

Thomas F. Ross *, Daniel J. Manns, Wayne M. Faas

National Climatic Data Center
Asheville, North Carolina

1. INTRODUCTION

How Cold is it in Antarctica? How hot is it in the Sahara Desert? Visually "see" climate data graphically using the National Climatic Data Center (NCDC) CLIMVIS system. CLIMVIS is an interactive visualization program that permits NCDC users to view climate information via the World Wide Web. CLIMVIS has won several World Wide Web awards including the highest Magellan rating, the top 5% of all Science and Technology - Meteorology web sites, USA Today Hot Site for the Day, and the educational "Too Cool School Site of the Week."

2. WHO WE ARE

The NCDC is part of the National Oceanic and Atmospheric Administration (NOAA), which is under the umbrella of the Department of Commerce (DOC). NCDC's mission is to manage and disseminate national and global environmental data. NCDC collects data from around the globe and archives nearly a half-million magnetic tapes/cartridges, 1.2 million microfiche records, and 319 million paper records. NCDC has more than 150 years of data on hand and adds 55 gigabytes of information each day.

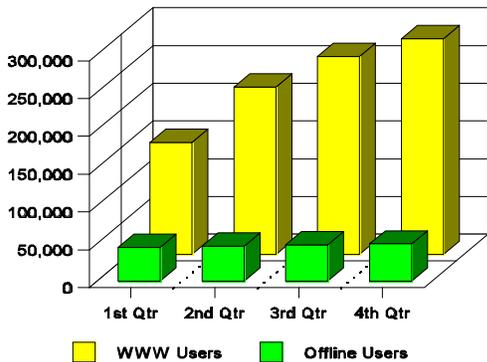


Fig 1. NCDC 1996 Contacts

NCDC averages nearly 50,000 offline user contacts per quarter concerning data availability. Requests from educators and university researchers make up 2 to 5 % of that total.

* Corresponding author address: Thomas F. Ross, NOAA/National Climatic Data Center, 151 Patton Avenue, Room 468, Asheville, NC 28801-5001. E-mail: tross@ncdc.noaa.gov

The Climate Services Branch handles contacts by telephone, electronic mail, letter, or fax. NCDC also maintains a World Wide Web (WWW) home page at the following address: <http://www.ncdc.noaa.gov>. This site handles approximately 240,000 users per quarter and continues to grow. The yearly number of on-line and off-line contacts is shown in Figure 1. NCDC contacts include a wide spectrum of business, academic, and government users.

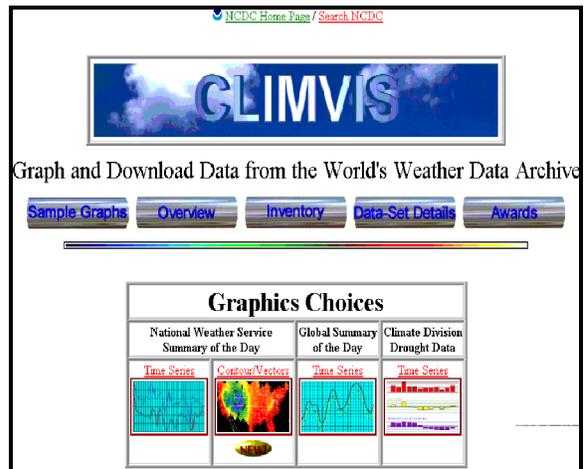


Fig 2. CLIMVIS WWW Page

3. CLIMVIS SYSTEM

Using the CLIMVIS system, data can be viewed as time series graphs for individual sites around the world or as contoured products for various regions of the United States. Users pick the site, time and weather elements, and the charts are dynamically produced.

Go to the NCDC Home Page (<http://www.ncdc.noaa.gov>) and choose the "Interactive Visualization of Climate Data" option via our WWW site.

Once you have chosen the "Interactive" button, select CLIMVIS from the list of NCDC visualization tools, then you receive the CLIMVIS Home page. Under "Graphics Choices" you have four different options which include the following visual displays: time series graphs and contours/vectors. (Figure 2.)

National Weather Service Summary of the Day: Approximately 300 currently active National Weather Service stations are included, with a lag time (after end of data month) of about 8-10 weeks. This is our best quality and most complete data for these stations. Sixteen parameters for as early as 1869 to present are available. Data can be viewed as a time series for individual sites (Figure 3.) or as a contoured chart (Figure 6.) for a state, a region, or the entire contiguous United States.

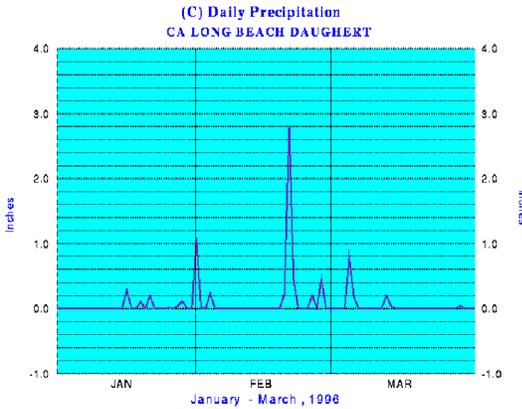


Fig 3. NWS Summary of the Day- Time Series

Global Summary of the Day: Approximately 8000 active global stations, including over 1200 active U.S. stations are included, with a lag time (after end of data month) of about 4-5 weeks. Twelve parameters beginning with 1994 are available. These data undergo considerable quality control, but the U.S. Summary of the Day is the best choice for National Weather Service sites. Data from individual sites can be viewed or data from two sites in the same region or different regions can be viewed as time series charts. (Figure 4.)

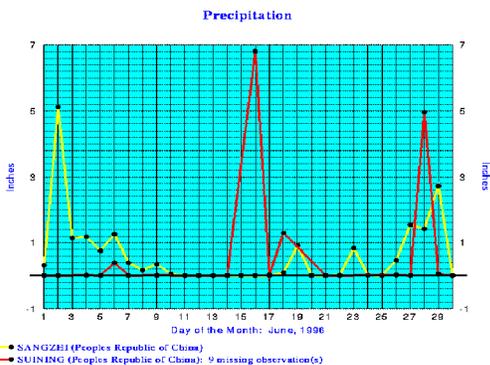


Fig 4. Global Summary of the Day- Time Series

Climate Division Data: Monthly drought indices, precipitation, and temperature data for U.S. climate divisions are available. Divisions are homogeneous climate regions, data presented are estimated monthly averages for each division. Period available is from 1895 to present. The data are viewed in time series charts. (Figure 5.) Divisional state maps are also available.

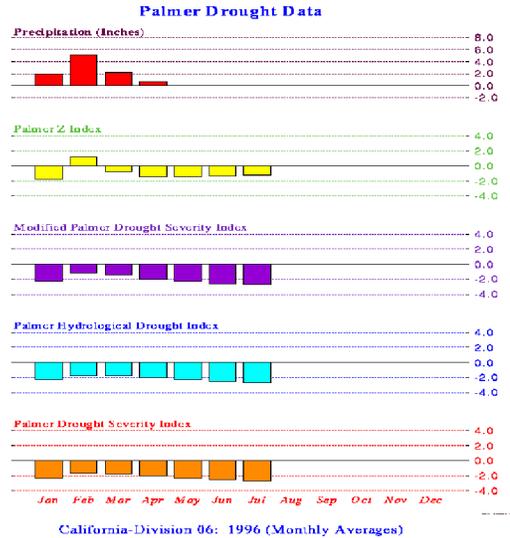


Fig 5. Climate Division Data- Time Series

Data Download Option: After the user creates a specific graph using CLIMVIS, the user has the option to download the data values plotted in the graph. Users just click on the " To Download the Data File Click Here!" option (Table 1.).

1996 California- Division 06 Precipitation	
Month	Value
01	2.00
02	5.14
03	2.15
04	.64
05	.08
06	.01
07	.05

Table 1. Sample Divisional Data File Download

5. METHOD OF ACCESS

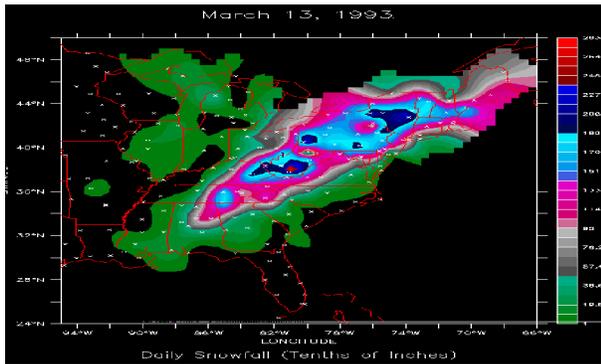


Fig 6. U.S. Summary of the Day- Contour Plot

The above (Figure 6.) is a sample contour plot available using the CLIMVIS system. Users have the options of defining the following: geographic region, any of 16 weather elements, and time. Up to four plots can be done on a single screen and users again have the option to download the data points that made up the graph. Try it out, it's easy !

Global Historical Climatology Network (GHCN)- This is a new CLIMVIS system feature. The GHCN is a research quality archive database comprised of nearly 10,000 global stations. Users can plot, contour and download monthly variables of temperature, precipitation and pressure data.

4. APPLICATIONS

The CLIMVIS system package allows students to choose a city from over 10,000 locations worldwide and visually "see" the climate for the time selected. Students can **compare** the climate at various cities around the globe or can **observe and study** how the climate varies at any city for a long period of time. Various weather parameters can be viewed as time series graphs: temperature, precipitation, winds, pressure, hours of sunshine, degree days, etc. Two cities from separate regions around the world can be viewed at the same time. Another CLIMVIS feature allows the user to view winds in vector form to study wind flow and wind patterns. Students can also plot U.S. Climate Divisional data over an area to see how a particular weather system affect a state or region.

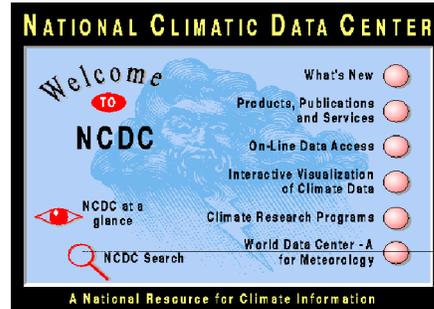


Fig 7. NCDC Home Page

You can access the CLIMVIS page through the NCDC home page by clicking on the "Interactive Visualization of Climate Data" button. Another option is to connect to the page directly at the following WWW page.

<http://www.ncdc.noaa.gov/onlinprod/drought/xmgr.html>

For more details on CLIMVIS, see the Daniel J. Manns paper "Climate Visualization of NOAA's Environmental Data" presented at the 1997 AMS 13th International Conference on Interactive Information and Processing Systems for Meteorology, Oceanography, and Hydrology

6. CONCLUSION

NCDC has developed the CLIMVIS system to allow users to easily graph and retrieve climate data from a variety of national and international databases. The system will continue to grow and evolve as NCDC continues to archive and disseminate climatic data and information to our various users. NCDC's commitment to the educational community involves more than just the CLIMVIS system. Please visit the NCDC Home page (<http://www.ncdc.noaa.gov>) , NCDC offers additional climatological and satellite data not only from domestic sites but from areas and locations around the globe.

NCDC'S Climate Services Branch is responsible for distribution of climate information. They can be contacted via the following phone number, Internet, electronic mailbox or facsimile.

Please call for latest availability and pricing of any of these products and services.

Telephone Number : 704-271-4800
Fax Number : 704-271-4876
WWW Home Page: <http://www.ncdc.noaa.gov>
Internet Access : orders@ncdc.noaa.gov

