

SWS Contract Report 434

**NORTH
CENTRAL
REGIONAL
CLIMATE
CENTER
NCRCC**

**CLIMATE DATA AND INFORMATION INVENTORY
OF THE NORTH CENTRAL UNITED STATES
MANAGED BY THE
NORTH CENTRAL REGIONAL CLIMATE CENTER**

*by
Wayne M. Wend/and, John L Vogel & Stanley A. Changnon, Jr.
Illinois State Water Survey
Champaign IL 61820*

**Contract No. COMMNA-81-AAD00112
from the National Climate Program Office
Washington DC**

**Champaign, Illinois
November 1987**

CLIMATE DATA AND INFORMATION INVENTORY

OF THE NORTH CENTRAL UNITED STATES

managed by

THE NORTH CENTRAL REGIONAL CLIMATE CENTER

by

Wayne M. Wendland, John L. Vogel and Stanley A. Changnon, Jr.

Illinois State Water Survey

Champaign IL 61820

Contract # COMMNA-81-AAD00112

from the National Climate Program Office

Report to the National Environmental Data Referral Service
of the National Environmental Satellite, Data, and Information Service

November 1987

1. Introduction

During the final year of its 5-year demonstration phase, the North Central Regional Climate Center (located at the Illinois State Water *Survey*) enlisted the aid of State Climatologists in the 12 state region, to complete a regional data survey of weather and climate observations. The objectives were to gather, catalog, and make a listing of names and addresses of private and public agencies and individuals who have taken, and/or are taking routine observations of atmospheric parameters which may not be known to the general public. This project was funded by the National Environmental Satellite, Data, and Information Service (NESDIS), for inclusion in the National Environmental Data Referral Service (NEDRES). The purpose is to develop a clearinghouse of environmental data and information to enable persons or agencies to easily identify sources of such past and current information.

Many energy-related organizations and companies, some governmental agencies, a few universities, conservation groups, individuals interested in weather, and other agencies routinely make and record observations of weather and related elements. Many of these records are retained by the data-collection agency for their own use, and these data are not distributed. In many instances, the existence of these data is not known to others outside the collection agency.

Unless the data are collected for proprietary use, these data-collection agencies are often willing to share their data and information. However, potential data users may not be aware of the data records available. The objective of the NEDRES is to serve as a clearinghouse to those individuals and agencies interested in acquiring

environmental data and information, but not acquainted with many/all the sources of such materials.

NEDRES intends to maintain and update a nationwide file of environmental data and information which are available to interested parties. Potential users of such data and information need only inquire through the NEDRES data base concerning the availability of certain environmental information within a given area and period. NEDRES' files contain the names and addresses of data-collecting agencies, but not the data themselves. Thus, inquiries to NEDRES will be answered with a list of potential data sources, not data themselves. Acquisition of the data themselves must then be coordinated between the inquiring person or agency, and the agency/person that originally recorded the data.

NEDRES contacted the North Central Regional Climate Center (NCRCC) to determine if a survey could be completed for the 12 states of the North Central Region. NCRCC agreed to manage such a survey for NEDRES, and worked with State Climatologists to perform the survey from September 1985 to November 1987.

2. Tasks

Prior to the survey, NCRCC staff met with the State Climatologists (SCs) from each of the 12 states of the North Central Region (North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa, Missouri, Wisconsin, Illinois, Michigan, Indiana, and Ohio) to determine if they were interested in completing the survey in their states. The State Climatologists of all these states except Minnesota opted to participate in the survey. Personnel of the North Central Regional Climate Center

surveyed Minnesota, with assistance from Prof. Donald Baker of the Dept. of Soils, University of Minnesota-Minneapolis. Each of the participating SCs, listed in Table 1, was briefed on the project and instructed as to potential sources for information, as well as the coding and use of the survey summary routine provided on computer disc by NCRCC personnel.

In addition to an explanation of the objectives of the survey, each State Climatologist was provided (1) a list with possible persons or agencies in each state who might be expected to record weather, climate, and environmental data (see Table 2); (2) a form letter which could be used as a basis for the initial communication to potential data recorders (Fig. 1); (3) a form (which was to be distributed to all participants) on which particular information of their environmental data set could be listed (Fig. 2); and (4) a floppy disc containing a program to accept and record each of the completed survey entries.

Using the format of a previous data survey for western states (directed by Dr. Myron Mulnau, Idaho SC), we developed the letters and the response forms to be used by the participating SCs. The SCs also received about \$2,000 each to cover costs of mailing, telephone, and additional secretarial services. The actual amount of funds varied slightly depending upon how the transfer was accomplished and upon local overhead cost differences.

To accommodate the vast amount of expected material received from the survey, NCRCC staff wrote an interactive program (Appendix A) for an IBM PC which queried responses for each of the entries required by NEDRES (name, address, parameters measured, period of record, instrument

Table 1. Responsible persons Who completed the survey in each of the states of the region.

Illinois	John L. Vogel, NCRCC co-PI
Indiana	James E. Newman, SC
Iowa	Paul Waite, SC
Kansas	L. Dean Bark
Michigan	Fred V. Nurnberger, SC
Minnesota	Wayne M. Wendland, NCRCC Director
Missouri	Wayne Decker, SC
Nebraska	Kenneth G. Hubbard, SC
North Dakota	John W. Enz, SC
Ohio	Jeffrey Rogers, co-SC
South Dakota	William Lytle, SC
Wisconsin	Douglas R. Clark, SC

Table 2. Persons or agencies who may be expected to measure and collect environmental data.

Federal forests located in the state

State forests, conservation areas and recreation areas

State Departments of Conservation, Energy, and Natural
Resources

State Police and Highway Patrol offices

Meteorology, Atmospheric Science and Geography Depts. of
Colleges and Universities

Television stations

Power companies

Municipal water and sanitary treatment plants

Federal and state Environmental Protection Agency offices

National Weather Service Offices

National Weather Service Cooperative observers, to inquire
as to whether they knew of individuals or
agencies who routinely measured environmental
parameters

Fig. 1. Letter to initiate contact with potential environmental data recorders in Minnesota. Text of letter provided to serve as exchange to all SCs.

October 29, 1986

Subject: Compiling an inventory of Environmental (Climate and Water) Data Bases from Minnesota for the National Weather Service

We are serving as the agent for the National Environmental Data Referral Service (NEDRES), a division of the National Oceanic and Atmospheric Administration (NOAA), to gather information about (but not the data themselves) of environmental data that have been, or are being collected in Minnesota. This letter specifically is to inquire as to whether you make routine weather observations, or whether you know of someone who does. If the latter, would you please either forward this letter to her/him, or send us their name so that we may contact them directly.

Specifically, we want to identify the existence, location, characteristics and availability of weather, climate and other environmental data from Minnesota, data that have been acquired for some time and with regularity. Descriptive information concerning the observations either made by you, or of which you know, will be placed into a centralized computer bank in Washington (specifically located in the NEDRES office) to which you, other individuals, companies and other private and public agencies may inquire as to the existence of, and the availability of such data. NEDRES will not collect the actual data themselves, but only a description of the data, e.g., which parameters were/are being measured, location of the site(s), period of observations etc. When this data bank becomes fully operational, one will be able to inquire as to the availability of 1 or more parameters from a certain location and for a specific time period, merely by phoning NEDRES from a terminal equipped with a modem.

I write to you to inquire whether you make such observations yourself, or whether you know of others who routinely have, or are making weather observations, who we may contact for more information. If you have such information, or if you know of someone who does, we request that the attached form be completed and returned to us. We will supply the information from the form to NEDRES, who will place it in their referral service data bank, from which inquiries may be made. Please understand that if and when inquiries for data are received, the holder of the data may permit or refuse the request, permit a partial fulfillment of the request, and may change for the service (these choices will be made by the holder of the data).

Will you please return completed forms to me by 31 October 1986. If you know of others whom I might contact, please list their names and addresses on the forms as well. Thank you very much for your consideration.

Sincerely,

Wayne M. Wendland, Director
North Central Regional Climate Center
Illinois State Water Survey
217-333-0729

End.

Fig. 2. Form distributed to all environmental data recorders to obtain descriptors needed for inclusion in NEDRES data file.

Atmospheric Data Survey

Name _____ Address _____ Phone Number ____/____-_____

Name of Data Set _____ Station or Network Name _____ Number of Stations _____ Or send a map _____ Counties _____

Latitude _____ Longitude _____ (if known)

Why are these data collected? _____

Parameter	Frequency				Instrument Brand/Model	Records			Height Above Ground	Date Begin	Date End
	Continuous	Hourly	Daily	Other		Magnetic Tape	Charts	Hand			
<u>Precipitation</u>											
Total											
Hourly											
Daily											
Weekly											
Other											
<u>Temperature</u>											
Air											
Soil											
<u>Wind</u>											
Speed											
Direction											
<u>Moisture</u>											
Humidity											
Dew Point											
<u>Solar Radiation</u>											
Total											
Net											
Diffuse											
<u>Pressure</u>											
<u>Air Quality (please specify)</u>											

Have your instruments been calibrated since installation? Yes ___ No ___; if yes how often and by whom? _____

Where are these climate records located (Name and Address of person, place, or organization) _____

Would you be willing to share these data with others? If so, would there be any charges or restrictions attached to their usage? _____

If you have any questions, contact John Vogel (217/333-4261); 2204 Griffith Dr., Champaign, IL 61820

type, etc). This program was duplicated and distributed to all participating SCs. The program listed each item for which a response was necessary (required or optional), presented an example, and accepted the typed entry into memory. After all entries were typed onto the disc, it was returned to NCRCC for review. The responses from all states were rewritten onto master discs, which were submitted to NEDRES for entry into the clearinghouse database.

3. Results of the Survey

Each of the SCs mailed from 200 to more than 1,000 letters (average of about 350 per state) to prospective in-state respondents. The initial letters were followed by phone calls, particularly if the person/agency was strongly suspected of recording data but no response to the first letter was received. The actual number of responses varied substantially from state to state. The number of observing sites reported in each of the states is given in Table 3. Those states which reported more than about 100 sites included 1, 2 or 3 relatively large networks within their states which were organized for some specific purpose. For example, North Dakota operates a raingage network to monitor the impact of potential weather modification which includes more than 900 observers; Kansas reported 2 relatively large networks (a total of 219 observers) organized to monitor ground water discharge and water management programs; and Minnesota operates a raingage network (primarily in summer) including several hundred observers.

Table 3. Number of sites reported from each of the states within the North Central Region.

Illinois	60 plus 2 TV raingage networks of ca. 30 each
Indiana	67
Iowa	43
Kansas	269
Michigan	387
Minnesota	659
Missouri	24
Nebraska	50
North Dakota	961 plus power company network of unknown number of observers
Ohio	197
South Dakota	271
Wisconsin	73

TOTAL: more than 2,161

4. Conclusions

Results in most states indicated that telephone follow-up to the written form-letter inquiries greatly enhanced the responses for the survey. Although this component increased the time commitment to the project and the total cost, the additional procedure was very beneficial to the success of the survey.

The software developed within the NCRCC for the proper formatting of data entries was particularly beneficial to this project. We recommend that it be implemented in other similar surveys. It provided a routine technique to systematically order entries from many states, written by many individuals into a common format, acceptable to the principal agency, NEDRES.

The great variability in the number of responses from state to state was undoubtedly the result of the State Climatologists' familiarity with the states' climatic resources, the zeal with which the surveys were conducted, and the population of participating states, particularly that with environment-related businesses.

As with most cooperative ventures, the survey required more time than originally perceived. Personnel changes in the various State Climate Centers, along with computer changes and malfunctions slowed responses from the states. However, the assistance of the State Climatologists was a great benefit to the study. From previous phone, correspondence, and other contacts, they are best acquainted with the operators of networks and observation sites. In addition, conducting the survey gave the State Climatologists a better understanding of the availability of weather/climatic data within their state.

5. Acknowledgements

We are grateful to the State Climatologists and others of the region who participated in this survey (listed in Table 1). Their knowledge of the climatological community in each of their states and their time and commitment gave this survey the breadth required for success. Myron Mulnau (Idaho SC) provided copies of the communications he used in the NEDRES survey for the western states. James Angel, NCRCC staff member, wrote the program which prompted the typist for each specific entry for the NEDRES survey. The program gives an example of the format and the information content on the screen for the typist to follow, also indicating whether each entry was mandatory or for information only. This program is available on IBM-PC compatible disc from the authors of this report.

Appendix A: Interactive FORTRAN program developed to query typist
for all possible entries to describe NEDRES data file.

```
character fname*64, answer*4, answr1*50, answr2*54
character answr3*61, answr4*56, answr5*66
write(*,1)
1 format(/' WARNING: Use a different filename for each run!',/)
write(*,'(a\)' ) ' Output file name? '
read(*,'(a)' ) fname
open (unit=14, file=fname, status='new',
*access='sequential')
C
C   INTRODUCTION
C
C   call intro
C
C   TITLE
C
C   5 write(*,10)
10 format(/' Enter the dataset title. (Mandatory)',
1//' Maximum length: 240 characters.',
2/' Capitalize first word and proper nouns only.',
3/' If title is very general, add site location.',
4//' EXAMPLE: ..TI-Daily climatological data -- Stamford,',
5' Connecticut.',
6//' ATTENTION: The first 5 characters to type are "..TI-" '/')
C
C   call readit(3)
C
C   ABSTRACT
C
C   call space
35 write(*,37)
37 format(/' Enter the abstract. (Mandatory)',
1//' Maximum length: 10,000 characters.',
2/' Do not use a period after abbreviations. Example: St Louis.
3/' Acronyms: spell out the meaning first.'
4/' If the abstract is more that one paragraph use the left',
5/' square bracket to denote end of each paragraph ([])',
6/' See manual for content and purpose.',
7//' ATTENTION: The first 5 characters to type are "..AB-" '/')
C
C   call readit(125)
C
C   COLLECTION
C
C   call space
55 write(*,57)
57 format(/' Enter the data collection description. (Optional)',
1//' Maximum length: 1600 characters per subfield.',
2/' The six subfields are:',
3/'     Observing station type: site of instrumentation',
4/'     Observing station name: self-explanatory',
5/12x,' Instrumentation: if one or more common instruments are',
6/15x,' used, enter it in parameter list later',
7/10x,' Data collection: point, trackline, network, etc.',
8/'     Number of site: self-explanatory',
```

```

9/'      Number of observations:  if known ')
  write(*,60)
60 format('/' You will be prompted for the six subfields',
1/' Observing station type is site of instruments, e.g. ship,',
2/' land, satellite, island, etc.',
3///' ..DC-Observing station type:  ',\))
  read(*,'(a50)') answr1
c
  write(14,'(30a,a50)') '..DC-Observing station type:  ',answr1
  if (answr1.eq.' ') goto 61
  call readit(19)
c
61 write(*,62)
62 format(///' Observing station name:  ',\))
  read(*,'(a54)') answr2
  write(14,'(26a,a54)') 'Observing station name:  ',answr2
  if (answr2.eq.' ') goto 63
  call readit(19)
c
63 write(*,64)
64 format(///' Instrumentation  (if many common inst. enter into',
1/' parameter list later; otherwise enter name & function of,
2/' instrumentation.)',
3///' Instrumentation:  ',\))
  read(*,'(a61)') answr3
  write(14,'(19a,61a)') 'Instrumentation:  ',answr3
  if (answr3.eq.' ') goto 65
  call readit(19)
c
65 write(*,66)
66 format(///' Data collection type,  e.g., point, network, etc.',
1///' Data collection type:  ',\))
  read(*,'(a56)') answr4
  write(14,'(24a,a56)') 'Data collection type:  ',answr4
  if (answr4.eq.' ') goto 67
  call readit(19)
c
67 write(*,68)
68 format(///' Number of sites:  ',\))
  read(*,'(a61)') answr3
  write(14,'(19a,a61)') 'Number of sites:  ',answr3
  if (answr3.eq.' ') goto 69
  call readit(19)
c
69 write(*,70)
70 format(///' Number of observations:  ',\))
  read(*,'(a54)') answr2
  write(14,'(26a,a54)') 'Number of observations:  ',answr2
  if (answr2.eq.' ') goto 82
  call readit(19)
c
c      DATA CENTER
c
82 call space

```

```

      write(*,84)
84 format(/' Enter data processing description.  (Optional)',
1//' Maximum length:  960 characters per subfield.'
2//' There are two subfields:',
3/5x,' Quality control:  instrument calibration, error checking.',
4/5x,'      Processing:  conversion, formatting, merging, etc.',
5//' ..DD-Quality control:  ',\ )
      read(*,'(a56)') answr4
c
      write(14,'(24a,a56)') '..DD-Quality control:  ',answr4
      if (answr4.eq.' ') goto 87
      call readit(11)
c

87 write(*,88)
88 format(/' Processing:  ',\ )
      read(*,'(a66)') answr5
      write(14,'(14a,a66)') 'Processing:  ',answr5
      if (answr5.eq.' ') goto 89
      call readit(11)
c
c   PERIOD OF RECORD
c

89 call space
      write(*,90)
90 format(/' Enter the period of record.  (Mandatory)',
1//' Maximum length:  29 characters.',
2/' Earliest date first, separated by a ";" and a space.',
3/' Latest date, or "to present" followed by a period.',
4//' EXAMPLES:  ..PE-1976 04 00 00; 1978 01 00 00.',
5/'      ..PE-1970 01 01 00; to present.',
6//' The 01 01 00 in the example are month day hour',
7/' If these are unknown, enter 00.',
8//' ATTENTION: The first 5 characters to type are "..PE-" '/')
c
      call readit(1)
c
c   LENGTH OF RECORD
c

      call space
      write(*,100)
100 format(/' Enter the length of record.  (Mandatory)',
1//' Maximum length:  1600 characters.',
2/' If no info is available type "not applicable" ',
3/' Number of years of data available in the form "xxx years." ',
4/' and can be followed by free text to indicate lapses in data. ',
5//' EXAMPLE:  ..LR-2 years.  No data collected between May and',
6' July.',
7//' Fractions of years are typed "2 years, 6 months." ',
8//' ATTENTION: The first 5 characters to type are "..LR-" '/')
c
      call readit(20)

```



```

C
C   GEOGRAPHIC PLACE
C
    call space
109 write(*,110)
110 format(/' Enter geographic place names.  (Mandatory)',
    1//' Maximum length: 800 characters.',
    2/' Capitalize first word in sentence and all proper names.',
    3/' Refer to manual for more information about style.',
    4//' EXAMPLE:  ..GE-Global ocean.  North America, USA.',
    5//' Each sentence which contains land or water area listed',
    6/' by decreasing area size beginning with the largest area',
    7/' and ending with the smallest area should start a new line.',
    8//' ATTENTION: The first 5 characters to type are "..GE-" '/')

C
    call readit(10)

C
C   GEOGRAPHIC CODE
C
    call space
119 write(*,120)
120 format(/' Enter geographic code.  (Optional)',
    1//' Maximum length: 800 characters.',
    2/' This paragraph contains a variety of codes',
    3/' for geographical locations.  Refer to the manual.',
    4//' ATTENTION: The first 5 characters to type are "..GC-" '/')

C
    call readit(10)

C
C   GRID LOCATORS
C
    call space
129 write(*,130)
130 format(/' Enter grid locators.  (Optional)',
    1//' Maximum length: 1400 characters.',
    2/' Latitude descriptor start with N or S and have 6 digits.',
    3/' Longitude descriptor start with W or E and have 7 digits.',
    4/' If minutes and seconds are not known enter zeroes.',
    5//' By entering the coordinates of the point with the lowest',
    6/' latitude and longitude and the point with the highest',
    7/' latitude and longitude, a rectangle with two sides parallel',
    8/' to the Equator is described.',
    9//' EXAMPLE:  ..GL-N453000 W0750000; N480000 W0773025.')
    write(*,132)
132 format(//,
    1' ATTENTION: The first 5 characters to type are "..GL-" '/')

C
    call readit(17)

C
C   PARAMETER MATRIX
C
    call space
    write(*,134)
134 format(/' Enter the parameters used.  (Mandatory)',

```

```

1//' Maximum length: 10000 characters.'
2/' This entry describes the parameter being measured. ',
3' Free style format.',/. ' One parameter per sentence. Please ',
4' include the following: ',
5//' 1. The parameter measured: "maximum temperature", ',
6'"precipitation" ',/,' 2. Type of instrument used:',
7' "glass mercury thermometer"',
8/' 3. Units and the degree of precision: "inches to',
9' the nearest tenth"')
C
write(*,136)
136 format(' 4. Frequency of observation: "once a day", ',
1/34x,'"twice a day at 0700 and 1700 CST"',
2/' 5. Any brief description and/or comments as appropriate',
3//' EXAMPLE: ..PA-Precipitation was collected in an 8 inch ',
4/11x,'raingage and is measured once a day using a graduated ',
5/' stick to the nearest hundredth of an inch.',
4//' ATTENTION: The first 5 characters to type are "..PA-" '/')
C
call readit(125)
C
PARAMETER TABLE
C
DESCRIPTORS
C
CONTACT ADDRESS
C
call space
139 write(*,140)
140 format('/' Enter the contact address. (Mandatory)',
1//' Maximum length: 10,000 characters.',
2/' This paragraph contains name and complete address of,
3/' contact who will supply copies of the dataset.',
4/' Always include the country in the address.',
5/' Period at the end of each line, never after initials in name')
write(*,142)
142 format('//' EXAMPLE: ..CO-James C Sadler. 809-948-7577. ',
1'Department of ',
2/10x,' Meteorology. University of Hawaii. Honolulu, HI 96822.',
4/10x,' USA.',
3//' ATTENTION: The first 5 characters to type are "..CO-" '/')
C
call readit(125)
C
AVAILABILITY CONDITIONS
C
call space
149 write(*,150)
150 format('/' Enter the conditions of availability. (Mandatory)',
1//' Maximum length: 480 characters.',
2/' Describes the volume of data and the available media in',
3/' terms of what is available from the contact given above',

```

```

4/' rather than the collector of the original data.',
5//' EXAMPLE: ..AV-Two magnetic tapes available as data file',
6/'          TD-9644. Copies of the data are available on ',
7/'          various media at the cost of reproduction',
8//' ATTENTION: The first 5 characters to type are "..AV-" '/')
c
    call readit(6)
c
c    PRINCIPAL INVESTIGATORS
c
    call space
159 write(*,160)
160 format('/' Enter the principal investigators. (Optional)',
1/' Maximum length: 240 characters.',
2/' This paragraph contains the names of the principal',
3/' investigator(s) of projects or programs.',
4/' Initials have periods following them. The final name',
5/' in a series is followed by a period.',
6//' EXAMPLE: ..PI-Smith, Donald R.; Jones, J. Richard.'
6//' ATTENTION: The first 5 characters to type are "..PI-" '/')
c
    call readit(3)
c
c    PROCESSING/COLLECTING
c
    call space
169 write(*,170)
170 format(/,
1' Enter the processing/collecting organization. (Optional)',
2//' Maximum length: 10,000 characters.',
3/' If an organization other than the contact was instrumental',
4/' in the data collection or processing, the information is',
5/' entered here.',
6//' ATTENTION: The first 5 characters to type are "..P0-" '/')
c
    call readit(125)
c
c    PROGRAM SPONSOR
c
    call space
179 write(*,180)
180 format(/,
1' Enter program sponsor, contract, project or experiment name.',
2' (Optional)',
3//' Maximum length: 480 characters.',
4/' The name is listed with a period at the end, followed',
5/' by the acronym, if necessary.',
6//' EXAMPLE: ..PR-Enviromental Protection Agency. EPA.',
7//' ATTENTION: The first 5 characters to type are "..PR-" '/')
c
    call readit(8)
c
c    PUBLICATIONS
c

```

```

    call space
189 write(*,190)
190 format(/' Enter publications. (Optional)',
    1/' Maximum length: 9,000 characters.',
    2/' Provides for reference to articles or reports which ',
    3/' are the source of data sets and to useful documentation',
    4/' such as manuals, descriptions, detailed inventories, or',
    5/' significant publications that result from analyses or',
    6/' applications of the data.',
    7/' ATTENTION: The first 5 characters to type are "..PU-" '/')
c
    call readit(112)
c
    CATEGORY CODES
    call space
    write(*,200)
200 format(/' Enter category codes. (Mandatory)',
    1/' There are 3 types of categories. 1st is subject specific',
    2/' and classifies by general disciplines. The 2nd identifies',
    3/' record types. And the 3rd category is a corporate source',
    4/' code. Please refer to the manual for guidelines and codes.',
    5/' On punctuation, if several code members are used for subject',
    6/' and record type, separate them with commas. Between code',
    7/' types, use a semicolon.',
    8/' Capitalize all letters in corporate source codes.',
    9/' Example: ..CC-11; 1; US-USDCOM-NTIS.')
    write(*,210)
210 format(/,
    1' ATTENTION: The first 5 characters to type are "..CC-" '/')
    call readit(2)
c
c
    CROSSROADS
c
    write(14,220)
220 format('*****')
    write(*,'(//)')
    write(*,'(a)') ' If you do not have another station to enter'
    write(*,'(a)') ' type "stop"; otherwise, hit return or enter'
    write(*,'(//)')
    read(*,'(a)') answer
    if (answer.ne.'stop'.and.answer.ne.'STOP') goto 5
2001 format(a80)
    close (14)
    stop
    end
c -----
    subroutine intro
    write(*,10)
10 format(/' This program creates a file in a form acceptable for',
    1/' the NEDRES historical data base.',
    2/' When you are finished with an entry hit return after the',
    3/' last line of the entry. Note the limit of 80 characters per',
    4/' line. End each entry with a period. If a mistake is made',
    5/' in the current line, backspace and correct. If a mistake is',

```

