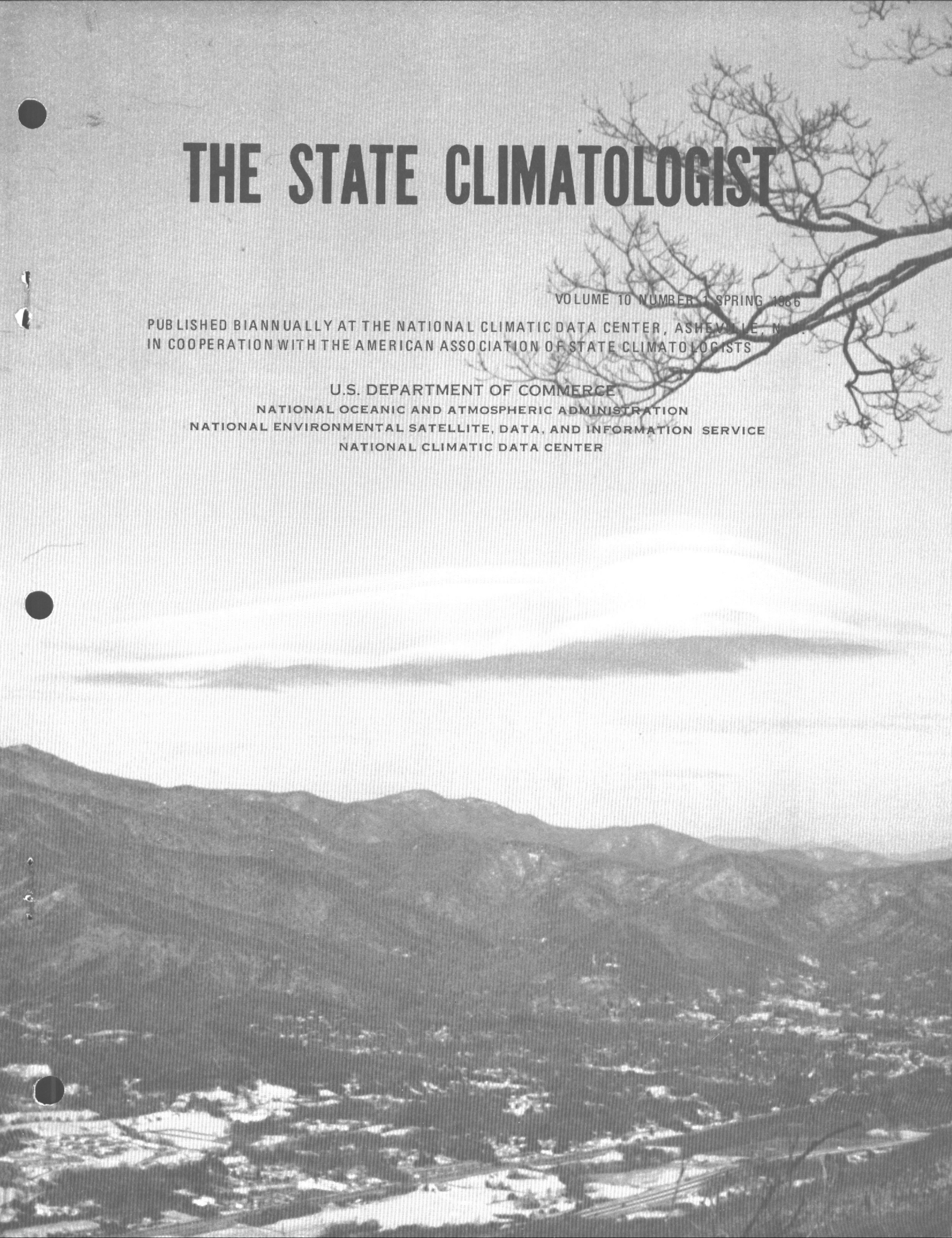


# THE STATE CLIMATOLOGIST

VOLUME 10 NUMBER 1 SPRING 1986

PUBLISHED BIANNUALLY AT THE NATIONAL CLIMATIC DATA CENTER, ASHEVILLE, N.C.  
IN COOPERATION WITH THE AMERICAN ASSOCIATION OF STATE CLIMATOLOGISTS

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE  
NATIONAL CLIMATIC DATA CENTER



\*\*\*\*\* B U L L E T I N \*\*\*\*\*

The joint conferences on Climate and Water Management/Human Consequences of 1985's Climate have been shortened to one week (August 4-8, 1986). The 1986 Annual Meeting of the American Association of State Climatologists will be held on Friday, August 8. The Agricultural Meteorology and Climatology For Production in the Southern Region (S-173) will also have their annual meeting during the week.

For more details on the joint conferences see page 16.

*COVER PHOTO: A Standing Wave Lenticular Cloud east of Mt. Mitchell, N. C.  
Photo by G. W. Goodge*

HELMUT E. LANDSBERG

Helmut Landsberg died of a heart attack on December 6, 1985, while attending a World Meteorological Organization's Commission for Climatology meeting in Geneva, Switzerland. He was 79.

Dr. Landsberg was born in Frankfurt, West Germany, in 1906 and received his PhD from the University of Frankfurt in 1930. In 1934, he emigrated to the United States to become an assistant professor of Geophysics at Pennsylvania State University where he wrote the first edition of his elementary textbook entitled Physical Climatology. Between 1941 and 1964, this historic volume evolved through two editions, three revisions, and a total of nine printings. In the second edition he wrote "our purpose will have been fulfilled if we can show that climatology is far from being a dead (or deadly boring) subject but an area with fascinating challenges for future research." In 1941, he joined the University of Chicago where he became an associate professor of meteorology.

Helmut left the University of Chicago in 1943 and served the War Department as a consultant on the military applications of climatology and later as a research administrator in the Department of Defense. In 1946, he published a paper in Scientific Monthly entitled "Climate as a Natural Resource," which could still serve as a blueprint for applied climatologists. In 1954 he became Director of the Office of Climatology of the U.S. Weather Bureau and later became Director of the Environmental Data Service in the Environmental Science Services Administration.

In "retirement" he served as a part-time lecturer at the University of Maryland until becoming a research professor in 1967, and from 1974 to 1976 he directed the University's meteorology program and Institute of Fluid Dynamics and Applied Mathematics. He also served as President of the World Meteorological Organization's Commission for Climatology.

In 1976, he was named professor emeritus of the University of Maryland's Physical Science and Technology Institute. In February 1985, President Reagan awarded Dr. Landsberg the National Medal of Science, the most prestigious science award a civilian can receive.

Dr. Landsberg was instrumental in the establishment of the State Climatologist Program and the centralization of all weather records processing to form the National Weather Records Center in Asheville, NC. In recognition of his leadership, strong support, and overall contributions to climatology, the American Association of State Climatologists (AASC) presented him with a lifetime membership to the AASC in 1984.

While we have lost a friend, confidant, advisor, and advocate, his many contributions over more than half a century will be preserved. We can always take comfort in the fact that until hours before his death he was doing exactly what he wanted to do.

There is, of course, no way to replace a world-class climatologist. However, each of us should, indeed we must, continue in our efforts to keep alive the State Climatologist Program that Dr. Landsberg felt had made so many important contributions in the past and would make in the future.

## "Clim 20" Station List, By State

The NCDC's Climatology of the United States No. 20 ("Clim 20") series of summaries gives climatic data from selected sites in the National Weather Service cooperative observation network. There have been several issues of the No. 20 series, which are based on specific periods-of-record of observations. (The contents of the various issues are described in detail in the NCDC Environmental Information Summary (EIS) C-26: Climatology of the United States No. 20, Climatic Summaries for Selected Sites.) The site/station list varies through the issues mainly because of changing user requirements for the summaries, and because of the opening and closing of observation sites in the cooperative observation network. The current issue, which summarizes observations from the 30-year period 1951 through 1980, comprises summaries for 1,879 locations that have a population of at least 5,000 persons. The previous issue was for 1,063 sites, with each summary based on at least a 20-year period-of-record beginning in 1951, and from the overall period 1951 through 1975. Those sites were selected on the basis of statewide locations without regard for population size. Earlier issues, which were based on variable and sometimes very long periods-of-record, contain summaries for approximately 1,800 locations. Those summaries were prepared by Weather Bureau (and later, NOAA) State Climatologists, and contain narrative information along with the climatological data.

Station lists, by state, are now available from the NCDC. These lists give the state station inventory by the three issue categories described above: the current issue, the previous issue, and earlier issues. Each issue inventory contains the station number, location (latitude/longitude), elevation from sea level, and period-of-record for each site, in an alphabetically ordered list. Also, the number-keyed locations of the No. 20 sites are shown on a state map for each issue (the map precedes the issue inventory in the list).

These state station lists will aid the climatic data user in his search for available location-specific data summaries; a "Clim 20" could possibly fill the need. All issues of the No. 20 are available from the Center as individual site publications, and in statewide collections (the current issue as a hardcopy bound volume, and all issues on microfiche, by state).

Walter James Koss  
Chief, Statistical Climatology  
Branch, NCDC

NOTE FOR PUBLICATION

The Data Systems Division of the National Weather Service (NWS) is in the process of developing a catalog of data files and computerized data bases of current operational meteorological and hydrological observation stations in the United States and its surrounding waters. This new Operational Station Data Catalog will also include information on existing state, local and private observation networks.

It is the intent of the NWS to provide a convenient reference on existing observation stations and networks. This would serve as an important source of information for both government and nongovernment organizations who might wish to establish a station data file for a particular application or may wish to establish some special-purpose observation network and need to know where observation stations may already exist. The forthcoming NWS Catalog not only will present current information on operating stations and networks, but will provide specific guidance on how and where to obtain that information.

In support of this effort, the NWS would appreciate hearing of any station listings or of any state, local or private-sector observation network of which you may be aware. If possible, it would be useful if a point of contact could be identified through which the contractor preparing the Operational Station Data Catalog could obtain more detailed information.

Any information or suggestions you may have can be sent to:

National Weather Service, W/OTS2x1  
Gramax Building, Room 731  
8060 13th Street  
Silver Spring, MD 20910

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NOTE: Any questions on this publication note should be directed to:

Dr. Lowell Krawitz  
9282 Darlington Road  
Philadelphia, PA 19115  
(215) 698-2468

USCLICOM

SPECIAL INTRODUCTORY OFFER

FOR STATE CLIMATOLOGISTS ONLY

For a limited time, the National Climatic Data Center is offering a special introductory USCLICOM package. We believe the USCLICOM system is an excellent choice for climatological data management at many State Climatologist offices.

We are interested in receiving comments about the system and copies of applications programs that you may develop using CLICOM. Of particular interest are programs that are applicable to needs of developing countries.

The following pages give a brief description of the USCLICOM system and the general pricing structure.

For State Climatologists willing to participate in this program through an exchange of applications programs, NCDC will provide an Option B program package, membership in the USCLICOM user group, and training tailored to the individual level of expertise for a total cost of \$375. Interested State Climatologists should contact William Propest, Data Base Administrator, NCDC or call 704-259-0385.

## 1. INTRODUCTION

The U.S. CLICOM System Data Management Module (USCLICOM), is a micro-computer based climatological data processing system. It provides the capability to digitize, quality control, manage, and analyze climate data. USCLICOM provides capabilities to control all aspects of climate data management. In addition to managing climate data, it manages detailed historical information on the locations and observing practices of stations, data dictionary information, and data inventories.

In order to simplify use by personnel with little technical training, USCLICOM is menu/form driven. The menus guide the user to the task of interest where he/she then provides specific information by filling in standard forms. This approach allows the experienced user to perform tasks quickly while providing the novice user with all of the information required to perform most tasks. In order to help the novice user familiarize himself with the system, extensive on-line help is available.

## 2. DATA MANAGEMENT

USCLICOM provides a variety of tools for storing and retrieving climate data. All data can be presented to the user as a set of full-screen forms. To select the data of interest, the user fills in the appropriate fields (such as the station identifier or date), hits a key, and the system retrieves the records which satisfy the conditions specified. Single key searches will find any data in less than one second.

Since many climatological archives are larger than the capacity of a micro-computer's disk, the system supports off-line storage of the data on cartridge tapes, diskettes, or optical disks. This includes a data set directory with a catalogue of the data stored on each unit, as well as software for bringing the data on-line.

The information managed by CLICOM is organized into four categories: climatological data; inventory information; station history information; and data dictionary information. All information is maintained by the commercial data base management system (DBMS).

Climate Data: USCLICOM manages five distinct types of climatological data; monthly, daily, synoptic, hourly, and upper air soundings. All, except upper air, are stored by station and climatological element over a specified time interval. For example, a single record of daily data might contain one month of daily maximum temperatures for a single station. Another might contain the daily minimum temperatures for the same station-month. Most other data are maintained in a similar fashion. Monthly data are stored in a yearly record of monthly values, synoptic and hourly data in a daily record. The data are maintained by element in order to provide the flexibility to handle each user's requirements and observing practices. The system currently supports over 150 standard climatological parameters and allows users to add more than 800 additional parameters to meet their unique requirements.

Data Inventory Information: The data inventory contains a detailed inventory of data available for a given station and time.

Station History Information: The CLICOM station history contains detailed information on the names, locations, instrumentation, and observing practices of all climatological stations whose data reside within the USCLICOM database. Historic as well as current information is maintained. Users can search for stations by name, identifier, location, county, drainage basin, data observed and other attributes.

Data Dictionary Information. The data dictionary contains a variety of information about the data sets and climatic parameters, or elements, managed by CLICOM. This includes information such as data set descriptions, variable and code definitions, and record formats.

### 3. DATA ENTRY AND QUALITY CONTROL

Data Entry. Although capable of importing digital data, USCLICOM has extensive facilities to receive climate data through manual key-entry. In order to speed this process, key-entry forms, which differ substantially from the archive record forms, are provided on the screen. In order to make screen data entry form as similar as possible to the forms that the data are recorded on, these forms present the data as a 2-dimensional array with different climatological elements forming the horizontal axis and time the vertical. Thus, a key-entry form for daily climate data might list maximum temperature, minimum temperature, and daily precipitation across the top of the form, with the day of the month running down the left. A sample key-entry form is shown below. As the key-entry personnel type past the edges of the form displayed, the screen scrolls in the appropriate direction.

Station-ID:3100900                      Data set-ID:001                      Year:1975                      Month:01

	TMPMAX	TMPMIN	PRECIP
1	<u>206</u>	<u>33</u>	<u>3</u>
2	<u>94</u>	<u>-33</u>	<u>0</u>
3	<u>128</u>	<u>-50</u>	<u>18</u>
4	<u>94</u>	<u>22</u>	<u>127</u>
5	<u>100</u>	<u>-28</u>	<u>0</u>
6	<u>28</u>	<u>-17</u>	<u>114</u>
7	<u>89</u>	<u>-17</u>	<u>0</u>
8	<u>78</u>	<u>6</u>	<u>180</u>
9	<u>144</u>	<u>28</u>	<u>3</u>
10	<u>178</u>	<u>6</u>	<u>213</u>
11	<u>178</u>	<u>67</u>	<u>279</u>
12	<u>100</u>	<u>50</u>	<u>130</u>
13	<u>78</u>	<u>-28</u>	<u>109</u>
14	<u>22</u>	<u>-67</u>	<u>0</u>
15	<u>44</u>	<u>-67</u>	<u>0</u>

The vertical definition of the form is fixed by record type. The vertical axis of monthly data is month. Therefore, a form contains a year of data. Similarly, a daily data form contains a month of values and an hourly form a complete day.



The horizontal definition of the form is defined by the user. This allows him to set up the screen to match the forms used to record the data. This arrangement simplifies the task of key-entry personnel and improves their accuracy. Up to 40 elements can be included on each data entry form.

Quality Control. In order to ensure that all climatological data entered into the CLICOM system are as accurate as possible, the data are subject to a variety of quality control procedures. Each data value is subject to three checks; value limits, rate of change limits, and consistency between elements. The value limits check compares the value against the record maximum, minimum, and the mean, and standard deviation for the given station, element, and month. Values outside record limits or outside user specified confidence levels are flagged. The rate of change check compares the value against the previous value entered and the maximum change rate expected for the given station, element, month. The consistency check compares related elements recorded at the same time. For example, the daily minimum temperature cannot exceed the daily maximum.

In order to find additional errors that are difficult to detect when examining a single station, the area value check assembles all values recorded concurrently and presents a contour plot to the user. In order to minimize the effects of local topography, the actual data values are not plotted. Instead, standardized values are used. The data value for each station is converted to the number of standard deviations from the mean, using the mean and standard deviation for that particular station, element, and month. The resulting standard scores are then presented on the screen as a contour plot. The user is responsible for examining the pattern and noting and changing suspicious values.

#### 4. SYSTEM CONFIGURATION

##### Hardware

##### Minimum

- PC AT compatible with
- 512 Kilobytes(K) memory (RAM)
- 20 Megabyte (MB) hard disk
- 1.2 MB diskette drive
- Color monitor
- Dot matrix printer

##### Recommended

- PC AT compatible with
- 1 Megabyte(MB) memory (RAM)
- 40 MB hard disk
- 1.2 MB diskette drive
- Medium resolution color monitor (640 x 350)  
with Enhanced Graphics Adaptor (EGA)
- Backup device such as streaming tape drive or optical disk drive
- Dot matrix printer

## Optional Equipment

Plotter  
Digitizer  
Uninterruptable power supply  
Additional PC's for data entry each with  
    640 K memory  
    2 360 K diskette drives  
    Medium resolution color monitor and EGA  
    Network interface board

## Software

### Commercial Software Packages

<u>Function</u>	<u>Package</u>	<u>Vendor</u>
Data base management system	DataEase	Software Solutions
Graphics Library	Grafmatic	Microcompatibles
Screen utilities	FORLIB-PLUS	Microcompatibles
Sort utility	COSORT	Information Resources

### USCLICOM Software Modules (written in FORTRAN)

Data entry and quality control  
Data selection, retrieval, and reformatting  
Inventory data  
Load digital data files for quality control  
Produce summaries and other products (see the attached Products  
    Overview)

## 5. MORE INFORMATION

For more information on the USCLICOM System, please contact NCDC for the 21-page Users Guide. This document will provide details to the system so that the potential user can get an indepth view of the system. For further information, contact:

David McGuirk or Bill Propest  
National Climatic Data Center  
Federal Building  
Asheville, North Carolina 28801  
(704)-259-0387 (FTS 672-0387)

USCLICOM Price List

<u>Required Commercial Software</u> <sup>1</sup>	<u>Manufacturer</u>	<u>Suggested Retail</u>
DataEase 2.5 <sup>2</sup>	Software Solutions	\$ 600
Grafmatic	Microcompatibles	\$120 135
FORLIB Plus	301-593-0683 Microcompatibles	\$55 50
COSORT	516-365-7629 Information Resources →	\$200 250

1. The National Climatic Data Center cannot distribute these packages. Users must secure them through the manufacturer or other software distributors.
2. For a free DataEase demonstration disk or additional information, call (800) 243-5123.

USCLICOM Software

- Option A: Executable code for all NCDC-developed applications modules  
DataEase database structures, reports and menus  
User Manual  
System Administration Manual  
1 Year free membership in the USCLICOM User Group<sup>3</sup>  
Media: 5 high density (1.2 MB) diskettes  
Cost: \$300
- Option B: Same as Option A with the addition of the FORTRAN source code for all NCDC-developed applications.  
Media: 6 high density diskettes  
Cost: \$450 *special \$375*      *7 megabytes*  
*5 megabytes on the machine*
3. The USCLICOM User Group acts as a clearinghouse for USCLICOM information and tips from users. It also coordinates the standardization and exchange of applications modules developed by USCLICOM users, and supplies information on software updates.  
Cost: \$100 annually

Training

Intensive one-week USCLICOM training sessions will be held in Asheville, NC, as demand warrants. These sessions cover a variety of topics related to the use of a USCLICOM system. Subjects include system organization; DataEase database design, retrieval, and manipulation; design and use of the station history, data dictionary, and inventory subsystems; system products; system administration; and a review of PC-DOS/MS-DOS.

The sessions will be held whenever 10 or more users have requested training.  
Cost: \$300 per person.

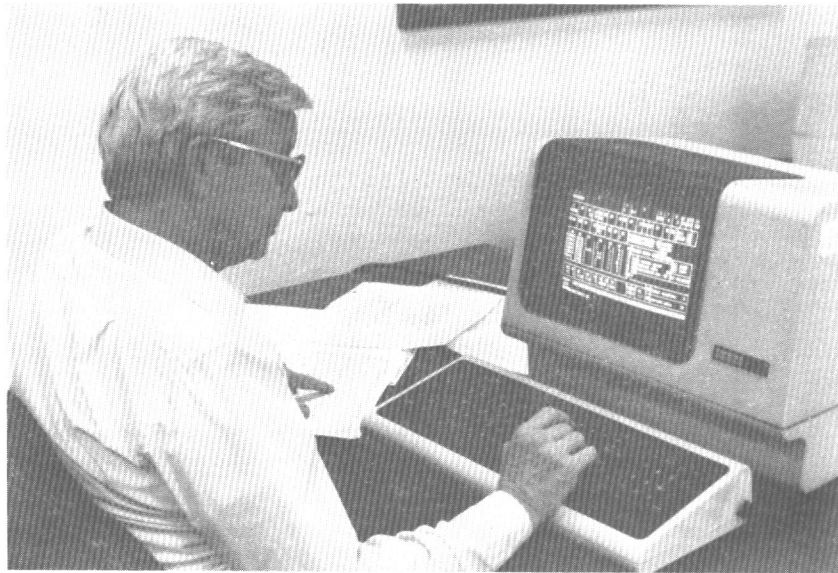
## National Climatic Data Center's

### PRIMARY DATA BRANCH

The Primary Data Branch (PDB) is one of two branches in the Data Operations Division (DOD) of the National Climatic Data Center (NCDC). The Cooperative Data Branch (CDB) featured in the April 1985 edition of the State Climatologist.

No one seems to recall why we are called the Primary Data Branch. Probably because we are the first stop for data on the way to publication and archiving. In PDB we log and arrange forms for digitizing, prepare tapes and diskettes for reading to computer digitizing, and prepare tapes and diskettes for reading to computer files. Once the data have been digitized or read to files on the computer, we verify and edit the data. We produce error summary reports for NWS, inventories for the Archive and Customer Service Sections, and microfilm copies of the Local Climatological Data (LCD) publication.

The PDB processes hourly meteorological data from NWS, FAA, and Navy stations; upper air data from NWS, Navy, and foreign cooperative stations; surface marine observations collected aboard merchant vessels, Navy shipping, coastal stations, and buoys worldwide; rocketsonde data from civilian and military sites; and turbidity (particles in the atmosphere) data from a World Meteorological Organization (WMO) network. Processing of all of these different data sets and maintaining a monthly schedule is accomplished by the 25 capable members of the PDB staff. Dick Cram is the Branch Chief. To keep the work accurate and on schedule, he relies on Ray Sharpe, supervisor of data processing; Roger Tanner, supervisor of program maintenance and file management; John Judd, upper air work leader; Charlotte Ward, marine work leader; and the rest of the meteorological technicians and programmers in PDB.



*Don Howell validates surface data, using an interactive VAX computer system.*

The Surface Section processes hourly observations from about 700 NWS and FAA stations. Data from nearly 400 stations are digitized, and publications for about 300 stations are produced monthly. The Surface Section processes data, with help from the Navy office, from over 60 Navy land stations throughout the world, and completes editing of data from prior years for special projects or customer requests. The surface hourly data are digitized from the forms, selected from the Automated Field Operations System (AFOS) of NWS, or read from diskette. The data are processed interactively with terminals connected to a VAX computer. The data are edited, corrected, rechecked by the computer; and the error types are logged during the interactive process. Once data pass through the computer edit system without error, they are ready for publication and archiving. During the processing, summary-of-the-day data, hourly and maximum precipitation data, six-hourly summaries, and weather types and occurrences are checked and cross-checked for consistency and accuracy. At the end of the processing cycle, error reports are mailed to the stations and publications are written to microfilm and sent to another division for printing and distribution. The digital data tapes are sent to the archive for customer service. Manuscript records are also archived and routinely copied to microfiche.

*The Surface Validation Section includes, from left to right, Cal Smith, Ray Sharpe, Charlie Thomason, George Statler, Dick Wolf, Don Howell, Don Grisinger, Mindy Lane, and Bill Clayton.*



The Surface Section also processes surface marine observations on a monthly schedule. The data arrive on manuscript forms from 1,800 merchant ships in the U.S. Voluntary Observing Ship program of NWS. Data also arrive on magnetic tape from several sources: The National Meteorological Center (NMC) sends worldwide telecommunicated reports; the National Data Buoy Center provides data from the U.S. buoys; the Navy provides reports from Naval shipping; and over 40 member countries of the WMO send observations from ships of their countries. Manuscript data are digitized and reviewed for accuracy by a meteorological technician. All the digital data are processed with a computer quality control program that assigns flags to erroneous or suspect data elements. Summaries of the data are produced for the NWS to publish in the Mariner's Weather Log.

The Upper Air Section processes data for nearly 150 stations for the NWS, Navy and cooperative stations in Mexico and South America. Data arrive on special microcomputer link tapes and diskettes from NWS sites, and on forms or printed paper tape from foreign cooperative sites and Navy stations. The manuscript



*The Upper-Air Data Validation Section includes, from left to right, Connie Neely, Rudy Kittel, Beulah Taylor, Dan Dellinger, John Judd, and Lew France.*

observations are received on magnetic tape from approximately 10 U.S. military sites. Japan also provides data on magnetic tape. The data are merged with data from prior years and statistical summaries are produced on microfilm for the period-of-record at each site. The turbidity data indicate the amount of particulate matter in the atmosphere. Data arrive on manuscript forms or magnetic tape from a WMO worldwide network called the Background Air Pollution Monitoring Network (BAPMoN). The data are digitized and processed annually. Tables of daily and monthly mean values are produced on microfilm and sent to the WMO for printing and distribution.

data are digitized and all soundings are recomputed by a computer program. Differences between the computer-generated observations and the data recorded at the station are verified by meteorological technicians, and the original observations are corrected. The data are provided to the digital archive and to CDB for publication in the Monthly Climatic Data for the World.

The Upper Air Section also processes rocketsonde and turbidity data on an annual basis. Rocketsonde

*The folks in the program maintenance staff who keep the systems running and program refinements include, from left to right, Roger Tanner, Wilbur Biggs, Frances Ingle, and Dino Frattaroli.*



The Maintenance and File Management Staff keeps the processing running smoothly. They investigate and correct data and program problems to assure that processing schedules are maintained. They correct problems discovered in historic data files, and track job submissions, computer disk, and tape usage. The group also modifies programs and writes software to improve existing systems or to provide for constantly changing needs of the various data networks.



*Assistance in the upper-air, marine, surface data management, and computer job submission is in the capable hands of Jim Martin (left), and Ed Terry (right).*

The Primary Data Branch has a large and continuing task. We could not do our job well without the fine efforts of all the observers involved in the different networks of the National Weather Service and other U.S. and foreign agencies. Our thanks to all observers for providing quality data to the National Climatic Data Center. It makes our job much easier!



**-ANNOUNCING-**

**A FIVE DAY  
CLIMATE EXPERIENCE**

**August 4-8, 1986**

**QUALITY INN ON THE PLAZA  
ASHEVILLE, NORTH CAROLINA**

**Joint Conferences**

**CLIMATE AND WATER MANAGEMENT  
-A CRITICAL ERA**

Focus is on the practical use of climate information for Water Management. Topics include *the use and need for climate information* in water resources management relevant to HUMAN CONSUMPTION - AGRICULTURE - TRANSPORTATION - ENERGY - WETLANDS - WATER QUALITY - RECREATION - INDUSTRIAL USE - ACID RAIN - DIVERSION - FLOOD PLAIN MANAGEMENT.

**THE HUMAN CONSEQUENCES  
OF 1985's CLIMATE**

The first annual symposium will explore and document the human and economic responses to climate and significant weather anomalies over the past year to eighteen months. Papers will summarize the general weather conditions and reveal the human responses to these weather conditions.

**STATE CLIMATOLOGIST**

Eleventh Annual Meeting - August 8, 1986

**Exhibits/Displays**

Exhibition areas will be available for the presentation of instruments; computer models; Federal, State, and private sector services; and other climate activities of weather related organizations.

**Field Trips**

- Hydrologic Laboratory
- Paper Mill
- Vineyard/Winery
- Acid Rain Watershed Study Area

**Activities**

- Mountain Hiking
- White Water Rafting
- Biltmore House and Winery
- Golf/Tennis Tournaments
- Outlet Shopping
- Barbecue

**Tours**

National Climatic  
Data Center

**Sponsored By:** National Oceanic and Atmospheric Administration  
American Meteorological Society

**Co-Sponsored By:** NOAA's National Environmental Satellite, Data, and Information Service, National Climatic Data Center, Assessment and Information Services Center, National Meteorological Center/Climate Analysis Center, National Weather Service/Office of Hydrology; U.S. Geological Survey; U.S. Dept. of Agriculture; American Association of State Climatologists; Tennessee Valley Authority; Interstate Conference on Water Problems; American Water Resources Association; U.S. Army Corps of Engineers; and Water Pollution Control Federation.

**For More Information...**

ABOUT REGISTRATION CONTACT:  
American Meteorological Society  
45 Beacon Street  
Boston, Massachusetts 02108

ABOUT EXHIBITS AND ACTIVITIES CONTACT:  
DOC NOAA NESDIS  
National Climatic Data Center  
Federal Building, Room 301-E  
Asheville, North Carolina 28801