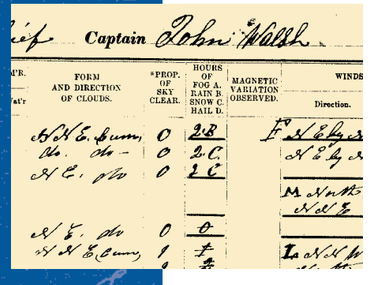


ANNUAL REPORT 2001

Climate Database Modernization Program

PROGRAM GOALS

The National Oceanic and Atmospheric Administration's (NOAA) Climate Database Modernization Program (CDMP) has a very simple goal: to make major climate databases available via the world wide web. Over 1.75 terabytes of climate data are now only a mouse click away. Such access will increase the utilization of climate information. During the year 2001 the modernization program took on many different forms, from imaging and keying weather observations as they were received from the field, to making shoreline data usable in Geographic Information Systems, to imaging historical paper records and books containing climate observations from the United States and around the world. Major advances were made in making these records available on the web through the use of a number of web sites. *(see URL list on inside back cover)*

The program is managed by the National Environmental Satellite, Data, and Information Services's National Climatic Data Center (NCDC). NCDC, located in Asheville, NC, was selected to manage this program because the vast majority (about 99%) of NOAA's data are archived at their facility.

ACCESS MADE EASIER

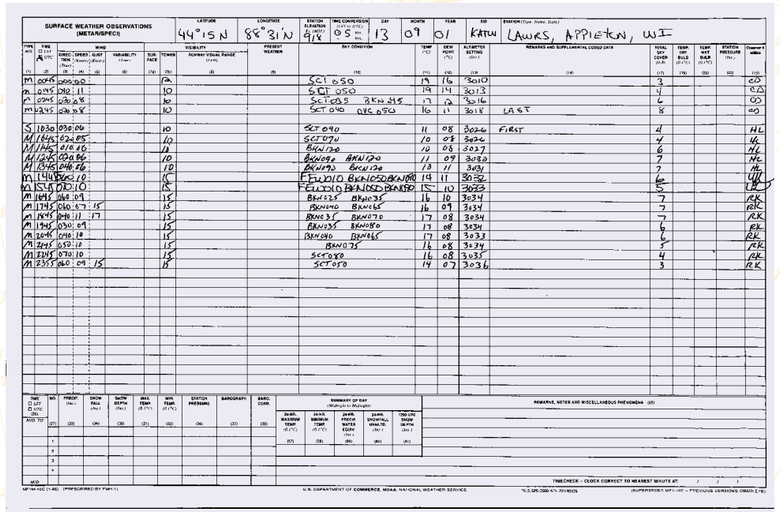
Based on CDMP efforts and earlier projects that imaged historical paper climate records, CDMP was able to make these data available on-line during 2001. Information Manufacturing Corporation (IMC) of Rocket Center, WV, developed a document management system called Web, Search, Store, Retrieve, Display. This system is more commonly known by its acronym: WSSRD (pronounced WIZARD). WSSRD is housed in a state-of-the-art data center where environmental conditions and security are fully maintained. Hardware is up to date and software is user-friendly. By the end of FY01, WSSRD was loaded with over 21 million records covering 21 different data types, such as surface airways observational forms, cooperative data forms, climate record books and marine observations. Before CDMP and the WSSRD system, records were stored in the basement of the NCDC. When a request for information was received, NCDC staff located the paper document and the requested information was sent to the customer via fax or mail. CDMP efforts have expedited this laborious process. Today these data are on-line and instantly available.

WSSRD
web search store retrieve display

Users without internet access can contact NCDC through its modern publication subscription and distribution center in Rocket Center, WV. The staff located at this facility will respond to a toll-free telephone number, e-mail, and fax inquiries. A total of seven monthly publications are distributed from Rocket Center: six publications from the National Climatic Data Center and one from the National Geophysical Data Center (NGDC).

INFORMATION AVAILABLE

The largest data type contained within WSSRD are surface airways observational forms, dating from 1949 to the current month. These forms record hourly weather observations taken from civilian airports and military installations. This data set alone contains over 19 million indices and images. Data are accessible by station name, state, and date.



Surface Weather Observation forms like this one are a part of the over 21 million records covering 21 different data types that were made available in 2001 through WSSRD: Web, Search, Store, Retrieve, Display.

The next largest data set with 765,000 indices and images, and one of the most popular with users, is the cooperative observer records. Cooperative observations are daily climate observations taken by a network of over 8,000 members throughout the United States, most of whom are volunteers. These monthly records are imaged and available in WSSRD for the period of 1995 to the current month, and are also accessible via NCDC's on-line store system.

Thirteen tasks undertaken in 2001 made a variety of climate data more accessible. Foreign data journals came from the NOAA Central Library and the National Oceanographic Data Center, shoreline charts from the Coastal Services Center, historical water levels from the National Ocean Survey and images from the National Geophysical Data Center's Defense Meteorological Satellite Program (DMSP).

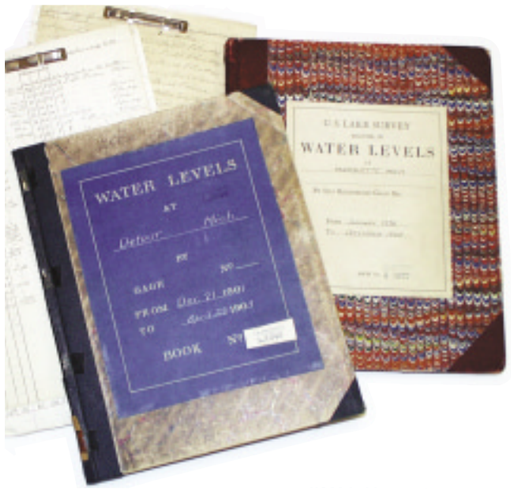
Access to NOAA's collection of data sets is not restricted to WSSRD. Many agencies built or enhanced their own web sites to allow instant access to data and information. The web site of the Coastal Services Center located in Charleston, SC, provides access to over 5,000 shoreline charts from across the United States *(see URL list on inside back cover)*. Efforts are currently underway to convert these charts from raster images to vectors. This conversion process will enable the information to be loaded into GIS processes.

The National Geophysical Data Center in Boulder, CO, is converting photographic negatives of historical data from DMSP film into digital images. The DMSP film details satellite imagery of clouds, snow and ice, fires,

and human settlements collected from the early 1970s. These images are being made available on-line through the DMSP web site. *(see URL list on inside back cover)*

The NOAA Central Library in Silver Spring, MD, is imaging foreign meteorological data summaries. These priceless data documenting the climate of many countries over the past two centuries are being made available on the NOAA library web site. *(see URL list on inside back cover)*

Scanning paper and film is only one way that CDMP is converting data into digital form. Image Entry (IE) of London, KY, has completed a multi-year effort to key daily observations from 1892 – 1947 from the Cooperative Observer network. These data were keyed from over 50,000 pieces of microfiche. It took an incredible 2 billion key strokes to create this new data set. Once these data have undergone full quality control and are combined with the post-1948 data, the historical daily climate of the United States will be fully documented for over a century.



NOAA holds a vast amount of Water Level Data such as the materials above.

PREPARING DATABASES FOR ACCESS

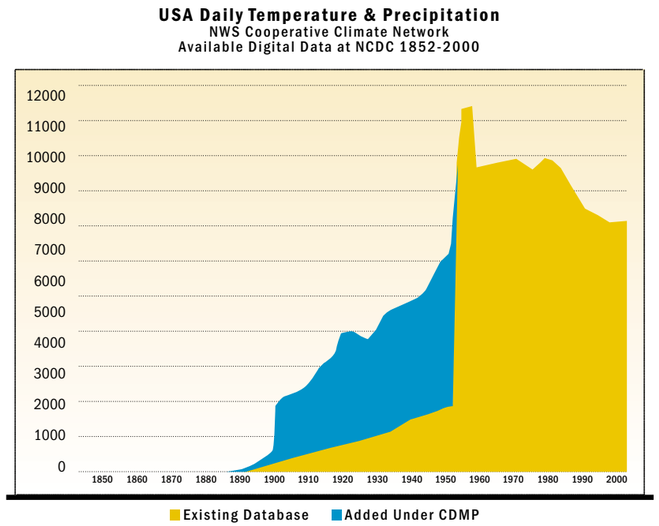
Over 30 data related tasks were undertaken during FY01, with four of the five NOAA line offices actively participating in this year's program. Tasks included efforts to modernize lightship data from the coast of America, water level data from the Great Lakes, nautical charts from U.S. harbors, storm data reports, pre-1890 station history information, and marine meteorological observations from the mid-1800s.

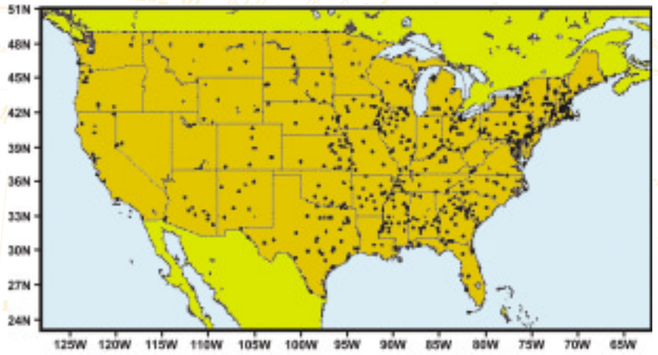
Image Entry (IE) of London, KY, has completed a multi-year effort to key daily observations from 1892 – 1947 from the Cooperative Observer network. These data were keyed from over 50,000 pieces of microfiche. It took an incredible 2 billion key strokes to create this new data set.

To facilitate this vast amount of data imaging, CDMP has established Image Entry (IE) as an incoming records processing center. This facility receives paper climate records on a daily basis. Within 48 hours, these paper records are imaged, placed on-line through WSSRD, and the digital data are transmitted to NCDC for immediate addition to their web-based on-line store system. This quick turn-around time converting paper documents to digital images and data made these records very popular with a variety of users.

Since 1860 the U.S. weather observing agencies have compiled Climate Record Books (CRB). These CRBs were previously archived on microfilm, subsequently limiting their access. During 2001, Lason Systems, Inc., of Beltsville, MD, subcontractor to SER Solutions, Dulles, VA, imaged the microfilm resulting in approximately 178,000 images being added to WSSRD. Data contained on these images were subsequently keyed. These digital data will be made available in early 2002.

The Federal Government has published climate reports and summaries since the mid-1800s. Over the years, the content, format and style of





The above chart indicates Forts in the U.S. that are part of the task known as the Forts Project. CDMP will image and key Forts data from 600 rolls of microfilm, thereby making data from the 1820s into the 1890s accessible.

these publications have changed, while the data continues to be a valuable national resource. In 2001, Lason imaged the full collection of five historical publication series, which documents the climate of states, river basins, and individual cities. These data will be made available in WSSRD early in 2002.

As the American population moved west in the early 19th century, weather conditions were routinely recorded. In a task commonly known as the Forts Project, CDMP will image and key Forts data from 600 rolls of microfilm, thereby recording data for over 5,000 locations and observations for various periods of time from the 1820s into the 1890s. Additional original records, currently located in the National Archives in Washington, DC, are slated to be imaged and keyed during the coming year.

Improved access is only one part of the CDMP. The understanding of how and where observations were taken and recorded are equally important. The National Climatic Data Center has station history information documenting how and where observations were conducted, both in digital form and more complete records on paper. To allow the electronic ingest of current information, future expansion, and web access, CDMP has sponsored the complete redesign and implementation of a new station history database. The paper forms are also being made available by inventorying and imaging the 500,000 existing pages.

IMC employee Ms. Randie Powell was awarded NOAA Team Member of the Month for the development of a streamlined customer-oriented subscription service center.

To understand the parameters under which these original observations were taken, a search was completed to locate pristine copies of the guidelines issued since the late 1800s. Known as Circulars and Federal Meteorological Handbooks, these documents are now being imaged and placed on WSSRD.

Not content to limit climate history to daily temperatures and precipitation, CDMP embarked on a task to digitize hourly observations from 1900 to 1948. These hourly observations contain a variety of data including pressure, winds, weather, visibility, and clouds. In 2001, a priority list of stations was established and work was begun to define keying formats and instructions. Actual keying will begin in 2002.

The National Oceanographic Data Center has collected a unique set of ocean climate reports covering the last century. Reports from around the world and in a variety of paper formats have been boxed and shipped to Image Entry for inventory and imaging. This task will make yet another data set, once buried in file cabinets, accessible via the internet.

PARTNERS AND PEOPLE

This year's accomplishments of the CDMP would not have been possible without the efforts of many people throughout the country, all working as part of the CDMP team. By utilizing private sector contractors, the CDMP gained a pool of quality team members, while in turn providing much-needed employment opportunities in WV, KY, and MD. The Regional Climate Centers also joined the CDMP team this year, lending their expertise to several CDMP projects.

IMC continued to provide imaging services and on-line image access using their WSSRD access system. Their development of a streamlined, customer-oriented subscription services center at their facility in Rocket Center, WV, earned IMC employee Ms. Randie Powell the NOAA Team Member of the Month award.

IE continued to provide incoming records services while working on multiple keying

Keith Eggleston of the Northeast Regional Climate Center; Joe Elms of the National Climatic Data Center; and Ken Williams and Leona Davidson of Image Entry work together on the pre-1949 surface hourly keying task.

projects. The Regional Climate Centers worked in conjunction with IE for the Forts and pre-1949 surface hourly keying tasks. The Northeast Regional Climate Center located at Cornell University in Ithaca, NY, and the Midwestern Regional Climate Center in Champaign, IL, provided station selection and keying formats for IE. They will perform quality assurance on these data once the keying is completed.

Lason Systems, Inc., a subcontractor to SER Solutions, provided imaging services for the serial publications and imaging and keying of the Climate Record Books. The SER/Lason team also continued imaging of the Defense Meteorological Satellite Program film for NGDC and imaging of the meteorological summaries for the NOAA Central Library.

IN CONCLUSION

The Climate Database Modernization Program has proven quite successful, both at creating jobs and in making climate data from across NOAA more accessible. NOAA agencies and the participating partners are working together to serve the American people both now and for future generations. A great deal has been accomplished, yet much remains to be done. The CDMP staff, both public and private, look forward to achieving their goal of a greater utilization of a true national resource for years to come.

WEB ADDRESSES FOR NOAA ORGANIZATIONS:

National Oceanic & Atmospheric Administration (NOAA):
www.noaa.gov

National Environmental Satellite, Data, and Information Service (NESDIS):
www.nesdis.noaa.gov

National Climatic Data Center (NCDC):
www.ncdc.noaa.gov

National Geophysical Data Center (NGDC):
www.ngdc.noaa.gov

National Oceanographic Data Center (NODC):
www.nodc.noaa.gov

National Ocean Service (NOS):
www.nos.noaa.gov

National Marine Fisheries Service (NMFS):
www.nmfs.noaa.gov

PRODUCT SPECIFIC URLS:

NGDC/Defense Meteorological Satellite Program (DMSP):
http://www.ngdc.noaa.gov/dmsp/

NOS/Coastal Services CSC Shorelines:
http://www.csc.noaa.gov/products/shorelines/meth.htm

NOS Products/Data:
http://mapindex.nos.noaa.gov

NOAA Library:
http://docs.lib.noaa.gov/rescue/data_rescue_home.html