

NWSDSS

**Hydrologic Engineering Center
National Weather Service to
Data Storage System Conversion Utility**

User's Manual

**Version 5.3
March 1995**

**Hydrologic Engineering Center
U.S. Army Corps of Engineers
609 Second Street
Davis, California 95616-4687
(916) 756-1104**

NWSDSS

Table of Contents

Chapter	Page
1. Purpose	1
2. Description	1
3. Use	2
3.1 Input Parameters	2
3.2 Program Options	3
4. Programmer Information	3

Appendices

A. Input Description	A-1
B. Sample Output	B-1
C. Sample Catalog of Stations	C-1

NWSDSS

1. Purpose

NWSDSS is a utility program which extracts precipitation and other meteorological information from National Weather Service files containing National Climatic Data Center (NCDC) formatted data, and stores the data into a Data Storage System (DSS) database file. The program can process several NCDC formats including TD-3240 and TD-9654 (hourly data) as well as TD-3200 and TD-9655 (daily data). Hourly data is stored in the regular-interval time series format; daily is stored in the irregular-interval format. The program may also be used to create a catalog of all stations encountered in the NCDC file.

2. Description

Data is extracted from NCDC formatted data files according to specifications provided by the user in an input file. The specifications include a list of stations, a list of events, and an optional list of desired weather data elements supplied by the user. The list of stations consists of station identifiers in ascending numerical order and their respective alphanumeric identifiers. The list of events contains a beginning year and month and duration in months for each event. The events are specified in chronological order. The weather data element list specifies which of the various possible elements are to be extracted.

Observation times for daily stations may optionally be specified in the input list. These times are recorded in the respective DSS records, overriding the times indicated in the NCDC file. A complete description of user specifications and their formats is presented in Appendix A.

All available weather data elements are extracted for each available event and station and the resultant DSS pathnames are reported in the program's output; stations and events not found are also reported. Sample program output is presented in Appendix B.

A list of all stations encountered in the NCDC file and the starting and ending dates of their records may be optionally cataloged in a separate file. An example of the catalog of stations is shown in Appendix C.

Precipitation amounts accumulated during periods of missing hourly data are available from files containing the TD-3240 format. When they are found during extraction, the accumulated amounts and the times and dates of the accumulation period are written to a separate file which may be used as miscellaneous precipitation input to the program PRECIP. An example of the accumulated amounts is also shown in Appendix C.

3. Use

NWSDSS is normally run as a batch job (DOS) or in a script process (UNIX). Sample executions for each operating system are shown below.

DOS:

```
NWSDSS INPUT=NWS.LST OUTPUT=NWS.OUT DSSFILE=NWS.DSS CDROM=NWS.DAT
```

UNIX:

```
#!/bin/csh
nwsdss input=nws.lst output=nws.out dssfile=nws.dss cdrom=nws.dat
```

Keywords on the command line can be abbreviated. For example, the following two lines will do the same thing:

```
NWSDSS INPUT=NWS.LST OUTPUT=NWS.OUT DSSFILE=NWS.DSS CDROM=NWS.DAT
```

```
NWSDSS I=NWS.LST O=NWS.OUT DSS=NWS.DSS CD=NWS.DAT
```

The input list is read from a file in the format shown in Appendix A. The input list is echoed in the output. Output may be displayed on the console or directed to a file.

3.1 Input Parameters

Input parameters are used to make file assignments and to specify global input variables. Default file assignments are made by the program, but substitutes may be specified by the user on the program execution line.

The parameter names and defaults are:

<u>Name</u>	<u>Default</u>	<u>Description</u>
INPUT	CON(stdin)	Input file
OUTPUT	CON(stdout)	Output file
DSSFILE	nwsdss.dss	DSS file
CDROM	'no default'	NCDC data file (must be specified)
CAT	nwsdss.cat	Catalog file
ACC	nwsdss.acc	Accumulated amounts file
A	NWSDSS	DSS pathname part A to use for output

3.2 Program Options

Program options are used to select optional program functions. They may be specified when initiating the program as follows:

```
NWSDSS -OPTIONS PARAMETERS
```

Example:

```
NWSDSS -LTD IN=NWS.LST OUT=NWS.OUT DSS=NWS.DSS CD=NWS.DAT
```

Options include:

```
L - show the contents of each data record extracted from the NCDC file  
M - show the contents of each data record containing missing data flags  
C - generate catalog (list) of all stations found in the NCDC file  
T - trace program operation  
D - debug program operation
```

4. Programmer Information

NWSDSS is written in FORTRAN and is implemented in both the DOS and UNIX environments. Use of the program presumes that the NWS data has been extracted into NCDC formatted text files from a CD-ROM or some other source of data prior to use of the NWSDSS program.

When extracting data from the CD-ROM, the user typically uses a menu-based system to select time periods, station ID's, time increment and parameter types. The selected data is then read from the CD-ROM and written to a text file using the appropriate NCDC format. This file is then used as the input data file for the NWSDSS program.

Appendix A

Input Description

Description

The input to NWS DSS identifies stations and event time windows for which data is desired. The input file must also specify the type of NCDC format used. Optional comments may be used throughout the list, and a time of observation may be specified for daily values. The input list must not exceed the maximum allowable number of stations (=250), events (=30), and hours of observation (=500).

Each type of input is provided on a separate input line and is labelled with a two-character identifier as follows:

TA	NCDC Data Format
**	Comment
ST	Station
EV	Event
ET	Weather Element Types
HO	Time of Observation

Order

Comments may appear anywhere. The NCDC data format specification must be the first non-comment record. Stations must appear in ascending order of their index numbers. Event windows must appear in ascending chronological order. Weather element types may appear anywhere. Hour of observation information must appear in ascending order of station index numbers first and then in ascending chronological order according to the effective dates of changes in hour of observations. Station, event and hour of observation information may appear in any sequence relative to each other as long as each type is in its respective order.

** Comment

<u>Field</u>	<u>Columns</u>	<u>Content</u>	<u>Description</u>
1	1 - 2	"**"	Comment identifier
2	3 - 80	a...a	Comment

TA NCDC Format

<u>Field</u>	<u>Columns</u>	<u>Content</u>	<u>Description</u>
1	1 - 2	"TA"	NCDC format information identifier
2	3 -	a...a	"TD32" - TD3200 or TD3240 format "TD9654" - TD9654 format "TD9655" - TD9655 format

ST Station

<u>Field</u>	<u>Columns</u>	<u>Content</u>	<u>Description</u>
1	1 - 2	"ST"	Identifier for station information
2	4 - 9	iiiiii	NCDC station identification number (integer)
3	10 - 41	aaa a	Alphanumeric station label to be used in DSS pathname

HO Hour of Observation¹

<u>Field</u>	<u>Columns</u>	<u>Content</u>	<u>Description</u>
1	1 - 2	"HO"	Identifier for hour of observation information
2	4 - 9	iiiiii	NCDC station identification number (integer)
3	11 - 12	ii	Hour of observation, 24 hour clock (integer) if zero, hour of observation in NCDC file is used
4	14 - 17	iiii	Year observation time began (integer)
5	19 - 20	ii	Month observation time began (integer)
6	22 - 23	ii	Day observation time began (integer)

EV Event Window

<u>Field</u>	<u>Columns</u>	<u>Content</u>	<u>Description</u>
1	1 - 2	"EV"	Identifier for event window information
2	4 - 7	iiii	Beginning year of event (integer)
3	9 - 10	ii	Beginning month of event (integer)
4	12 - 13	ii	Length of event in months (integer)

¹Optional, for daily data only, and for observation times prior to December, 1981. Later observation times are considered reliable and, therefore, override HO specifications.

ET Element Type¹

<u>Field</u>	<u>Columns</u>	<u>Content</u>	<u>Description</u>
	1 - 2	"ET"	Identifier for element type information
2	3 -	aaaa aaaa	Weather element codes, separated by commas or blanks ²
			PRCP - Precipitation
			DYSW - Weather occurrence
			EVAP - Evaporation
			MNPN - Minimum precipitation
			MXPN - Maximum precipitation
			SNOW - Snowfall
			SNWD - Snow depth
			TMAX - Maximum temperature
			TMIN - Minimum temperature
			WDMV - Wind movement
			WTEQ - Snow water equivalent

¹Optional. Applies only to daily data. Default is PRCP (precipitation).

²The following are equivalent:

ET SNOW SNWD TMAX TMIN

and

ET SNOW
ET SNWD
ET TMAX
ET TMIN

Example

The following is an example of an input data set:

```
TA TD32
**
** Example Input Data
**
ST 180015 Station #1
ST 468536 Station #2
ST 490000 Station #3
EV 1932 03 02
EV 1948 08 03
EV 1955 01 03
EV 1984 10 03
HO 468536 15 1940 01 04
HO 468536 16 1948 09 06
HO 468536 07 1955 06 01
ET PRCP TMAX TMIN
```

In this example, daily precipitation and temperature minimums and maximums are to be extracted from a file in the TD3200 format for three stations and four events. The first event occurred in March and April 1932. An observation time is specified for station 468536 for three different periods; observation times for the other stations and prior to January 4, 1940 at station 468536 will be the time reported in the NCDC file.

Appendix B

Sample Output

N W S D S S VERSION 5.3.0 SEPTEMBER 1, 1994

15SEP94 10:15:01

INPUT DATA

1 TA TD9654
2 ST 361100 STATION # 1
3 ST 367851 STATION # 2
4 ST 369999 STATION # 3
5 EV 1932 07 02
6 EV 1969 01 01
7 EV 1969 08 01
8 EV 1970 07 02
9 EV 1971 01 03
10 EV 1977 10 01

-----DSS---ZOPEN NEW FILE OPENED 71 NWS DSS.DSS 42
TAPFMT = TD9654 FREQ = HOURLY
STATION # 1 NOT ON TAPE
MONTH 7 YEAR 1932 NOT AVAILABLE AT STATION # 2
MONTH 8 YEAR 1932 NOT AVAILABLE AT STATION # 2
MONTH 1 YEAR 1969 NOT AVAILABLE AT STATION # 2
-----DSS---ZWRITE FILE 71, VERS. 1 /NWS DSS/STATION #2/PRECIP-ING/
01AUG1969/1HOUR/OBS/
-----DSS---ZWRITE FILE 71, VERS. 1 /NWS DSS/STATION #2/PRECIP-INC/
01JUL1970/1HOUR/OBS/
-----DSS---ZWRITE FILE 71, VERS. 1 /NWS DSS/STATION #2/PRECIP-INC/
01AUG1970/1HOUR/OBS/
-----DSS---ZWRITE FILE 71, VERS. 1 /NWS DSS/STATION #2/PRECIP-INC/
01JAN1971/1HOUR/OBS/
-----DSS---ZWRITE FILE 71, VERS. 1 /NWS DSS/STATION #2/PRECIP-INC/
01FEB1971/1HOUR/OBS/
-----DSS---ZWRITE FILE 71, VERS. 1 /NWS DSS/STATION #2/PRECIP-INC/
01MAR1971/1HOUR/OBS/
MONTH 10 YEAR 1977 NOT AVAILABLE AT STATION # 2
END OF TAPE ENCOUNTERED
STATION # 3 NOT ON TAPE
END OF JOB
-----DSS---ZCLOSE FILE 71
 NO. RECORDS= 6
 FILE SIZE= 9700 WORDS, 87 SECTORS
 PERCENT INACTIVE= 0.00

Appendix C

Sample Catalog of Stations

T A P E C A T A L O G

STATION	FROM		TO		EVENT TYPE
	YR	MO	YR	MO	
367847	1948	11	1948	11	PRCP SNOW SNWD
367851	1969	7	1973	12	PRCP SNOW SNWD TMAX TMIN DYSW
367855	1948	5	1956	3	PRCP TOBS DYSW

Sample Accumulated Amounts

ACCUMULATED PRECIPITATION

STA	LAT	LON	AMT	DUR	DATE	TIME
			IN	HR		
150031	LAT	LON	000.35	11	31JAN49	0800
150031	LAT	LON	000.57	10	13JAN51	1000
150031	LAT	LON	000.55	21	13MAR51	1100
150031	LAT	LON	000.48	12	27OCT53	0600