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THE NATIONAL CLIMATIC DATA CENTER (NCDC) LIBRARY—A TREASURE TROVE FOR DATA ARCHAEOLOGISTS

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The data archaeologist of the 90s is making existing information accessible—information that may unlock many of the questions of global climatic change. It is interesting that, in many ways, the NCDC library has long been servicing data archaeological needs and requests. Some examples include: 1) making existing data accessible to those who need them, 2) linking data sets with other sets in different locations, 3) finding special data collections, 4) locating metadata, 5) salvaging data sets, 6) improving communication and cooperation among scientists, and 7) inventorying. These will continue to be important visions for the NCDC library into the 90s. Although the NCDC library is not large by most standards, it has a treasure trove of information and data for today's data archaeologist. The following paragraphs outline many of our services.

Making Data More Accessible

With the library's move to a new location in 1981, NCDC made a commitment to provide better response to data archaeological requests. Our first objective was to organize the

many stacks of books onto shelves. Most books had labels which used Universal Decimal Classification (UDC) numbers. The rest of the collection was uncataloged; i.e., observation manuals, historical collections, microformats, articles, periodicals, etc. All publications were placed in Library of Congress (LC) classification number order.

To allow easier and more efficient access for data archaeologists, some aspects of the LC classification system were modified after coordinating with the Library of Congress. Our atlases and maps are classified with the same call numbers as our books; that is, primarily by subject, not by geographic area. In addition, publications are arranged by beginning date of data where possible to make it easier for data archaeologists to move back through time from title to title to search out data overlaps and voids. Also, all of our holdings, regardless of media or format, are filed together. For example, if a researcher requires historical information on drought, then all books, videos, periodicals, bibliographies, articles, microformats, CD-ROMs, software diskettes, etc.,

U.S. DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE

NATIONAL CLIMATIC DATA CENTER IN COOPERATION WITH
AMERICAN ASSOCIATION OF STATE CLIMATOLOGISTS

which contain drought information will be filed together rather than separately by media categories, as is the usual case. The NCDC system focuses on the expert's need rather than on clerical actions.

Linking Data Sets

We also link our data with that of other locations, both internal and external to the NCDC library. This linkage allows the data archaeologist to take logical steps to find related information more efficiently. For example, on our first volume of Local Climatological Data we have a label referring the user to related NCDC manuscript collections. On the same volume we have another label advising the user that microfiche sets are also available in station order, not date order. For those interested in only one station for the entire period, they will probably be more interested in a station sort. Our storm section shows another linkage because it has labels referring users to the central NOAA Library and the National Technical Information Service for early storm and typhoon data. In addition, other referrals are made to various in-house experts.

Another method of linkage can be found in the additional notes in our cataloging entry. Titles and Superintendent of Documents classification numbers change over time, so we link them for outside users and for our own historical understanding. This is particularly important as our cataloging is input for the heavily used international data base, On-line Cataloging Library Center (OCLC).

Finding Special Data Collections

It is unusual for NCDC's projects to regularly need data which we do not already have. In one such instance

however, our library contacted the Pennsylvania Hospital's Medical Library in Philadelphia to borrow microfilm of the hospital's daily weather data, 1825-1871. A copy of this microfilm is now in the NCDC library with the rest of the Pennsylvania data, as well as in the NCDC film archive for all to use.

Other examples of existing data which have recently been located include both national and international projects related to the Comprehensive Ocean-Atmosphere Data Set (COADS). The Smithsonian's National Archive holds an important collection of pre-1860 manuscript marine logbooks known as the Maury Collection. NCDC has acquired a microfilm copy of this collection for our library and plans to digitize it. Also, contacts have been made with archives in other countries such as Japan and Germany to fill gaps in the marine record. Within NCDC's own archives, we have also located valuable data for the World War I and II years which are missing in the marine record. After being digitized, these newly discovered logbooks will add tremendously to COADS and thus a better understanding of past climate.

Locating Metadata

Not only do we assist our users as they research for data sets, we also help as they search for explanations for the differences in how basic observations were recorded and reported over time. These metadata, or data about data, are important in determining potential biases which may have affected the climatological record. Data archaeologists often must trace back changes through various manuals, instruction sheets, and forms. Although the NCDC library has a good collection, for some acquisitions we refer to the central NOAA Library, the World Meteorological Organization (WMO), and other offices and agencies

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that are now recording, using, or referring to this data.

An example of the importance of how historical metadata affect climate and global change research occurred recently. Data archaeologists at NCDC needed historical manuals and old Weather Bureau circulars which clarified methods used for making cloud observations since the 19th century. The NCDC library received through interlibrary loan and also located in our own microfilm collection many of these historical manuals and publications. Based on these metadata, the scientists were able to determine that the previously reported increases in cloudiness during the first half of this century were primarily due to changes in observing practices and were probably not real.

Salvaging Data Sets

Although most data are physically very accessible, some data are deteriorating. We need to reprocess and rescue them in some other format or media before they disintegrate. A project currently underway at NCDC involves digitizing monthly temperature and precipitation data for the Signal Corps fort stations published in the early 19th century. For cost effectiveness, NCDC also works with individual state climatologists to preserve valuable data sets. For example, NCDC provided the monthly weather reports and reviews for Utah, 1891 to 1897, to the Utah State University for microfilming. We received in exchange two copies of the resultant microfilm.

These publications are examples of the wealth of historical climate data available in the NCDC library which are deteriorating rapidly. Once these data are stored on other media, especially through digitization, the resulting climate data will benefit many researchers and ultimately our

knowledge of climate.

Improving Communication and Cooperation Among Scientists

One way the NCDC library convinces others to share data is by setting the example. We have donated 83 of our publications to the Defense Technical Information Center (DTIC). These were early Defense publications for which DTIC planned to digitize and distribute the bibliographic citations. Now, more scientists will be able to find these data through public data bases.

Another way we promote cooperation is by opening up our own library to the scientist or data archaeologist. When they can readily find most of what they need from the library without assistance, they are more likely to put their publications or data here.

Inventorying

The NCDC library inventories its collections by cataloging through the on-line, international data base mentioned earlier, OCLC. This is a long-standing (1967) and heavily used data base accessed by many national and international libraries. A major effort is now underway at NCDC to provide catalog entries for all publications in our library. This is not a simple task since many publications are non-standard entries such as observation manuals, historical collection materials, microformats, etc. However, on-line cataloging is essential to the data archaeologist for finding existing information which, in many cases, may be great distances away.

Future Expectations:

Because of these actions over the last decade, we think the NCDC library is probably the world's most convenient and accessible library for working with

United States national, regional, and state weather data. We probably do not have the most data nor the most complete catalog, but we believe we have the most convenient arrangement for data archaeologists.

There is a new project on the horizon. Due to the potential impacts of global climate change, NCDC's separate but extensive foreign data collection is becoming increasingly important. There are proposals to reorganize and merge several collections containing international climate publications from several buildings into a pattern similar to our own NCDC library. We will be automating these bibliographic records and other bibliographic records for data at different locations such as the Library of Congress. The NCDC/World Data Center-A for Meteorology, the central NOAA Library, and others are studying and arranging these systems so the data archaeologists of the world will have convenient access to these data sets as soon as possible.

Linda D. Preston, Librarian, NCDC

Peter M. Steurer, Chief, Data Base Management Branch, NCDC

Profiler Update

In the Fall 1990 issue of the State Climatologist, we told you about our intention to establish an archive of Wind Profiler Demonstration Network data at the NCDC. Now an update—after a little background. The Forecast Systems Laboratory (FSL), the STORM Project Office, and NCDC joined together to develop and implement an advanced data management system that will be operated by NCDC. Called MADER, for Management of Atmospheric Data for Evaluation and Research, this system will provide good access to

researchers for profiler data. The system will also provide the direct feed of both 60-minute and 6-minute resolution profiler data to NCDC.

The objectives of the MADER 91 project include providing on-line user access to all STORM catalog and inventory information, and delivering profiler data from NCDC to on-line and off-line users.

Inventory information includes station history parameters, a data dictionary, and inventory details. Station history will include any instrument changes, including configuration, changes in parameters the station observes such as surface observations, and geographical information. The data dictionary defines all the parameters in the 60- and 6-minute resolution data sets, including units, quality control information, and data codes. Inventory details will include counts of all data elements by time period and station.

Data will be stored in an enhanced version of BUFR (E-BUFR). Software to translate E-BUFR into Unidata's netCDF and into FORTRAN-readable arrays will be provided along with the data.

Because the system will not operate until the end of 1991, the Profiler Hub at Boulder started to store profiler data from January 1991 on and delivers a backlog to NCDC for servicing. Eventually all profiler data for 1991 will be available. Since there is a great interest in receiving profiler data before then, NCDC has agreed to service profiler data in the interim, albeit with limited capability. NCDC is able to furnish profiler data off-line to interested users, who will also receive station history and data dictionary information, but no inventory details. A limited amount of data are available on-line via Internet.

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"Profiler information and data can be obtained from NCDC's Research Customer Service Group."

Profiler information and data can be from NCDC's Research Customer Service Group (Tom Ross). Tom can be reached at (704) 259-0994 or fax (704) 259-0876. He will stay in touch with the Profiler Program in Boulder to keep abreast of the latest developments with profiler data availability and the MADER project. To obtain further information about Wind Profiler Demonstration Network data management activities, contact Marjorie McGuirk at FSL (303) 497-3090 or Wayne Faas at NCDC (704) 259-0296.

Wayne Faas, NCDC

Marjorie McGuirk, FSL

MS degrees in Biological Sciences and Climatology, respectively, at the University of Delaware. He also has completed the course work for a PhD in climatology (physical geography) at LSU. His research interests include synoptic and water-budget climatology, and, of course, applied climatology. Jay brings to the SC office a dual dedication to services and research, with a long-term interest in a better understanding of the climatic variability that often plagues the environments and economies of the south. Jay is also interested in more personal and professional interaction with members of the AASC during the coming years.

Robert A. Muller
Southern Regional Climate Center

Jay Grymes Appointed State Climatologist for Louisiana

"Jay had worked as the assistant state climatologist in the Louisiana Office of State Climatology for nearly five years..."

John M. "Jay" Grymes, III was appointed State Climatologist for Louisiana effective retroactively August 1, 1991. He replaces Bob Muller, who had served as SC for Louisiana since 1978, when Bob, working together with Bill Bartlett of NCDC, re-established a state climate office for Louisiana. George Cry, the last of the "federal" state climatologists for Louisiana, is currently the Director of the Lower Mississippi River Flood Forecast Center of the NWS in Slidell, Louisiana. Bob will continue to be active with climate concerns as the Director of the Southern Regional Climate Center, housed with the Louisiana Office of State Climatology (LOSC) at LSU.

"So after months of planning, a date was selected, July 25, 1991, and as is usually the case, panic set in amongst the staff."

Jay had worked as the assistant state climatologist in LOSC for nearly five years, and Bob reports that it was easy to turn the position and the responsibilities over to Jay, since Jay was doing almost all of the data requests and mini-research projects. Jay came to LSU after earning BA and

CCWSP National Ceremony

The ultimate dream of the Centennial Cooperative Weather Station Program (CCWSP) Committee was to have a national ceremony to honor the Cooperative Weather Network and the member observers. The first push was to have a Rose Garden ceremony with President Bush as host. However, after more than two years of letter writing, telephone calls, staff change after staff change, the committee finally had to face reality. As fate would have it, an opportunity presented itself involving Marilyn Quayle, the Vice President's wife. After many more staff hours of work, Mrs. Quayle agreed to attend the ceremony to be held in the Main Commerce Building on the Mall in Washington, DC.

So after months of planning, a date was selected, July 25, 1991, and as is usually the case, panic set in amongst the staff. Thanks to Walt Cottrell of the NWS Constituent Affairs staff, the plans came off without a hitch. It was agreed that two representative observers from each NWS region (one

After lining up for pictures with Mrs. Quayle and seemingly hours of waiting for everyone to assemble, the ceremony began."

from the Pacific and Alaska regions) would be invited as guests of the NWS. The observers ideally would be from Centennial stations where families had passed the observing job from generation to generation. Though there were a few exceptions to the guideline, the assembled group of nine families was an excellent representation of the volunteer observers.

The day-and-a-half visit to Washington began with a bus trip to the World Weather Building, home of the National Meteorological Center (NMC). Actually, the visit to Washington began with a spectacular lightning display outside the hotel windows around three in the morning. Of course, the NWS took credit for the show! An interesting tour of NMC was followed by a briefing by Mike Matson of the National Environmental Satellite, Data, and Information Service on the use of satellite data. Next, it was downtown to a luncheon hosted by the Department of Agriculture. After a quick tour of the Joint Agriculture Weather Facility led by Dr. Norton Strommen, it was over to the Herbert C. Hoover Building, home of the Department of Commerce and NOAA.

After lining up for pictures with Mrs. Quayle and seemingly hours of waiting for everyone to assemble, the ceremony began. There were the nine observers on stage with Mrs. Quayle; Ambassador Rockwell A. Schnabel; Deputy Secretary of Commerce; Dr. John A. Knauss, Under Secretary of Commerce for Oceans and Atmosphere; Dr. Bruce L. Gardner, Assistant Secretary of Agriculture for Economics; Mr. Robert C. Landis, Deputy Director of the NWS; and Dr. Mark D. Shulman, President of the AASC. Mrs. Quayle was very gracious in her remarks and presentation of a plaque to each observer. Shulman presented Mrs.

Quayle a gift on behalf of the AASC. The secret service watched the audience who in turn watched them.

Then ever so quickly, the ceremony was over and the VIPs were gone. The observers piled back into the bus for a ride to the NWS Headquarters in Silver Spring, MD. After tours of the NWS History Museum, it was back to the hotel for a well deserved rest.

The next morning the group assembled again for the ride to Sterling, VA, and the new Weather Service Forecast Office (WSFO). The bus rides were very entertaining as the driver not only drove but he talked and talked and talked. In Sterling, the group toured the WSFO and its state-of-the-art equipment. The launch of a radiosonde balloon, just after a Concorde took off, had everyone looking up.

Several of the observers were hosted by their elected representatives. The video cameras from the major networks and the reporters from the papers were everywhere. Thanks to the support of NOAA, the AASC, and the American Meteorological Society, the cooperative observers had the time of their lives. The entire cooperative network received nothing but good publicity from this activity.

Stephen R. Doty
Chairman, CCWSP

Centennial Update

To date, 19 states have responded with data. Of these seven states: KS, MI, NH, NJ, NY, ND, and OK have provided data for all the requested sites: IN, NM, SC, and WI have provided nearly all. GOOD SHOW!!

AL (33%), IA (17%), ME (40%), MA (11%), NC (25%), OH (42%), OR (18%), and TN (55%) are coming

"IN, NM, SC, and WI have provided nearly all. GOOD SHOW!!"

"...those sites identified as 'good Centennials' may become candidates for inclusion into the monthly HCN data set—once their station histories are compiled."

"The Historical Climatology Network-Daily (HCN/D) consists of daily maximum and minimum temperatures and precipitation totals for 138 stations."

along nicely. CO, too, is done, although the data have not yet reached NCDC. MN has completed keying all the precipitation data for its Centennials. Also, IL and SD have been steadily making progress.

NCDC has begun the merge and conversion into a single standard format for the entire Centennial data set from the variations used for keying and is gearing up for the eventual QC. When possible, we prefer the data be on magnetic tape, else on 5¼" high density floppies using the "ENTER" program (Summary of the Day format).

Once these data are complete, plans are to incorporate those previously identified as "HCNs" (you know who you are!) into a daily HCN database. This HCN daily data set contains 138 sites that basically have no changes in observation times and few station relocations.

However, the attributes of these 138 are slowly being degraded with time, as the trend to shift from P.M. to A.M. readings continues so do the station closings and moves...all the while confounding homogeneity. Currently only 135 are maintained. So...the "new blood" offered by the Centennial network will definitely enhance the HCN products.

Similarly, those sites identified as "good Centennials" may become candidates for inclusion into the monthly HCN data set as well—once their station histories are compiled. The original 1,219 station network count has dropped to 1,216 due to station closings. Two Colorado stations, Rocky Ford and Lamar, will be included in the 1991 HCN dataset.

Questions regarding the potential as HCN sites may be directed to Pam Hughes of NCDC at (704) 259-0386.

As always, Steve Doty is willing to assist.

Many THANKS! are extended for all participation so far and for the forthcoming efforts. And, please keep those tapes and floppies coming!!

Pam Hughes
Global Climate Laboratory, NCDC

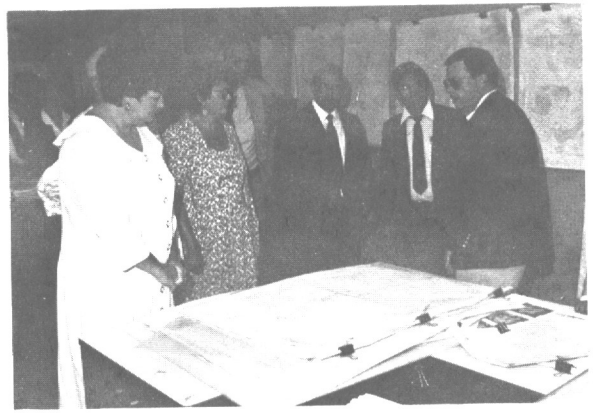
HCN—Daily Coming in 1992

The Carbon Dioxide Information Analysis Center of the DOE's Oak Ridge National Laboratory (ORNL/CDIAC) is nearing completion of another numeric data package (NDP) generated from NCDC's archives. The Historical Climatology Network—Daily (HCN/D) consists of daily maximum and minimum temperatures and precipitation totals for 138 stations. These stations are a subset of the 1,219-station network used for the monthly HCN. These daily data are from B.O.R. through 1987. A station history file is included. ORNL/CDIAC will distribute the NDP free of charge. For information contact: Office of Scientific and Technical Information, P.O. Box 62, Oak Ridge TN 37831 (615-624-0390).

Earlier this year, ORNL/CDIAC also completed a NDP for the "Historical Sunshine and Cloud Data in the U.S." These monthly data are B.O.R. through 1987 for approximately 200 NWS "First-Order" stations.

Pam Hughes
Global Climate Laboratory, NCDC

CENTENNIAL COOPERATIVE WEATHER STATION
 PROGRAM ACTIVITIES, WASHINGTON, DC
 (JULY 24-26, 1991)



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