

PRODUCTS AND SERVICES GUIDE



NATIONAL CLIMATIC DATA CENTER

ASHEVILLE, NC

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See <http://www.ncdc.noaa.gov/ol/climate/climateproducts.html> for a digital copy of 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.

Tom Karl
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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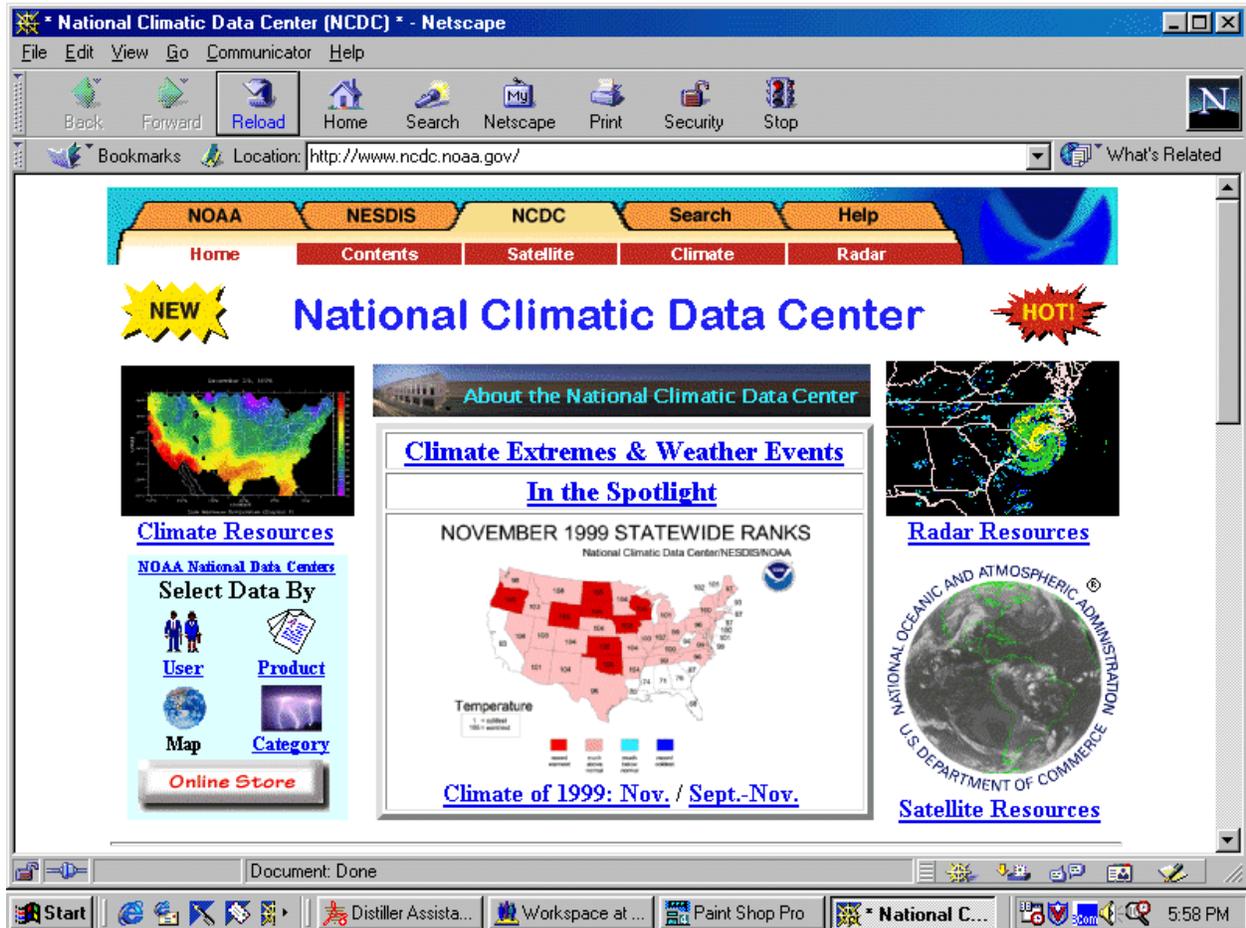
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WORLD WIDE WEB SERVICE

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 Netscape or Internet Explorer. Some of the datasets and products available via WWW are highlighted in the following pages, with at least the first page of the web system shown. Our WWW service is in the midst of many changes and additions, so we encourage you to check our homepage for the latest updates, and only use this Guide as an overview of some of our online products and services.

Our web system is frequently updated, and includes access to U.S. and global climatic data, satellite data, radar images, inventories of datasets available off-line, publications, special reports on extreme weather events, and an on-line ordering system. Approximately 150 gigabytes of data and information are downloaded each month from this system. If you encounter slow response from the system during peak hours (typically late morning through afternoon), we suggest you try again during other times of day (or night). We appreciate your usage and suggestions!



NOAA National Data Center Climate Data Online

During 1998-1999, the National Climatic Data Center developed the NOAA National Data Center Climate Data Online (NNDC CDO) System to a) provide fast, easy online access to a variety of climatic datasets; b) provide the climatic support and backbone for the NNDC Server (in development); and c) facilitate migration from a Unisys mainframe customer support environment to an open systems unix environment.

The system includes both recent and historical data, useful for studies of particular weather events, and for historical analysis of data for statistical and other research purposes. The types of data currently included in the system, which continues to be populated, are surface daily and monthly data, hourly precipitation data, and 15-minute precipitation data. The data are primarily for the United States, although there are two monthly datasets, one of which includes global stations. The system will be greatly expanded during 2000, with global surface hourly and global upper air data added to the system. The URL is:
<http://www5.ncdc.noaa.gov:7777/plclimprod/plsql/poemain.poe>.

The NNDC CDO backbone is an Oracle relational database system, using structured query language and other programming languages to retrieve data. Data are accessible and selectable by region, country, state (US), climate division (US), county (US), and station, and by time period (year, month, day, hour). The data are available free of charge to NOAA users and to educational institutions (.edu), with charges applied for other users. However, charges are greatly reduced as compared to traditional off-line delivery of climatic data.

The climatic data currently accessible are:

- Daily (primarily U.S.) for full period of digital record, typically 1948 to present, over 19,000 stations historically, over 8000 currently active.
- Monthly (primarily U.S.) for full period of digital record, typically 1948 to present, over 19,000 stations historically, over 8000 currently active.
- Global monthly for 1987 to present, over 3000 stations historically, over 1000 currently active.
- Hourly precipitation (primarily U.S.) for full period of digital record, typically 1948 to present, over 6000 stations historically, over 2800 currently active.
- 15-minute precipitation (primarily U.S.) for full period of digital record, typically 1971 to present, over 3400 stations historically, over 2400 currently active.

The main user interface (Figure 1) allows initial selection by region, by country, or by data type. So, you can select, for example, one country to see what types of data are available for that country. Or, you can select one data type to see what countries and stations have data available for that type of data.

The next "page" (Figure 2) allows selection of the entire dataset ('worldwide'), selection by region, by country, or by station number range. Selection of United States as the country then

leads to an interface (Figure 3) allowing selection by entire state, climate division, county, or individual station(s). This is quite flexible in that you can select, for example, all stations in a county, or just pick selected stations from a particular state.

The next “page” will vary depending on what you selected so far. For example, if you choose “climate division” as your criteria, you’ll then see a map of the divisions for that state (Figure 4). If you choose “county” as your criteria, you’ll see a list of counties (Figure 5). If you choose station as your criteria, you’ll see a full list of stations for the state (Figure 6).

The next “page” (Figure 7) then provides for selection of the period/dates you require and the output format desired. Also, some datasets (e.g., daily, monthly) provide element selection capability on this page, so that you can select just the desired weather elements (e.g., precipitation, temperature). Our basic format options (for most datasets) are:

- Space-delimited with station name in each data record
- Space-delimited without station name
- Comma-delimited with station name in each data record
- Comma-delimited without station name
- The standard (archive) variable length format for that particular dataset
- The standard fixed length format for that particular dataset

Most users prefer one of the delimited formats. Comma-delimited is often better for import into a spreadsheet. Space-delimited is easier on the eyes and easy to write a program for, such as with Fortran or C++. The standard dataset formats are often required by users with application programs previously written for those specific NCDC formats.

The next “page” will provide a summary of your request and will then direct you into our Online Store, unless you have free access as mentioned above. The Online Store then requests payment information, with a similar interface as you would see for other online systems. At present, payment by credit card is the only option, but we plan to add a subscription option, whereby users will be able to subscribe to the system for a year at a fixed price.

Finally, you’re directed to an html address with a list of files that have been produced, or are being produced. Your data file may already be available, so you can click on the file to see if it’s there. If not, just bookmark the page for future reference. Also, you’re “double-covered” in that we send you an email with directions to your data when your order has finished processing. You’ll have access to the data file, an inventory for your selection, a station list, and data format documentation. Most small orders (e.g, a few mb) complete processing in a few minutes. However, some larger orders require a few hours to process, so keep that in mind after placing your order. Of course, if our system is quite busy, run times will be longer; and if the internet “lines” in your path to NCDC are busy, your time required to ftp the data files will be longer.

A complete help system is included (<http://www5.ncdc.noaa.gov/cdo/info.html>) with a data price schedule, general system information, detailed system help for diagnosing problems (e.g., inability to connect due to firewall on user end), format documentation, data samples, station lists, utility software, etc.

Although with limited publicity, this system has proven to be quite popular since its online implementation in June 1999. Customers for the available datasets are now frequently using this system rather than placing off-line orders by phone for later delivery by mail. However, when off-line orders are placed, NCDC uses NNDC CDO to fill the order and provide the data on the requested media (e.g., CDROM, zip disk, magnetic tape, ftp delivery). This means we only have to maintain one system for both online and off-line support for these datasets, and future datasets that will be added. That translates into substantial cost savings to the government.

We currently limit the data volume for a specific user-requested file to 40 mb, which is then compressed (gzip) to 5 mb or so. We plan to increase that limit in the near future, as bandwidth improvements allow. Of course, you can place several orders (i.e., for several files) in one web session to retrieve all of the required data. For the immediate future, we suggest that requirements for large data volumes (over ~ 100 mb) be placed as an off-line order by phone (828-271-4800) or email (orders@ncdc.noaa.gov).

Again, the system URL is: <http://www5.ncdc.noaa.gov:7777/plclimprod/plsql/poemain.poe>. We encourage you to give it a try and provide feedback to us. We continue to implement enhancements to the system, with user feedback being a key to that process. Our long-term plan is for this system to be NCDC's primary method of delivering in-situ data to weather and climate data customers.

Figure 1

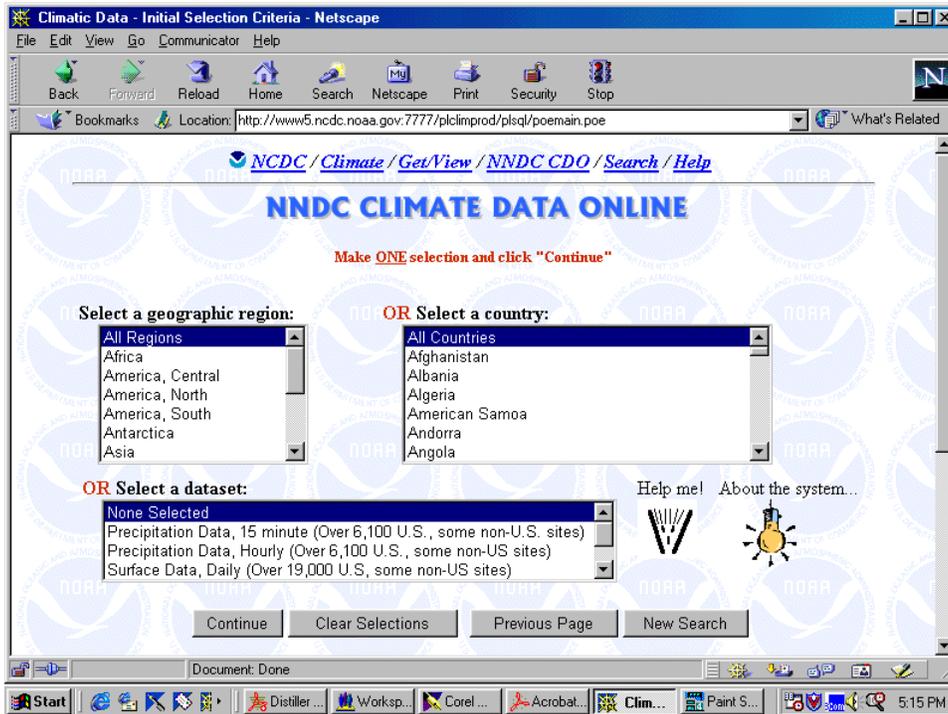


Figure 2

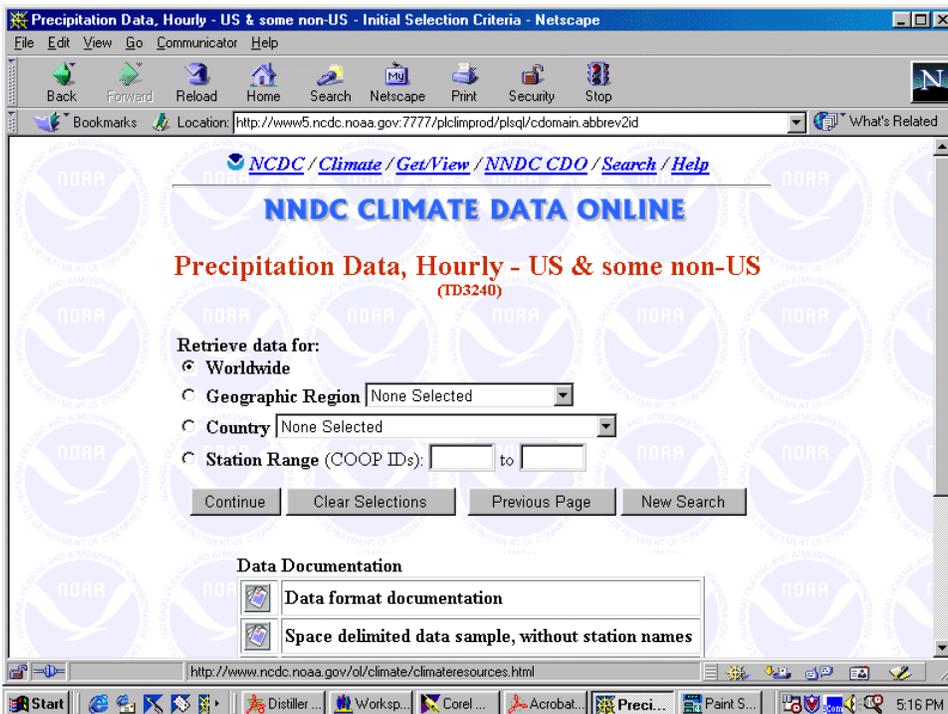


Figure 3

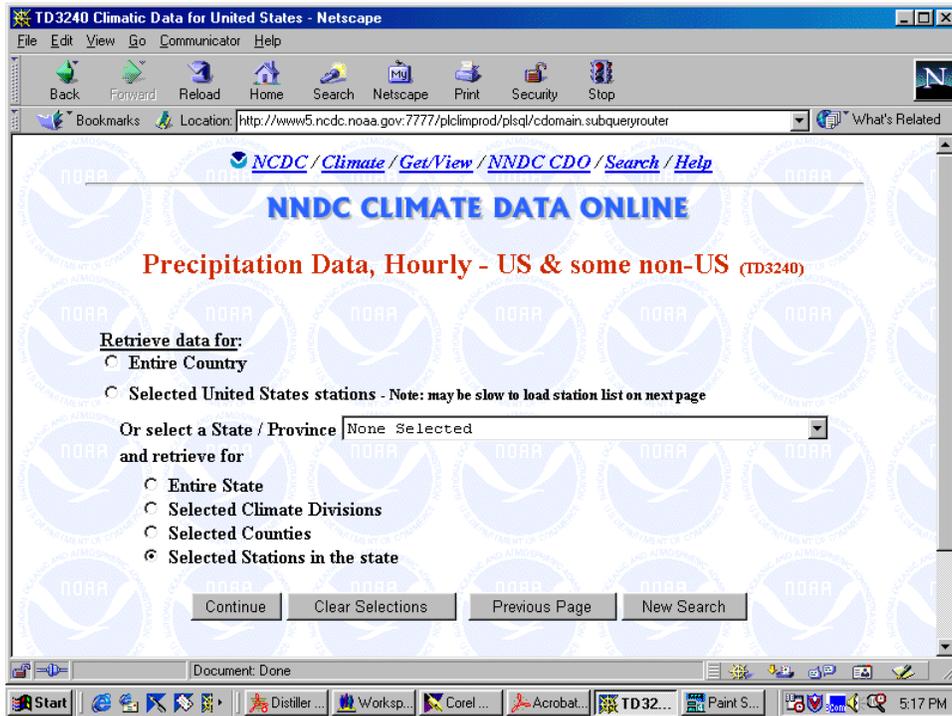


Figure 4

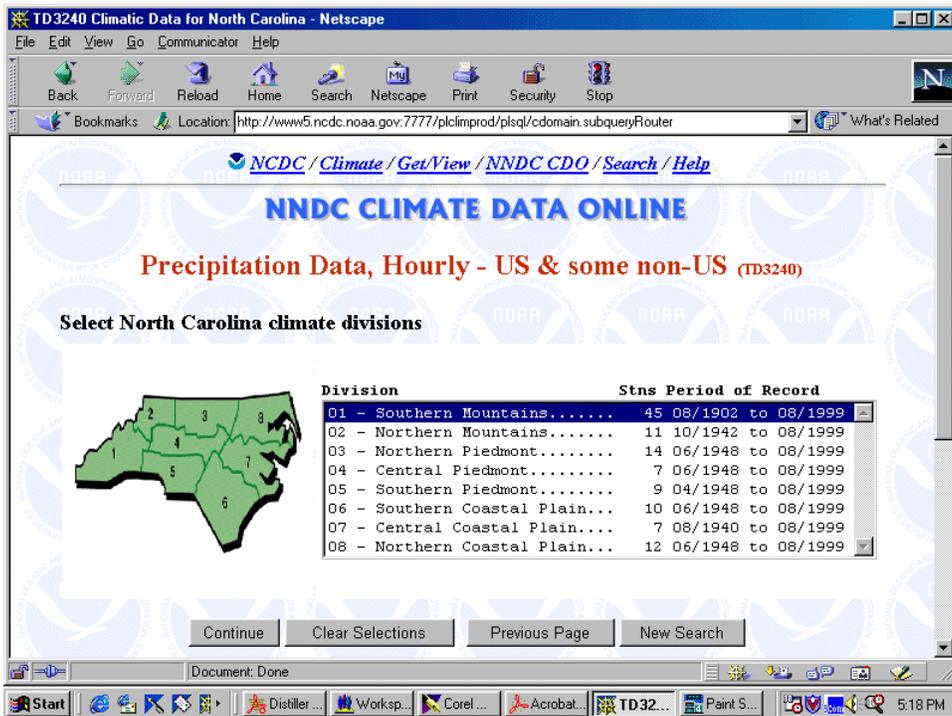


Figure 5

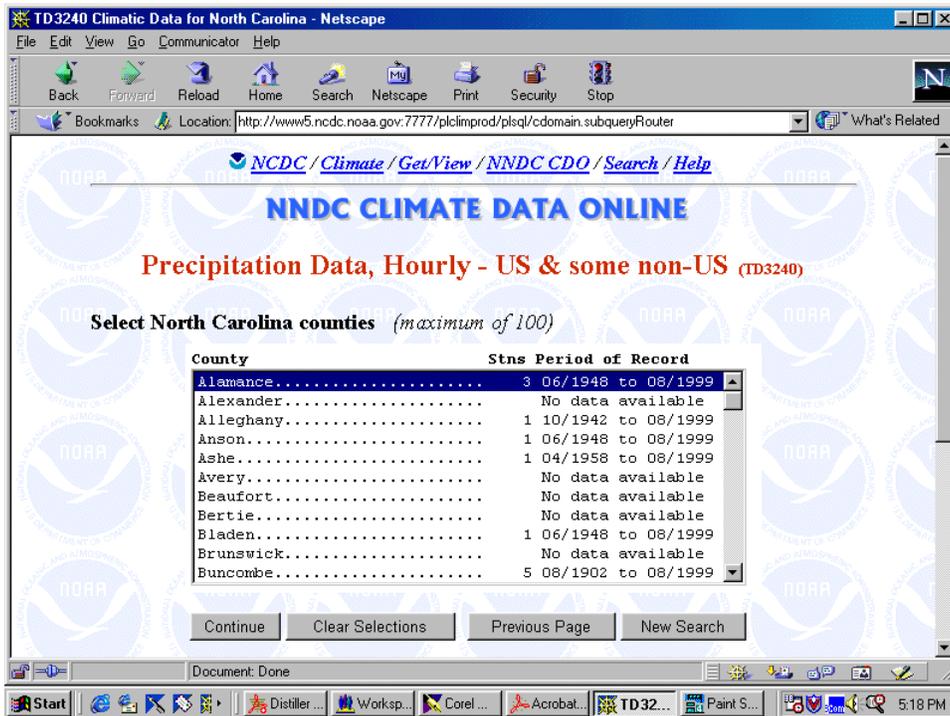


Figure 6

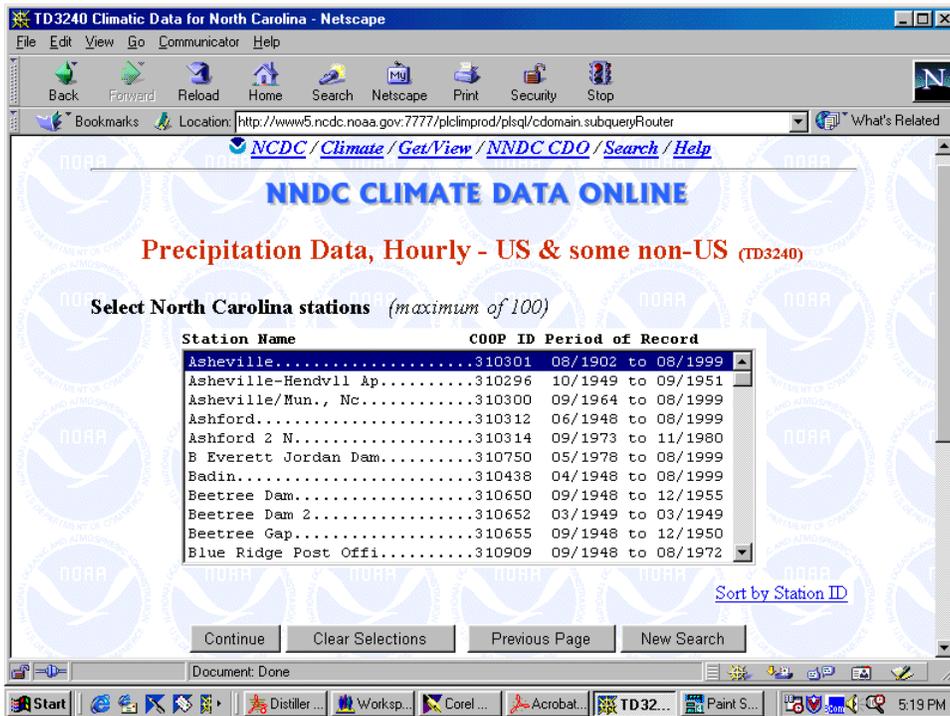
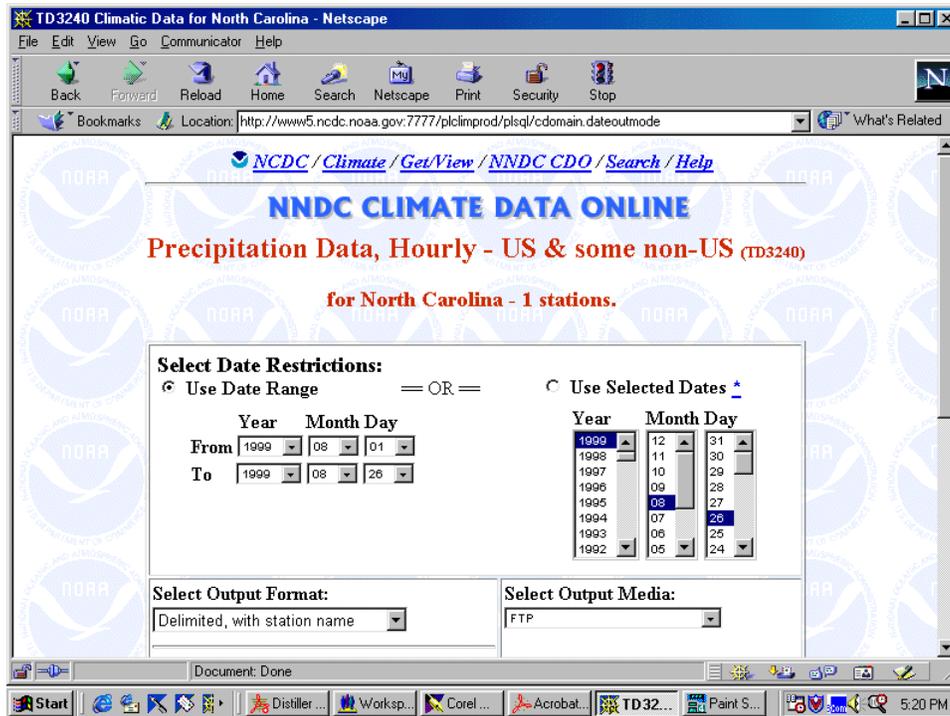


Figure 7



Additional WWW Systems and Pages

The following pages provide a snapshot of additional web pages and systems available through NCDC's WWW homepage. This is only a brief overview of what's available, so we suggest you go to the specific web pages shown below to review any page or system of particular interest to you. For example, the "extreme weather and climate events" system (**page 13**) has proven to be quite popular, and is a good one-stop source for this type of information. We also have a system to graph selected data (**page 30**) and a system to produce printable forms for several of our datasets (**page 33**).

NCDC: Climatic Extremes and Weather Events - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Stop

Bookmarks Location: <http://www.ncdc.noaa.gov/extremes.html> What's Related

[NCDC](#) / [Climate Resources](#) / [Get/View Data](#) / [Extremes](#) / [Search](#) / [Help](#)

U.S. Hurricanes	U.S. Heavy Rainfall	U.S. Temperature Extremes	U.S. Tornadoes
Billion \$\$ Weather Disasters		1991-1999 Weather Events	Historical Global Extremes
Global Climate Change		Satellite Images	
El Nino/La Nina		U.S. Radar Composites	
Climate of 1999	U.S. Local Storm Reports	Climatic Data	

Document: Done

Start | | | | | | | | | 12:54 PM

Hurricanes - Netscape

File Edit View Go Communicator Help

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Bookmarks Location: <http://www.ncdc.noaa.gov/climate/severeweather/hurricanes.html> What's Related

[NCDC](#) / [Publications](#) / [Extremes & Events](#) / [Hurricanes](#) / [Search](#) / [Help](#)

Hurricanes

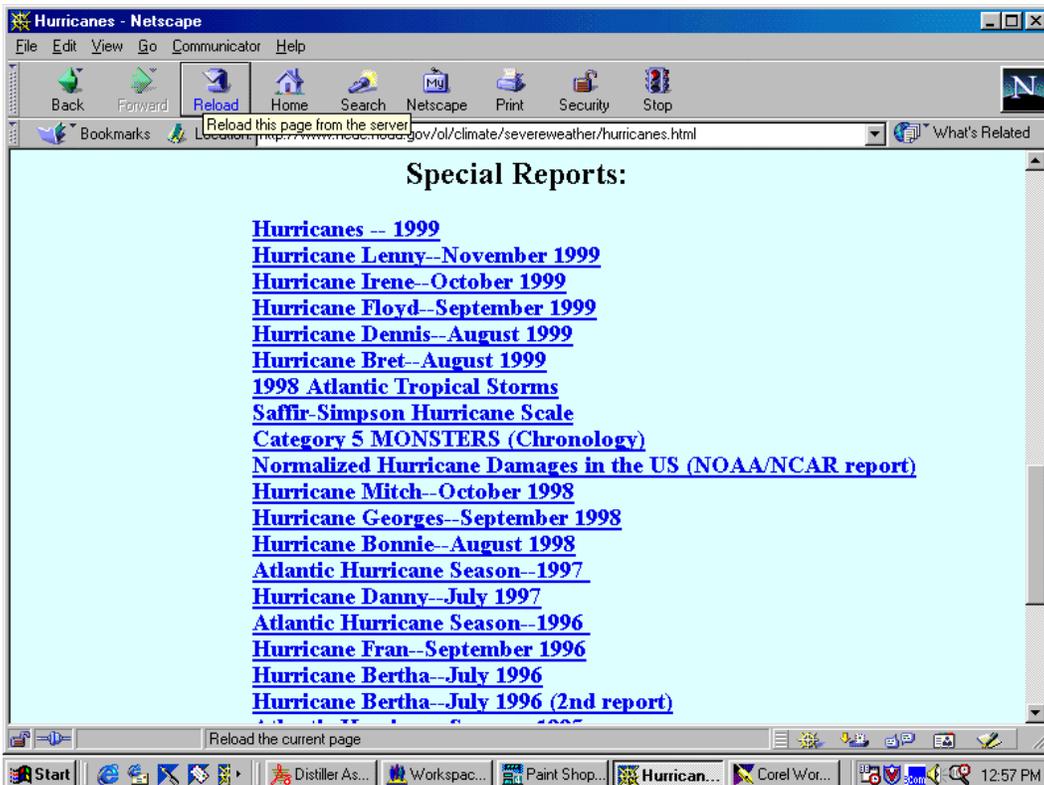
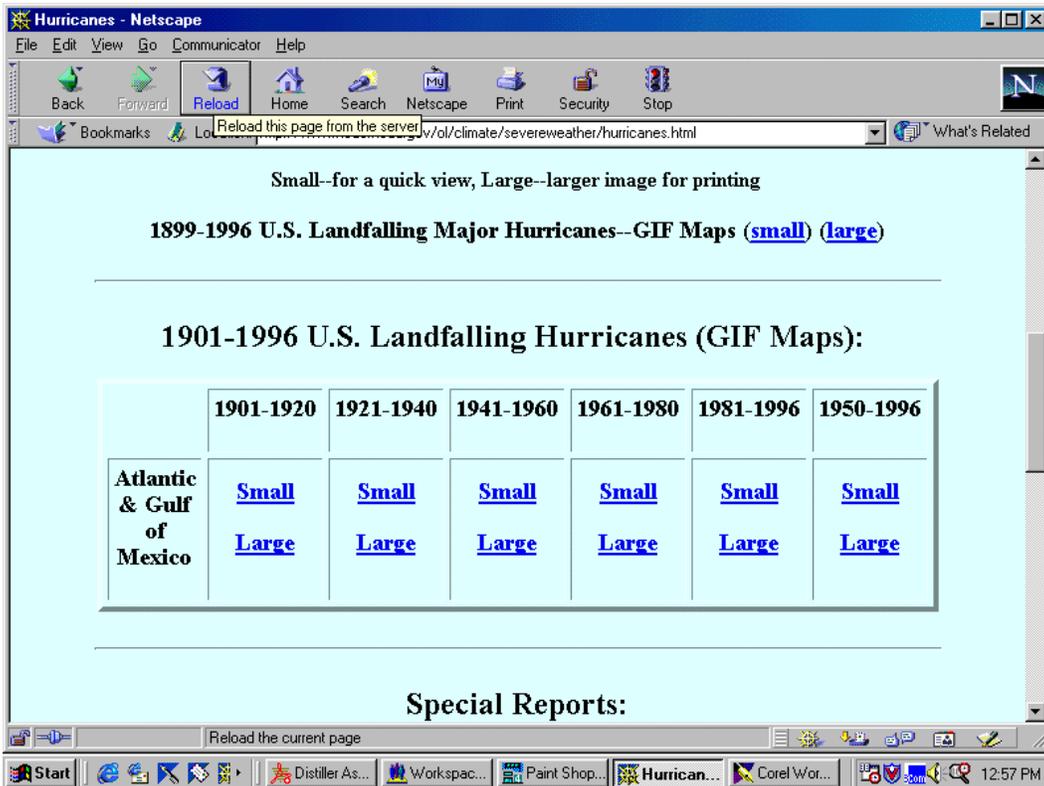
Updated 18 November 1999

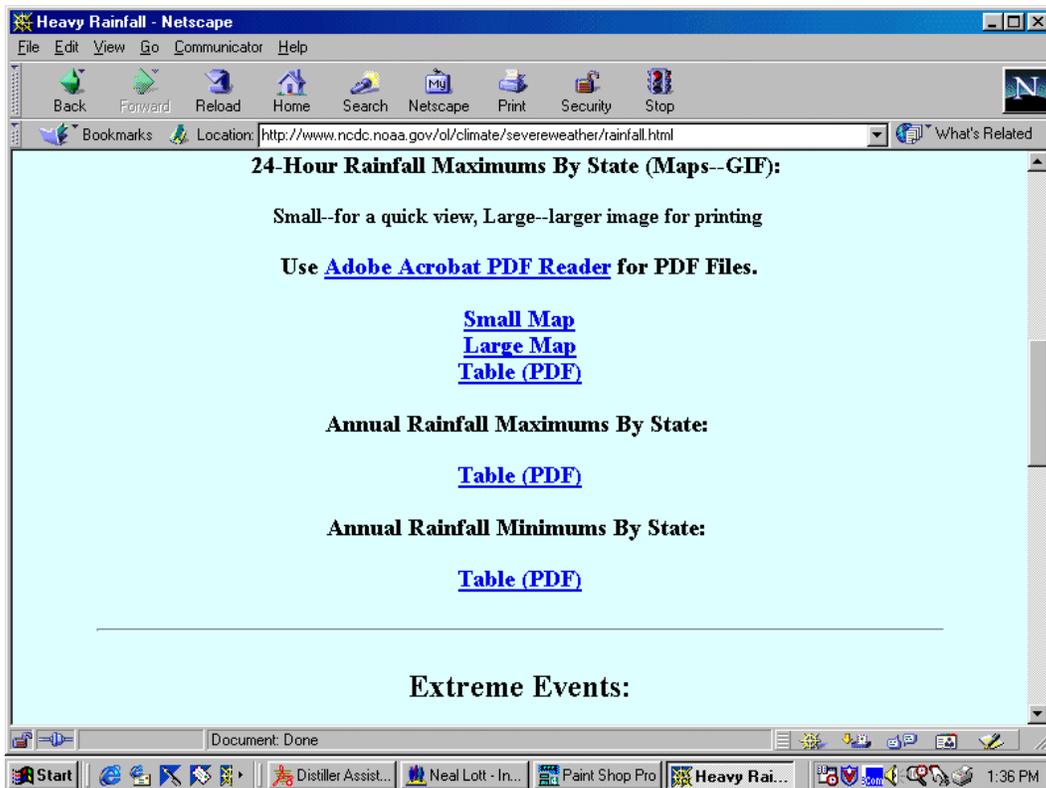


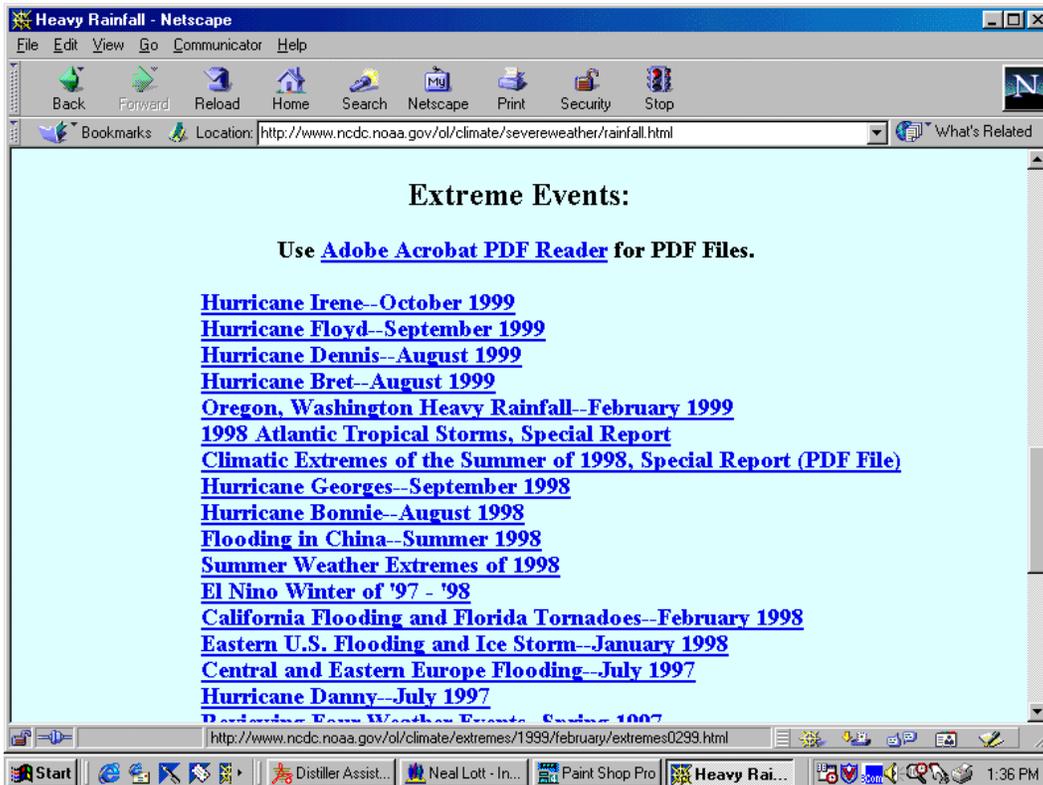
Hurricane Mitch

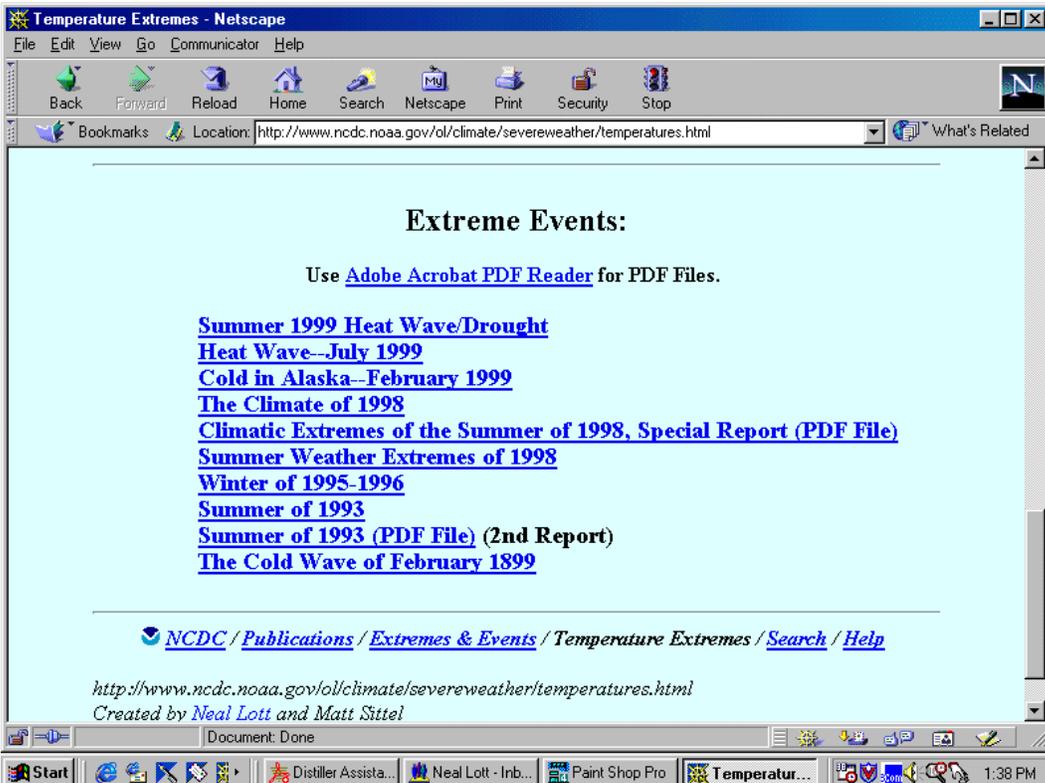
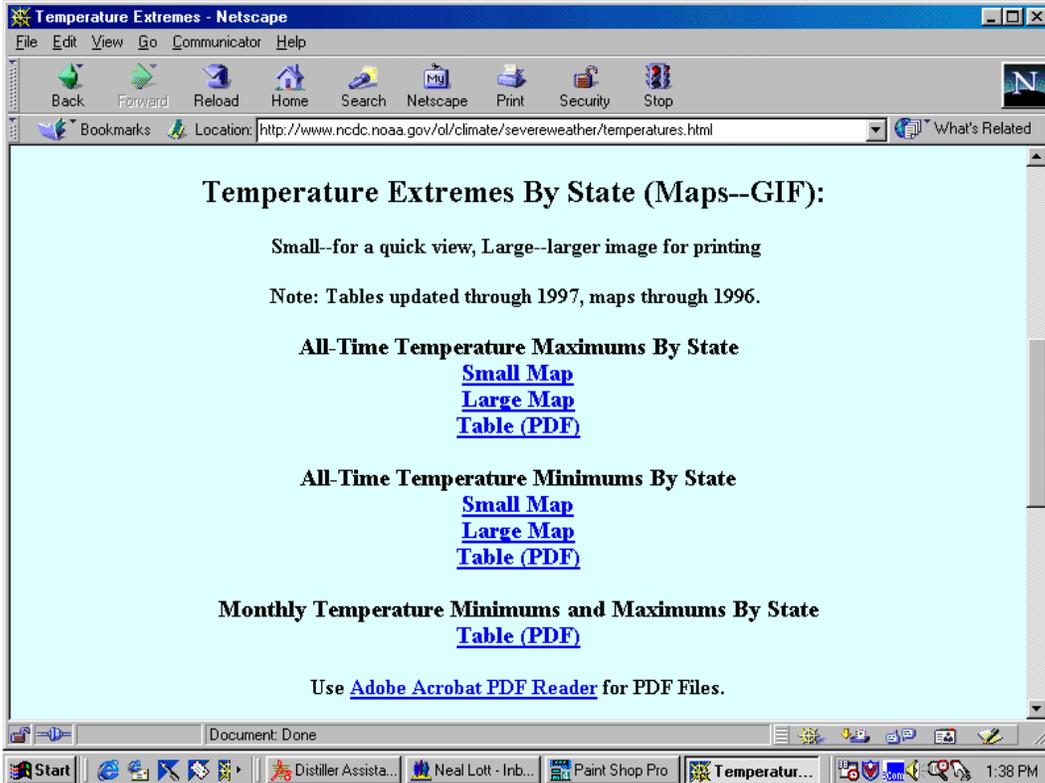
Document: Done

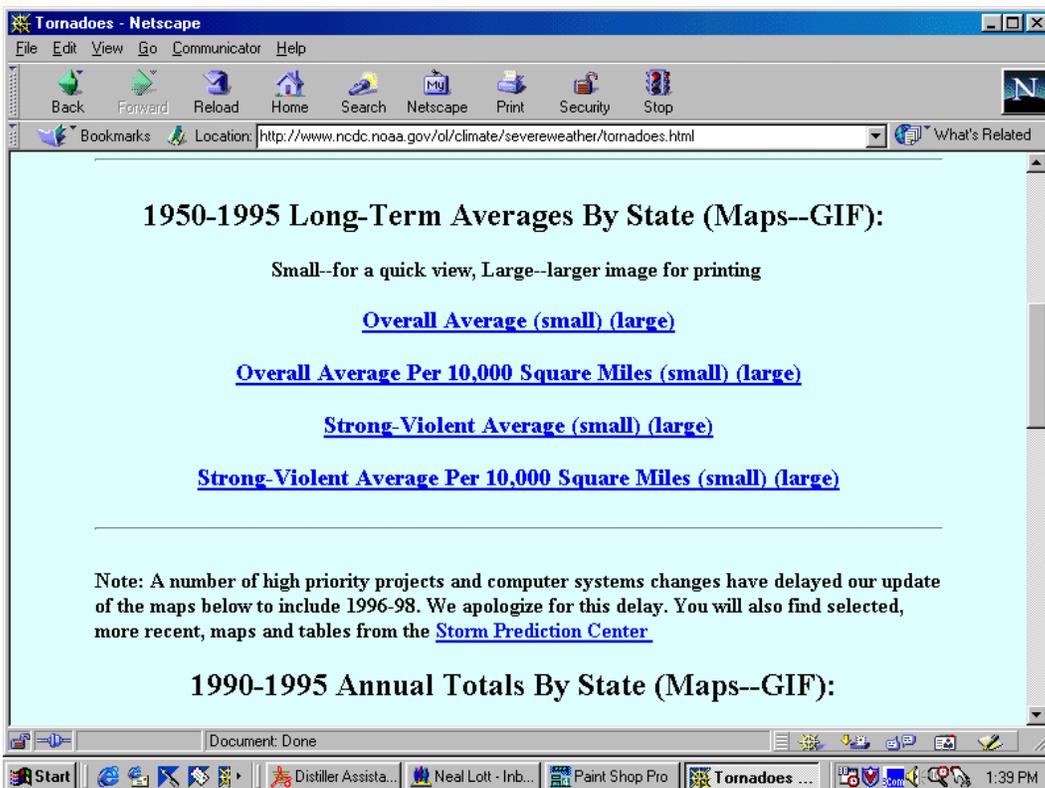
Start | | | | | | | | | 12:56 PM











Tornadoes - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Stop

Location: <http://www.ncdc.noaa.gov/ol/climate/severeweather/tornadoes.html>

Special Reports:

[1998-1999 Tornadoes and a Long-Term Tornado Climatology](#)
[Oklahoma, Kansas Tornadoes--May 1999](#)
[Arkansas, Tennessee Tornadoes--January 1999](#)
[The Fujita Tornado Scale](#)
[California Flooding and Florida Tornadoes--February 1998](#)
[Texas Tornadoes--May 1997](#)
[Tornadoes and Flooding--March 1997](#)
[Fort Smith, Arkansas Tornado--April 1996](#)
[Galva, Iowa Tornado--June 1994](#)
[Super Outbreak of April 1974](#)

Top of Page

[NCDC](#) / [Publications](#) / [Extremes & Events](#) / [Tornadoes](#) / [Search](#) / [Help](#)

<http://www.ncdc.noaa.gov/ol/climate/severeweather/tornadoes.html>

Location: <http://www.ncdc.noaa.gov/satgallery/tornadoes/itsmith96/itsmith96.html>

Start | Distiller Assista... | Neal Lott - Inb... | Paint Shop Pro | Tornadoes ... | 1:40 PM

Worldwide Weather Events of 1991-1999 - Netscape

File Edit View Go Communicator Help

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Location: <http://www.ncdc.noaa.gov/ol/reports/weather-events.html>

[NCDC](#) | [Contents](#) | [Climate](#) | [Products](#) | [Events](#) | [Search](#) | [Help](#)

Worldwide Weather Events of 1991-1999

Hurricane Mitch

- [1999](#)
- [1998](#)
- [1997](#)
- [1996](#)
- [1995](#)
- [1994](#)
- [1993](#)
- [1992](#)
- [1991](#)
- [Billion \\$\\$ Disasters](#)
- [International Storm Events Database](#)
- [WWW Sites with Information](#)

Document: Done

Start | Distiller Assista... | Neal Lott - Inb... | Paint Shop Pro | Worldwide ... | 1:40 PM

Worldwide Weather Events of 1991-1999 - Netscape

File Edit View Go Communicator Help

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Bookmarks Location: <http://www.ncdc.noaa.gov/ol/reports/weather-events.html> What's Related

1999

[1998-1999 Tornadoes and a Long-Term Tornado Climatology](#) (Tech Report) [Online Store](#)

[Hurricanes -- 1999](#)

[Climate-Watch, December 1999](#) (White Christmas??, Global Weather)

[Climate-Watch, November 1999](#) (Hurricane Lenny, Midwest Warmth, India Cyclone)

[Climate-Watch, October 1999](#) (Hurricane Irene, Mexico Flooding, India Cyclone)

[Hurricane Floyd--September 1999](#)

[Climate-Watch, September 1999](#) (Hurricanes, Drought in South, Global Summary)

[Hurricane Dennis--August 1999](#)

[Hurricane Bret--August 1999](#)

[The 1999 Drought](#) (NCDC's Drought Summary)

[The 1999 Drought](#) (NOAA's Drought Information Center)

[Climate-Watch, August 1999](#) (Camille...30 Years Ago, Drought in East, Global Summary)

[Severe Derecho in Upper Midwest, July 1999](#) (Midwest Regional Climate Center)

[Climate-Watch, July 1999](#) (Northeast Heat, Drought, Global Summary, etc)

[Climate-Watch, June 1999](#) (Drought in the East, Global Summary, etc)

[Climate-Watch, May 1999](#) (Severe Tornado Outbreak--OK & KS, Global Summary, etc)

[Climate-Watch, April 1999](#) (1974 Tornado Outbreak, Drought, Global Summary, etc)

[Climate-Watch, March 1999](#) (Hungary Flooding, U.S. Snowfall, Global Summary, etc)

[December 1998 - February 1999 Review](#) (The Winter of '98-'99 U.S./Global Review)

Document: Done

Start Distiller Assista... Neal Lott - Inb... Paint Shop Pro Worldwide ... 1:41 PM

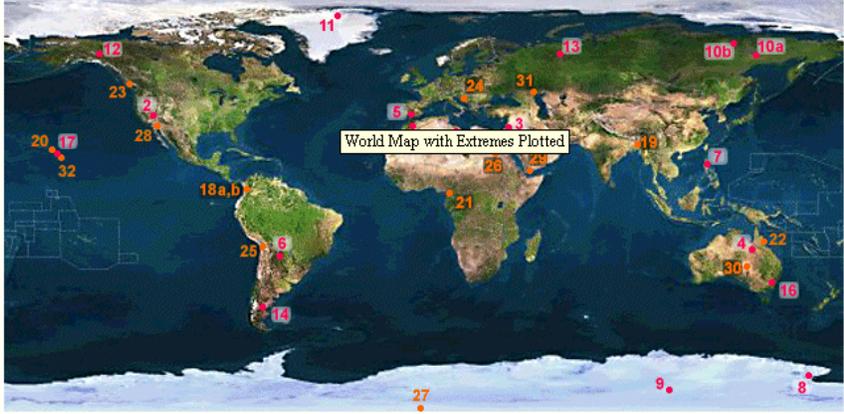
NCDC: Global Measured Extremes of Temperature and Precipitation - Netscape

File Edit View Go Communicator Help

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Bookmarks Location: <http://www.ncdc.noaa.gov/ol/climate/globalextremes.html> What's Related

Global Measured Extremes of Temperature and Precipitation



World Map with Extremes Plotted

Temperature Extremes shown in **RED**

- [Highest Temperatures](#)
- [Lowest Temperatures](#)

Precipitation Extremes shown in **ORANGE**

- [Highest Average Precipitation](#)
- [Lowest Average Precipitation](#)

Document: Done

Start Distiller Assista... Neal Lott - Inb... Paint Shop Pro NCDC: Glo... 1:43 PM

NCDC: Global Measured Extremes of Temperature and Precipitation - Netscape

Location: http://www.ncdc.noaa.gov/ol/climate/globalextremes.html

Highest Temperature Extremes

Locator #	Continent	Highest Temp. (deg F)	Place	Elevation (Feet)	Date
1	Africa	136	El Azizia, Libya	367	13 Sep 1922
2	North America	134	Death Valley, CA (Greenland Ranch)	-178	10 Jul 1913
3	Asia	129	Tirat Tsvi, Israel	-722	21 Jun 1942
4	Australia	128	Cloncurry, Queensland	622	16 Jan 1889
5	Europe	122	Seville, Spain	26	4 Aug 1881
6	South America	120	Rivadavia, Argentina	676	11 Dec 1905
7	Oceania	108	Tuguegarao, Philippines	72	29 Apr 1912
8	Antarctica	59	Vanda Station, Scott Coast	49	5 Jan 1974

Lowest Temperature Extremes

Locator #	Continent	Lowest Temp.	Place	Elevation (Feet)	Date
-----------	-----------	--------------	-------	------------------	------

Document: Done

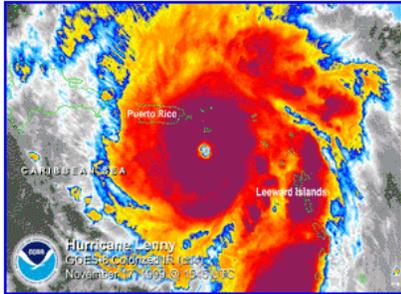
Start | Distiller Assista... | Neal Lott - Inb... | Paint Shop Pro | NCDC: Glo... | 1:43 PM

Images/Movies of Hurricanes and Special Events - Netscape

Location: http://www.ncdc.noaa.gov/ol/satellite/olimages.html

NCDC Contents Satellite Get/View Images Search Help

Images/Movies of Hurricanes and Special Events

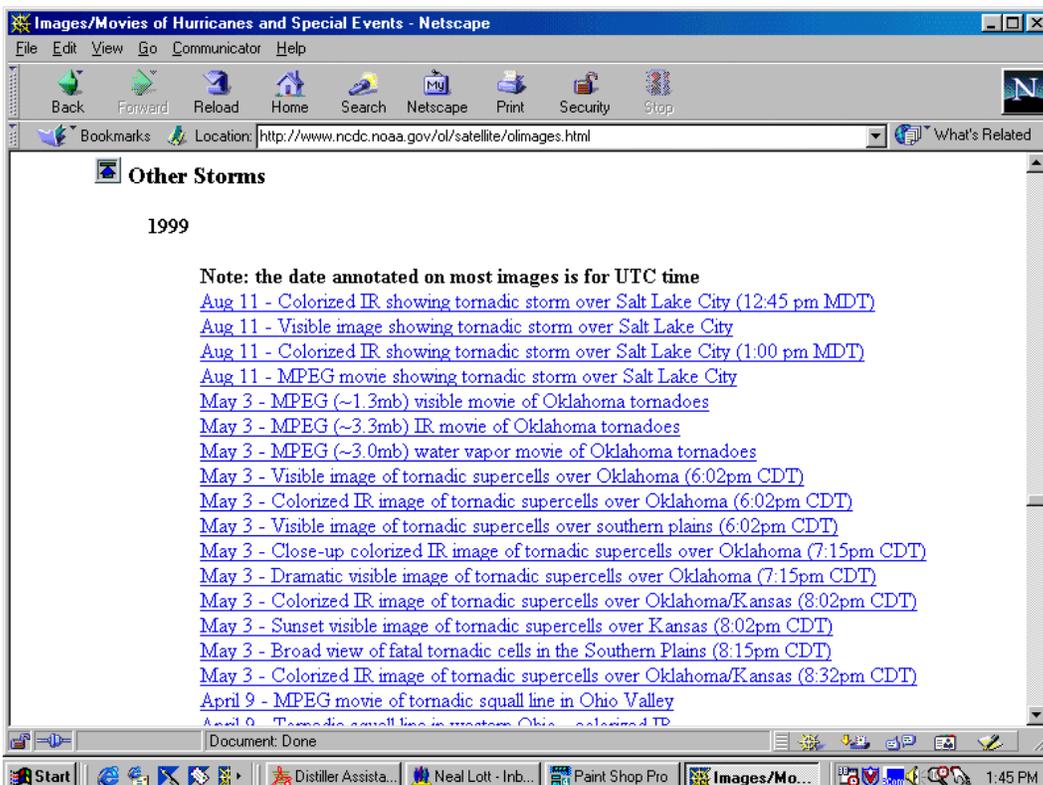
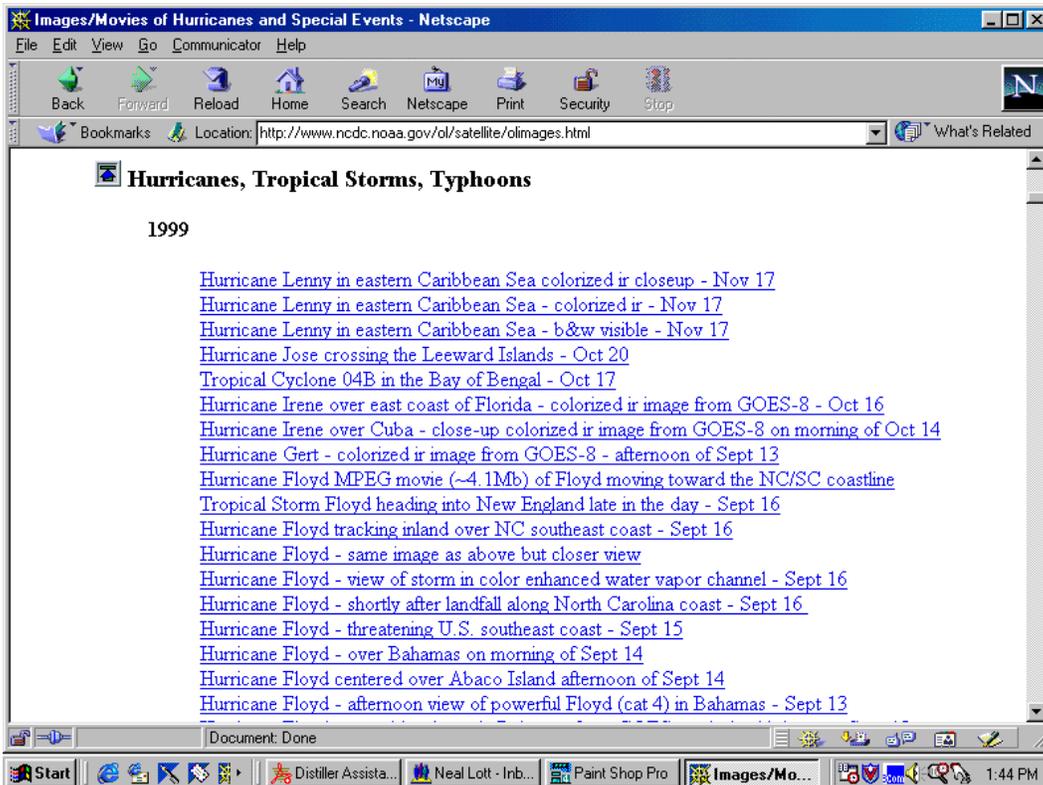


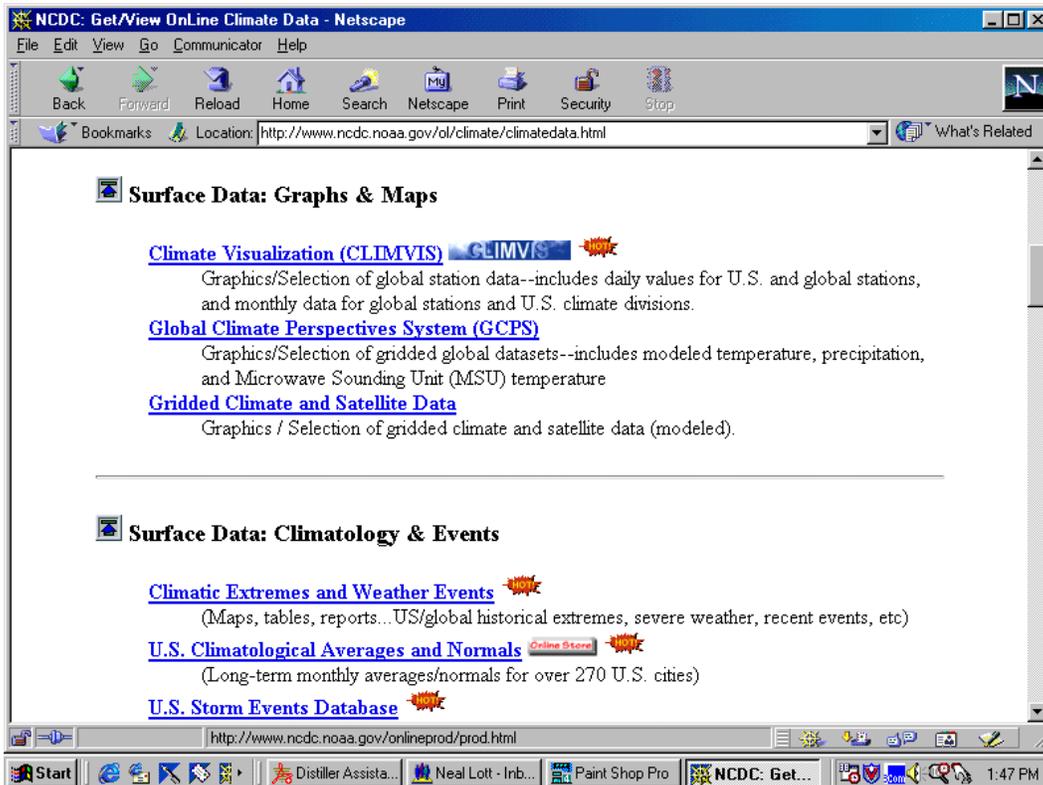
Hurricane Lenny as cat 4 hurricane

- [Hurricanes, Tropical Storms, Typhoons](#)
- [Other Storms](#)
- [Miscellaneous](#)
- [Satellite Gallery with discussions](#)
- [Operational Significant Event Imagery from NESDIS](#)

Document: Done

Start | Distiller Assista... | Neal Lott - Inb... | Paint Shop Pro | Images/Mo... | 1:44 PM





NCDC: Get/View OnLine Climate Data - Netscape

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Bookmarks Location: <http://www.ncdc.noaa.gov/ol/climate/climatedata.html> What's Related

Surface Data: Daily (Temperature, Precipitation, Winds, Pressure, Snow, Etc)

Data Files and Graphics:

- Global and U.S.--[Select by Station](#) , or [All Stations by Month](#)
(1994 - present, over 8000 worldwide stations with over 1000 in U.S., all elements *)
- U.S.--[Select by Station](#) , or [By Region \(Contour Map\)](#) 

Data Files and Printable Forms:

- U.S. High Resolution--[Select by Station \(Cooperative, NWS\)](#)  \$\$\$ 
(Latest 12 months available, over 8000 stations, temperature and precipitation)
- U.S.--[Select by Station \(Unedited Local Climatological Data\)](#)  \$\$\$ 
(1997 - present, over 300 stations, before final quality control, all elements *)
- U.S.--[Select by Station \(Edited Local Climatological Data\)](#)  \$\$\$ 
(1997 - present, over 300 stations, after final quality control, all elements *)

Data Files:

- U.S. High Resolution--[Select by Station \(Cooperative, NWS\)](#)  \$\$\$  
(Full period of record, 1948 - present, over 18000 stations, all elements *)
- [World War II Era](#)

Document: Done

Start Distiller Assista... Neal Lott - Inb... Paint Shop Pro NCDC: Get... 1:47 PM

NCDC: Get/View OnLine Climate Data - Netscape

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Bookmarks Location: <http://www.ncdc.noaa.gov/ol/climate/climatedata.html> What's Related

Surface Data: Monthly (Temperature, Precipitation, Pressure, Etc)

Data Files and Graphics:

- Global Data--[Select by Station](#) , or [All Stations](#)
(“GHCN”, 1800 - 1996, over 7000 stations, temperature/precipitation/pressure)
- U.S. National/State/Divisional Data--[Select by State/Division](#) , or [Complete Datasets](#), or [Plot \(Line Graph\) Divisional Averages](#)
(1895 - present, national/state/divisional averages by month, temperature & precipitation)

Data Files and Printable Forms:

- U.S. Data--[Select by Station \(Unedited Local Climatological Data\)](#)  \$\$\$ 
(1997 - present, over 300 stations, before final quality control, all elements *)
- U.S. Data--[Select by Station \(Edited Local Climatological Data\)](#)  \$\$\$ 
(1997 - present, over 300 stations, after final quality control, all elements *)
- Annual Climate Summaries--[Select by Station \(Cooperative Network\)](#)  \$\$\$ 
(1997 - present, over 8000 stations, temperature and precipitation)

Data Files:

- U.S. High Resolution--[Select by Station \(Cooperative, NWS\)](#)  \$\$\$  
(Full period of record, 1948 - present, over 18000 stations, all elements *)

Document: Done

Start Distiller Assista... Neal Lott - Inb... Paint Shop Pro NCDC: Get... 1:48 PM

NCDC: Get/View OnLine Climate Data - Netscape

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Bookmarks Location: http://www.ncdc.noaa.gov/ol/climate/climatedata.html What's Related

Surface Data: Modeled

Data Files and Graphics:

- [Global Gridded \(Modeled\) Data](#)
(1900 - 1995, monthly temperature and precipitation)
- [Global Surface Temperature Anomalies \(Modeled\)](#)
(1992 - present, monthly temperature)
- [Gridded Climate and Satellite Data \(Modeled\)](#)
(1860 - 1996, monthly temperature and precipitation)

Data Files:

- [Global Climate Model--100 Year Run, or 1000 Year Run](#)
(Temperature and precipitation models based on CO2 estimates)

Upper Air Data

Data Files:

- [North American Upper Air Data--Select by Station](#)
(1997 - latest available, wind/temperature/pressure)

Document: Done

Start Distiller Assista... Neal Lott - Inb... Paint Shop Pro NCDC: Get... 1:49 PM

NCDC: Get/View OnLine Climate Data - Netscape

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Bookmarks Location: http://www.ncdc.noaa.gov/ol/climate/climatedata.html What's Related

Marine Data

Data Files and Graphics:

- [Global Buoy Data--Select by Buoy](#) 
(1994 - present, click on ocean basin for station list, all elements *)

Data Files:

- [U.S. Coastal Subset of Global Marine Dataset](#)
(“COADS”, 1980 - 1992, all elements *)

Important Notes

1. * - **"all elements"** - Indicates all available elements as reported by each station, such as winds, temperature, dew point, visibility, pressure, weather conditions, precipitation amount, snow depth, etc.
2. Items highlighted by  provide graphical capabilities for viewing the data, in addition to station and region selection capability. Data values can be graphed and then downloaded.
3. Items highlighted by  have at least some form of the data/product available FREE in our Online Store. Items highlighted by \$\$\$ require payment for the data unless you have been authorized for free access.

Document: Done

Start Distiller Assista... Neal Lott - Inb... Paint Shop Pro NCDC: Get... 1:49 PM

NCDC Storm Events-Select State - Netscape

File Edit View Go Communicator Help

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Bookmarks Location: <http://www4.ncdc.noaa.gov/cgi-win/wwwcgi.dll?wwEvent~Storms> What's Related

[NCDC](#) / [Climate Resources](#) / [Climate Data](#) / [Events](#) / [Storm Events](#) / [Search](#) / [Help](#)

Storm Events

Select State

Select Desired State or *All

State:

Continue

Search the NCDC Storm Event database to find various types of storms recorded in your county or use other selection criteria as desired. The database currently contains:

Storms from 1993 through September, 1999, (except June and July 1993) and tornadoes from 1950-1992, wind and hail from 1959-1992 and missing 1993 data.

Document: Done

Start Distiller Assista... Neal Lott - Inb... Paint Shop Pro NCDC Stor... 1:50 PM

Climate of 1999 - Climate Perspectives Reports - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Stop

Bookmarks Location: <http://www.ncdc.noaa.gov/ol/climate/research/1999/perspectives.html> What's Related

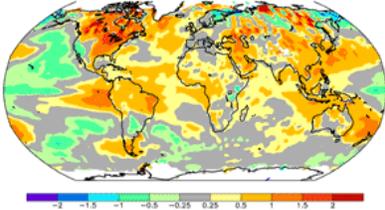
[NCDC](#) / [Climate Resources](#) / [Climate Research](#) / [Climate of 1999](#) / [Search](#) / [Help](#)

National Oceanic and Atmospheric Administration

The Climate of 1999

(US and Global Climate Perspectives)

National Climatic Data Center, Asheville, NC
December 21, 1999



[Climate of 1998 Annual Review](#)

- [Global Surface Temperature Anomalies](#)
- [Monthly Reports](#)
- [Special Reports](#)
- [Climate Variations Bulletin](#)
- [Climatic Extremes, Weather Events](#)
- [Climate of 1998 \(Reports\)](#)

Document: Done

Start Distiller Assista... Neal Lott - Inb... Paint Shop Pro Climate of ... 1:50 PM

NCDC: El Niño - Netscape

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Back Forward Reload Home Search Netscape Print Security Stop

Bookmarks Location: http://www.ncdc.noaa.gov/ol/climate/elnino/elnino.html

NCDC Contents Climate Products El Niño Search Help

El Niño/La Niña

Depicting the Impacts of the 1997-1999 El Niño/La Niña

NOAA Current SST Anomalies (C), 1/1/2000
(white regions indicate sea-ice)

- [Overview](#)
- [Events and Reports](#)
- [Data and Images](#)
- [NOAA El Niño/La Niña Page](#)
- [Other Resources](#)

Document: Done

Start Distiller Assista... Neal Lott - Inb... Paint Shop Pro NCDC: El Ni... 1:51 PM

Global Climate Change - Netscape

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Back Forward Reload Home Search Netscape Print Security Stop

Bookmarks Location: http://www.ncdc.noaa.gov/ol/climate/climateextremes.html

NCDC Contents Climate Get/View Change Search Help

Global Climate Change

Updated 24 June 1999

MONTHLY MEAN TEMPERATURE ANOMALY IN CELSIUS AUG. 1998
SSM DERIVED SNOW COVER SURFACES ARE IN GREY
CLIMATOLOGICAL BASE PERIOD IS 1962 - 1998
SST DATA COURTESY OF R. REYNOLDS NCEP/NNL/NOAA

- [Events, Reports, and Publications](#)
- [Data, Images, and Climatology](#)
- [WWW Sites with Natural Disaster and Other Information](#)

Document: Done

Start Distiller Assista... Neal Lott - Inb... Paint Shop Pro Global Cim... 1:51 PM

Billion Dollar U.S. Weather Disasters 1980 - 1999 - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Stop

Bookmarks Location: http://www.ncdc.noaa.gov/ol/reports/billionz.html What's Related

NCDC Contents Climate Products Disasters Search Help

Billion Dollar U.S. Weather Disasters 1980-1999



National Climatic Data Center
Asheville, NC 28801
October 15, 1999

The U.S. has sustained 44 weather-related disasters over the past 20 years in which overall damages and costs reached or exceeded \$1 billion. * 38 of these disasters occurred during the 1988-1999 period with total damages/costs exceeding \$170 billion. Seven occurred during 1998 alone--the most for any year on record, though other years have recorded higher damage totals. All figures below reflect direct and indirect damages, costs, and deaths. Events are listed beginning with the most recent (reverse chronological order).

* Important note: The damage figures represent actual dollar costs at the time of the event and are NOT adjusted for inflation. Therefore, event costs over time should not be compared.

Document: Done

Start Distiller Assista... Neal Lott - Inb... Paint Shop Pro Billion Doll... 1:51 PM

Billion Dollar U.S. Weather Disasters 1980 - 1999 - Netscape

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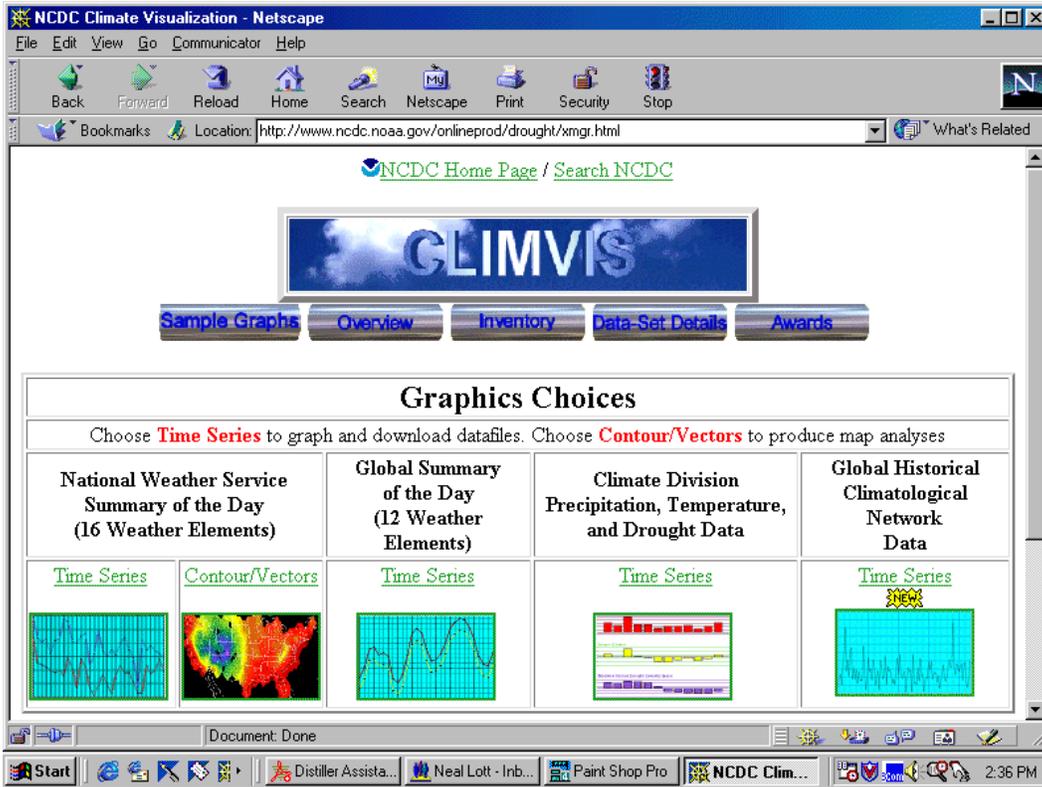
Back Forward Reload Home Search Netscape Print Security Stop

Bookmarks Location: http://www.ncdc.noaa.gov/ol/reports/billionz.html What's Related

- Hurricane Floyd** September 1999. Large category 2 hurricane makes landfall in eastern NC, causing severe flooding in NC and some flooding in SC, VA, MD, PA, NY, NJ, DE, RI, CT, MA, and VT; preliminary estimates of at least \$6.0 billion damage/costs; 75 deaths. [Special Report](#)
- Eastern Drought/Heat Wave** Summer 1999. Very dry summer and high temperatures, mainly in eastern U.S., with extensive agricultural losses; over \$1.0 billion damage/costs; estimated 256 deaths. [Special Report](#)
- Oklahoma-Kansas Tornadoes** May 1999. Outbreak of F4-F5 tornadoes hit the states of Oklahoma and Kansas, along with Texas and Tennessee, Oklahoma City area hardest hit, at least \$1.0 billion damage/costs; 55 deaths. [Special Report](#)
- Arkansas-Tennessee Tornadoes** January 1999. Two outbreaks of tornadoes in 6-day period strike Arkansas and Tennessee; approximately \$1.3 billion damage/costs; 17 deaths. [Special Report](#)
- Texas Flooding** October-November 1998. Severe flooding in southeast Texas from 2 heavy rain events, with 10-20 inch rainfall totals; approximately \$1.0 billion damage/costs; 31 deaths.
- Hurricane Georges** September 1998. Category 2 hurricane strikes Puerto Rico, Florida Keys, and Gulf coasts of Louisiana, Mississippi, Alabama, and Florida panhandle; estimated \$5.9 billion damage/costs; 16 deaths. [Special Report](#)
- Hurricane Bonnie** August 1998. Category 3 hurricane strikes eastern North Carolina and Virginia;

Document: Done

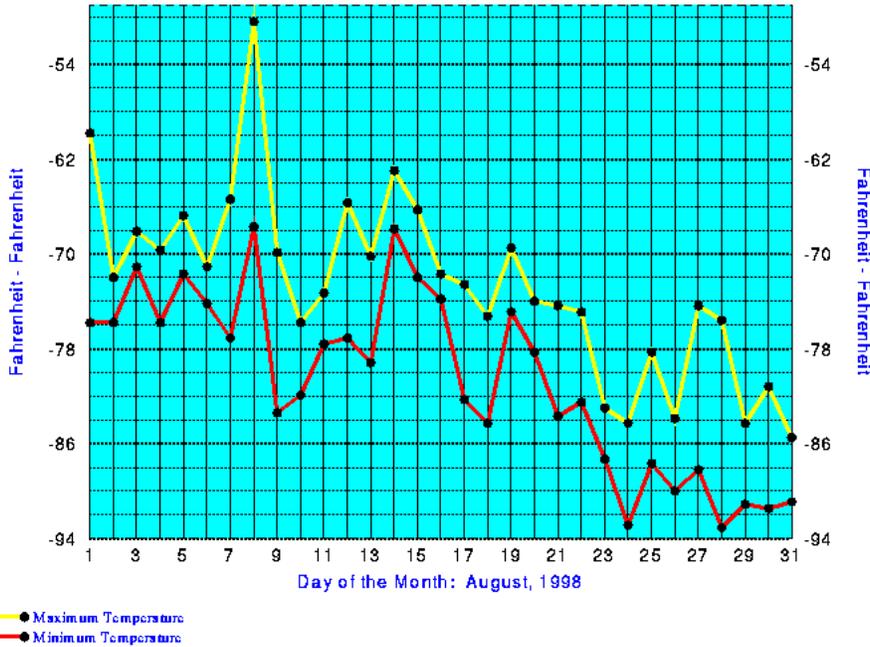
Start Distiller Assista... Neal Lott - Inb... Paint Shop Pro Billion Doll... 1:52 PM



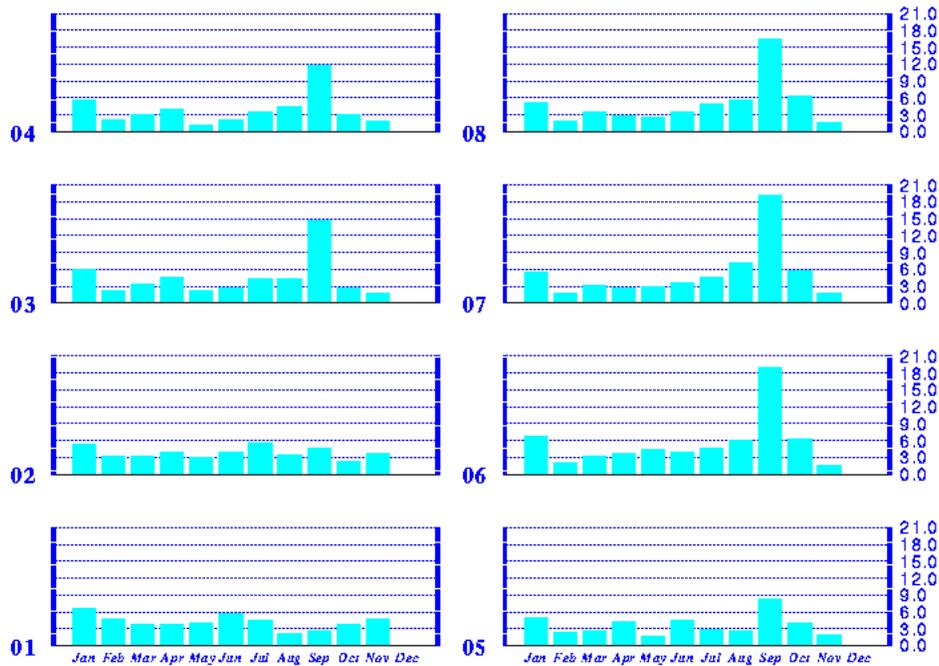
This graph, and the dataset associated with it, are not for commercial distribution

Mon Jan 3 14:40:42 2000

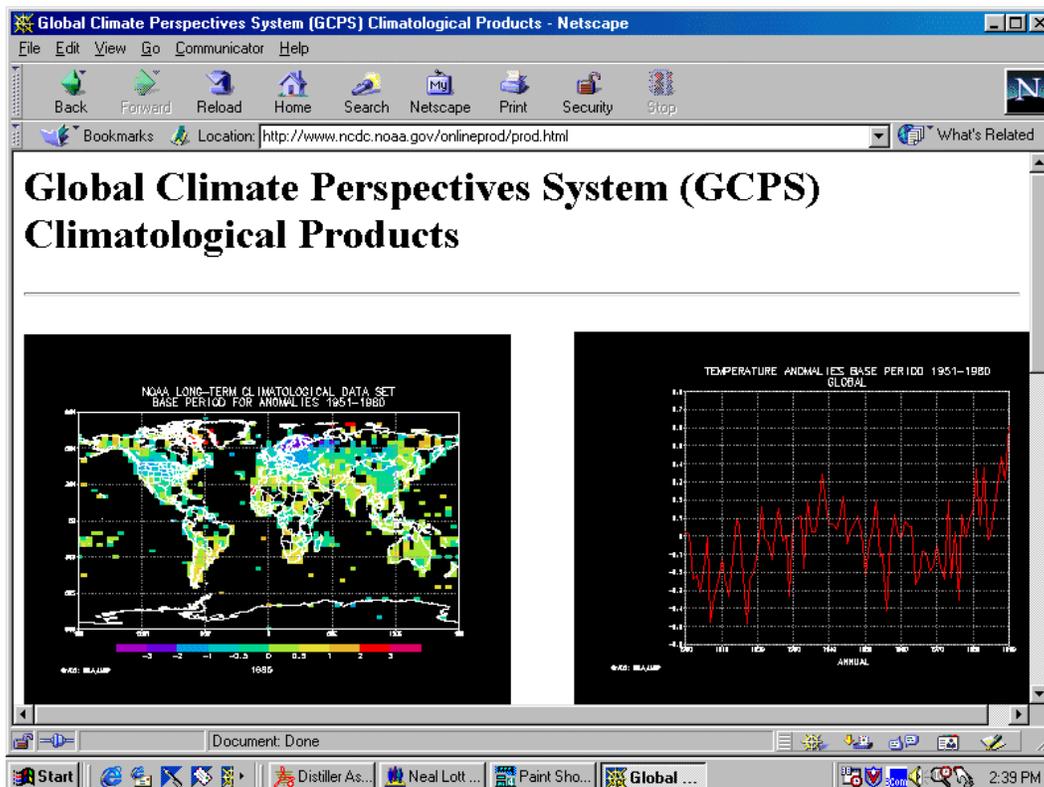
HENRY Antarctica



Precipitation (Inches)



North Carolina - All Divisions: 1999 (Monthly Averages)



National Virtual Data System - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Stop

Bookmarks Location: <http://ols.nndc.noaa.gov:7777/plolstore/plsql/olstore.prodsspecific?prodnum=C00095-PUB-A0001> What's Related

National Virtual Data System **Search by...** **Purchase...** [Home](#) [Help](#) [Contacts](#)
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Comparative Climatic Data



Comparative Climatic Data
for the United States through 1998

- [Overview](#)
- [Data Tables](#)
- [Table Notes](#)
- [Downloading of ASCII data used in Publication](#)

[Overview](#)

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Start | Distiller As... | Neal Lott ... | Paint Sho... | Nationa... | 2:40 PM

National Virtual Data System - Netscape

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Bookmarks Location: <http://ols.nndc.noaa.gov:7777/plolstore/plsql/olstore.prodsspecific?prodnum=C00095-PUB-A0001> What's Related

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[Keyword](#) [Atlas](#) [Region](#) [Category](#)
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Observed Data

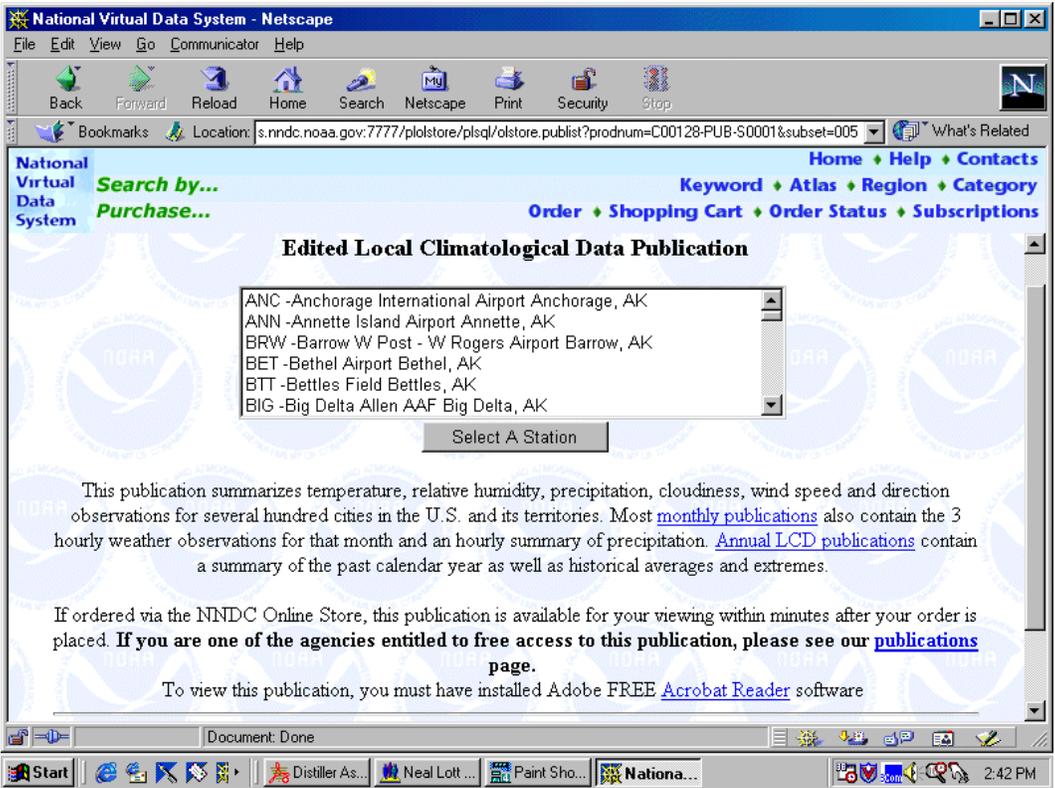
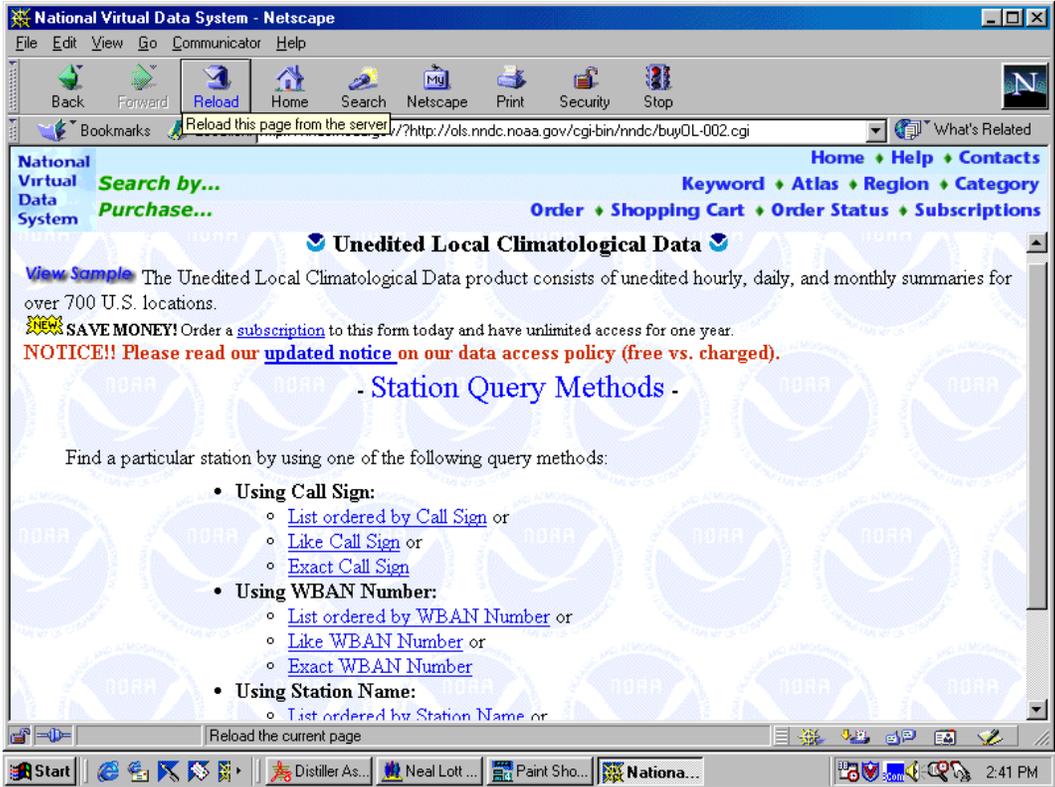
- [Temperature - Highest of Record, Degrees F](#)
- [Temperature - Lowest of Record, Degrees F](#)
- [Mean Number of Days Maximum Temperature 90 Deg. F or Higher](#)
- [Mean Number of Days Minimum Temperature 32 Deg. F or Less](#)
- [Mean Number of Days with Precipitation 0.01 Inch or More](#)
- [Snowfall \(Including Ice Pellets and Sleet\) - Average Total in Inches](#)
- [Wind - Average Speed \(MPH\)](#)
- [Wind - Maximum Speed \(MPH\)](#)
- [Sunshine - Average Percent of Possible](#)
- [Cloudiness - Mean Number of Days \(Clear, Partly Cloudy, Cloudy\)](#)
- [Average Relative Humidity - Morning \(M\), Afternoon \(A\)](#)

Climatological Normals

- [Normal Daily Maximum Temperature, Degrees F](#)
- [Normal Daily Minimum Temperature, Degrees F](#)
- [Normal Daily Mean Temperature, Degrees F](#)
- [Normal Heating Degree Days \(July-June\) Base 65 Degrees F](#)
- [Normal Cooling Degree Days \(Jan-Dec\) Base 65 Degrees F](#)

<http://www.nodc.noaa.gov/cl/climate/online/ccd/extremelow.html>

Start | Distiller As... | Neal Lott ... | Paint Sho... | Nationa... | 2:40 PM



Global Surface Summary of Day - Netscape

File Edit View Go Communicator Help

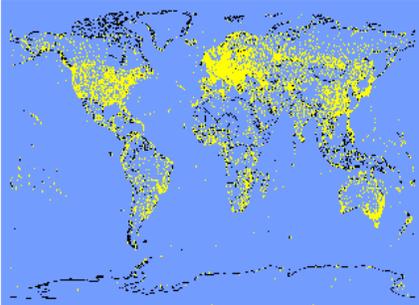
Back Forward Reload Home Search Netscape Print Security Stop

Location: http://www.ncdc.noaa.gov/cgi-bin/res40.pl

NCDC Contents Climate Get/View Surface Search Help

Global Surface Summary of Day

Version 5 - Over 8000 Worldwide Stations - updated 31 Aug 1999



- [Important Notes](#)
- [Informational Files](#)
- [Data Files \(Current\)](#)
- [Data Files \(All Months\)](#)
- [Data Files \(Severe Events\)](#)
- [Utility Software](#)
- [Map of Station Locations](#)
- [Uncompression Software](#)
- [Anonymous FTP Instructions](#)
- [Brief Description of Data](#)
- [Details/Format](#)
- [Interactive Selection/Graphing](#)

Document: Done

Start Distiller As... Neal Lott... Paint Sho... Global ... 2:43 PM

National Virtual Data System - Netscape

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Location: http://nndc.noaa.gov/?http://ols.nndc.noaa.gov/cgi-bin/nndc/buy0L-003.cgi

Home Help Contacts
Keyword Atlas Region Category
Order Shopping Cart Order Status Subscriptions

National Virtual Data System Search by... Purchase...

Summary of the Day

- COOP Station Query Methods -

Find a particular COOP station by using one of the following query methods:

- by [State, Territory, or Country](#)
- by **Station ID**:
 - [Like Station ID](#) or
 - [Exact Station ID](#)
- by **Station Name**:
 - [Like Station Name](#) or
 - [Exact Station Name](#)
- by [Coordinate Ranges](#).

Summary of the Day

The Summary of the Day product consists of daily observations from over 8000 sites in the U.S. for recent 12 months.

Document: Done

Start Distiller As... Neal Lott... Paint Sho... Nationa... 2:44 PM

World War II Era Summary of Day Dataset - Netscape

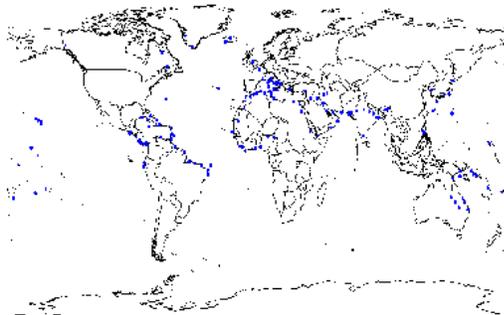
File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Stop

Location: <http://www.ncdc.noaa.gov/ol/climate/online/ww-ii-data.html>

NCDC Contents Climate Get/View Surface Search Help

World War II Era Summary of Day Dataset



- [Introduction](#)
- [Available Files](#)
- [Anonymous FTP Instructions](#)
- [Notes](#)

Document: Done

Start Distiller As... Neal Lott... Paint Sho... World ... 2:44 PM

NCDC: USHCN - Daily Historical Climatology Network - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Stop

Location: <http://www.ncdc.noaa.gov/ol/climate/research/ushcn/daily.html>

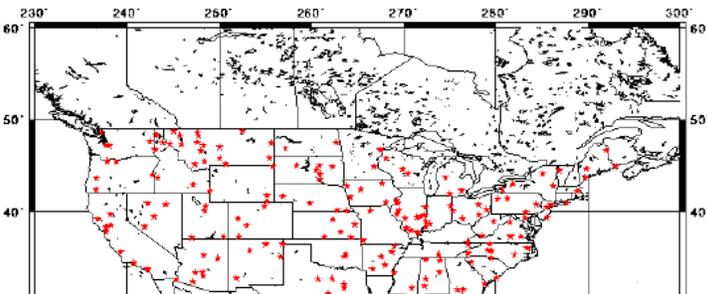



Climate Research Data

The Daily Historical Climatology Network

National Climatic Data Center, Asheville, NC

March 19, 1998



Document: Done

Start Distiller As... Neal Lott... Paint Sho... NCDC: ... 2:45 PM

Globe - NCDC Page - Netscape

File Edit View Go Communicator Help

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Bookmarks Location: <http://www.ncdc.noaa.gov/GLOBE/globe.html> What's Related

GLOBE - Global Learning and Observations to Benefit the Environment



Table of Contents

- [Overview](#)
- [Description of Dataset Files](#)
- [Data Access](#)
- [References](#)
- [Questions and Comments](#)

Document: Done

Start Distiller As... Neal Lott ... Paint Sho... Globe ... 2:46 PM

GHCN - Netscape

File Edit View Go Communicator Help

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Bookmarks Location: <http://www.ncdc.noaa.gov/cgi-bin/res40.pl> What's Related

NCDC Contents Climate Research **GHCN** Search Help

The Global Historical Climatology Network (GHCN)

- [Maps/Data Access](#)
- [Overview of GHCN](#)
- [GHCN Gridded Data](#)
- [References](#)

[NCDC](#) | [Contents](#) | [Climate](#) | [Research](#) | [GHCN](#) | [Search](#) | [Help](#)

[Maps/Data Access](#)

Document: Done

Start Distiller As... Neal Lott ... Paint Sho... GHCN ... 2:46 PM

Climate Division: Temperature, Precipitation, Drought Data - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Stop

Bookmarks Location: <http://www.ncdc.noaa.gov/onlineprod/drought/tpage.html> What's Related

Climate Division: Temperature-Precipitation-Drought Data

Table of Contents

- [Overview](#)
- [Description of Dataset Files](#)
- [Data Access](#)
- [Questions and Comments](#)
- [References](#)

Overview

The major parameters in this file are sequential "Time Biased Corrected" state climatic division monthly Average Temperatures (Deg.F. to 10ths), Precipitation (Inches to 100ths), and Palmer Drought Indices (PDSI, PHDI, PMDI, and ZNDX). Period of record is 1895 through latest month available, updated monthly.

Document: Done

Start [Icons] Distiller As... Neal Lott... Paint Sho... Climate... 2:47 PM

National Virtual Data System - Netscape

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Bookmarks Location: <http://nndc.noaa.gov/?http://ols.nndc.noaa.gov/cgi-bin/nndc/buy01-005.cgi> What's Related

National Virtual Data System

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Annual Climatological Summary

[View Sample](#) Monthly and annual summaries for over 8000 U.S. locations, highlighting monthly average temperatures, total precipitation, heating and cooling degree days, departures from normal, extremes and "days with..." values.

NEW! SAVE MONEY! Order a [subscription](#) to this form today and have unlimited access for one year.

NOTICE!! Please read the following [updated notice on our data access policy \(free vs. charged\)](#).

- COOP Station Query Methods -

Find a particular COOP station by using one of the following query methods:

- by [State, Territory, or Country](#)
- by **Station ID:**
 - [Like Station ID](#) or
 - [Exact Station ID](#)
- by **Station Name:**
 - [Like Station Name](#) or
 - [Exact Station Name](#)

Document: Done

Start [Icons] Distiller As... Neal Lott... Paint Sho... Nationa... 2:47 PM

United States Historical Climatology Network (USHCN) - Netscape

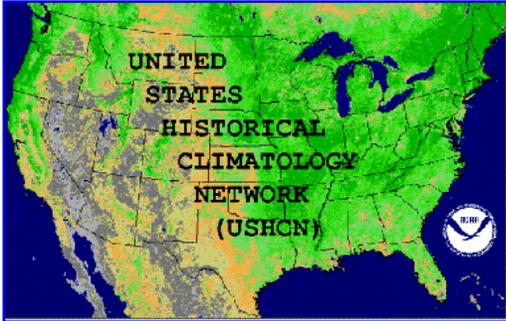
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Bookmarks Location: <http://www.ncdc.noaa.gov/ol/climate/research/ushcn/ushcn.html> What's Related

NCDC Contents Climate Research USHCN Search Help

United States Historical Climatology Network (USHCN)



- [Introduction](#)
- [Logo Image Information](#)
- [Quality Control, Homogeneity Testing, and Adjustment Procedures](#)
- [Data Package Description](#)
- [Updated Data Status](#)
- [References](#)
- [Obtain Data On-Line](#)

<http://www.ncdc.noaa.gov/ol/images/ushcn.gif>

Start | Distiller As... | Neal Lott... | Paint Sho... | United ... | 2:48 PM

SSM/I Global Gridded Products - Netscape

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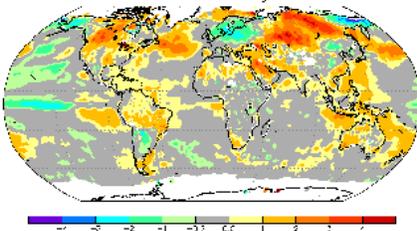
Back Forward Reload Home Search Netscape Print Security Stop

Bookmarks Location: <http://www.ncdc.noaa.gov/ol/climate/research/blended/blended.html> What's Related

NCDC Contents Satellite Get/View SSM/I Data Search Help

Blended Satellite / In Situ Data

Global Surface Temperature Anomalies



- [Overview](#)
- [Description of Dataset Files](#)
- [Data Access](#)
- [Questions and Comments](#)

[NCDC](#) | [Contents](#) | [Satellite](#) | [Get/View](#) | [SSM/I Data](#) | [Search](#) | [Help](#)

Document: Done

Start | Distiller As... | Neal Lott... | Paint Sho... | SSM/I ... | 2:48 PM

NCDC: Locate Weather Observation Station Record - Netscape

File Edit View Go Communicator Help

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Bookmarks Location: <http://www.ncdc.noaa.gov/ol/climate/stationlocator.html> What's Related

NCDC / [Climate-Radar](#) Data Inventories / [Locate Station](#) / [Search](#) / [Help](#)



Web CtiServ Version 2.1

Locate Weather Observation Station Record

U.S. Controlled Stations Only At This Time *

Locate Station by:

- [Latitude/Longitude](#)
- [State/Division/County/City *](#)
- [List Radar Stations by Name / by Alias](#)
- Search By: *Select the field you wish to search*
 - [Station Name*/City*](#) *(city not identified in some records)*
 - [Zip Code*](#)
 - [State*](#) *(use two character abbreviation)*
 - [County*](#) *(county not identified in some records)*
 - [WBAN #*](#)
 - [Call Sign*](#)
 - [Cooperative Station ID#*](#)
 - [World Meteorological Organization ID#*](#)

Enter the value you wish to find,

[List of Stations with Photographs Available On Line](#) 

Document: Done

Start Distiller As... Neal Lott ... Paint Sho... NCDC: ... 2:49 PM

Inventories - Netscape

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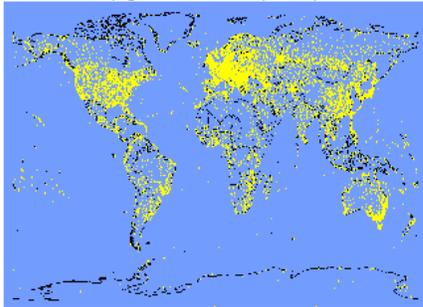
Back Forward Reload Home Search Netscape Print Security Stop

Bookmarks Location: <http://www.ncdc.noaa.gov/ol/climate/surfaceinventories.html> What's Related

NCDC Contents Climate Inventories Surface Search Help

Inventories/Station Lists

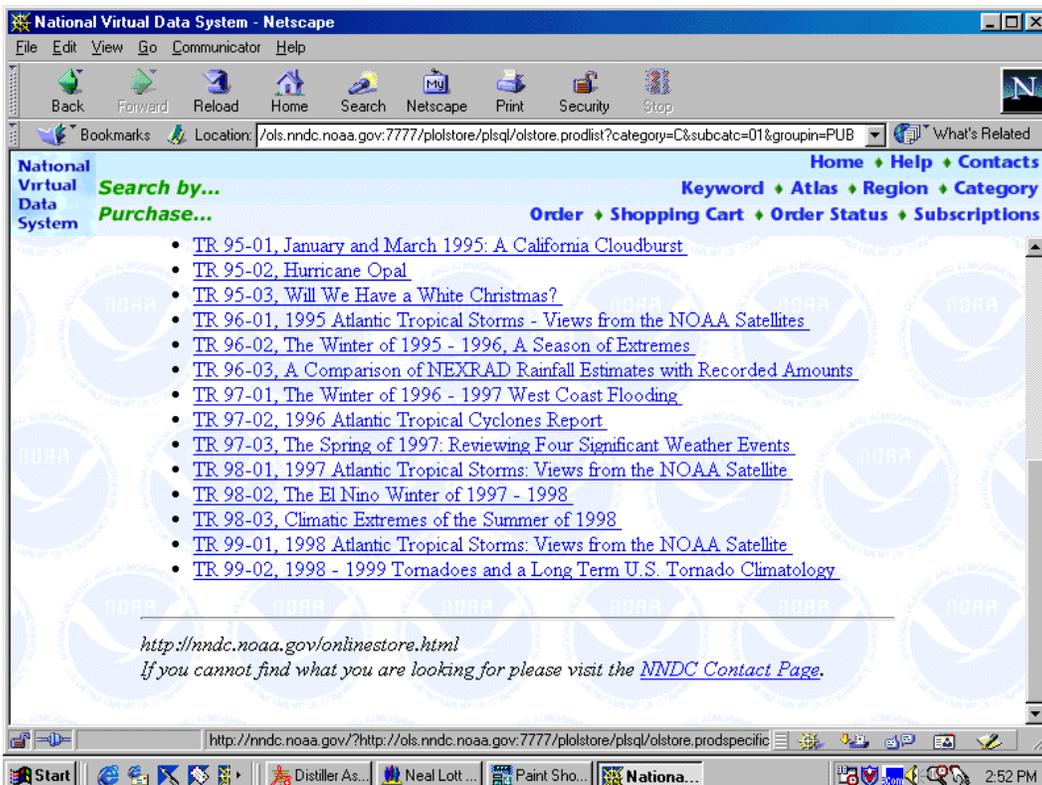
For U.S. and Global Surface Data
(Updated June 24, 1999)



- [Introduction](#)
- [Surface Data Inventories/Station Lists](#)
- [GIS Shape Files](#)
- [Other Inventories & Information](#)
- [Anonymous FTP Instructions](#)
- [Notes](#)

Document: Done

Start Distiller As... Neal Lott ... Paint Sho... Invento... 2:50 PM



NCDC: Heating and Cooling Degree Day Data, (State, Regional, and National) - Netscape

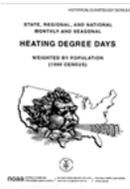
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Bookmarks Location: <http://www.ncdc.noaa.gov/ol/documentlibrary/hcs/hcs.html> What's Related

NCDC Contents Climate Resources Doc Library Search Help

Heating and Cooling Degree Day Data



STATE, REGIONAL, AND NATIONAL
HEATING DEGREE DAYS
WEIGHTED BY POPULATION
(1960-1999)



STATE, REGIONAL, AND NATIONAL
COOLING DEGREE DAYS
WEIGHTED BY POPULATION
(1960-1999)

Monthly State, Regional and National Historical Climatological Series (HCS)

- HCS 5-1: Heating Degree Days**
 - [Overview](#)
 - [Publication](#)
- HCS 5-2: Cooling Degree Days**
 - [Overview](#)
 - [Publication](#)

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NCDC Climate Products - Netscape

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Bookmarks Location: <http://www.ncdc.noaa.gov/ol/climate/climateproducts.html> What's Related

Publications:

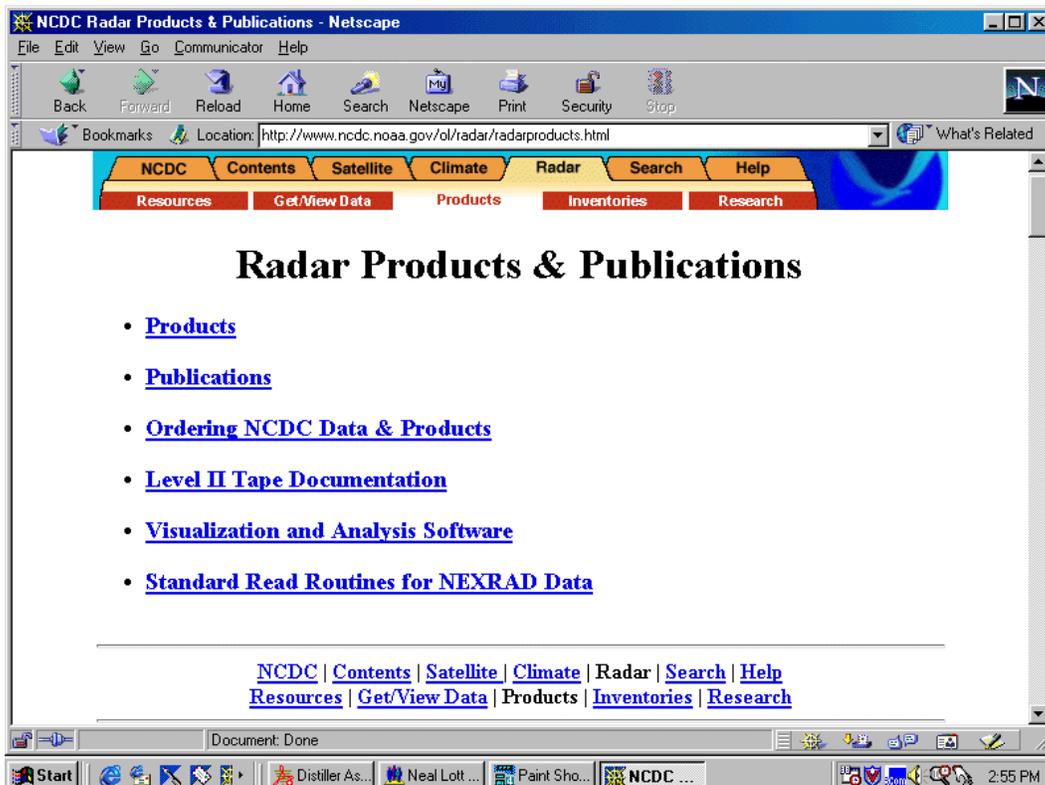
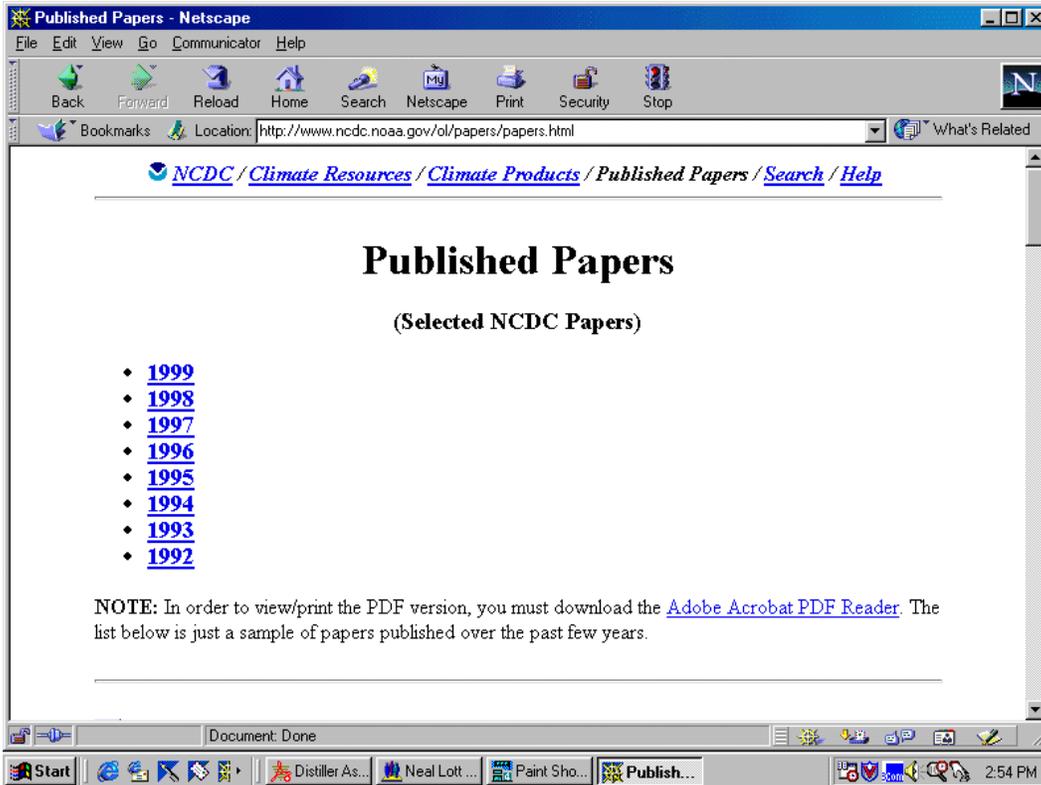
- [NCDC Products & Services Guide](#)
- [Local Climatological Data](#) (Hourly/Daily Data for nearly 300 U.S. Cities)
- [Climatological Data](#) (Daily/Monthly Data for ~ 8000 U.S. Locations)
- [Hourly Precipitation Data](#) (Hourly Precip Data for over 2500 U.S. Locations)
- [Annual Climatological Summaries](#) (Monthly/Annual Summaries for ~ 8000 U.S. Locations)
- [Climate Variations Bulletin](#) (Monthly Reports of U.S. Climate)
- [Storm Data Publication](#) (Monthly Reports of Damaging Weather)
- [Comparative Climatic Data](#) (Climatological Averages for U.S. Cities)
- [Heating and Cooling Degree Days](#) (Monthly State, Regional, and National Degree Days)
- [Climates of the World](#) (Regional Narratives and Climatic Tables by City)
- [Climatology of the U.S.](#) (Maps of Temperature, Precipitation, Degree Days)
- [Technical Reports](#) (Special Reports and Studies)
- [Wind Climatology](#) (PDF format) (Wind Climatology for selected U.S. Cities)
- [Freeze/Frost data for the U.S.](#) (PDF format)
- [Published Papers](#) (Selected NCDC Papers from Journals, etc)

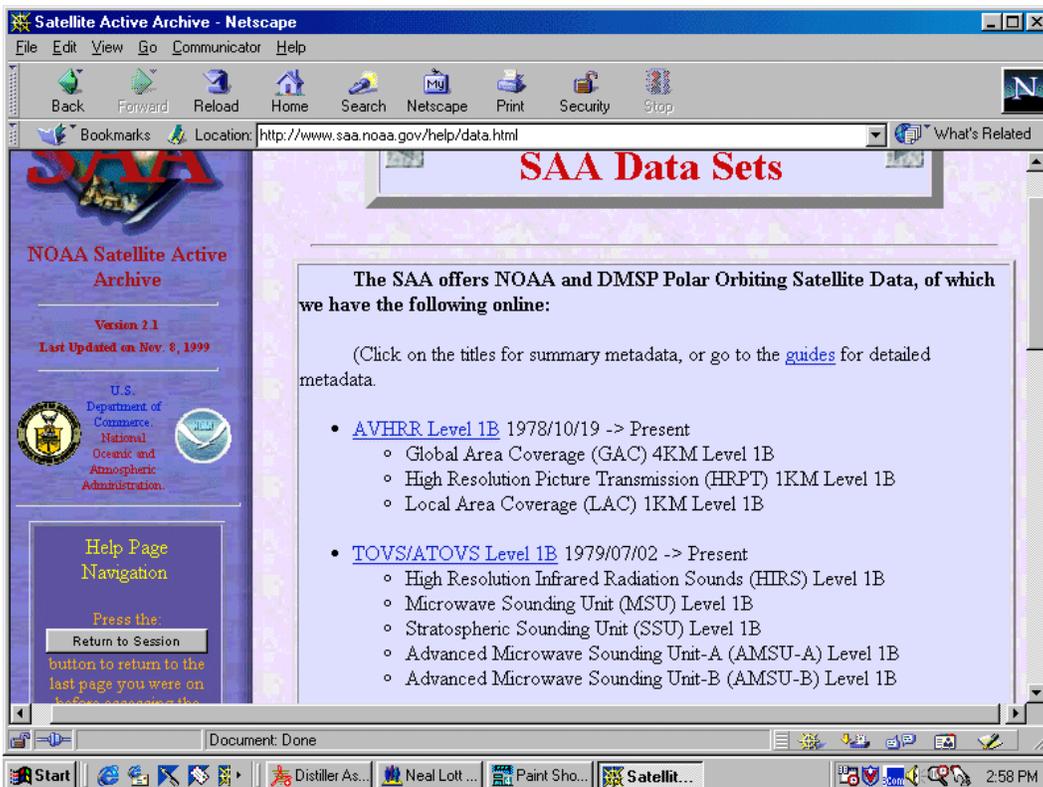
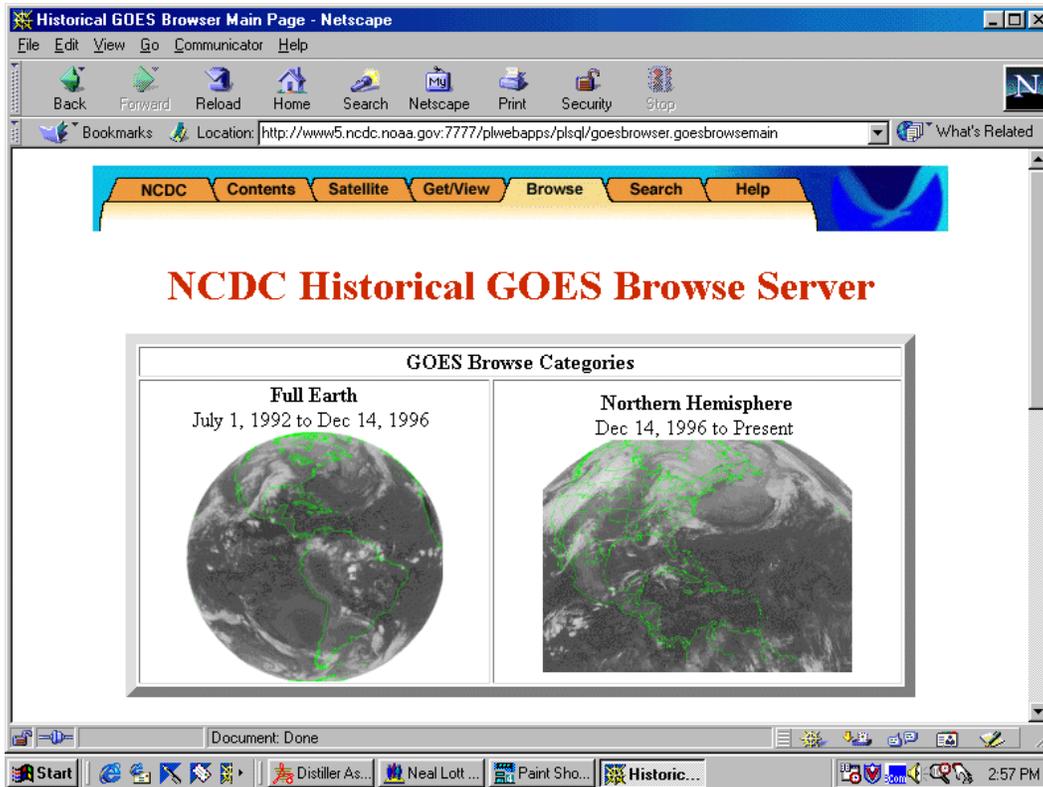
Reports and Web Pages:

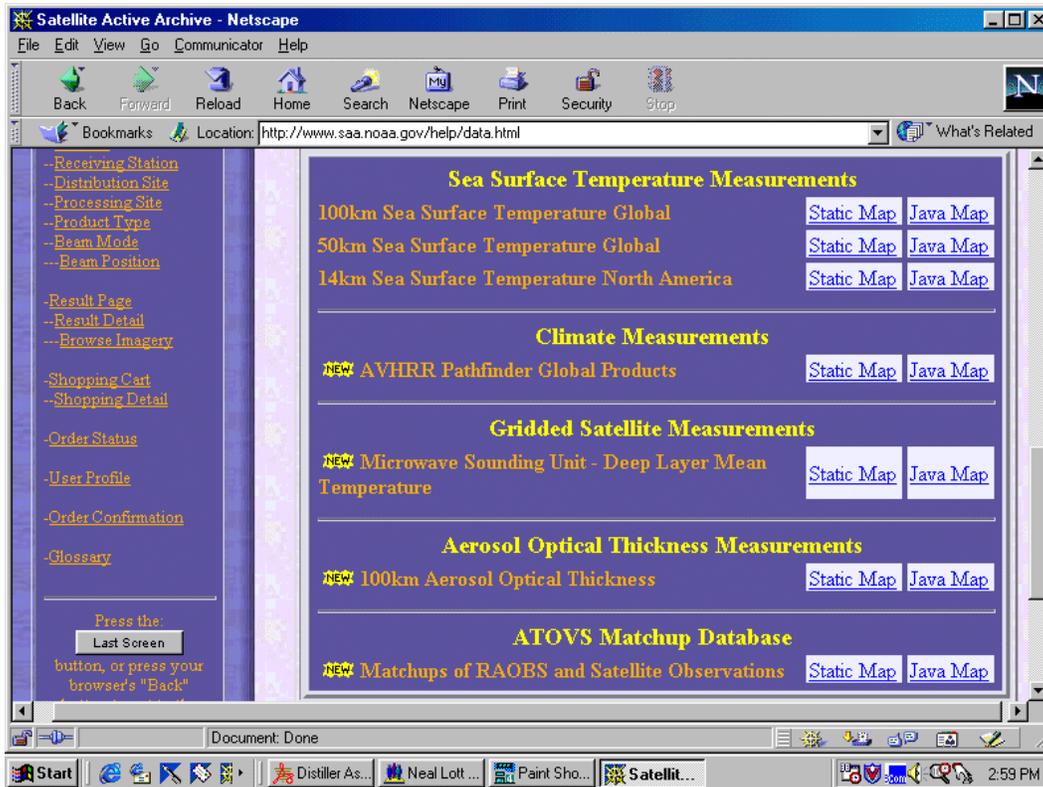
- [Climatic Extremes and Weather Events](#)
- [Global Warming--Frequently Asked Questions](#)
- [Weather Events of 1991-1999](#)
- [Winter Olympics 1998 - Nagano, Japan](#)
- [Samples of our Most Popular Publications](#)

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Start | Distiller As... | Neal Lott... | Paint Sho... | NCDC: ... | 2:54 PM







SSM/I Monthly Image Products Main Page - Netscape

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Location: <http://www5.ncdc.noaa.gov:7777/plwebapps/plsql/ssmimain>

NCDC Contents Satellite Get/View SSM/I Data Search Help

SSM/I Monthly Image Products

Monthly Mean Temperature (C) Anomaly September 1997

Overview

SSM/I Mean Temperature and Surface Wetness Anomalies

Image type:

Region:

Product:

Make your selections above and click the "Submit" button to proceed

Document: Done

Start | Distiller As... | Neal Lott... | Paint Sho... | SSM/I ... | 3:00 PM

Weather Satellite Events Art Gallery: Main Gallery - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Stop

Location: <http://www.ncdc.noaa.gov/ol/satellite/satelliteseye/satelliteseye.html>

NCDC Contents Satellite Get/View Gallery Search Help

Hurricanes	Miscellaneous Phenomena	Extratropical Cyclones	Tornadoes
Blizzards		Fires	Latest Masterpiece
		Volcanoes	Clouds
Educational Topics			
Snowstorms	Floods	Thunderstorms	
Sea Ice			

Document: Done

Start | Distiller As... | Neal Lott... | Paint Sho... | Weathe... | 3:00 PM



CD-ROM PRODUCTS

NCDC produces a suite of CD-ROM's with diverse environmental data ranging from global tropical cyclone tracks, to worldwide climatologies, to hourly surface data. More details concerning these CD's, including an **on-line ordering system (with discounted prices vs those below), are accessible via <http://www.ncdc.noaa.gov/ol/climate/climateproducts.html>.**

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. **\$175.00.**

Global Climate Normals 1961-1990: This CD-ROM contains a collection of DOS files which describe the 1961 - 1990 global standard climate normals for over 4000 stations worldwide, computed by more than 135 countries and territories. The files include ASCII data files, documentation files, eye-readable ASCII table files, graphics files, and limited extraction software. The data are provided in large files with a fixed length record format. They can be read by software written by the user according to the format specifications outlined in the documentation files. The data files may also be opened by any ASCII-compatible application that can handle large data volumes. The graphics files are maps identifying the countries that submitted normals. This CD-ROM contains no software or extraction routines that allow users to import the data directly into their spreadsheets or other applications. NCDC product in conjunction with the World Meteorological Organization. **\$100.00.**

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. **\$175.00.**

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. **\$350.00.**

Global Upper Air Statistics (GUAS). This single-volume CD-ROM set uses 17-year (1980-1996) 2.5 degree gridded upper air climatic summaries derived from the European Centre for Medium Range Weather Forecasts (ECMWF) model analyses--similar to that used for GUACA above. It 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 the data as easy-to-use ASCII files without access/display software, and covers the 17-year period summarized for each month. Joint NCDC and U.S. Navy product. **\$100.00.**

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. **\$175.00.**

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. **\$175.00 per region or \$525.00 per set.**

Radiosonde Data of North America 1946-1996. 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 1990-1996. 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. **\$700.00, four volume set.** The latest single CD-ROM (1990-1996) is available separately for **\$175.00.**

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 1996 as the latest year. Northern hemispheric extratropical storm track data are included from 1965 to 1996. 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 1980-1996 period are included along with basin-wide tropical storm climatological statistics. Joint NCDC and U.S. Navy product. Requires 520K of RAM memory. **\$175.00.**

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. **\$175.00.**

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. **\$175.00.**

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. **\$100.00.**

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 (1994-1996 on separate CD; 1997 on separate CD), 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. **\$100.00 volume or \$1300.00 set.** A 1994-1996 single volume CD-ROM is available for **\$100.00** ; A 1997 single volume CD-ROM is also available for **\$100.00**.

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. **\$600.00, 12 volume set.**

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. **\$350.00.**

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 current processed month. 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 (begin Oct 94) of the CD-ROMs cost \$100.00 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. **\$100.00.**

HUSWO CD-ROM. The Hourly U. S. Weather Observations (HUSWO) CD-ROM contains 1990-95 hourly weather data for 262 NWS locations. It has a map interface and station list for data selection, or you can copy the data files directly from the CD (without using the interface). The elements included are: Total and opaque sky cover, temperature and dew point, relative humidity, station pressure, wind direction and speed, visibility, ceiling height, present weather, ASOS cloud layer data, snow depth, and hourly precipitation. Data can be output in either English or Metric units. Joint NCDC and EPA product. **\$175.00.**

International Surface Weather Observations. The International Surface Weather Observations (INSWO) CDROM set contains 5 CD's, and is compatible with MSDOS, all Windows (e.g., 95, 98, NT), and Unix systems. The dataset includes hourly and/or synoptic (every three hours) climatic data for approximately 1500 international stations for 1982-1997. It provides excellent worldwide coverage of city locations, including U.S. stations. The 1982-1993 version of this dataset was used to develop the climatological tables for the 1997 American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Handbook of Fundamentals. The elements included are: total sky cover; cloud types by layer; lowest cloud height; ceiling height; temperature and dew point; sea-level pressure; altimeter setting; wind direction, speed, and gust; visibility; three-hour pressure change; present weather and past weather. The data and inventory files are well-organized, with directories by state for the U.S. and by WMO block for the rest of the world. Each data file contains data for one station-year in compressed form--easily uncompressed with Winzip or with software provided on the CD. The overall set contains nearly 15 gigabytes of data when uncompressed. Please note that the non-U.S. data cannot be redistributed by users of the CD for commercial purposes. **\$500.00**

The Maury Collection, Global Ship Observations 1792-1910. In recognition of the International Year of the Ocean (YOTO), NCDC has produced a CDROM entitled "The Maury Collection, Global Ship Observations, 1792-1910." It contains nearly 1.5 million historical ships' weather observations, 1792-1910, with the majority taken during the period 1820-1860. The observations include air and sea temperatures, ocean currents, pressure, cloud cover, present weather, and wind direction/speed. The data were digitized from paper copies of hand written

forms via the U.S.-PRC Protocol on Cooperation in the Field of Marine and Fishery Science and Technology, by the Joint Coordination Panel for Data and Information Cooperation, facilitated by NOAA and the government of China. This CD-ROM contains no display or extraction routines. **\$100.00.**

United States Snow Climatology CD-ROM. This 3-disk CD-ROM set describes the snow climatology of the United States. Snowfall and snow depth data through 1996 were analyzed for 5525 stations in the contiguous U.S. and Alaska. Climatic variables include daily, monthly, and seasonal snowfall and snow depth. Computed statistics include mean, median, quartiles, extremes, frequencies, and the number of years with non-missing data. Several indicators were computed, based on the data and metadata, to enable the user to assess the quality of the stations. These include frequencies of station moves and observation time changes, number of missing values and breaks in the record, number of values failing the QC checks, and percentages indicating how complete the data record is. The snow climatology CD-ROM also includes files from two other NCDC projects: return period statistics of seasonal (August-July) 1-day, 2-day, and 3-day extreme snowfall, and total seasonal snowfall amount, for 10-year, 25-year, 50-year, and 100-year return periods; 1961-1990 snowfall and snow depth normals. The CD-ROM set is a collection of DOS ASCII files; the CD contains no software or extraction routines that allow the user to import data directly into spreadsheets or other applications. However, a file may be easily copied from the CD-ROM onto a hard drive or other device with the DOS copy command for manipulation. The text files are easily read by a word processor or text file editor. **\$300.00**

Time Series of Global Monthly Vegetation Cover from NOAA/AVHRR (1985-1997) CD-ROM. This CD-ROM contains data generated from the National Oceanic and Atmospheric Administration (NOAA) Polar-orbiting Operational Environmental Satellite (POES) Advanced Very High Resolution Radiometer (AVHRR) instrument. These data were further processed into Normalized Difference Vegetation Index (NDVI) data. There are twelve years of global monthly NDVI files, in both digital and graphical formats. The CD-ROM is arranged as a series of HTML files that are linked to each other through the Welcome page. A portion of this CD-ROM is available online at URL: <http://www2.ncdc.noaa.gov/docs/ndvisamp/intro.htm>. **\$175.00**

Important Notes

- ◆ Many NCDC CD-ROM products were produced for use in a 'DOS' PC environment and will not work in an Apple 'MAC' environment. In addition, the majority of NCDC CD-ROMs were produced in a pre-Windows 95/98 environment and may not work without configuration changes or rebooting in DOS mode. NCDC will provide a help sheet for Windows 95/98 users, if requested.
- ◆ Some of the CD-ROMs present the data in an atlas type format (interactive software) rather than as ASCII data files. If you have technical questions, please call 828-271-4702.

Ordering Information

The NCDC's Climate Services Branch is responsible for distribution of NCDC CD-ROM products. Domestic customers add a \$11.00 service charge per order; foreign users add \$31.00 per order.

Mailing Address: National Climatic Data Center
151 Patton Avenue
Asheville, NC 28801-5001
Attn: Climate Services Branch
Telephone: 828-271-4800; Fax: 828-271-4876
Internet: orders@ncdc.noaa.gov

SPECIALIZED PRODUCTS

General Information

These Specialized Products can be provided on diskette or as paper copy (unless otherwise indicated). Please call 828-271-4800 or email "orders@ncdc.noaa.gov" for further details. There are charges involved for these services.

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.

Mixing Height Summary: This summary provides a day by day estimate of the mixing height for the boundary layer by using surface and upper air observational data. It's often used for pollution and air dispersion models.

Stability Array: This provides month by month averages of surface-based stability in Pasquill stability categories. Hourly or synoptic surface observations are used as input.

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 CDROM 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. See glossary of acronyms at end of Guide for details on terms used below.
2. The periods of record for these datasets vary considerably depending on data type and station (if applicable).
3. 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.
4. 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.
5. Cost to customer varies depending on data volume and the processing required for order.
6. **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.
7. 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 see what's available.
8. Points of contact for information, cost estimates, and data requests:

National Climatic Data Center
Climate Services Branch
151 Patton Avenue
Asheville, NC 28801
Telephone: 828-271-4800
Fax: 828-271-4876
Internet: orders@ncdc.noaa.gov

DATABASE: Worldwide surface observations (hourly/synoptic). Includes 2 datasets - TD3280 and TD9956.

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 TD9956 (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, daily precipitation amount, and snow depth are not included, but are placed in TD3210 (see below). Hourly precipitation amount stored in separate dataset (TD3240).
- "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.

Notes - Request database manual for further details. Data subsets for 1961-1995 are available on 3-volume and 1-volume CDROM sets.

TD9956--Air Weather Service's (AWS) DATSAV3 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.

Notes - Request database manual for further details. NCDC can produce summary of day data (1 record per day) from this dataset--18 elements summarized as available. A 1982-1997 hourly subset is available on a 5-volume CDROM set.

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 TD9956 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 1946-1996 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.

- Data are also available on a CDROM set.

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 - Various sources including ASOS, diskettes from stations, and key-entry.

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 and national composites of reflectivity (precipitation) are available via the World Wide Web (WWW): <http://www.ncdc.noaa.gov> -- click on Radar Resources.

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.

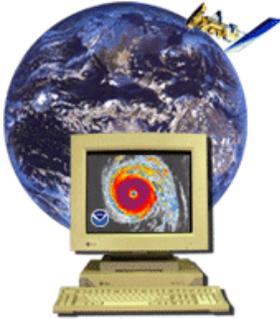
Storm Tracking Information Overlay (STI) - A product which shows a plot of the past hours movement, current location, and forecast movement for the next hour or less for each identified thunderstorm cell.

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.

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 satellite systems are the Geostationary Operational Environmental Satellite (**GOES**), which began in 1975, and the Polar-orbiting Operational Environmental Satellite (**POES**), which began as the TIROS series in 1960. The NCDC also archives certain data sets from the Defense Meteorological Satellite Program (**DMSP**) satellites. See complete product listing below along with the latest prices.

About NOAA's Satellites

NOAA's current 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. For optimum coverage over the Western Hemisphere, there are normally two GOES satellites, one positioned over the equator at 75 west longitude and the other positioned at 135 west longitude. There are several instruments on the satellites but the two NCDC is concerned with are the Imager and Sounder instruments. The Imager consists of five channels ranging from the visible to the longwave infrared channel. The visible channel has a resolution of 1 km while the infrared channels have a resolution of 4 km at nadir, except for the water vapor channel which is 8 km. The Sounder has 18 thermal infrared channels and can make over 50,000 soundings per hour. Each of the GOES satellites scans predetermined areas of the earth. During routine mode of operation, observations are taken over the United States every fifteen minutes by each satellite. More frequent observations of five minutes or less can be obtained when severe weather threatens. Several operational and experimental products are created to improve near real-time and longer range forecasts.

The POES satellite system offers the advantage of daily global coverage, by making nearly polar orbits about 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. NOAA tries to maintain a two satellite configuration to obtain global observations at least four times daily.

NOAA has begun its fourth generation of polar orbiting satellites with the launch of NOAA-K in May 1998. These satellites, like their predecessors, operate in near sun-synchronous orbits. These new satellites carry a series of instruments which have been modified and improved from previous NOAA satellites. The Advanced Very High Resolution Radiometer (AVHRR) has been retrofitted with a sixth channel in the near-IR (1.6 μ m), which is time shared with the original channel 3. The

new channel is referred to as channel 3A and operates during the daylight part of the orbit. Channel 3B corresponds to the original channel 3 and operates during the night portion of the orbit. The actual shared time may vary depending on NOAA's.

The Microwave Sounding Unit (MSU) and Stratospheric Sounding Unit (SSU) instruments have been replaced with Advanced Microwave Sounding units AMSU-A1, AMSU-A2 and AMSU-B. The AMSU-A is a 15-channel microwave radiometer in two separate units. The new AMSU data is expected to provide improved temperature and humidity soundings. Additionally, window channels 1, 2 and 15 will provide information on precipitation, sea ice and snow cover. The AMSU-B is a five-channel microwave radiometer; three of the channels are centered on the 183.31 Ghz water vapor line. The other two channels are at 89 Ghz and 150 Ghz.

The new High Resolution Infrared Radiation Sounder (HIRS/3) has a different calibration sequence. On HIRS/2, the calibration mode required the use of three calibration targets (space view, cold target, and warm target). On HIRS/3, the cold target will not be routinely used in the calibration sequence, resulting in one additional scan line of Earth data (38 Earth scans per 256 second cycle). Detailed information about the NOAA-K,L,M instruments, data formats, calibration and similar technical characteristics of the spacecraft are contained in the NOAA-KLM User's Guide which is available on-line at www2.ncdc.noaa.gov/docs/klm/. A file of this document is also available for downloading via ftp; details can be found at the User's Guide site.

Satellite Active Archive (SAA)

NOAA's Satellite Active Archive (SAA) provides direct Internet access to NOAA's satellite data collected by POES and DMSP satellites using the File Transfer Protocol (FTP) method. The SAA allows users to search inventories of satellite data, preview representative Earth images of that data, and download selected data sets for further processing and analyses in one session.

AVHRR data are available beginning January 1995, TOVS data are available beginning July 1995 and DMSP data are available beginning February 1997. The URL for the SAA is www.saa.noaa.gov.

After the user has placed his or her requirements via the Inventory Search Criteria page, an order may be placed for FTP. Up to thirty-two datasets with no more than 10 MB of data each can be ftp'ed 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 data set 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.

Digital Satellite Data and Products

Polar Operational Environmental Satellite (POES):

LEVEL 1b DATASETS:

AVHRR GAC (Global Area Coverage)	10/78 - Present
AVHRR HRPT/LAC (Local Area Coverage)	04/85 - Present
TOVS MSU (Microwave Sounding Unit)	10/78 - Present
TOVS SSU (Stratospheric Sounding Unit)	10/78 - Present
TOVS HIRS/2 (High Resolution Infrared Sounder)	10/78 - Present
SBUV/2 (Solar Backscatter Ultraviolet/2)	03/85 - Present
AMSU-A/B (Advanced Microwave Sounding Unit)	10/98 - Present
TOVS HIRS/3 (High Resolution Infrared Sounder)	10/98 - Present

PRODUCTS:

TOVS Sounding Product	01/79 - Present
RTOVS Sounding Product	10/98 - Present
Vegetation Index/AVHRR (3rd Generation)	04/85 - Present
Heat Budget Data--	
Monthly Mean	01/79 - Present
Seasonal	06/74 - Present
Mapped GAC Imagery--	
Polar Stereographic	12/78 - Present
Mercator	06/85 - Present
Sea Surface Temperature Data--	
7 - 8 Day Observation File	12/78 - Present
250 km Monthly Mean Data	01/79 - Present
100 km Analysis (Global Scale)	12/72 - Present
50 km (Regional Scale) and 500 km	03/74 - Present
14 km Analysis (Local-Scale)	01/86 - Present

Geostationary Operational Environmental Satellite (GOES):

GVAS & GVAR DATA:

Full Disk and Sectors	03/75 - Present
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PRODUCTS:

Sounder Products--	02/95 - Present
Vertical Temperature Profiles	
Layer Precipitable Water	
Total Precipitable Water	

Lifted Index
Geopotential Heights

Imager Products-- 02/95 - Present
Cloud Drift Winds
Water Vapor Winds
ASOS Supplemental Cloud Height/Amount

Defense Meteorological Satellite Program (DMSP):

LEVEL 1b DATASETS:

Special Sensor Microwave/Temperature (SSM/T) 08/87 - Present
Special Sensor Microwave/Imager (SSM/I) 08/87 - 06/06/96
Special Sensor Microwave/Water Vapor (SSM/T2) 06/94 - Present

PRODUCTS:

Temperature, Sensor, and Environmental
Data Records (TDR,SDR,EDR) 07/87 - Present
SSM/T Sounding Product 01/89 - Present
SSM/I Monthly Gridded Products-- 01/87 - 12/94
Precipitation
Snow Cover/Sea ice
Total Precipitable Water
Cloud Liquid Water
Oceanic Surface Wind Speed
RTNeph Layered Cloud Amount,
Type, Base, Height 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 07/83 - Present
B1 Radiance Data (10km) from GMS 07/83 - Present
B1 Radiance Data (10km) from METEOSAT 07/83 - Present
B2 Radiance Data (30km) from NOAA Polar
Orbiters 07/83 - Present
B3 Radiance Data (30km, 3hr) from NOAA
Polar Orbiters 07/83 - 06/30/94
B3 Radiance Data (30km, 3hr) from GOES 07/83 - 06/30/94
B3 Radiance Data (30km, 3hr) from
METEOSAT 0783 - 06/94
B3 Radiance Calibration Tables (3hr for each
satellite) 07/01/83 - 06/30/94
C1 Global Cloud Data (3hr, 280km grid,

satellites merged) all	07/83 - 06/91
C2 Global Cloud Data (monthly, 280km grid, all satellites merged)	07/83 - 06/91
D1 Global Cloud Data (3hr, 280km grid) <i>(replaces C1 Data-will be processed back to 1983, gap in yrs 1987-89)</i>	06/86 - 12/92
D2 Global Cloud Data (monthly, 280km grid) <i>(replaces C2 Data-will be processed back to 1983, gap in yrs 1987-89)</i>	01/90 - 12/92

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

GOES Imagery:

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

250km Global Monthly Mean Charts	07/81 - Present
50km Regional Charts (selected regions)	04/76 - Present
14km Local Charts (mainly U.S. coastal areas)	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

Satellite Data Pricing Schedule

Data Type	Fees
PRINTS¹	
Custom Images - Prints (8"x10" and 11"x17") Alternate formats: Transparency IBM diskette	\$85.00 each (add \$25.00 for each additional channel for same scene. Copies: add \$10.00 each.)
Reproduction Images	\$25.00 ea
DIGITAL	
POES Level 1b	\$50.00 minimum
AVHRR	\$75.00 per data set (screened ²) \$30.00 per data set (unscreened)
TOVS/ATOVS	\$75.00 per day/satellite
SBUV	\$75.00 per month
POES Products	
TOVS Sounding Product	\$75.00 per week
RTOVS ³ Sounding Product	\$75.00 per week/satellite
SBUV HIF	\$75.00 per month
SBUV PMF	\$75.00 per month
Mapped GAC - Stacked	\$75.00 per week (pre 10/26/94)
Mapped GAC - Polar	\$75.00 per day
Mapped GAC - Mercator	\$75.00 per day
Global Vegetation Index ⁴	
Weekly (B-level)	\$75.00 per month
Monthly (C-level)	\$75.00 per quarter
Climatology (D-Level)	\$300.00 per set
Sea Surface Temperature	
7/8 Day Global Observations	\$75.00 per week
250 km Monthly Means	\$200.00 (p.o.r.)
100 km Global Analysis	\$75.00 per month
50 km Regional Analysis	\$200.00 per year
14 km Analysis	\$75.00 per month \$150.00 per month/all areas

Data Type	Fees
Aerosol Products	
Observation files	\$75.00 per week
Aerosol Analysis	\$75.00 per month
Heat Budget Products	
Daily data by month	\$150.00 per month
Daily by season	\$75.00 per season
Monthly means	\$75.00 per month/satellite
Sea/means	\$75.00 season/satellite
Sea/annual means	\$75.00 per year
GOES Digital Data	
1978-1997/09/17	\$80.00 per scene ⁵ on tape
	\$45.00 per scene - ftp ⁶
1997/09/18 to present	\$45.00 per scene - tape or ftp
GOES Products	
Sounding product	\$75.00 per day/satellite
Supp'l ASOS Cloud Cover	\$75.00 per day/satellite
Satellite Winds	\$75.00 per day/satellite
DMSP Level 1b	\$50.00 minimum
SSM/I	\$30.00 data set or \$75.00 per day
SSM/T	(same as above)
SSM/T2	(same as above)
(All three datasets)	\$100.00 per day
DMSP Products	\$50.00 minimum
TDR, SDR, EDR	\$30.00 per data set or \$300.00 per day
SSM/T Soundings	\$75.00/week
SSM/T2 Soundings	\$75.00/day
ISCCP	
B1 Radiance Data ⁷ (~10km, 3hr)	\$30.00 per day/satellite
B3 Rad Data (30km) POES	\$75.00 week
B3 Rad Data (30km, 3hr) GOES	\$75.00 per bi-weekly
B3 Rad Data (30km, 3hr) GMS	“ ”
B3 Rad Data (30km, 3hr) MET	“ ”
BT Cal Tables (3hr, by satellite)	\$75.00 per year

Data Type	Fees
ISCCP - Continued	
C1 Cloud Data (3hr, 280km)	\$150.00 per month
C2 Cloud Data (monthly, 280km)	\$75.00 per year
D1 Cloud Data (3hr, 280km)	\$150.00 per month
replacement for C1 Data from 1986	
D2 Cloud Data (monthly, 280km)	\$75.00 per year
replacement for C2 Data from 1986	

Additional fees:

- \$11.00 per output tape (\$100.00 per CD-ROM)
- \$11.00 shipping and handling
- \$20.00 foreign shipping fee
- Add 50% to cost for RUSH orders (filled within 4 working days)

Footnotes:

- ¹ quotes on other formats provided. **Custom images** are created using customer defined parameters such as time, location, resolution, and any special enhancements. **Reproduction images** are copies of existing images, usually of a significant event such as a hurricane. To preview a sampling of event images go to www.ncdc.noaa.gov/ol/satellite/olimages.html
- ² data sets previewed for total cloud cover coverage by NCDC
- ³ beginning June 1, 1998
- ⁴ please enquire for prices for First and Second Generation Veg products. See GVI Users Guide for details at <http://www2.ncdc.noaa.gov/docs/gviug/>.
- ⁵ a scene constitutes one image for full or subsetted area with all or selected channels from either Imager or Sounder instrument
- ⁶ ftp orders filled for geographic areas no larger than continental U.S.
- ⁷ see above for prices on POES level 1b data

Contact information for satellite data and products:

Telephone: 828-271-4850
 Facsimile: 828-271-4876
 E-mail: satorder@ncdc.noaa.gov

Please verify prices before sending in orders.

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: 828-271-4800
Fax: 828-271-4876
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. 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, 1996 edition - Climatological tables for U.S. cities. Also available via NCDC's web site (<http://www.ncdc.noaa.gov>) under Climate Resources.

** 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:

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|--------------|----------------|-------------------|
| 1. Argentina | 4. Germany | 7. Poland |
| 2. Australia | 5. Japan | 8. United Kingdom |
| 3. France | 6. Philippines | 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