

PRODUCTS AND SERVICES GUIDE



NATIONAL CLIMATIC DATA CENTER

ASHEVILLE, NC

January 1997

NCDC's HomePage at <http://www.ncdc.noaa.gov> provides frequent updates to this guide.

A message from the Director, National Climatic Data Center

The National Climatic Data Center offers a wide range of products and services. Our users range from large engineering firms designing the latest in safe energy efficient structures, to the attorney documenting a weather event, to the individual planning for a retirement move.

Services offered include data resource consultations, subscription items and publications, copies of original records, certifications, generation of specialized climate studies, and a host of other climate-related activities. Services are delivered on a variety of media including on-line access, CD-ROMs, magnetic tape, floppy disks, computer tabulations, maps, and publications.

I hope you find our Products and Services Guide helpful. Suggestions of ways that this guide could better meet your needs are always appreciated. You may contact either Tom Ross at 704-271-4994, ext 181 (e-mail: tross@ncdc.noaa.gov) or Neal Lott at ext 182 (e-mail nlott@ncdc.noaa.gov) should you wish to offer comments or suggestions.

Kenneth D. Hadeen
Director

About the National Climatic Data Center

The National Oceanic and Atmospheric Administration (NOAA) Data Centers (of which NCDC is the largest) are world-class centers that provide long-term preservation, management, and ready accessibility to environmental data. The combined archive includes records taken even before Ben Franklin's weather observations and continues with the latest real-time satellite imagery. The Centers are part of the National Environmental Satellite, Data and Information Service (NESDIS). The NCDC is located in Asheville, NC .

NCDC Mission Statement

NCDC's mission is to manage the Nation's resource of global climatological in situ and remotely sensed data and information to promote global environmental stewardship; to describe, monitor and assess the climate; and to support efforts to predict changes in the Earth's environment. This effort requires the acquisition, quality control, processing, summarization, dissemination, and preservation of a vast array of climatological data generated by the national and international meteorological services.

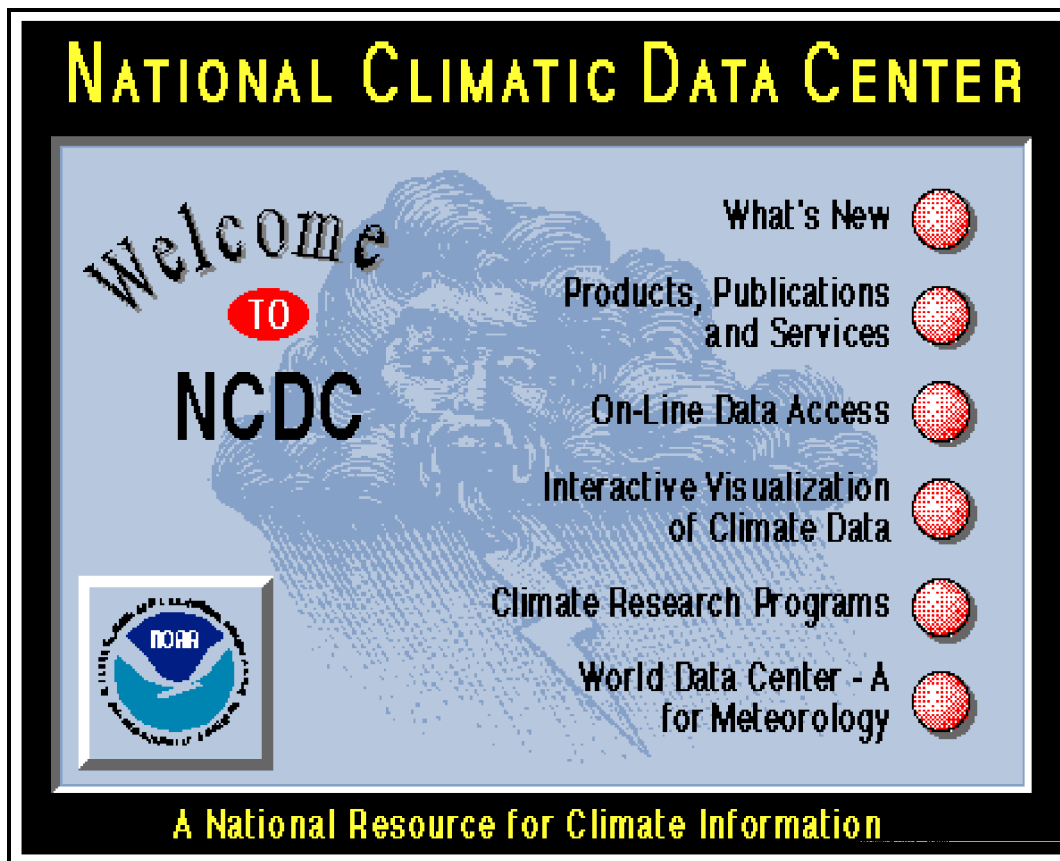
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ON-LINE SYSTEMS

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WORLD WIDE WEB HOMEPAGE SERVICE



ADDRESS: <http://www.ncdc.noaa.gov>

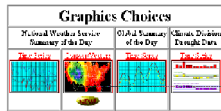
The National Climatic Data Center (NCDC) maintains an Internet World Wide Web (WWW) homepage service. This service is accessible through numerous Internet 'browsers,' such as Mosaic. Many of the datasets and products available via WWW are listed below. Unless otherwise stated, the dataset/product is available through the 'On Line Data Access' icon on the NCDC Homepage.

- ▶ **National Weather Service Summary of Day Data** for beginning of digital record (approximately 1948) through the most recent available for the current year.
- ▶ **Global Summary of Day Data** for January 1994 through the most recent available

(approximately 1 month after end of 'data month') for current year. See page 20 for additional details.

- ▶ **U.S. Cooperative and National Weather Service Monthly Precipitation Data** for full period of digital record through latest complete year. See page 21 for additional details.
 - ▶ **Numerous Data Inventories** for surface, upper-air, cooperative, NEXRAD, and other datasets. See page 16 for additional details.
 - ▶ **World War II Era Summary of Day** data for 162 overseas locations.
 - ▶ **U.S. climate divisional data** (precipitation, temperature, and drought index, by month) from 1895 to present.
 - ▶ **A Subset of the Comprehensive Ocean-Atmosphere Dataset** (ocean-based data), a highly quality-controlled, long-term marine dataset.
 - ▶ **The Global Climate Perspectives System** which provides for graphical display of global long-term data.
 - ▶ **The Global Historical Climatology Network Dataset** , a long-term series of worldwide monthly climatic data.
 - ▶ **The U.S. Historical Climatology Network Dataset** , a long-term series of U.S. monthly climatic data.
 - ▶ **The Satellite Active Archive** , a browse/inventory system for satellite data. See page 10 for additional details.
 - ▶ **Special Sensor Microwave Imager (SSM/I)** data derived from the Defense Meteorological Satellite Program (DMSP) satellites.
 - ▶ **Climate Visualization (CLIMVIS)** graphical display software for viewing long-term time series (bar graphs) of National Weather Service summary of day data and U.S. climate divisional data, along with recent time series of Global summary of day data. Also has map-contouring capability for U.S. data. See page 7 for additional details.
 - ▶ **Publications** such as: *Products and Services Guide* , the *Climate Variations Bulletin* , and *Technical Reports* on major weather events (e.g., Hurricane Opal). Located under 'Products, Publications, and Services' icon.
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CLIMATE VISUALIZATION (CLIMVIS)



CLIMVIS allows users to graphically display global daily data in monthly or longer data plots, create daily contour maps of the U.S. for the past 50 years, and download data values (e.g., daily maximum/minimum temperature) to a local file. The system guides the user interactively via a map and other instructions through data selection by country, state, and/or individual station(s). It creates GIF images which can then be downloaded for local use along with data files of the values used in creating the image.

Available Datasets:

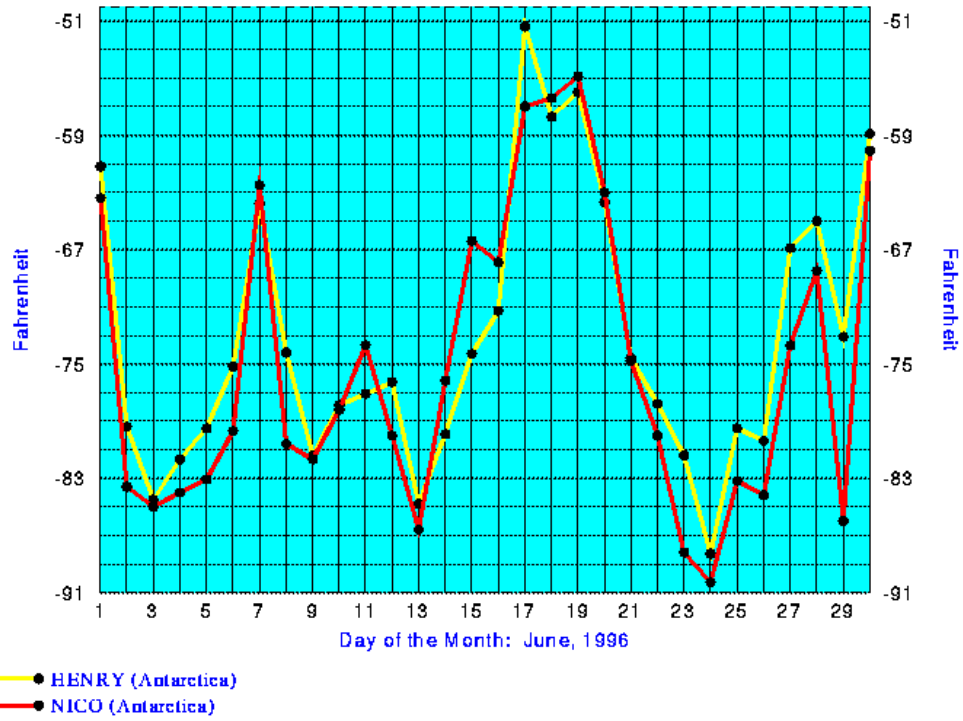
National Weather Service Summary of the Day : Approximately 300 currently active National Weather Service stations are included, with a delay time (after end of data month) of about 8-10 weeks. This is our best quality and most complete data for these stations. Sixteen parameters for as early as 1869 to present are available for data plotting and download. Contour maps can also be created. See Global Summary of Day for additional U.S. stations.

Global Summary of the Day : Approximately 8000 active global stations, including over 1200 active U.S. stations are included, with a delay time (after end of data month) of about 4-5 weeks. 12 parameters for January 1994 to present are available for data plotting and download. These data undergo considerable quality control, but the National Weather Service Summary of the Day is the best choice for NWS sites.

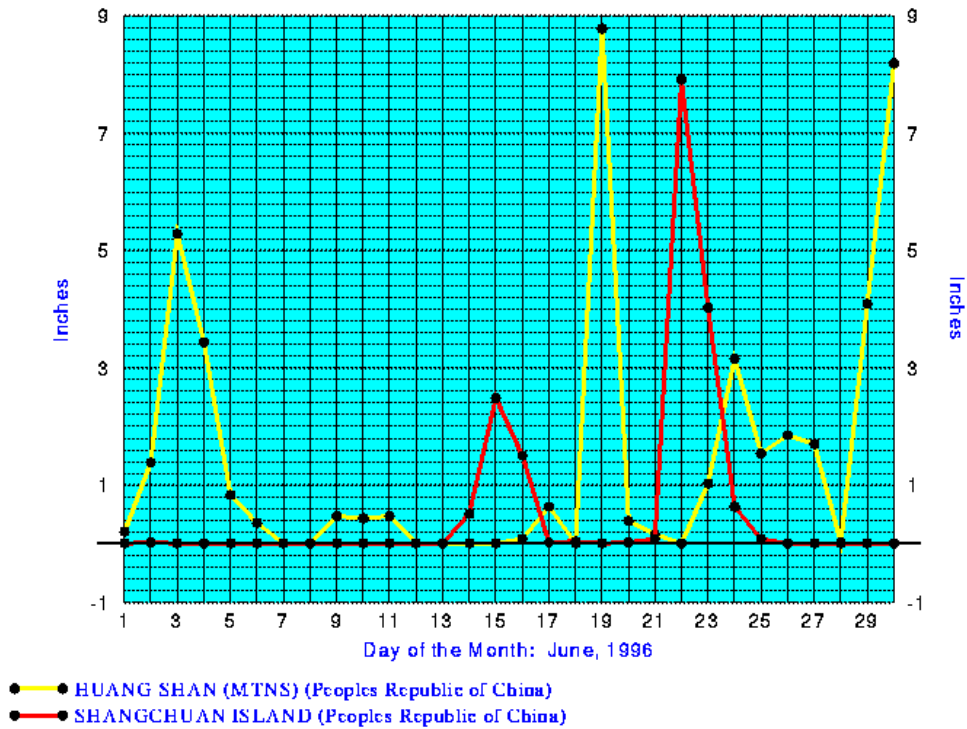
Climate Division Data : Drought indices, precipitation, and temperature data by month for all U.S. climate divisions are included, with a delay time (after end of data month) of about 1 week. Data presented are the estimated averages for each division for that month. The period 1895 to present is available for data plotting and download.

Three sample data plots and one sample contour map are shown on the following pages (not included in ASCII text version of this guide). They provide a hint of what's available through this system, which is now NCDC's most popular on line system. It's accessible via our homepage (<http://www.ncdc.noaa.gov>)--click on ON LINE DATA ACCESS and then on CLIMVIS to use it.

Mean Temperature

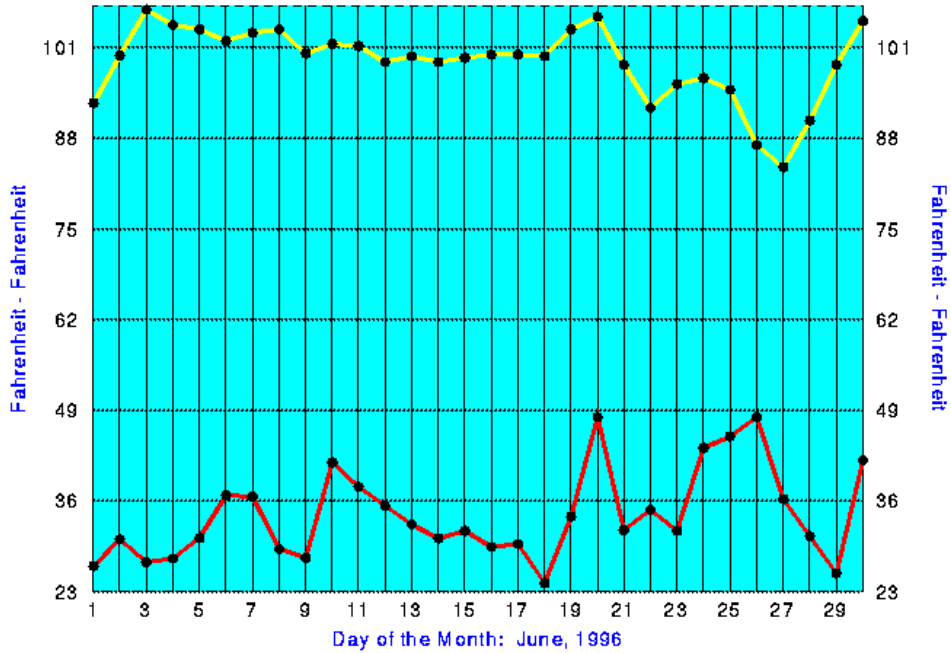


Precipitation

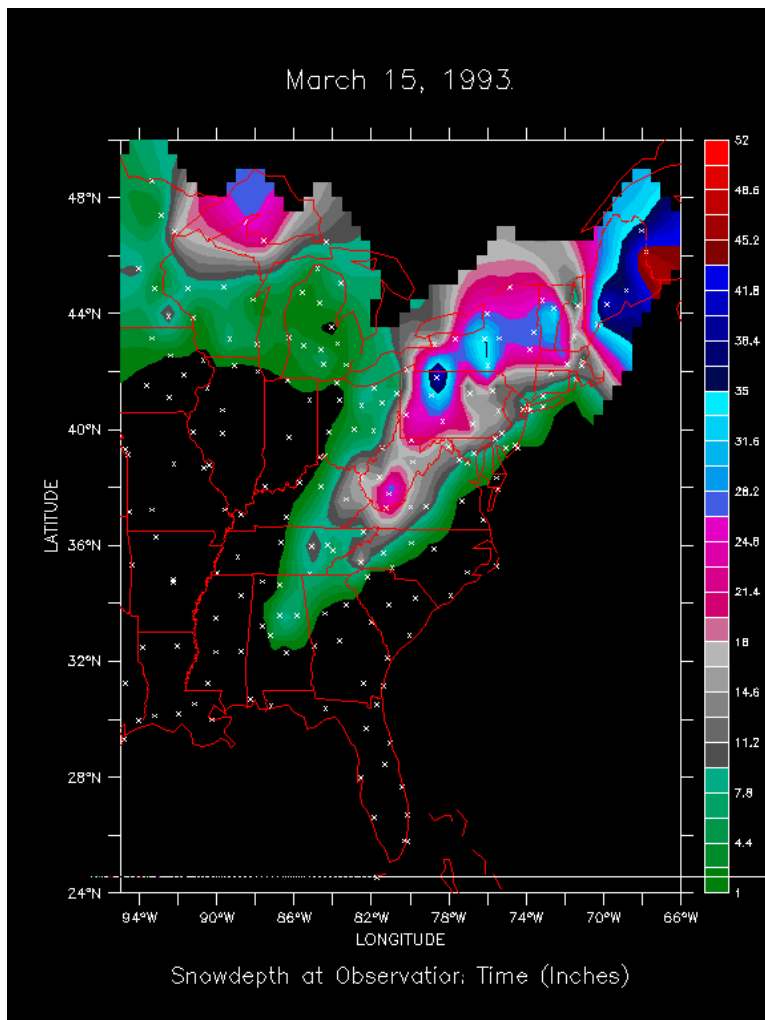


NEEDLES AIRPORT

California



- Mean Temperature
- Mean Dew Point



THE SATELLITE ACTIVE ARCHIVE (SAA)

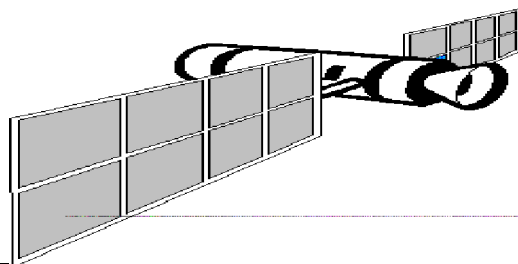
NOAA's Satellite Active Archive (SAA) is a revolutionary system designed to provide easy access to satellite data. It is a gateway to NOAA's digital library of real-time and historical satellite data collected by NOAA's Polar Orbiting Environmental Satellites (POES). The system allows users to search inventories of satellite data, preview Earth images of that data, and then download the data.

The SAA contains the POES AVHRR data from March 1, 1994 to the present and TOVS data from July 1, 1995 to the present. Other satellite datasets and products will be added in the near future. Users can obtain detailed information about current SAA datasets via the SAA Homepage on the Internet. There are now two versions of the SAA. The telnet version, which is the original version, allows users with an X-Windows emulator to create searches by drawing a box over the study area. Recently, a more user-friendly version of the SAA has been added and is available on the World Wide Web, eliminating the need for any X-Windows software.

URL ADDRESS: *http://www.saa.noaa.gov/*
TELNET ADDRESS: *saa.noaa.gov*

Once the data requirements have been determined, an order may be placed electronically or for copy to tape format. Up to eight datasets with no more than 5 mb of data each can be ftp'ed to your site per session at no cost. For datasets larger than 5 mb, the data will automatically be shipped to the user on magnetic tape at a charge of \$50.00 for the first dataset and \$30.00 for subsequent datasets. The user must contact the NCDC to establish an open account for SAA if tape orders will be made.

For SAA user assistance: 704-271-4850, saainfo@nesdis.noaa.gov. For other satellite data/information (POES, GOES, DMSP, etc), also call 704-271-4850, or email satorder@ncdc.noaa.gov.



ON-LINE ACCESS AND SERVICE INFORMATION SYSTEM (OASIS)

The National Climatic Data Center maintains the On-Line Access and Service Information System (OASIS) for selected NCDC data and metadata files. The system is designed for use by scientific researchers with programming capabilities. Once connected to OASIS, users can obtain these files by FTP computer access. Data are placed on-line as soon as possible after receipt or processing. These data are available without charge via FTP for immediate downloading (up to 5 MB), or users can order data for off-line delivery (standard NCDC charges). Most datasets are available from NCDC in either enhanced BUFR or ASCII format, and format information is available on-line. Data format translators are available. In addition to data, important metadata are included with the on-line data. Station histories, data dictionaries, field experiment information, and data inventories are included.

URL Address: <http://hurricane.ncdc.noaa.gov/codiac/oasis-www.html>

OASIS READ LIBRARY AND FILE DUMP PROGRAMS

To the left are instructions for accessing the read library and the file dump program to decode enhanced BUFR, the data format on OASIS.

After you log in, you are now in a UNIX environment and will need to change directories to get to the code. Go to directory: **pub/E-BUFR/ebdump** . Then display the contents of the directory by typing **ls** or **dir** . There will be four files listed: **ebdump.tar** , **README** , **ebdump.vax** , and **README.vax** . The README file contains instructions on the use of the read library and the ebdump program. The ebdump.tar and ebdump.vax files contain an archive of the source code. To download the files to your UNIX machine, type '**mget README ebdump.tar**' ; to download the files to your VAX machine, type '**mget README.vax ebdump.vax**' . You can logout of the server by typing **QUIT** .

open ftp.ncdc.noaa.gov
the login is: ftp or anonymous
the password is: your E-Mail address

If you are on a UNIX system, you will have to use the **tar** command to extract the source code from the archive. At your

prompt, type '**tar xvf ebdump.tar**'. If you do an **ls** command next, you will see many files, including one named "**Makefile**." In order to compile the source code and get an executable of the ebdump program, type '**make**.' The ebdump program is an example of how the read library can be used. It is a stand-alone program that can be used to view the data. To execute ebdump, simply type '**ebdump**'. The program will prompt you for the data to display.

Users are encouraged to study the README file . There are many software routines to use with enhanced BUFR formatted data. They are described in the **README** file. Software routines whose names begins with BF extract information from buffer message sections. Routine names that begin with DSP use extracted information and provide output. Ebdump is intended as a prototype program to be used as a guide for users in writing their own programs accessing the read library routines.



OASIS DATASETS

Data	Period of Record	Process Time Before On-Line Availability
Wind Profiler		
Winds-60	2 Years	1 ½ - 2 hours
Surface-60	Oct 96-latest	1 ½ - 2 hours
Moments-60	14 days	1 ½ - 2 hours
Moments-6	14 days	1 ½ - 2 hours
RASS-6	14 days	1 ½ - 2 hours
RASS-60	Oct 96-latest	1 ½ - 2 hours
NWS Surface Hourly	Jan 92-latest	1-2 months
NWS Rawinsonde	Jan 92-latest	1-2 months
NWS Precipitation		
Hourly	Jan 92-latest	8-9 months
15-Minute	Jan 92-latest	8-9 months
N American Rawinsonde	Jan 92-Apr 94	24 hours
Cooperative Summary of the Day (TD 3200)		
State files	Jan 92-Dec 93	As Required
U.S. Climate Division Data (TD 9640)		
Monthly temp, precip, & four drought indices	1895-latest month	As Required
General Circulation Model		
Carbon Dioxide	100 and 1000 year	As Required
Field Experiments		
CAPE	Jun-Jul 1991	As Required
STORM-FEST	Jan-Feb 1992	As Required
GCIP	Jan-Apr 1992	As Required
NEXRAD Level II		
Inventories	Mar 1991-latest	2 months
SBUV UV/Ozone Data	Apr 92-Apr 94	As Required

BULLETIN BOARD SYSTEM

The National Climatic Data Center's (NCDC) Bulletin Board System (BBS) is a PC-based system with 400 MB of data storage. The bulletin board operates 24 hours/day using PC Board software as its primary operating system, and can be accessed using most commercial modems, but not via WWW. Simply follow the instructions given after dialing into the system.

NOTE: Call 704-271-4619 if you have technical questions.

NCDC Bulletin Board Products

There are several products available on the Bulletin Board, each having unique file name(s). Listed below are the products currently available in the BBS. A \$111 annual subscription fee is required for some of the products.

- ▶ **Product Documentation** has been developed for several of the data files listed below. This documentation provides formats and further interpretation/clarification of the data. Without using these files, the data are often difficult or impossible to understand. A separate file has

been developed for selected products. It is suggested that the documentation file for each product you will be using be downloaded and printed for future use. The same format will be used for all files with the same product name.

Modem Specifications for Accessing BBS

Telephone: (704) 271-4286
Baud Rate: 1200, 2400, 4800, or 9600
Parity: No
Data Bits: 8
Stop Bits: 1
Echo: Y or N

- ▶ **Preliminary Monthly Summary (HDD/CDD/TMP/PCP) Data** for approximately 300 U.S. locations are provided in a single file. Data for each location includes the heating and cooling degree day totals, departures from normal, and seasonal totals to date; average monthly maximum, minimum, and mean temperatures, and departure of the means from normal; and precipitation totals and departures from normal.

- ▶ **Printable Local Climatological Data (LCD)** - 132 column ASCII format. The printable LCD contains exactly the same data as the printed version. The sequential order of

appearance of sections of the publication are not the same as the printed version. Note: This report will "wrap-around" on 80 column printers. To prevent wrapping, customers must use condensed print, utilize the DOS mode command, or have a 132 column printer.

- ▶ **Spreadsheet Local Climatological Data.** The spreadsheet LCD contains 9 character cells, delimited by commas, with text enclosed in quotes. It can be imported into most commercial spreadsheet software.
- ▶ **Station Narratives .** This 80 column printable narrative contains general information about the location of each station, overall climatology, and highlights of expected weather for each area. It is the same as that printed in the Annual Summary of the LCD.
- ▶ **Printable ASOS Local Climatological Data .** Beginning in 1993, as part of a modernization effort by the National Weather Service, additional data are being measured at stations converted to the new Automated Surface Observing System (ASOS). A new format for such stations has been developed and is known as the "ASOS Local Climatological Data." A major difference between this publication and the standard LCD is that the abridged hourly surface weather observations are available for every hour in the BBS. As more stations are converted to ASOS operations, the number of ASOS LCD's will increase, and the number of standard LCD's will decline.
- ▶ **ASOS Unedited Summary of the Day NWS Form F6.** This product is roughly analogous to the National Weather Service Form F6 which provides daily extremes and a monthly summary for selected weather elements. Since it is exactly the same as the first page of the Printable ASOS Local Climatological Data, it can be used as an abridged edition of that publication. No hourly surface weather observations, hourly precipitation data, or maximum short duration precipitation data are listed.
- ▶ **Daily Weather Highlights .** This product is a narrative description of daily weather events from around the United States derived from the National Weather Service's Automation of Field Operations and Services (AFOS) system. Two files per day are produced which include National Weather Service summaries that are released for distribution at 3 P.M. and 8 P.M. NCDC provides weekly updates of the files. The files are NOT available on the same day they are produced.
- ▶ **Other Data and Services.** The data available from the NCDC BBS represents only a tiny fraction of the total amount of data archived at NCDC. For other sources of digital data from NCDC, information can be obtained directly from the BBS. Some on-line data and metadata are accessible via internet-ftp, and digital data are available on magnetic tape and diskette. The downloadable BBS 'informational' files include:
 - (1) NCDC Products and Services Guide
 - (2) Description of CD-ROM products
 - (3) Digital dataset summary
 - (4) Inventories of selected digital datasets

Files will continue to be added to this system in the future. Please call (704) 271-4800 or fax (704) 271-4876 to order data or publications. Our Internet address is: orders@ncdc.noaa.gov

NCDC ON-LINE INVENTORIES

Following are instructions for obtaining various data inventories via internet from NCDC. Follow the instructions below to access any of these inventories. They are accessible through our mosaic/homepage server at -- <http://www.ncdc.noaa.gov>, or through direct ftp connection as follows:

- a) Enter: open ftp.ncdc.noaa.gov
- b) Login is: ftp
- c) Password is: your email address
- d) You are now logged onto a UNIX workstation. Enter 'help' if you'd like a list of available commands.
- e) To move to the correct subdirectory, enter: cd /pub/data/inventories
- f) To get a copy of the file descriptions, enter: get README.TXT destination (destination is your output location and name)...e.g.-- get README.TXT c:README.TXT - copies to hard drive c:
Note that file names are in all CAPITAL letters .
- g) Then, to get a copy of any of the inventory files, use the same procedure, such as--get COOP.TXT c:COOP.TXT
- h) To logoff the system when finished, enter: bye

FILE DESCRIPTIONS:

FILE	DESCRIPTION
CDROM.TXT	A brief summary of the CDROM products available from NCDC.
COMPLETE-GUIDE.TXT	A products and services guide for NCDC. WP6 file is the Wordperfect version.
COOP.TXT	Historical cooperative station index through 1996, with latitude, longitude, and elevation. Cooperative stations are
FILE	DESCRIPTION

	U.S. stations operated by local observers which generally report max/min temperatures and precipitation. National Weather Service (NWS) data are also included in this dataset. The data receive extensive automated + manual quality control. The index includes a county location cross-reference.
COOP-ACT.TXT	Same as 'COOP.TXT' but only includes stations which are currently active.
COOP-FULL.TXT COOP-FULLFMT.TXT	Similar to 'COOP.TXT' but with some additional information, such as time zone, relocation information, and call letters/WBAN numbers for applicable stations. Get the 'COOP-FULLFMT.TXT' file for format documentation.
COOP-MAP.GIF	GIF image showing location of active U.S. cooperative stations.
COOP-STATE-CODES.TXT	The 2-digit numbers for each state which correspond to the first 2 digits of the cooperative station numbers.
COUNTRY-LIST.TXT	Reference showing country names and the associated station number ranges assigned for each country--see 'GLOBAL-STATION-LIST.TXT' for further information.
DATASETS.TXT	A brief summary of some of the major digital datasets available from NCDC.
GLOBAL-SFC-1930-1995A.TXT (B) (C) (D) (E)	Monthly inventory of worldwide surface observations for the TD9950 database from 1930-1995. These 5 files cover WMO blocks 01-19, 20-39, 40-59, 60-79, and 80-99 respectively. They contain the most complete inventory in this directory for these data. They can be used in conjunction with other files described in this directory, such as 'GLOBAL-STATION-LIST.TXT.' There are currently about 10,000 hourly/synoptic stations active worldwide. The data receive extensive automated quality control.
GLOBAL-SFC-1996.TXT	Monthly inventory of worldwide surface observations for the TD9950 database for 1996.
GLOBAL-STATION-LIST.TXT	Global station list sorted by country and state, with latitude/longitude/elevation. Shows all active worldwide

FILE**DESCRIPTION**

	surface and upper-air observing stations which report hourly and/or synoptic data. The 'COUNTRY-LIST.TXT' file provides country-by-country information on station numbers assigned.
GLOBAL-STATION-LIST2.TXT	Global station list sorted by station number, with latitude/longitude/elevation. Shows all active worldwide surface and upper-air observing stations which report hourly and/or synoptic data. The 'COUNTRY-LIST.TXT' file provides country-by-country information on station numbers assigned.
GLOBAL-STATION-LIST-HISTORY.TXT	Same as above but also shows inactive stations and a chronology of stations since the early 1970's.
GLOBONLN.TXT	Description of NCDC's global summary of day data capabilities, with the latest month and some previous months on-line via ftp and WWW/mosaic.
NEXRAD.TXT	Inventory of NEXRAD level II data available from NCDC.
NEXRAD- DESCRIPTION.TXT	Descriptive information about NEXRAD level II and level III data/products. Includes a list of all stations planned for the network, and details concerning the type data available.
NEXRAD-LVL3.TXT	Inventory of NEXRAD level III data available from NCDC.
PUBLICATIONS.TXT	A guide to publications available from NCDC.
STATION-HIST.WP5	WordPerfect-5.0 file with the station histories for U.S. National Weather Service stations. Includes detailed information on location, anemometer height, etc.
TD3280.TXT	TD3280 (Navy, NWS first-order stations) inventory--historical index of stations/periods of record included in TD3280. Some stations which have incomplete periods of record shown here have full periods of record in the 'GLOBAL' inventories mentioned above. TD3280 data receive extensive automated + manual quality control. Generally, NCDC services requests for NWS/Navy hourly data from this tapedeck, and requests for other hourly/synoptic data from TD9950.

FILE**DESCRIPTION**

UPPERAIR.TXT

Historical index of NCDC's new Comprehensive Aerological Reference Dataset (CARDS)--a dataset of worldwide upper air soundings collected from numerous sources. This index includes each stations' latitude, longitude, elevation, and beginning/ending date for data.

WBAN.TXT

Historical WBAN index through 1995 (elevations are listed in meters). WBAN's are received at NCDC for NWS and U.S. military stations. This is an index of these stations -- many of which have data in digital form.

ALPHA-WBAN.TXT

NUMERIC-WBAN.TXT

WBAN-FULLFMT.TXT

Similar to 'WBAN.TXT' but with some additional information, such as cooperative station number and WMO number where applicable. The 'ALPHA' file is sorted by station name, while the 'NUMERIC' file is sorted by WBAN number. Get the 'WBAN-FULLFMT.TXT' file for format documentation.

WBAN-MSC.TXT

WBAN-AWSMSC-WMO cross reference--the WBAN index and Global Station List (both mentioned above) cross-referenced with World Meteorological Organization (WMO) numbers. These are the 3 numbering systems used by NCDC for national/international locations.

Notes: Most files are ASCII text format with a 'TXT' name extension (e.g., COOP.TXT). File names are strictly upper-case. The files are updated periodically as resources/information allow. To read any of the files (after downloading), you can use Wordperfect or any other editor. Of course, Fortran or any other language may be used to read any of the files.

If you have technical questions about these inventories, please contact Neal Lott or Tom Ross:

Phone: 704-271-4995, x182 (N. Lott)

704-271-4994, x181 (T. Ross)

Email: nlott@ncdc.noaa.gov

tross@ncdc.noaa.gov

Fax: 704-271-4876

704-271-4876

The data to which these inventories pertain (e.g., hourly surface data) are not available on-line (Internet, etc). To place orders for data (magnetic tape, cartridge tape, 8 mm tape, diskette, paper copy), please contact NCDC's Climate Services Branch (704-271-4800, Fax 704-271-4876, Internet orders@ncdc.noaa.gov).

GLOBAL SURFACE SUMMARY OF DAY DATA

NCDC offers global surface Summary of Day data for over 8000 stations on-line via FTP and WWW. These Summary of Day data files include the latest month's data (normally available approximately 1 month after the end of the data month), along with all data since January 1994. They are accessible through the NCDC homepage server at -- <http://www.ncdc.noaa.gov> or through direct FTP connection as follows:

```
-- open ftp.ncdc.noaa.gov          --password is: your email address
-- login is: ftp or anonymous -- directory for global summary of day:
                               /pub/data/globalsod
```

The directory has a 'readme.txt' file with information about the contents and individual file names. The data are available as 7 regional files for the latest month or as 1 file containing all of the data for the latest and previous months (in ASCII or compressed mode). Also, 'tar' files containing each years' complete dataset are available--e.g., filename "all-1996.tar". The daily elements included are:

- Mean temperature (.1 Fahrenheit)
- Mean dew point (.1 Fahrenheit)
- Mean sea level pressure (.1 mb)
- Mean station pressure (.1 mb)
- Mean visibility (.1 miles)
- Mean wind speed (.1 knots)
- Maximum sustained wind speed (.1 knots)
- Maximum wind gust (.1 knots)
- Maximum temperature (.1 Fahrenheit)
- Minimum temperature (.1 Fahrenheit)
- Precipitation amount (.01 inches)
- Snow depth (.1 inches)

Indicators for occurrence of:

Fog	Rain
Thunder	Snow
Tornado/Funnel Cloud	Hail

Also, NCDC provides the latest month in metric units as a separate file. Other periods of historical Summary of Day data (as well as many other datasets) can be obtained off-line from NCDC. Please contact NCDC's Climate Services Branch for additional information: 704-271-4800, Fax - 704-271-4876, Internet - orders@ncdc.noaa.gov. For technical questions, contact Neal Lott--nlott@ncdc.noaa.gov, 704-271-4995.

MONTHLY PRECIPITATION DATA FOR U.S. COOPERATIVE & NWS SITES

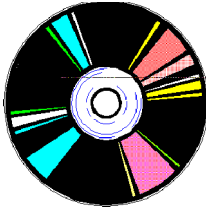
The directory '/pub/data/coop-precip' contains historical monthly precipitation data for all U.S. cooperative and National Weather Service stations. The periods of record vary by station, with some stations having data back to about 1900, although many begin around the 1948 time frame. The data files end with the latest complete year, and the directory has a data file for each state (e.g., 'alabama.txt'), along with one file for several stations outside the U.S. such as Guam and Puerto Rico (filename 'others.txt'). There are currently over 8000 NWS and cooperative weather stations active and included in this directory, with many more currently inactive stations also included. The file 'coop.txt' shows the location (latitude/longitude) for each of these stations. Also, the files 'all-states.txt' and 'all-states.txt.Z' have the entire dataset in ASCII and compressed mode.

The files consist entirely of ASCII character data. A header record begins each file with the station number, station name, state abbreviation, year, 12 months (Jan - Dec), and 'annual' appearing from left to right. The monthly and annual precipitation amounts are in inches and hundredths (e.g., 1122 = 11.22 inches). A value of '9999' indicates missing or incomplete data for that month, with '99999' indicating missing for the yearly total. The monthly total is only presented when all reported data are available and validated for that month. Likewise, the annual total is only presented when every monthly total for the year was available. These data are taken from NCDC digital database TD3220, which also contains additional elements such as temperature and snowfall. These additional elements are available off line on tape or diskette.

Instructions for accessing these data:

- FTP (open) to 'ftp.ncdc.noaa.gov'
- Login as 'ftp'
- Use your email address as password
- Change directory to '/pub/data/coop-precip'
- Download files as needed, such as 'texas.txt' or 'south-carolina.txt'

NCDC also has a link to this directory on its WWW/Homepage server (<http://www.ncdc.noaa.gov>). Other types of monthly and daily summary data (as well as many other datasets) can be obtained off-line from NCDC. Please contact NCDC's Climate Services Branch for additional information: Phone 704-271-4800, Fax 704-271-4876, Internet orders@ncdc.noaa.gov. For technical questions, contact Neal Lott--nlott@ncdc.noaa.gov, 704-271-4995.



CD-ROM PRODUCTS

NCDC produces a suite of CD-ROM's with diverse environmental data ranging from global tropical cyclone tracks, worldwide climatologies, and hourly surface data.

International Station Meteorological Climate Summary (ISMCS) Vers 4.0 . Provides detailed climatological summaries for 2600 locations worldwide. These locations include National Weather Service stations, domestic and overseas Navy and Air Force sites, and numerous foreign stations. Limited summaries are also given for approximately 4000 additional worldwide sites. This version also contains year/month and long term mean precipitation data for 1000 foreign locations. Tabular or statistical data can be exported to a printer or spreadsheet. Joint NCDC, USAF and U.S. Navy product. **\$130.00, DOS only.**

National Climate Information Disc - Vol 1. Provides monthly sequential temperature, precipitation, and drought data for the 344 climate divisions in the contiguous U.S. The data can be viewed in a tabular or graphical format and output sent to a printer. The CD-ROM covers the period 1895-1989 and contains 1032 time-series graphs, 4180 maps, and 5400 frames of video animation. NCDC product. **\$130.00, DOS only.**

U.S. Navy Marine Climatic Atlas of the World - Vers 1.1. Includes analysis and display software for climatological averages of atmospheric and oceanographic data. The data are summarized with user-defined 1 and 5 degree grid areas covering the global marine environment. The summaries are produced using predominately ship data collected between 1854-1969. The major elements include air and sea temperature, dewpoint temperature, scalar wind speed, sea-level pressure, wave height, wind and ocean-current roses. This CD-ROM allows the user to define element intervals (e.g. 5 to 10 knots, 2 degree temperature intervals). The CD-ROM also allows contouring for explicitly user-defined regions and exporting data to a printer or diskette. Narratives for Mediterranean ports and ocean basin climatology narratives are included. Requires 540K of RAM. U.S. Navy sponsored product. **\$130.00, DOS only**

Global Upper Air Climatic Atlas (GUACA). This two-volume CD-ROM set uses 12-year (1980-1991) 2.5 degree gridded upper air climatic summaries derived from the European Centre for Medium Range Weather Forecasts (ECMWF) model analyses. The CD-ROM presents upper air statistics for 15 different vertical levels in the Northern and Southern Hemisphere for dry bulb and dewpoint temperature, geopotential height, air density, and vector and scalar wind speed. The CD-ROM provides access/display software for gridpoint data, contouring capability for user-defined areas, and vertical profiles. The climatology covers the 12-year period as well as individual year-months. Joint NCDC and U.S. Navy product. **\$260.00, sold only as a set, DOS only.**

NOTE: An ASCII data CD-ROM (no graphic interface) is also available covering the 1980-1995 period at a cost of \$75.00.

CLIVUE CD-ROM. The National Climatic Data Center (NCDC) developed a CD-ROM in support of a museum exhibit which traveled across the U.S. The CD contains a 1,500-station subset of NCDC's nearly 8,000 U.S. daily cooperative stations. The user selects a date and area of the U.S. and the CD-ROM database is queried for stations within the specified domain having data. Then, the system displays daily maximum and minimum temperatures, precipitation, and snowfall for the site. Graphs showing 7 years, 21 years, and the full period of record (varies by station) for the station(s) are available. Visual displays allow users to view trends, variability, and extremes. Joint NCDC and Franklin Institute product. **\$130.00, DOS only.**

SAMSON CD-ROM Set . The Solar and Meteorological Surface Observational Network (SAMSON) 3-volume CD-ROM set is divided geographically into regions: eastern, central, and western U.S. It contains hourly solar radiation data along with selected meteorological elements for the period 1961-1990. It encompasses 237 NWS stations in the United States, plus offices in Guam and Puerto Rico. The dataset includes both observational and modeled data. The hourly solar elements are: Extraterrestrial horizontal and extraterrestrial direct normal radiation; global, diffuse, and direct normal radiation. Meteorological elements are: Total and opaque sky cover, temperature and dew point, relative humidity, pressure, wind direction and speed, visibility, ceiling height, present weather, precipitable water, aerosol optical depth, snow depth, days since last snowfall, and hourly precipitation. Joint NCDC and NREL product. **\$130.00 per region or \$390.00 per set, DOS only .**

Radiosonde Data of North America 1946-1995. Contains all available radiosonde data for North America (U.S., Canada, Mexico, and Caribbean Islands) through the 100-mb level on four disks. Periods covered are: 1946-1965, 1966-1979, 1980-1989, and 1990-1995. Data include significant, mandatory, and special wind levels for all observation times, and include geopotential height, temperature, dew point, wind direction, and scalar speed. The user can select for output to printer, screen, or file: a single station or multiple stations for a defined time period, or all stations within a specified geographic region in either synoptic or station sort. The CD contains available station metadata, and software is available to access the data for DOS, UNIX and VMS computer systems. Joint NCDC and ERL product. **\$520.00, four volume set .**

NOTE: The latest single CD-ROM (1990-1995) is available separately for \$130.00.

Global Tropical and Extratropical Cyclone Climatic Atlas (GTECCA) 2.0. This single volume CD-ROM contains all global historic tropical storm track data available for five tropical storm basins. Periods of record vary for each basin, with the beginning as early as the 1870s and with 1995 as the latest year. Northern hemispheric extratropical storm track data are included from 1965 to 1995. Tropical track data includes time, position, storm stage (and maximum wind, central pressure when available). The user has the capability to display tracks, and track data for any basin or user-selected geographic area. The user is also able to select storm tracks passing within a user-defined radius of any point. Narratives for all tropical storms for the 1980-1995 period are included along with basin-wide tropical storm climatological statistics. Joint NCDC and U.S. Navy product. Requires 520K of RAM memory. **\$130.00, DOS only .**

Global Daily Summary (GDS). This CD-ROM provides access to a 10,000-station set of daily

maximum/minimum temperature, daily precipitation, and 3-hourly present weather for the 1977-1991 period of record. Data can be selected for viewing or output to file for geographic areas or by a predefined user-selected list of stations. The dataset includes element flags for suspected erroneous data. A data inventory contains station name, latitude/longitude, elevation, period of record, and the number of observations of available data. Requires a bare minimum of 4MB of RAM, with 8MB of RAM recommended. **\$130.00, DOS only.**

Global Historical Fields (GHF) - Vers 1.0. This version has no data for the Southern Hemisphere. This CD-ROM allows users to view daily surface charts for the period 1899 through April 1994. Daily upper air charts (700mb, 500mb, 300mb) are available from the late 1940's through April 1994. Surface charts contour sea level pressure only (not station plots); upper air charts contour geopotential heights and temperatures. Charts can be contoured, looped, and exported to a file or printer. Joint NCDC and U.S. Navy product. **\$130.00, DOS only.**

U.S. Divisional and Station Climatic Data and Normals (USDS) Vol 1.0. This NCDC CD-ROM contains a collection of ASCII text data and documentation files that pertain to the U.S. climate normals and by-products of the normals. Climatic variables include temperature, precipitation, degree days, and Palmer Drought Indices. The current normals period of 1961-1990 is covered with monthly values calculated for approximately 6600 precipitation and 4700 temperature stations. The earlier data/normals are provided for comparison and research applications. This CD-ROM contains no software or extraction routines that allow users to import the data directly into spreadsheets or other applications. Format and description of the files match NCDC magnetic tape series TD-9640 and TD-9641. **\$130.00.**

NCDC Cooperative Station Data. This NCDC 21 volume CD-ROM set has TD-3200 cooperative station data. Major elements include daily high and low temperatures, daily rainfall, daily snowfall and snow depth, and evaporation. General period of record is 1948-1993, but longer for selected stations. There are approximately 8000 active stations in the dataset. Historically, approximately 23,000 stations are included for various years. States are grouped geographically into volume numbers. The set contains inventories, station histories, and ASCII data files. Joint NCDC and ARL project. An extraction program is provided on diskette. **\$75.00 volume or \$1300.00 set .**

NOTE: An annual 1994 single volume CD-ROM is available for **\$130.00.**

Hourly Modeled Sounding Data. This 12 volume CD-ROM set contains hourly 80 KM modeled gridpoint U.S. sounding data for 1990. This data is the output from the Penn State University MM4 model which used available daily sounding data for 1990 as input. Wind, temperature, dewpoint depression, and geopotential height data for 8 standard and 15 variable levels are included in the NWS TTAA, TTBB format. One of the applications of this CD-ROM is to access air pollution impacts on a local scale. Joint NCDC and ARL product. Requires 544K of RAM. Sold only as a set. **\$480.00, 12 volume set, DOS only .**

Coastal-Marine Automated Network (C-MAN) Station and Buoy Reports and Summarized Elements (SeaBreeze). This two volume CD-ROM set contains climatic summaries and archived observations measured by National Data Buoy Center (NDBC) moored buoys and C-MAN stations for 197 sites. The period of record generally covers a 3-20 year period depending on the station and ends with December 1993. The two volume set consists of archived observations and climatic

summary tables. All measurements are included except for spectral wave data and subsurface measurements. A map shows station locations and data inventories show measurements and time periods for each station. The following elements are summarized: monthly frequency distributions of wind speed, wind gust, sea level pressure, air and sea temperature, air-sea temperature difference, dew point (where available), significant wave height, average and dominant wave period. Additional tables include: wind speed versus direction, significant wave height versus dominant and average wave periods, significant wave height versus wind speed. The individual monthly means and extremes for all measurements are included. Stations with less than 3 years of data will only have individual monthly means and extremes summarized. Joint NCDC and NDBC product. Requires 420K of RAM memory. This item is sold only as a set. **\$260.00, DOS only**.

NOAA Weather Charts-CD-ROM Subscription. The series is available as a **subscription (one year basis only) or as individual CD's**, and contains weather charts most commonly used by researchers and the general public. They are archived as PCX files on a monthly basis and serve as a continuation of NCDC's microfilm archive. The series includes monthly CD-ROM editions of: A) Surface and Upper Air Weather Charts; B) Initial Analysis and Forecast Charts; and C) Tropical Strip /Precipitation and Observed Weather Charts. The CD-ROMs are available approximately eight weeks after the close of the data month. Subscription orders begin with the February 1996 charts. Contact NCDC's Climate Services Branch at 704-271-4800, 4876 FAX, or orders@ncdc.noaa.gov for additional chart details, hardware and software requirements, and ordering information. **\$300.00 per year per chart series (A, B, or C), or at a reduced price of \$600.00 per year for the entire set. Back issues of the CD-ROMs will cost \$75.00 per CD-ROM.**

Polar Ice CD-ROM. The Arctic and Antarctic Sea Ice Data CD-ROM Version 1.0, contains weekly ice data in the International Sea Ice in the Digital Form (SIGRID) format for 1972-1994 for the Arctic and 1973-1994 for the Antarctic. This .25 degree grid structure includes total ice concentration, thickness stage, and form of ice for the complete period of record. The SIGRID format was designed to meet the sea ice requirements of large-scale climate and statistical studies. The CD-ROM contains no display or extraction routines. The SIGRID reference file provides detailed information concerning the coding system for digitizing sea ice chart data. Joint NCDC, U.S. Navy, National Ice Center product. **\$75.00, DOS**, but files can be converted to UNIX.

Important Notes

- ◆ Many NCDC CD-ROM products were produced for use in a 'DOS' PC environment (listed as 'DOS only') and will not work in a 'MAC' environment. In addition, the majority of NCDC CD-ROMs were produced in a pre-Windows 95 environment and will not work without PC configuration changes. Several CD-ROMs may not work under a Windows environment. NCDC will provide a help sheet for Windows 95 users, if requested.
- ◆ Many of the CD-ROMs present the data in an atlas type format (interactive software) rather than as ASCII data files.
- ◆ Starred items (**) indicate 520K or more of free RAM needed.
- ◆ If you have technical questions, please call 704-271-4702.

Ordering Information

The NCDC's Climate Services Branch is responsible for distribution of NCDC CD-ROM products to users (see below). Domestic users add a \$11.00 service charge per order; foreign users add a \$21.00 service charge per order.

Mailing Address: National Climatic Data Center
151 Patton Avenue
Asheville, NC 28801-5001
Attn: Climate Services Branch
Telephone: 704-271-4800
Fax: 704-271-4876
Internet: orders@ncdc.noaa.gov

SPECIALIZED PRODUCTS

General Information

These Specialized Products can be provided on diskette or as paper copy (unless otherwise indicated). There are charges involved for these services.

Wind Stratified Conditional Climatology (WSCC): This summary provides bivariate distributions of ceiling and visibility classes vs wind direction as a function of the passage of time out to 48 hours. In other words, for a given set of conditions at hour '00', the WSCC shows the climatic probabilities for various conditions during the next 48 hours. The climatic probabilities are calculated from the surface hourly data for the station, and can be produced for any station (U.S. or foreign) with adequate observational data.

Cooperative Station Extremes Tabulation: This tabulation shows daily and monthly extremes for the entire period of record (generally 1948 to present) for U.S. cooperative and National Weather Service sites. There are currently over 8000 of these stations active. The elements included are maximum/minimum temperature, precipitation, and snowfall.

Wind Rose Summary: This summary provides a statistical summary of wind speed vs wind direction for any station (U.S. or foreign) reporting adequate observational data. Data are tabulated in incremental 'bins' such as 0-3 miles per hour, 4-7 miles per hour, etc.

Summary of Meteorological Observations--Surface (SMOS): This is the same summary presented in NCDC's ISMCS CDROM, and can be produced for any U.S. or foreign station with adequate synoptic and/or hourly data. It provides 38 detailed climatic tables, such as:

- A one-page climate summary for the station with monthly averages and extremes of temperature, precipitation (amount and/or frequency), cloudiness, humidity, winds, and occurrence of various weather phenomenon (e.g., fog, thunderstorms).
- Frequency distribution of daily maximum and minimum temperatures by month.
- Bivariate distribution of dry vs wet bulb temperatures.
- Frequency distribution of wind direction vs wind speed by month-hour.

Local Climatological Data (LCD) For National Weather Service (NWS) Stations: This is similar to the LCD publication, but provided on diskette for quick access. January 1984 through the latest processed month are available as individual element files for each month (max/min

temperatures, precipitation, and heating/cooling degree days).

Comparative Climatic Data: This product contains climatological normals and averages for 270 NWS offices, in ASCII data files.

Hurricane Summaries on Diskette: A related product is the GTECCA CDROM (see CD-ROM section for details). These statistical and narrative summaries of hurricanes cover the northern Atlantic, eastern Pacific, and western Pacific as follows:

North Atlantic - 1886 through latest year available

East Pacific - 1949 through latest year available

West Pacific - 1946 through latest year available

Summary of Day Data for U.S. and Foreign Sites: This historical summary of day data can be produced from any station reporting synoptic and/or hourly observational data. The format is the same as the on-line global summary of day data. It includes the following elements for each day available:

Mean temperature

Mean dew point

Mean sea level pressure

Mean station pressure

Mean visibility

Mean wind speed

Maximum sustained wind speed

Maximum wind gust

Maximum temperature

Minimum temperature

Precipitation amount

Snow depth

Indicators for occurrence of:

Fog

Rain

Snow

Hail

Thunder

Tornado/Funnel Cloud

DIGITAL DATASETS

General Information

1. The periods of record for these datasets vary considerably depending on data type and station (if applicable).
2. All reference to QC pertains strictly to data checking and corrections performed within the Federal Climate Complex by NCDC and/or AWS. Other gross QC is usually performed at the point of origin such as NCEP and AFGWC.
3. The media available are: Magnetic tape (1600 or 6250 BPI), IBM 3480 cartridge tape, diskette (3.5 or 5.25 inch), and Exabyte 8 mm tape. These options vary depending on database.
4. Cost to customer varies depending on data volume and the processing required to fill the order.
5. **This is only a summary of the major digital datasets available from NCDC** . Other datasets/data types (in addition to those listed below) are available. Contact NCDC's Climate Services Branch for further information.
6. NCDC's WWW Homepage has numerous datasets and data inventories on-line at <http://www.ncdc.noaa.gov>. NCDC makes frequent updates to this system; users are encouraged to review the Homepage periodically to view what is available.
7. Points of contact for information, cost estimates, and data requests:

National Climatic Data Center
Climate Services Branch
151 Patton Avenue
Asheville, NC 28801
Telephone: 704-271-4800
Fax: 704-271-4876
Internet: orders@ncdc.noaa.gov

DATABASE: Worldwide surface observations (hourly/synoptic) . Includes 2 datasets - TD3280 and TD9950.

TD3280--Navy and first order National Weather Service (NWS) stations.

Data Type : ASCII character data.

Quality Control : Undergoes extensive automated and manual QC.

Data Origin : Mainly from ASOS-direct ingest, diskettes from the stations, and keyed data for NWS stations; and from TD9950 (see below) for Navy stations.

Content/Elements :

- About 380 stations currently active.
- Includes most surface elements observed in the U.S. (wind speed and direction, temperature, dew point, cloud data, sea level pressure, altimeter setting, station pressure, present weather, and visibility). Wind gust, precipitation amount, and snow depth are not included, but are placed in TD3210 (see below).
- "Specials" are not included and only synoptic hours (every 3rd hour) are included for 1965-1981 (for most stations).

Period of Record : 1948 to present.

Note: Request database manual for further details.

TD9950--Air Weather Service's (AWS) DATSAV2 Surface--worldwide stations.

Data Type: ASCII character data.

Quality Control : Extensive automated QC (all data); manual QC for USAF stations.

Data Origin : Mainly from GTS, various other sources, and keyed data prior to 1973.

Content/Elements :

- About 10,000 stations currently active.
- Includes all surface elements observed internationally (see TD3280) along with wind gust, precipitation amount, snow depth, and other elements as reported by each station. Also includes "Specials."
- Observational practices vary by country.

Period of Record : 1973 to present with some data from 1930 to present.

Note: Request database manual for further details. It is possible to produce summary of day data (1 record per day) from this dataset--18 elements summarized as available.

DATABASE: Worldwide ship and buoy observations (hourly/synoptic) . Includes 2 datasets - TD1129 and TD1171.

Data Type - ASCII character data.

Quality Control - Undergoes automated + some manual QC.

Data Origin - Data originate from GTS + some key entered data.

Content/Elements

- Includes elements observed by ships and buoys--temperature and dew point, wind direction and speed, visibility, present weather, sea level pressure, sea surface temperature, cloud data, ice data, and wave/swell heights and periods. - Generally, buoys only observe temperature, wind, pressure, sea surface temperature, and wave/swell data; while some ship reports include other elements. Elements vary considerably by station.

Period of Record - As early as 1800's to present.

Notes - Request database documentation for further details.

- Occasionally, if needed observations are not found in TD1129 or TD1171, we use TD9950 as a source.

DATABASE: Worldwide upper-air observations --TDF63 (multiple tape decks).

Data Type - ASCII character data.

Quality Control - Undergoes some automated QC.

Data Origin - TD6301 originates mostly from diskettes sent from the stations (U.S. + some Mexican), while other tape decks originate from various sources such as GTS.

Content/Elements

- Includes all elements observed in upper air soundings--generally temperature, dew point, wind direction and speed, and height of each pressure level.

Period of Record - Generally 1946 to present.

Notes - Request database documentation for further details.

- Also have North American data for 1946-1995 on 4-volume CDROM set.
-

DATABASE: Cooperative station summary of day data for the U.S.--TD3200 .

Data Type - ASCII character data.

Quality Control - Undergoes automated and manual quality control.

Data Origin - All data are key entered.

Content/Elements

- Includes summary of day parameters such as maximum/minimum temperatures, precipitation, and snowfall/snow depth. Some stations have additional data such as evaporation and soil temperature.

- About 8000 stations currently active.

Period of Record - Generally 1948 to present (some late 1800's to present).

Notes- Request database manual for further details.

DATABASE: Summary of day data for National Weather Service (U.S.) and Department of Defense (U.S. and foreign) sites . Includes 2 datasets--TD3210 and TD9953 (AWS's TDF34).

Data Type - ASCII character data.

Quality Control - Both datasets are QC'ed (automated + manual).

Data Origin - TD3210 currently originates from diskettes for NWS stations and TD9950 for Navy stations; TD9953 is key entered.

Content/Elements

- Includes maximum/minimum temperatures, precipitation, snow depth, peak wind gust, sunshine, days with various weather phenomenon, and several other elements for selected stations.

- About 600 stations currently active.

Period of Record - Generally 1940's to present with some data as old as the late 1800's.

Notes - Request database documentation for further details.

DATABASE: Monthly summary data for NWS and cooperative U.S. stations --TD3220.

Data Type - ASCII character data.

Quality Control - Undergoes automated and manual quality control.

Data Origin - Monthly summaries built from NWS and cooperative daily data as described above.

Content/Elements

- Includes temperature (mean minimum, mean maximum, overall mean, extreme minimum, extreme maximum), precipitation amount, and for selected stations-- snowfall, evaporation data, and soil temperature data.
- About 8000 stations currently active.

Period of Record - Generally 1948 to present (some late 1800's to present)

Notes - Request database manual for further details.

DATABASE: Hourly solar radiation and meteorological data for the U.S., Guam, and Puerto Rico--TD3282.

Data Type - ASCII character data.

Quality Control - Underwent extensive QC of data.

Data Origin - Originated from 3 sources--NWS hourly surface data, NWS summary of day data, and NREL solar radiation data.

Content/Elements

- Includes 5 solar radiation elements + 15 meteorological elements with both observational and modeled data.
- 239 stations.

Period of Record - 1961 to 1990.

Notes - Request database manual for further details.

- Data are also available on 3-volume CDROM set.

DATABASE: Worldwide gridded upper-air analysis (multiple pressure levels).
Includes 2 datasets:

TD6140 (NGM and MRF data)--

Data Type - Binary data.

Quality Control - No quality control performed.

Data Origin - Data originate from NCEP's model output.

Content/Elements

- NGM: Covers U.S., southern Canada, and nearby coastal waters. 180 km by 180 km polar stereographic grid. Includes temperature, specific humidity, vertical velocity, and u/v wind components from about 980 mb to 434 mb + 11 variables for the surface. 12 analysis hours/day.
- MRF: Worldwide coverage. 2.5 degree by 2.5 degree grid. Includes temperature, relative humidity, vertical velocity, geopotential, and u/v wind components from 1000 mb to 50 mb + 3 variables for the surface. 4 analysis hours/day.

Period of Record - 1991 to present.

Notes - Request database documentation for further details.

AWS's HIRAS--

Data Type - ASCII character data.

Quality Control - No quality control performed.

Data Origin - Data originate from AFGWC's model output.

Content/Elements

- Worldwide coverage.
- 4 analysis hours/day.
- On 2.5 degree by 2.5 degree grid.
- Includes temperature, dew point depression, specific humidity, precipitable water, vorticity, relative humidity, u/v wind components, D-value, and tropopause data from the surface to 10 mb.

Period of Record - 1985 to present.

Notes - Request database manual for further details.

DATABASE: Worldwide gridded cloud analysis --TD9951 (AWS's RTNEPH).

Data Type - Binary data.

Quality Control - Undergoes automated QC of data.

Data Origin - Data originate from AFGWC's model output.

Content/Elements

- 8 analysis hours/day.
- On polar stereographic grid (eighth-mesh--roughly 40 km by 40 km resolution).
- Includes cloud layer data (base, top, type, and amount) and total cloud amount from surface reports and satellite data, along with present weather and visibility from surface reports.

Period of Record - 1984 to present.

Notes - Request database manual for further details.

DATABASE: Global aircraft reports--TD6380.

Data Type - ASCII character data.

Quality Control - Undergoes automated QC.

Data Origin - Data originate from PIREPS, AIREPS, ASDAR, and ACARS reports.

Content/Elements

- Includes pressure altitude, temperature, relative humidity, dew point, wind direction and speed, clouds, and turbulence.

Period of Record - Generally 1973 to present.

Notes - Request database manual for further details.

DATABASE: Remote-sensing data. Satellite (worldwide), wind profiler (central U.S.), NEXRAD radar data (U.S. sites). See separate sections for additional details.

Data Type - All are binary data.

Quality Control - Little or no QC performed on these data.

Data Origin - Data originate from the sensor (satellite, profiler, radar).

Content/Elements

- Satellite data are available in several datasets from NCDC's Satellite Services Group.
- Profiler data are available from 1991 to present. (Selected data are on-line and can be copied via FTP transfer.)
- NEXRAD data are available as level II and level III.

Period of Record - Varies depending on the dataset and station.

Notes - Request database documentation for further details.

DATABASE: Worldwide gridded snow depth climatology--TD9954 (produced by AWS).

Data Type - ASCII character data.

Quality Control - Underwent extensive automated and manual QC.

Data Origin - Utilized many sources of information to produce the climatology.

Content/Elements

- Climatic averages of snow depth by month on polar stereographic grid (eighth-mesh--roughly 40 km by 40 km resolution).

Notes - Request database manual for further details.

NEXRAD DATA

NEXRAD LEVEL II (DIGITAL BASE DATA)

Level II data are digital base data output from the Radar Data Acquisition's (RDA's) signal processor in polar format containing status messages, performance/maintenance data, volume scan strategy, clutter filter bypass map, and wideband communication console messages. The meteorological elements included are base reflectivity, base velocity, and base spectrum width. Initially, Level II recorders were placed at selected sites for use when significant weather events were taking place. As the system developed, it became apparent that Level II data would be important in properly calibrating the radars, in research applications, and to test revised algorithms. Current plans call for level II recorders to be placed at all WSR-88D sites.

Exabyte tape drives and 8mm tapes are used as recording devices and media. Each tape can hold approximately 4.7 gigabytes of data and, depending on operational mode of the model and recorder model used, one tape may be filled about every 1.8 days for each site. These tapes are received at the National Climatic Data Center (NCDC) from individual sites and are processed on a series of 8505 Exabyte drives, reblocked, cataloged, inventoried, and archived.

The WSR-88D is a very complex system. Program modifications and engineering changes are common. Early models experienced difficulties in the recording of Level II data and even today tapes are received that contain spurious, erroneous, or illegal configurations. The user is cautioned that these anomalies may be encountered while reading the archived tapes, and in some cases, data gaps are evident.

Personnel at the NCDC will be glad to assist in solving problems encountered in reading the tapes; however, technical questions about the data themselves must be addressed to the:

NWS/Operational Support Facility
Applications Branch
1200 Westheimer Drive
Norman, OK 73069
Telephone: (405) 366-6530
Fax: (405) 366-6550

The NCDC also distributes the software, including source codes, to display the WSR-88D Level II data. Reflectivity, velocity, and spectrum width are displayed while the level II tape is being read and written to disk, or images can be displayed after the data have been written to disk. The WSR-88D Visualization Software (WVS) runs on SUN, IBM, HP, and SGI unix-based workstations. A copy of WVS may be obtained either by mail on 8mm tape or through ftp.

Also, NEXRAD inventories are available via the World Wide Web (WWW): <http://www.ncdc.noaa.gov>. Click on 'ON-LINE DATA ACCESS' and 'WSR-88D MAIN DIRECTORY' to reach the inventories, WVS, and other information related to NEXRAD data.

NEXRAD LEVEL III (PRODUCTS)

There are a total of 24 Level III products routinely available from the National Climatic Data Center (NCDC) which include 7 graphic products in clear air mode, 11 graphic products in precipitation mode, 5 graphic overlays and 1 alphanumeric product. Products are stored on Write Once Read Many (WORM) optical disks that are sent to the NCDC by National Weather Service Nexrad sites for archive and distribution to customers. Each product will include state, county, and city background maps. Level III graphic products are available only as color hard copy, gray scale hard copy or acetate overlay copies. The following is a list of the Nexrad Level III products available from NCDC:

Base Reflectivity (R) - A display of echo intensity measured in dBZ.

Base Spectrum Width (SW) - A measure of velocity dispersion within the radar sample volume.

Base Velocity (V) - A measure of the radial component of the wind either toward the radar (negative values) or away from the radar (positive values).

Composite Reflectivity (CR) - A display of maximum reflectivity for the total volume within the range of the radar.

Echo Tops (ET) - An image of the echo top heights color coded in user-defined increments.

Hail Index Overlay (HI) - A product designed to locate storms which have the potential to produce hail.

Mesocyclone Overlay (M) - This product is designed to display information regarding the existence and nature of rotations associated with thunderstorms.

One-hour Precipitation (OHP) - A map of estimated one hour precipitation accumulation on a 1.1 x 1.1 nm grid.

Severe Weather Probability Overlay (SWP) - A measure of a storms relative severity as compared with those storms around it.

Storm Structure (SS) (Alphanumeric product) - A table displaying information on storm attributes which include maximum reflectivity, maximum velocity at lowest elevation angle, storm overhang, mass weighted storm volume, storm area base and top, storm position and storm tilt.

Storm Total Precipitation (STP) - A map of estimated storm total precipitation accumulation continuously updated since the last one-hour break over the entire scope.

Storm Tracking Information Overlay (STI) - A product which shows a plot of the past hours movement, current location, and forecast movement for the next hour or less for each identified thunderstorm cell.

Tornadic Vortex Signature Overlay (TVS) - A product which shows an intense gate to gate azimuthal shear associated with tornadic-scale rotation.

VAD Wind Profile (VWP) - A graphic display of wind barbs plotted on a height staff of 500 ft or 1000 ft increments.

Vertically Integrated Liquid (VIL) - The water content of a 2.2 x 2.2 nm column of air which is color coded and plotted on a 124 nm map.

NCDC's SATELLITE DATA, PRODUCTS, and SERVICES



Satellite data and derived products from NOAA's satellite systems are available through the National Climatic Data Center. The two primary systems are the Geostationary Operational Environmental Satellite (**GOES**), which started in 1975, and the Polar Orbiting Environmental Satellite (**POES**), which began as the TIROS series in 1960. The NCDC also archives SSM/I, SSM/T1 and SSM/T2 data from the Defense Meteorological Satellite Program (**DMSP**) satellites. For a complete listing of satellite data, products and services, please visit the new Satellite Data, Products, and Services Web site at: <http://www.ncdc.noaa.gov/psguide/satellite/sathome.html>.

About NOAA's Satellites

NOAA's newest series of GOES satellites are three-axis body stabilized and equipped with a separate Imager and Sounder, replacing the old VAS (VISSR Atmospheric Sounder) instrument. Currently, there are two operational GOES satellites, GOES-8 and GOES-9, launched April 1994 and May 1995, respectively. Both are in Earth-synchronous orbits with GOES-8 positioned over the equator at 75 W longitude and GOES-9 positioned over the equator at 135 West longitude. The Imager instrument consists of five channels ranging from the visible to the longwave infrared channel. The visible channel has a resolution of 1km while most of the infrared channels have a resolution of 4km at nadir. The Sounder, carrying 18 thermal infrared channels, is capable of making over 50,000 soundings per hour, which is particularly useful over data sparse regions of the Western Hemisphere. Each of the GOES satellites scans predetermined areas of the earth from the mid Pacific region to the eastern Atlantic region. During routine mode, observations are taken over the United States four times every hour, but when severe weather threatens, the GOES Imager is capable of one minute interval observations over a smaller area. A variety of products from the Sounder and Imager are created operationally to improve near real-time and long range forecasts.

The POES satellite system offers the advantage of daily global coverage, by making nearly polar orbits roughly 14.1 times daily. Since the number of orbits per day is not an integer, the sub-orbital tracks do not repeat on a daily basis, although the local solar time of each satellite's passage is essentially unchanged for any latitude. Currently in orbit are NOAA-12 and NOAA-14; thus, there is global coverage four times daily. The satellite system includes the AVHRR (Advanced Very High Resolution Radiometer) and the TOVS (Tiros Operational Vertical Sounder). The AVHRR is equipped with five spectral channels in wavelengths similar to the GOES Imager. The TOVS carries three types of sensors: Microwave Sounding Unit (MSU), Stratospheric Sounding Unit (SSU), and High Resolution Infrared Radiation Sounder/2 (HIRS/2). Operational products such as the Global Vegetation Index, Sea Surface Temperatures, Total Stratospheric Ozone, and TOVS Soundings are created and archived at NCDC.

Satellite Active Archive (SAA)

NOAA's Satellite Active Archive (SAA) is a revolutionary system designed to provide easy access to satellite data. It is a gateway to NOAA's digital library of real-time and historical satellite data collected by NOAA's Polar Orbiting Environmental Satellites (POES). The system allows users to search inventories of satellite data, preview representative Earth images of that data, and download the data for further processing and analyses.

Users can access AVHRR data from June 1, 1994 to the present and TOVS data from July 1, 1995 to the present using a Web Browser. Other satellite datasets such as the DMSP SSM/I, SSM/T1, SSM/T2, and Level 1b data will be added in the near future. The WWW address is:
<http://www.saa.noaa.gov>.

Once the data requirements have been determined, an order may be placed electronically for ftp or copy to tape format. Up to thirty-two datasets with no more than 10 MB of data each can be ftp'ed to your site per session at no cost! For datasets larger than 10 MB, the order system will automatically set the order to tape output for a fee of \$50.00 for the first dataset and \$30.00 for subsequent datasets. The user must contact the NCDC to establish an open account for SAA, prior to placing tape orders. For one-time orders, contact the Satellite Services Group and provide the SAA entity IDs along with a means of payment.

Polar Operational Environmental Satellite (POES):

LEVEL 1b DATASETS :

AVHRR GAC, LAC, and HRPT	10/78 - Present
TOVS MSU, SSU, HIRS/2	10/78 - Present

PRODUCTS:

TOVS Sounding Product	01/01/79 - Present
Vegetation Index/AVHRR (3rd Generation)	04/01/85 - Present
<i>Plate Carree Projection only!! 16km gridded</i>	
Weekly Composite (B-level)	
Monthly Product (C-level)	
Climatology (D-level)	
Heat Budget Data--	
Monthly Mean	01/01/79 - Present
Seasonal	06/01/74 - Present
Mapped GAC Imagery--	
Polar Stereographic	12/22/78 - Present
Mercator	06/24/85 - Present
Sea Surface Temperature Data--	
7 - 8 Day Observation File/AVHRR	12/01/78 - Present
250 km Monthly Mean Data from AVHRR	01/31/79 - Present
100 km Analysis (Global Scale) from AVHRR	12/01/72 - Present
50 km (Regional Scale) and 500 km	03/01/74 - Present
14 km Analysis (Local-Scale) from AVHRR	01/01/86 - Present

Geostationary Operational Environmental Satellite (GOES):

GVAS & GVAR DATA :

Full Disk and Sectors	03/01/75 - Present
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PRODUCTS:

Sounding Products	02/01/95 - Present
Cloud and Moisture Drift Winds	02/01/95 - Present

Defense Meteorological Satellite Program (DMSP):

LEVEL 1b DATASETS:

Special Sensor Microwave/ Temperature(SSM/T)	08/18/87 - Present
Special Sensor Microwave/Imager (SSM/I)	08/18/87 - 06/06/96

PRODUCTS:

Temperature, Sensor, and Environmental Data Records (TDR,SDR,EDR)	07/16/87 - Present
SSM/T Sounding Product	01/01/89 - Present
SSM/I Monthly Gridded Products-- Precipitation	01/01/87 - 12/31/94
Snow Cover/Sea ice	
Total Precipitable Water	
Cloud Liquid Water	
Oceanic Surface Wind Speed	
RTNeph Layered Cloud Amount, Type, Base, Height	01/01/84 - Present
(Global analysis on 40km grid, every 3 hours)	

International Satellite Cloud Climatology Project (ISCCP):

B1 Radiance Data (10km) from GOES VISSR/VAS	07/01/83 - Present
B1 Radiance Data (10km) from GMS	07/01/83 - Present
B1 Radiance Data (10km) from METEOSAT	07/01/83 - Present
B2 Radiance Data (30km) from NOAA Polar Orbiters	07/01/83 - Present
B3 Radiance Data (30km, 3hr) from NOAA Polar Orbiters	07/01/83 - 06/30/94
B3 Radiance Data (30km, 3hr) from GOES	07/01/83 - 06/30/94
B3 Radiance Data (30km, 3hr) from METEOSAT	07/01/83 - 06/30/94
B3 Radiance Calibration Tables (3hr for each satellite)	07/01/83 - 06/30/94
C1 Global Cloud Data (3hr, 280km grid, satellites merged)all	07/01/83 - 06/30/91
C2 Global Cloud Data (monthly, 280km grid, all satellites merged)	07/01/83 - 06/30/91
D1 Global Cloud Data (3hr, 280km grid) <i>(replaces C1 Data-will be processed back to 1983, gap in yrs 1987-89)</i>	06/01/86 - 12/31/92
D2 Global Cloud Data (monthly, 280km grid) <i>(replaces C2 Data-will be processed back to 1983, gap in yrs 1987-89)</i>	01/01/90 - 12/31/92

Aerosols:

Optical Thickness (OT) Observations	06/87 - Present
OT Weekly Analyzed Fields	06/87 - Present
OT Monthly Analyzed Fields	06/87 - Present

Non-digital Satellite Products

AVHRR Imagery:

Local Area Coverage (LAC)	04/01/85 - Present
High Resolution Picture Transmission (HRPT)	04/01/85 - Present
Global Area Coverage (GAC) by satellite pass	10/30/78 - Present

GOES Imagery :

Visible and Infrared Hardcopy Imagery	01/01/78 - Present
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Sea Surface Temperature Charts :

250km Global Monthly Mean Charts	07/01/81 - Present
50km Regional Charts (selected regions)	04/01/76 - Present
14km Local Charts (mainly U.S. coastal areas)	01/01/86 - Present
Gulf Stream Anal. Charts-North/South Panels	10/19/78 - 09/30/95

Aerosol Charts :

100 km Weekly Contour	10/19/78 - Present
Monthly Mean	10/19/78 - Present

NOTE: Please contact NCDC's Satellite Services Group (see below) for prices and availability of other satellite data. NCDC has documentation for many of the above mentioned datasets which are provided at no charge. The *ISCCP* documentation and *Polar Orbiter Data User's Guide* are available on the Internet. Go to NCDC's Satellite Data Products and Services Home Page and click on **Listing of Satellite Data and Products** . The 'km' figures listed above (e.g., 10km) refer to the resolution of the instrument, such as 10 kilometer. The 'hr' values (e.g., 3hr) refer to the frequency of the product, such as every 3 hours.

Satellite Data Price and Order Guide

The National Climatic Data Center maintains an extensive archive of digital data, as well as non-digital satellite data, including miscellaneous slides, prints, film, and VHS tapes of special events too numerous to list. Please contact the Satellite Services Group for details and to confirm prices, ordering procedures, and print and digital formats.

Digital Orders:

Media Type--

- Round tapes (1600/6250bpi)
- IBM 3480 cartridges

- 8mm Exabyte tapes
- 4mm DAT tapes
- CD-ROM

Processing Fees --

- \$75.00 per dataset or input tape (\$80.00 per GOES dataset)
- \$11.00 per tape or CD-ROM output
- \$11.00 service and handling per domestic order/\$21.00 per foreign order

File Transfer Protocol (FTP) Services:

GOES data in McIDAS area format --

- \$45.00 per scene (image)

POES-AVHRR and TOVS data in level 1b format --

(Access via Satellite Active Archive)

- Free for subsetted datasets

DMSP SSM/I gridded datasets --

- Free from NCDC's WWW homepage (<http://www.ncdc.noaa.gov>)

NOTE: FTP services are possible for many other satellite datasets at costs similar to other output formats.

Hard Copy AVHRR and GOES Images :

Custom* 8" X 10" Prints/Transparencies

- \$85.00 per glossy finish

Reproduction Prints/Transparencies

- \$25.00 per glossy finish

Extra copies

- \$5.00 each

35mm slides

- Add \$25.00 to the above fees where appropriate

NOTE: Please add \$5.00 service & handling for orders less than \$50 and \$11.00 s/h for orders of at least \$50. Custom images are created for customer defined areas, dates, times, and channels, and generally have special enhancements. These images are processed from the original data files (level 1b from POES and GVAR from GOES) using McIDAS display and processing software. When ordering, please specify satellite, geographic area, feature wanted shown, satellite channel (visible vs. infrared), resolution, map projection, date, and UTC time.

Reproduction images are readily available and can be copied from NCDC's image library. The majority of these images include special events such as hurricanes, blizzards, volcanic eruptions, forest fires, etc. Hundreds of these images are available as GIF files on NCDC's Web site. The WWW address is: <http://www.ncdc.noaa.gov>. Click on "On-Line Data Access" and then on "Images of Hurricanes and other Storms".

NCDC maintains an archive of miscellaneous slides, prints, film, and VHS tapes of non-special and special events taken by various satellites too numerous to list here. Please contact the Satellite Services Group at the NCDC for details:

Telephone: 704-271-4850
Facsimile: 704-271-4876
E-mail: satorder@ncdc.noaa.gov

PUBLICATIONS

Following is a brief summary of publications available from the National Climatic Data Center (NCDC). Unless otherwise noted, the summaries are for U.S. locations only. However, there are a number of worldwide summaries/publications. For publications listed as available from NTIS, the phone number is 703-487-4650. Otherwise, please contact NCDC for information on pricing and availability. Some publications are out of print and available on microfiche/microfilm only (* items).

National Climatic Data Center
Climate Services Branch
Federal Building
Asheville, NC 28801
Phone: 704-271-4800
Fax: 704-271-4876
Internet: orders@ncdc.noaa.gov

HISTORICAL CLIMATOLOGY SERIES

- 1-1 A Long Record of Weather Observations at Cooperstown, NY, 1854-1977
- 1-2 Ninety-One Years of Weather Records at Yellowstone National Pk., WY, 1887-1977
- 1-3 A Long Record of Weather Observations in Southeastern Iowa, 1839-1979
- 2-1 Index of Historical Surface Weather Records, New York
- 2-2 A History of Sunshine Data in the U.S., 1891-1980 *
- 2-3 Inventory of Sources of Long Term Climatic Data
- 3-1 Atlas of Mean Winter Temperature Departures From the Long-Term Mean over the Contiguous U.S., 1895-1983
- 3-2 Atlas of Mo. & Sea. Temp Departures, (Winter), 1895-1983
- 3-3 Atlas of Mo. & Sea. Temp Departures (Spring), 1895-1983

- 3-4 Atlas of Mo. & Sea. Temp Departures (Summer), 1895-1983
- 3-5 Atlas of Mo. & Sea. Temp Departures (Fall), 1895-1983
- 3-6 Atlas of Monthly Palmer Hydrological Drought Indices (1895-1930) for the Contiguous U.S.
- 3-7 Atlas of Monthly Palmer Hydrological Drought Indices (1931-1983) for the Contiguous U.S.
- 3-8 Atlas of Monthly Palmer Moisture Anomaly Indices (1895-1930) for the Contiguous U.S.
- 3-9 Atlas of Monthly Palmer Moisture Anomaly Indices (1931-1984) for the Contiguous U.S.
- 3-10 Atlas of Monthly Palmer Drought Severity Indices (1895-1930) for the Contiguous U.S.
- 3-11 Atlas of Monthly Palmer Drought Severity Indices (1931-1983) for the Contiguous U.S.
- 3-12 Atlas of Monthly and Seasonal Precipitation Departures from Normal (1895-1985) for the Contiguous U.S. - Winter
- 3-13 Atlas of Monthly and Seasonal Precipitation Departures from Normal (1895-1985) for the Contiguous U.S. - Spring
- 3-14 Atlas of Monthly and Seasonal Precipitation Departures from Normal (1895-1985) for the Contiguous U.S. - Summer
- 3-15 Atlas of Monthly and Seasonal Precipitation Departures from Normal (1895-1984) for the Contiguous U.S. - Fall
- 3-16 Probabilities and Precipitation Required to End/Ameliorate Droughts
- 4-1 State, Regional, and National Monthly and Annual Temperatures Weighted by Area, 1931-1991
- 4-2 State, Regional, and National Monthly and Annual Precipitation Weighted by Area, 1931-1991
- 4-3 Regional and National Monthly, Seasonal and Annual Temperature Weighted by Area, 1895-1983

- 4-5 Time Series of Regional Seasonal Averages of Maximum, Minimum, and Average Temperature, and Diurnal Temperature Range Across the United States, 1901-1987
- 4-7 Climate Variations Bulletin (nationwide climate divisional data) - Preliminary report showing current monthly climate anomalies in a historical perspective using climate databases archived at NCDC. Back issues (monthly since 1989)
- 5-1 State, Regional, and National Monthly and Seasonal Heating Degree Days Weighted by Population, 1931-1992
- 5-2 State, Regional, and National Monthly and Seasonal Cooling Degree Days Weighted by Population, 1931-1991
- 5-3 Percent of Normal, State, Regional, and National Monthly and Seasonal Heating Degree Days Weighted by Population, 1931-1983
- 5-4 Percent of Normal, State, Regional, and National Monthly and Seasonal Cooling Degree Days Weighted by Population, 1931-1982
- 6-1 Statewide Average Climatic History (1983)
- 6-2 Tropical Cyclones of the N. Atlantic Ocean, 1871-1992 with annual updates
- 6-3 Climatic Averages and Extremes for U.S. Cities (274 cities)
- 6-4 Climates of The World

MARINE PUBLICATIONS

Climatic Summaries for NDBC Data Buoys (1986) - Seasonal/Annual Persistence of Wind Speed and Wave Height Events

Climatic Summaries for NDBC Buoys and Stations Update 1 (1990) - Seasonal/Annual Persistence of Wind Speed and Wave Height Events

Marine Climatological Summaries, 1961-70 (10 vols) - Approx- 50-75N, 50-170W

Summary of Synoptic Meteorological Observations (SSMO): Most World Coastal Marine Areas, 1850-1979 (97 vols) Great Lake Areas, 1960-73 (4 vols)

U. S. Navy Climatic Study of the Caribbean Sea & Gulf of Mexico:

Volume 1, W. Caribbean Sea & Central American Waters

Volume 2, E. Caribbean Sea

Volume 3, Florida Coastal Waters & SW Atlantic

Volume 4, Gulf of Mexico

U. S. Navy Regional Climatic Studies:

Mediterranean Sea (1987)

Northern California Operating Area (1988)

Southern African Waters (1989)

U.S. Atlantic Coast & Associated Waters (1989)

Mozambique and Adjacent Waters (1989)

Barents Sea and Adjacent Waters (1991)

Sea of Okhotsk and Adjacent Waters (1991)

Greenland, Iceland, UK, & Associated Waters (1992)

Persian Gulf and Northern Arabian Sea (1992)

Red Sea and Adjacent Waters (1993)

Gulf of Aden and Adjacent Waters (1993)

North Sea, Celtic Sea, Irish Sea, Assoc Wtrs (1994)

Climatic Studies of the Near Coastal Zone:

East Coast of the U.S. (1976)

West Coast of the U.S. (1976)

Persian Gulf and Gulf of Oman (1980)

Malacca and Sunda Straits (1982)

Red Sea South & Gulf of Aden (1982)

Southern Calif. Operating Area (1984)

Climatic Atlas of the Outer Continental Shelf Waters and Coastal Regions of Alaska:

Vol I, Gulf of Alaska (1988)

Vol II, Bering Sea (1988)

Vol III, Chukchi-Beaufort Sea (1988)
Vol I, Gulf of Alaska (1977)
Vol II, Bering Sea (1977)
Vol III, Chukchi-Beaufort Sea (1977)

Climatic Summaries:

Major Seventh Fleet Ports and Waters (1973)
Major Indian Ocean Ports and Waters (1974)

Environmental Guides:

Seven U.S. Ports (1972)
U.S. Gulf Coast (1972)
Mona Passage Area (1974)

Environmental Scenarios:

Northeast Atlantic (1973)
Northeast Pacific (with errata) (1974)
Bermuda (1974)

North Atlantic Tropical Cyclones, 1950-1980. *

Mariners Worldwide Climatic Guide to Tropical Storms at Sea - Narrative information and charts showing storm tracks, frequency maps and tropical cyclone roses.

U.S. Navy Hindcast Spectral Ocean Wave Model Climatic Atlas: Historical environmental dataset in the form of a wind and wave climatology. Data in the Atlas were produced by applying the Spectral Ocean Wave Model in hindcast mode to historical wind and pressure fields. Areas: North Atlantic Ocean - North Pacific Ocean - Mediterranean Sea.

Wind and Wave Summaries for Selected U.S. Coast Guard Operating Areas - Describes wind and wave conditions for the U.S. East Coast, Great Lakes and Eastern Pacific. Available from NTIS on microfiche only: Document No. AD-A130 647.

Addendum to Wind and Wave Summaries for Selected U.S. Coast Guard Operating Areas - Contains additional sites for the locations given in the first summary along with U.S. West Coast and Hawaiian locations. Also included is a section on coastal site wind statistics for the U.S. Coast.

Mariners Weather Log: January 1957 to present (published quarterly). Microfiche available 1972 to present from NTIS.

RAINFALL FREQUENCY ATLASES & EVENT STATISTICS

TP-40: Rainfall Frequency Atlas of the U.S. - Weather Bureau Technical Paper No. 40 - Presents 49 U.S. rainfall frequency maps for selected durations from 30 minutes to 24 hours

and return periods from 1 to 100 years.

HYDRO-35: Five- to 60-Minute Precipitation Frequency for the Eastern and Central U.S. (Supersedes TP-40 above for the eastern 2/3 of the U.S. for durations of 1 hr. and less.) - Presents 6 U.S. rainfall frequency maps for durations of 5, 15 and 60 minutes at return periods of 2 and 100 years. Equations are given to derive 10- and 30-minute values between 2 and 100 years.

NOAA Atlas 2: Precipitation Frequency Atlas of the Western U.S. (Supersedes TP-40 above for the 11 western states) - Contains maps for the 6- and 24-hour durations for return periods of 2, 5, 10, 25, 50, and 100 years.

Rainfall Event Statistics - Created for stormwater/wastewater discharge applications. Includes rainfall and evaporation data such as wet and dry day counts and storm frequencies, depths, and durations. Other evaporation-related parameters are estimated by using monthly means of temperature, cloud cover, relative humidity, and wind speed for each climatic division in the U.S. Available for over 3,200 U.S. cities.

MISCELLANEOUS SUMMARIES

Local Climatological Data - Monthly climatic data for National Weather Service locations. **
Climatological Data - Monthly climatic data by state for over 8000 stations in the U.S. **

Hourly Precipitation Data - Monthly precipitation data for over 2500 U.S. stations. **

Storm Data - Monthly summary of storms/related damage for the U.S. **

Monthly Climatic Data for the World - Monthly climatic data for worldwide locations. **

Climatic Atlas of the U.S., 1931-60 - Contoured maps of climatic averages for the U.S.

Climatological Summaries, 1951-80 (No. 20) - Climatic summaries by city for the U.S.

Freeze/Frost Data (No. 20 Sup. 1) - Freeze/frost statistics for over 3000 U.S. locations.

Climates of the States (No. 60) - Climatic summaries by state.

Monthly Normals, 1961-90 (No. 81):

Monthly Station Normals-Temperature, Precip, & Heating/Cooling Degree Days, 1961-90.

Monthly Precipitation Probabilities, 1961-90, No. 81 Sup. 1.

Annual Degree Days to Selected Bases, 1961-90, No. 81 Sup. 2.

Maps of Annual 1961-90 Normal Temperature, Precipitation, & Degree Days, No. 81 Sup. 3.

Summary of Hourly Observations, 1951-60 (No. 82) - Hourly observational summary by city.

Daily Normals, 1961-90 (No. 84) - U.S. daily normals by city.

Divisional Normals/Standard Deviations, 1931-90 (No. 85) - U.S. normals by climatic division for: Temperature and Precipitation, Heating and Cooling Degree Days.

Climatological Summary of States, 1951-60 (No. 86) - Statewide climatic summaries.

Airport Climatological Summary, 1965-74 (No. 90) - Climatic summaries, U.S. airport locations.

Comparative Climatic Data, nationwide, 1995 edition - Climatological tables for U.S. cities.

** Available by subscription.

SOLAR RADIATION PUBLICATIONS

Mean Daily Solar Radiation, monthly and annual maps.

Annual Average Daily Global Solar Radiation on a South Facing Surface (1952-75).

Input Data for Solar Systems (1941-70) - Contains:

Normal max, min and mean temperatures.

Normal heating and cooling degree days.
Monthly mean daily total solar radiation.

Insolation Data Manual (1952-75) - Contains statistics from "Input Data for Solar Systems" and a global cloudiness index.

Direct Normal Solar Radiation Data Manual (1952-75) - Long term, monthly mean, daily totals for 235 National Weather Service Stations.

Solar Radiation Energy Resource Atlas of the U.S. (1952-75) - Contains maps of monthly and annual values of:

Global average solar radiation.

Global average direct normal solar radiation.

Global average diffuse solar radiation.

Available from NTIS. Microfiche presentations available from NCDC. Include monthly & annual data in microfiche or photocopy form for 237 stations (up to 3 fiche per station).

Solar Radiation and Radiation Balance Data (The World Network) - Contains year-to-year monthly and annual means of global solar radiation, radiation balance and sunshine duration for the periods 1964-1968, 1969-1973, 1974-1979 and 1980-1984. Available for worldwide sites.

Solar Radiation Data, Monthly Summary (1977-1980) - Monthly publication is out of print, but is available on 101 microfiche.

Hourly Solar Radiation (unedited) (January 1981 - October 1985) - A continuation of the above data but editing for quality control was suspended with the publication in December 1980).

Hourly Solar Radiation Data (edited) (January 1988 - Current) - Global and direct solar radiation data are collected for the 31 station NOAA Solar Radiation Network.

Selected Climatic Maps of the United States (1931-60) - Contains the following maps:

Mean daily Solar Radiation (January and July).

Mean total hours of sunshine (annual).

Mean percentage of possible sunshine (January, July, annual).

Mean percentage of possible sunshine (monthly and annual maps).

WIND DATA PUBLICATIONS AND TABULATIONS

Wind Energy Resource Atlas (through 1978) - Twelve published volumes of wind energy statistics using data from approximately 975 locations are available from NTIS.

Comparative Climatic Data - Presents separate tables of monthly and annual average wind speed in MPH for about 300 U.S. sites.

Climatic Atlas of the U.S. (1931-60) - Presents maps of monthly and annual averages of prevailing direction, mean speed (MPH) and fastest mile of wind.

Local Climatological Data, Annual Summary - Presents tables of monthly and annual average, resultant and fastest mile wind speed for the current year, and monthly and annual mean and fastest mile speed for a long period, usually 15 to 30 years.

Airport Climatological Summaries (1965-74) - Presents monthly and annual tables of mean wind speed (Kts) and prevailing direction plus percent frequency of wind direction vs. wind speed (Kts)

Wind-Ceiling-Visibility Data at Selected Airports (1948-78) - 284 locations available - presents annual-only wind direction vs. wind speed circular graphs and tabulations for six ceiling-visibility classes.

Summary of Hourly Observations (1951-60) - 138 locations available - Presents monthly and annual tables of percent frequency of wind direction and speed (MPH) + percent frequency of hourly wind speed (MPH); and hourly sky cover.

Customized Wind Rose Tabulations - Federal Aviation Administration (FAA) Wind Rose for Airport Design: Wind direction versus wind speed frequency tabulations. The standard tabulation provides an overall summary of 36-point wind quadrant data for combined all-weather conditions. Wind speeds are reported in knots and use 9 standard FAA speed groups plus calm. In general, the most recent 8 years of hourly data will be summarized. Additional tabulations described under "Customized Tabulations" below provide diskette files in the FAA Airport Design software format. NCDC can provide customized 16-point or 36-point wind rose tabulations of monthly, seasonal, and/or annual data; wind units in mph, knots, or meters/sec; and customer-specified a) ceiling-visibility thresholds, b) hours of operations, c) variety of present weather conditions, and d) speed classes (up to 9 classes with flexible ranges).

Extreme Wind Speeds at 129 Stations in the Contiguous U.S. - Presents measured fastest mile wind speed and direction from beginning of record (usually 1941) to 1977 for each year, and computed extreme wind speeds for return periods from 2 years to 1 million years. Tropical storm extreme winds were included for this study, but caution should be used when using this book in hurricane prone areas.

Directional Extreme Wind Speed Data for the Design of Buildings and Other Structures - Presents largest yearly fastest-mile wind speed data corresponding to winds blowing from each octant at 37 airport stations in the United States.

Historical Extreme Winds in the U.S., Atlantic and Gulf of Mexico - Area covered: 53 coastal locations from Maine to Texas. Tables present measured annual values from beginning of record (varies from 1875 to 1947) to 1979. Maps present computed annual 100-year return period fastest-mile wind speed at 10 and 30 meters above ground level. Tropical storm extreme winds were included in this study.

Historical Extreme Winds in the U.S., Great Lakes and Adjacent Regions - Area covered: 70 locations in 8 Great Lakes states plus Iowa. Tables present measured annual values from beginning of record (varies from 1875 to 1951) to 1979. Maps present computed annual 100-year

return period fastest-mile winds at 10 and 30 meter heights above ground level.

Index to Summarized Wind Data (Sep 1977) - Presents samples of 15 different Wind Rose tabulation formats available from the NCDC together with an index arranged alphabetically by state/city and format. Periods of record are listed for each tabulation. Contains no actual or average wind data.

National Wind Data Index--Final Report (Dec 1978) - Presents sample of forms used to record original wind observations and a listing of periods of record available for actual manuscript wind observation data together with a list of anemometer heights and height-change dates. Contains no actual or average wind data.

Wind Energy Resource Information (WERIS) Index - Presents samples of the 19 types of statistical tables and the period of record available for the approximately 975 stations. Contains no actual or average wind data.

WORLDWIDE/FOREIGN PUBLICATIONS

Climates of the World (1969) - Presents average temperature and precipitation data for approximately 800 stations throughout the world. It also includes brief narrative descriptions of the climate of each continent and maps depicting the annual average worldwide distribution of temperature and precipitation.

World Weather Records - This six volume set contains monthly and annual tables of mean temperatures, mean pressures, and total precipitation for most stations throughout the world for which complete data for the ten year period (e.g., 1981-1990) are available. Prior issues back to 1920 are available on microfiche.

Volume 1, North America

Volume 2, Europe

Volume 3, West Indies, South and Central America
Volume 4, Asia
Volume 5, Africa
Volume 6, Islands of the World

Monthly Climatic Data for the World (MCDW) - Issued monthly only, and contains monthly mean values of surface and upper air measurements from a large number of selected stations throughout the world. The surface elements included are pressure, temperature, vapor pressure, precipitation, and percent of long-term averaged sunshine. The upper air data consist of height, temperature, dew point depression, and mean vector wind at standard constant pressure levels.

Miscellaneous Summaries - Weather data recorded by the U.S. Air Force and U.S. Navy weather services stateside and abroad are archived on paper and microfiche at NCDC. Hourly surface data are available from many locations since the 1940s on one form per day. Some autographic charts and radiosonde records are available. Much of this military data are also available in digital form, and can be printed on paper at cost. Summarized data available ranges from 1 sheet monthly averages to several-hundred page 3-hourly summaries. Detailed climatic summaries are also available for many regions of the world.

Worldwide Airfield Summaries - This series of summaries presents monthly and annual climatological information for approximately 4,000 airfields and climatic areas throughout the world. The period of record varies by stations and elements. The data used are prior to 1974. These summaries were prepared by the U.S. Air Force Environmental Technical Applications Center (ETAC) for the U.S. Naval Oceanography Command and are archived on 156 microfiche and on one CD-ROM. Copies of data for individual stations are available on paper or on microfiche.

Upper Air Studies - Joint U.S. Navy/U.S. Air Force Climatic Study of the upper atmosphere. These atlases introduce a new historical gridded upper air dataset. Data in these atlases were produced by summarizing the European Center for Medium-Range Weather Forecasts (ECMWF) 00 & 12Z gridded analyses for 1980-1985. Also available on CD-ROM for period 1980-1991.

Summary of Meteorological Observations-Surface (SMOS) - Monthly and annual summaries (some by 3-hour groups) of weather conditions; precipitation; surface winds; ceiling versus visibility and sky cover; temperature and relative humidity; and pressure for approximately 980 worldwide locations. Data available on paper and on CD-ROM.

Revised Uniform Summary of Surface Weather Observations (RUSSWO)/Surface Observational Climate Summary (SOCS) - Similar summaries to those listed above as 'SMOS' are available for approximately 450 worldwide locations on paper and on CD-ROM. Various periods of record are available.

NCDC Foreign Data Collection - Consists of over 100,000 volumes of publications printed in foreign countries and exchanged with NOAA for US climate publications. The collection contains worldwide average meteorological data on a country-by-country basis. A digital index file is used to locate potentially useful data. Significant large holdings include publications from:

1. Argentina 4. Germany 7. Poland

2. Australia
3. France
5. Japan
6. Philippines
8. United Kingdom
9. USSR

World Data Center-A For Meteorology - Of particular interest to research scientists are the collections of WDC-A for Meteorology, collocated with NCDC. Catalogs have been published and are available in most large research libraries for databases available, which include: GATE, FGGE, MONEX, WAMEX, ALPEX, IFYGL, and STREX.

NOAA Library - Contains an extensive collection of foreign weather data publications. Visitors are welcome. Address:

NOAA Central Library
2nd Floor, SSMC3
1315 East-West Highway
Silver Spring, MD 20910

GUIDES AND CATALOGS

Selective Guide to Climatic Data Sources (Washington, DC: NOAA, 1988) - Contains brief descriptions of many NCDC domestic, and some NCDC foreign holdings. Available on 7 microfiche, free from NCDC.

Guide to Standard Weather Summaries and Climatic Services (NAVAIR 50-IC-534) (Asheville, NC: NOCD, 1986) - Contains the most complete site inventory available of NCDC foreign (and domestic) summarized unpublished tabulations. Available only on 4 microfiche, free from NCDC.

Catalog of Publications of the World Meteorological Organization (Geneva, Switzerland: WMO, 1983) - For U.S. and Canadian requests, order from:

American Meteorological Society
45 Beacon St.
Boston, MA 02108
Phone: 617-227-2425 (ask for publications)

OL-A, AFCCC Directory of Climatic Databases (Asheville, NC: AFCCC, 1996) - Descriptions of many Air Force climatic databases available from Federal Climate Complex in Asheville, NC. Free from NCDC.

GLOSSARY OF ACRONYMS

AFGWC	Air Force Global Weather Central
ASOS	Automated Surface Observing System
AWS	Air Weather Service
ECMWF	European Center For Medium-range Weather Forecasts
GTS	Global Telecommunications System
MRF	Medium Range Forecast model
NCEP	National Centers for Environmental Prediction
NGM	Nested Grid Model
NREL	National Renewable Energy Laboratory
NWS	National Weather Service
POR	Period of Record
QC	Quality Control
TD	Tapedeck