasionally appear in Data Measurement Flag 1 for which documentation is not currently available, e.g., "C" and "s".

TABLE "F"

Data Quality Flag 2

0 - Valid data element.
1 - Valid data element (from "unknown" source, pre-1982).
2 - Invalid data element (subsequent value replaces original value).

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- 3 - Invalid data element (no replacement value follows).
- 4 - Validity unknown (not checked).
- 5 - Original non-numeric data value has been replaced by its deciphered numeric value.
- A - Substituted TOBS for TMAX or TMIN
- B - Time shifted value
- C - Precipitation estimated from snowfall
- D - Transposed digits
- E - Changed units
- F - Adjusted TMAX or TMIN by a multiple of + or -10 degrees
- G - Changed algebraic sign
- H - Moved decimal point
- I - Rescaling other than F, G, or H
- J - Subjectively derived value
- K - Extracted from an accumulated value
- L - Switched TMAX and/or TMIN
- M - Switched TOBS with TMAX or TMIN
- N - Substitution of "3 nearest station mean"
- O - Switched snow and precipitation data value
- P - Added snowfall to snow depth
- Q - Switched snowfall and snow depth
- R - Precipitation not reported; estimated as "0"
- S** - Manually edited value
- T - Failed internal consistency check
- U - Failed areal consistency check
(beginning Oct. 1992)

** - Manually edited value could be derived by any of the procedures noted by Flags A-R.

*** Revision 2.01 - Data for Austin, TX, station number 410420, has been added. The period of record is February 18930201-19260630.

3. **Start Date:** Varies. Most of the earlier records date back to 1898

4. **Stop Date:** Varies. The bulk of the data ceased in 1948.

5. **Coverage:** North America

- a. Southernmost Latitude: 15° N. Latitude
- b. Northernmost Latitude: 72° N. Latitude
- c. Westernmost Longitude: 170° W. Longitude
- d. Easternmost Longitude: 60° W. Longitude

6. **How to Order Data:**

Ask NCDC's Climate Services about the cost of obtaining this data set.
 Phone: 828-271-4800
 FAX: 828-271-4876
 E-mail: NCDC.Orders@noaa.gov

7. **Archiving Data Center:**

National Climatic Data Center
 Federal Building

:
 :

151 Patton Avenue
Asheville, NC 28801-5001
Phone: (828) 271-4800.

8. Technical Contact:

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, NC 28801-5001
Phone: (828) 271-4800.

9. Known Uncorrected Problems: See Appendix B.

10. Quality Statement: Benign neglect and limited resources (monetary and personnel) all contributed to a less than optimum conditions in maintaining integrity of the data.

11. Essential Companion Datasets: TD-3200

Please see Appendix B:

<http://ww1.ncdc.noaa.gov/pub/data/documentlibrary/tddoc/td3206B.doc>

Please see Appendix C:

<http://ww1.ncdc.noaa.gov/pub/data/documentlibrary/tddoc/td3206C.doc>

Please see Appendix D:

<http://ww1.ncdc.noaa.gov/pub/data/documentlibrary/tddoc/td3206D.pdf>

12. References: France, L., 1998: Surface land daily cooperative summary of the day, TD-3200. National Climatic Data Center, Asheville, NC, 35 pp. [Available from National Climatic Data Center, Federal Building, 151 Patton Avenue, Asheville, NC 28801-5001].

Karl, T.R., Williams, C.N., Jr., Young, P. and Wendland, W.M., 1986: A model to estimate the time of observation bias associated with monthly mean maximum, minimum and mean temperatures for the United States. *J. Clim. Appl. Meteor.*, **25**, 145-160.

Kunkel, K. E., K. Andsager, G. Conner, W.L. Decker, H.J. Hillaker, Jr., P.N. Knox, F.V. Nurnberger, J.C. Rogers, K. Scheeringa, W.M. Wendland, J. Zandlo and J.R. Angel, 1998: An expanded digital daily database for climatic resources applications in the Midwestern United States. *Bull. Amer. Meteor. Soc.*, **79**, 1357-1366.

National Weather Service, 1987: Cooperative Program Management, Weather Service Operations Manual B-17 (revised), NOAA-NWS, Silver Springs, MD.

Reek, T., and M. Crowe, 1991: "Advances in Quality Control Technology at the National Climatic Data Center". Preprints of the Seventh International Conference on Interactive Information and Processing Systems for Meteorology, Oceanography and Hydrology, New Orleans, American Meteorological Society, pp. 397-403.

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:

Reek T., S.R. Doty, and T. Owen, 1991: ValHiDD Documentation and Users Guide, Internal NCDC document, 20 pp.

Reek, T., S.E. Doty and T.W. Owen, 1992: A deterministic approach to the validation of historical daily temperature and precipitation data from the cooperative network. *Bull. Amer. Meteor. Soc.*, **73**, 753-762.

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