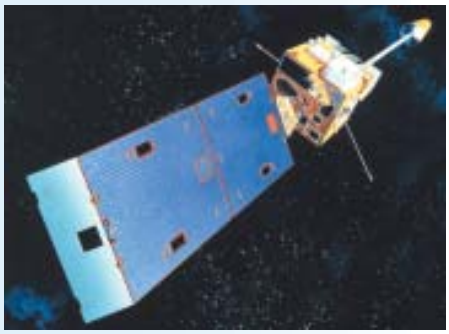


NOAA GOES satellite.

B.5 National Environmental Satellite, Data, and Information Service (NESDIS)

The National Environmental Satellite, Data, and Information Service (NESDIS) provides timely access to global environmental data from satellites and other sources to promote, protect, and enhance the Nation's economy, security, environment, and quality of life. NESDIS acquires and manages the Nation's operational environmental satellites, provides data and information services, and conducts related research.

The beginnings of NESDIS data responsibilities can be traced back to the Coast and Geodetic Survey magnetic investigations in the 19th Century. The creation of the first NESDIS national data center—the origin of today's National Climatic Data Center—began with the passage of the Federal Records Act of 1950 and the establishment of the National Weather Records Center in Asheville, North Carolina.

NESDIS' satellite responsibilities can be traced to the efforts of Weather Bureau scientists in the early 1950s who pressed for the development of satellites for weather studies. This resulted in the launch of TIROS-1 in 1960 by the National Aeronautics and Space Administration. Over the past four decades, NOAA has managed the operations of a series of geostationary and polar-orbiting environmental satellites, as well as the environmental data collected by them. NESDIS is also heavily involved with the design and development of the new environmental satellite programs that are planned to be operational during the next decade.

Hurricane Mitch, October 1998. Geographic boundaries are superimposed on NOAA GOES-8 imagery for use in the public media.

B.5.1 National Climatic Data Center (NCDC)

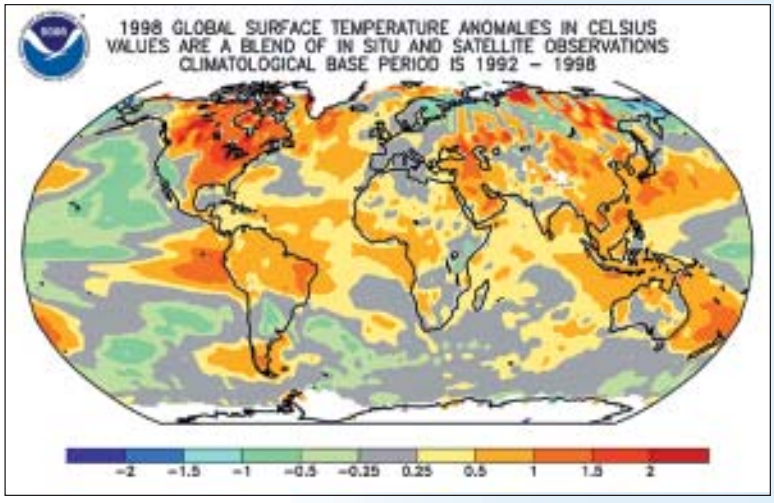
The National Climatic Data Center (NCDC) acquires and archives global data on the weather, climate, and changes in biological, chemical, and hydrological surroundings of Earth. These data are essential for assessments of Earth's recent climatic history, and for projecting possibilities of future climate events.

Climate Descriptions, Analysis, and Research

NCDC has performed a variety of analyses in support of the National Assessment, which was conducted under the auspices of the U.S. Global Change Research Program. The National Assessment includes analysis of past and future climate trends using historical data and climate models. For the observed record, temperature and precipitation extremes were analyzed. Coupled Ocean Atmosphere Climate Models were used in the Assessment to simulate the climate impacts of global warming due to increases in greenhouse gases. NCDC also spent a great deal of time in preparing the Intergovernmental Panel on Climate Change (IPCC) report. For the IPCC, global extreme weather and climate events analyses were developed.

To assist in answering the question: "How much will climate vary in the U.S.A. during the 21st Century?" NCDC, together with the Office of Science Technology Policy, the Environmental Protection Agency, and the NOAA Office of Global Programs, produced a CD, *Probabilities of Temperature Extremes in the U.S.A.* Using model projections, users can query the CD and obtain estimated probabilities of extreme temperature occurrences (both warm and cold) for any period during the next 100 years.

The unprecedented climate anomalies observed in 1997 and 1998 were instrumental in focusing public attention on the global environment. NCDC developed a Rapid Response Team in order to deal with the ever-increasing number of requests for information on climatic extremes, weather events, climate change, El Niño/La Niña, and natural disasters during the year. The Rapid Response Team placed global land/sea surface temperature information and U.S. temperature/precipitation data in century-scale perspective. Also, the Rapid Response Team provided several briefing documents for high-level government policy

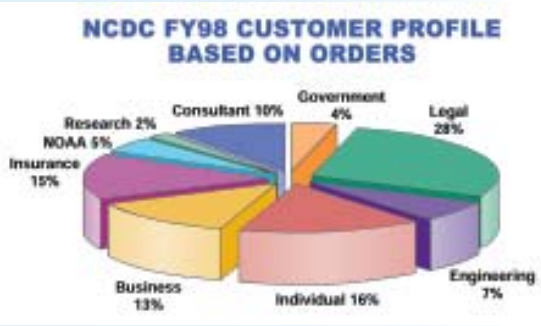


and decision-makers, including data on past hurricane seasons and the tendency for El Niño years to have lower than average (and La Niña years to have greater than average) degrees of Atlantic tropical cyclone activity.

The materials produced by the Rapid Response Team were placed on the Internet, and were used for numerous Congressional and press briefings. For global land-surface temperature data, NCDC analyses represent fully peer-reviewed science developed from the most rigorous methods in the world, maximizing station coverage and eliminating errors and subjectivity.

Climate Services

The NOAA Virtual Data System (NVDS) began with the vision of a single unified system to more effectively manage the valuable data at the Data Centers, and to provide faster and easier customer access. The NVDS is a unified, seamless, data access and delivery system designed to ensure quality service to users of environmental data. It points users to access, browse, and order data and information products without regard to the data's physical location, organizational structure, underlying discipline, or storage format.



The NOAA National Data Centers (NNDC) On-Line Data Store, part of the NNDC modernization program under the NVDS initiative, provides customers with direct electronic access, ordering, and retrieval of many Data Center products, data, and information. The On-Line Data Store enables customers to purchase NCDC's major data sets on-line by charging the items to their major credit card accounts.

NCDC's Web site, *Extreme Weather and Climate Events*, provides access to a large variety of information related to extreme climate events. The popularity and utility of the site continues to grow, with more than 365,000 hits per month. An increasing number of news media, educational, and government Web systems have links to the site. In addition to a variety of information on climate extremes, severe weather, weather events and climate change, the site provides information on Billion Dollar Weather Disasters (see next page). The United States has sustained 44 weather-related disasters over the past 20 years in which overall damages and costs reached or exceeded $1 billion.

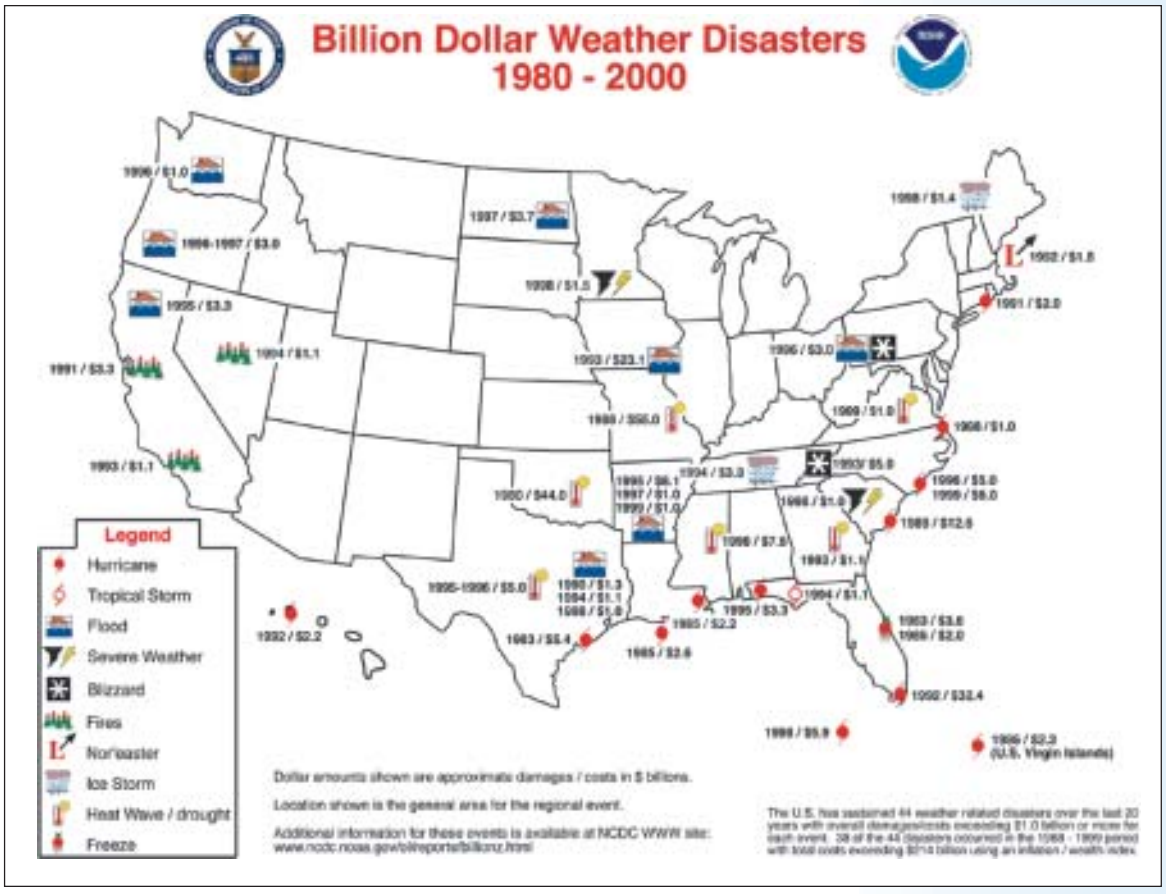
A new data set of observed snowfall extremes and derived snowfall return period statistics for 8,718 Cooperative Observer Stations in the contiguous U.S. and Alaska has been added to NCDC's archive. The data for these stations were provided to the Federal Emergency Management Agency to aid in Federal snow disaster declarations.

NCDC has participated in several meetings involving weather derivatives—a statistical instrument used by the energy, insurance, reinsurance, banking and financial sectors. Weather derivative instruments are being used in increasing numbers to manage risk related to losses in revenue due to weather and climate extremes. Historical and current weather and climate data are crucial in the development and settlement of these financial instruments. NCDC has developed the capability to provide near real-time and retrospective data permitting the weather derivatives business to streamline and improve their analyses.

Recent Products

NCDC produces a variety of environmental data sets on CD for use by researchers, other Federal agencies, the public, and the private sector. For example:

The Maury Collection, Global Ship Observations, 1793–1910
In recognition of the 1999 International Year of the Ocean (YOTO), NCDC produced this NOAA-YOTO data set, containing nearly 1.5 million historical observations of the global surface marine environment, with the majority of observations taken during the



years 1820 through 1860. The data were digitized from paper copies of handwritten forms via the U.S.–People's Republic of China 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.

Vegetation Cover
In conjunction with the NESDIS Office of Research and Applications (ORA), NCDC produced a Vegetation Cover data set. It contains more than 12 years of global monthly vegetation cover derived from the Advanced High Resolution (AVHRR) instrument flow onboard NOAA's polar orbiter satellites.

Global Standard Climate Normals, 1961–1990
The data set contains normals data from more than 4,000 stations worldwide, computed by more than 135 countries and territories. It was created as part of the World Meteorological Organization Climatological Normals activity. It includes approximately 20 climatic variables such as maximum temperature, minimum temperature, mean temperature, precipitation, snowfall, snow depth, etc. Computed statistics include mean, median, quantities, extremes, frequency distribution, standard deviation, and number of years with non-missing data.

Climate Data Quality Control, Archive, and Rescue

NCDC, in close coordination and cooperation with National Weather Service (NWS) managers in each region, has implemented the National Cooperative Data Bar Code Label Plan. The Plan is designed to expedite the inventory of monthly cooperative observation forms. Using bar codes, the forms are optically scanned upon receipt at the Center. The Archive Records Check-In database and Station Inventory Report, located on the Center's Web Home Page, are automatically updated for use.

Data rescue gives new life to historical data.

A three-year effort designed to rescue deteriorating film located at NCDC was completed. This project involved the migration of approximately 81,000 rolls of deteriorating 16mm and 35mm acetate-based microfilm to more stable media. The film contained images of weather observation forms and charts dating back from the 1700s through the 1970s. Examples include upper air and pilot balloon sounding reports, ship weather observations, and radar scope images.

NCDC's metadata rescue project for station

history forms has been completed. The project, which began in 1994, involved the digitization of station history records from the late 1800s through 1948. Approximately 25,000 unique stations were identified for this period, totaling approximately 100,000 keypunched records. This new metadata collection is now available for browsing via the NCDC Web pages.

In 1999, a new program was initiated to modernize climate databases and to make these data accessible via the Internet. In its first year, the Climate Database Modernization Program has undertaken several major projects including the development of a digital database containing daily climate observations for 1892–1947 for 20,000 cooperative stations. Paper records containing hourly airways observations from 1949–1999 have been imaged, thus building a digital database for records previously only available on paper or microfiche.

Further work includes imaging and digitizing climate record books for 1861–1990 and imaging five NCDC serial climate publications, 1890–1997. Incoming paper records will be digitized and placed on-line within 48 hours of receipt. Station history (metadata) information has been imaged and placed on-line. To make images Web-accessible, new software and hardware have been installed.

Satellite Data Distribution

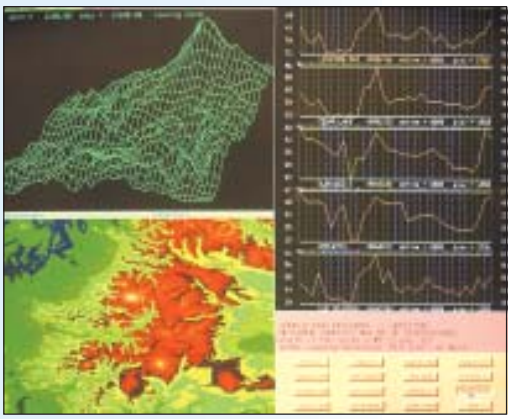
The National Climatic Data Center developed, in collaboration with the National Aeronautical Space Agency (NASA), a NASA/NOAA Prototype Long-Term Archive System. The system archives NASA satellite data at a NASA facility, and the data are accessible through the NOAA on-line ordering system. The experience gained with the prototype will be used to help estimate the costs associated with the long-term archive of NASA's Earth Observing System (EOS) data.

Collaboration with NASA continues as NOAA prepares to archive the large volume of MetOp, NOAA Preparatory Program, and NPOESS Satellite data scheduled to be obtained during the next several years. In 1999, NCDC began to archive the NOAA POES data directly from the Satellite Active Archive (SAA). This greatly reduced the manual mailing, mounting, and tracking of physical tapes from the SAA to NCDC.

In 1998, NCDC and the Office Satellite Data Processing and Distribution officially assumed the responsibility for the distribution of Defense Meteorological Satellite Program (DMSP) data from the NASA Marshall Space Flight Center Distributed Active Archive Center. NCDC processes requests for both subscription and *ad-hoc*

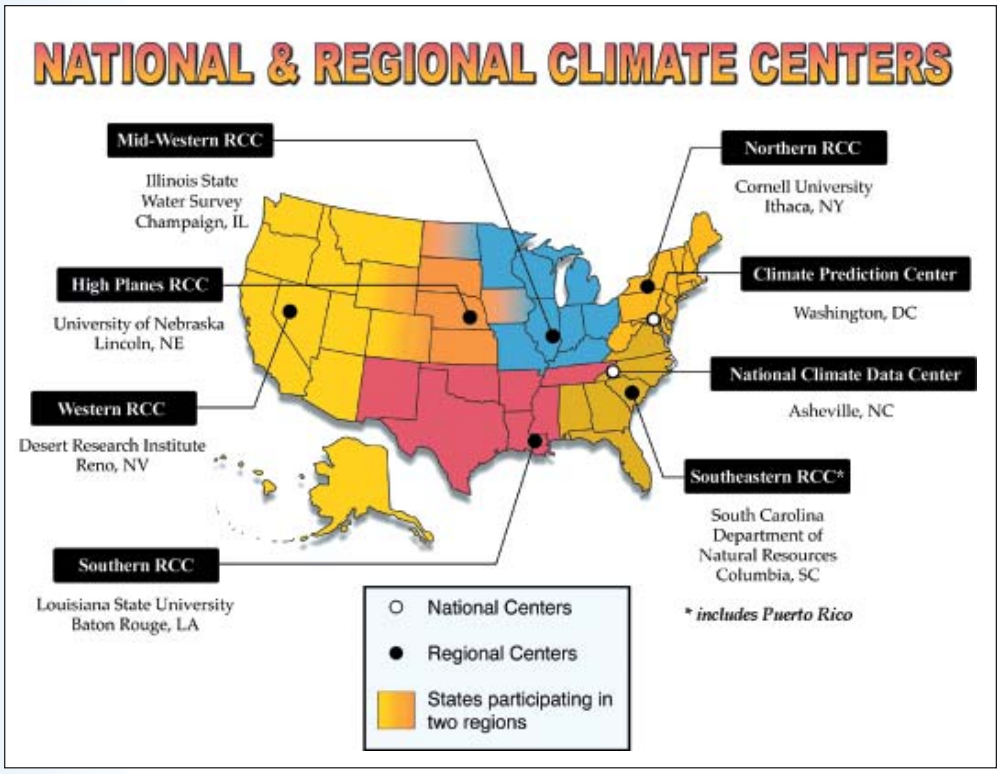
orders for DMSP data, and provides help desk support for users of these data. Furthermore, NCDC provides help-desk support for NESDIS, SAA.

Climate Data Distribution

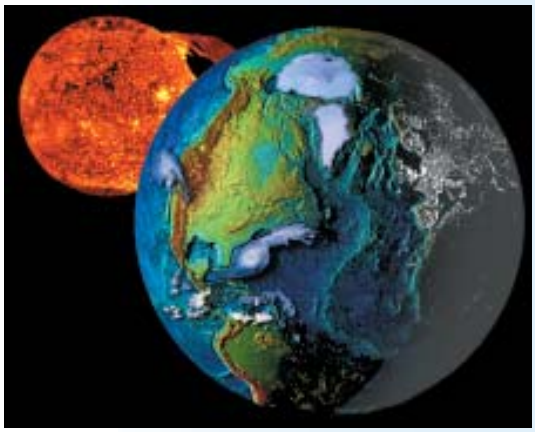


NNDC uses automated quality control systems to process COOP weather data. Visual displays (such as those shown above) are used to evaluate potential errors in the data.

NCDC assumed responsibility and coordination of the six United States Regional Climate Centers (RCC) as part of the National Climate Services System linking NCDC, regional centers, and the State Climatologists. In a collaborative effort with the RCCs, NCDC added the capability to provide near-real time Web access to preliminary climate data available from the Cooperative Observer Network (COOP). The RCCs collect the data, decode it, and provide preliminary quality control. These data are then ingested at NCDC, reformatted, and made available through the On-line Store for Web access. Currently, preliminary data for 1,322 COOP stations are available for downloading. This has greatly increased the access to these data.



B.5.2 National Geophysical Data Center (NGDC)



The National Geophysical Data Center (NGDC) is the Nation's source of global data and information for marine geology and geophysics, natural hazards, solid-Earth geophysics, solar-terrestrial physics, space weather, and paleoclimatology. NGDC and the University of Colorado cooperate in the operation of the National Snow and Ice Data Center. NGDC provides long-term stewardship for geophysical data, compiles new, well-documented databases, and provides value-added data services to the research community, private industry, academia, and the general public.

Much of the data at NGDC originates from NOAA observation and research programs. Significant amounts of data are also generated by cooperative programs and projects with universities, other government agencies, and international organizations. NGDC provides access to global data for U.S. science through the International Council of Scientific Union's World Data Centers (WDC) and other international data exchange programs.

Prediction and Mitigation of Natural Hazards

As world population grows, the possibility that a significant environmental event will affect some center of human activity substantially increases. Extreme events severely affect population centers and human technology, both on the ground and in space. NGDC can help mitigate these events by providing data to assist in their prediction, and to facilitate planning and education for hazard mitigation.

Society's concerns about Earth's changing environment, and the desire to mitigate the effects of natural hazards have influenced the direction of science requirements at NGDC. For example, data sets derived from tree rings, corals, and ice cores are being provided to scientists to assist in the development of climate models and to develop a long-term baseline (over thousands of years) of past climate. Damage expectations can be modeled using NGDC's historical data from earthquakes, volcanic eruptions, and tsunamis. These models are useful, not only to predict potential damage, but also for educational purposes— for both for the general public and those involved in emergency management.

Significant environmental events are not limited to the surface of Earth—increasingly events taking place in space also affect our activities. Extremes in space weather have caused failure of power grids, radiation hazards to astronauts, disruption of communications,

and satellite anomalies and failures.

NGDC supports the mitigation of natural hazards by providing data and information (e.g., frequency of occurrence, location, and extent of damage) to the civil defense, construction, and insurance communities for educational and preparedness activities. NGDC also provides current information regarding sunspot activity to the communications and space industries, and high-resolution relief models to aircraft concerned with the hazards of navigation (such as terrain avoidance in mountainous regions.)

Data available from NGDC improves scientists' ability to predict hazardous weather conditions, such as the floods and mud slides associated with El Niño. NGDC also provides historic baseline data which is used in climate modeling.

Supporting the User Community

The NGDC user community profile has varied over time. Trends reflect an increase in the number of requests from users outside of the U.S.—from a low of 24 percent of the 1988 total, to the present rate of 47 percent. This trend can be attributed to the use of the Internet, the acceptance of credit cards as a payment option, and the initiation of an on-line store service for ordering data. During 1999, more than 1.6 million users visited the NGDC's Web site to obtain information and data.

NGDC works closely with its user community to ensure that the Center meets users' needs. In addition to interactions with scientists at professional meetings, advisory boards, visiting scientist programs, and contacts by telephone—NGDC routinely requests feedback on service levels and user satisfaction from data users. The Center responds to user comments, suggestions, and issues. Copies of returned feedback forms are circulated to the staff so that user suggestions may be incorporated into future products and services, encouraging staff to be aware of user concerns.

NGDC is optimizing network computing by utilizing a wide array of distributed systems that are interconnected by high-speed ATM (Asynchronous Transfer Mode) and switched Ethernet networks. These switched network technologies allow the Center to better manage computer resources while providing quality of service that exceeds industry standards. NGDC recognizes the importance of its network infrastructure to all aspects of its business—from daily office communications and data analysis to video-conferencing, on-line commerce, and presentation of NOAA's data archives to the national and international communities.

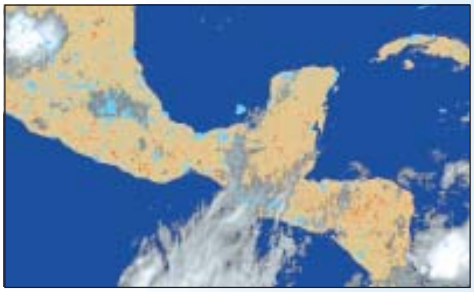
NGDC is working closely with other NOAA groups to implement the Next Generation Internet (NGI). The Boulder Research and Administrative Network (BRAN) serves the City, County, State, and Federal government agencies in Boulder, Colorado, and as such is a local extension to NGI researchers. NGDC is using the BRAN metropolitan fiber optic network to support networking research and demonstrate new networking technologies.

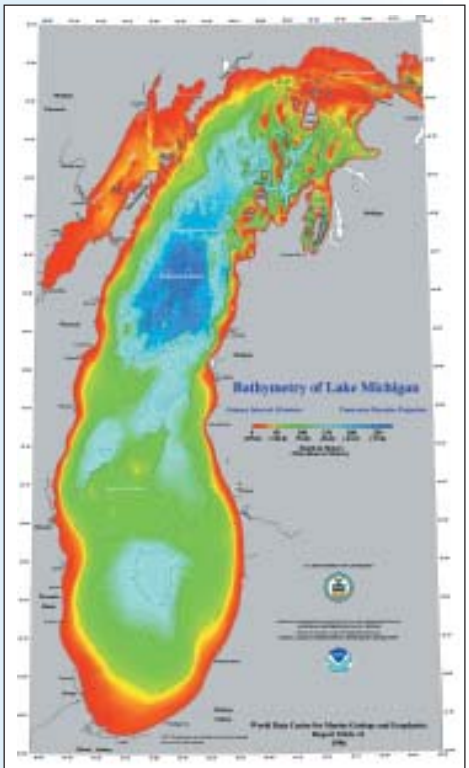
Recent Highlights

Major activities at NGDC have included the following:

- NGDC assisted in the monitoring of wildfires using imagery from the GOES, POES, and DMSP programs, which see wildfires as sources of heat and/or light. Wildfires have been especially destructive in the western United States, tropical areas of Southeast Asia, and South America due to the lack of rainfall.
- In cooperation with numerous agencies, NGDC has developed a greatly improved global 1 km digital elevation model (DEM). This DEM is being used by the aircraft industry in building their terrain avoidance system, and the Hazardous Materials Division of NOAA for use in oil-spill trajectory models.

Fire image from DMSP data, 1998. Red spots indicate fire locations.





Bathymetry of Lake Michigan

- In cooperation with other NOAA components and the government of Canada, NGDC published a CD containing seismic reflection and bathymetric data, as well as digital elevation models for the Great Lakes.
- Several major natural hazards databases—including significant earthquakes, U.S. earthquake intensities, tsunami runup and event information, volcanic eruptions, and hazard photos—are now on-line. Interactive search and retrieval capabilities are available for all of these data sets.
- NGDC's affiliated National Snow and Ice Data Center is monitoring large, floating ice-shelves using images from NOAA's polar orbiting satellites.

B.5.3 National Oceanographic Data Center (NODC)

Oceanographic Data and Information Services

The National Oceanographic Data Center (NODC) manages the world's largest collection of publicly available oceanographic data. NODC holdings include *in situ* and remotely-sensed physical, chemical, and biological oceanographic data from coastal and deep ocean areas. These data were originally collected for a variety operational and research missions by U.S. Federal agencies, including the Department of Defense (primarily the U.S. Navy); by State and local government agencies; by universities and research institutions; and private industry. NODC holdings currently contain in excess of one terabyte of data extending back over one hundred years, and the volume is expected to grow exponentially as new ocean observing systems are deployed.

Through the archive and access services of NODC, these data are being reused to answer questions about climate change, ocean

NOAA Ship Ronald H. Brown*, a state-of-the-art oceanographic and atmospheric research platform, is the largest vessel in the NOAA fleet. The ship was named to honor the late Secretary of Commerce, who was killed in a plane crash in 1996 while on a trade mission to Bosnia.*

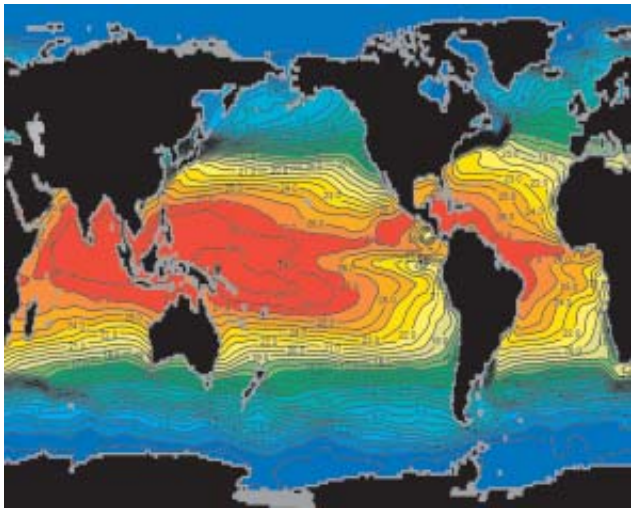
phenomena, management of coastal and marine resources, marine transportation, and natural disasters. Another significant user community is in education where these data and information products help teach each new generation of students about the oceans. Requests for oceanographic data and information have increased each year since the Center was established in 1961 as part of the U.S. Navy. More than 600,000 requests were handled in FY1999.

A significant percentage of the oceanographic data held by NODC is foreign. NODC acquires foreign data through direct bilateral exchanges with other countries, and through the facilities of the World Data Center (WDC) for Oceanography, which is collocated with and operated by NODC.

NODC forms partnerships at international, national, regional, and local levels to help ensure that new ocean data will be available for future uses. Recent examples of such partnerships include NODC data management services provided to major ocean science projects of the past decade—such as Tropical Ocean-Global Atmosphere (TOGA), World Ocean Circulation Experiment (WOCE), Global Temperature Salinity Profile Program, and Joint Global Ocean Flux Study.

Gathering recent data is only a part of NOAA's observational task. Under NODC leadership, the Global Data Archeology and Rescue (GODAR) project has grown into a major international program sponsored by the Inter-governmental Oceanographic Commission. GODAR is a comprehensive effort to locate, rescue, quality control, and disseminate historical global ocean profile data for use by the climate and global change research community.

NODC also produces special products and analyses from its holdings. Perhaps the best known examples are the World Ocean Database and World Ocean Atlas. These products, available on-line or as CDs, provide a consistently formatted resource of ocean profile data with objective quality control applied.



The World Ocean Database allows scientists to create ocean analyses at any depth based on observations dating back to the 1940s. These historical data are essential to understanding processes such as climate change.

Recent Highlights

NODC's Ocean Climate Laboratory announced that the world ocean has warmed significantly over the past 40 years based on analysis of *in situ* observations. The findings were published in the March 24, 2000 issue of *Science*. Media interest was extremely high, and

articles appeared in newspapers throughout the country including the *New York Times*, *Washington Post*, and *San Francisco Chronicle*. *CBS News*, *CNN World News*, *National Public Radio,* and a number of local radio stations also carried the announcement.

NODC continues to improve on-line access services. The Interactive Data Access and Retrieval System (IDARS) development continued toward the goal of providing a common graphical user interface-based tool to data access and browsing. The most recent real-time beach water temperatures and 24-hour temperature plots from beaches around all U.S. coasts are now on-line. IDARS users can now composite satellite sea surface temperature images while on-line in intervals from one day to months.

Providing on-line access to the public comes with increased security risks. NODC Information Technology staff have implemented improved 'firewall' systems based on non-proprietary hardware and software that handle greater volumes of traffic at less cost with reduced risk. This work has become a model for other NOAA installations.

Recent Products and Programs

World Ocean Atlas 1998
This atlas enables users to learn about the ocean's properties, including temperature, salinity, dissolved oxygen, derived oxygen variables, nutrients (phosphate, nitrate, silicate) and chlorophyll along with fields of various statistics. The atlas, a three CD set, is based on data in NODC's World Ocean Database 1998.

Harmful Algal Bloom Data Management System
This project aims to provide coastal physical, chemical, and biological data for decision makers and model developers. During FY1999, a data base design was chosen, and work began on obtaining significant data sets. This development is being guided by industry and research community representatives.

Barents Sea Atlas 1998
The time and space distribution of nearly 75,000 ocean stations (temperature, salinity, and oxygen) occupied in the Barents Sea during 1898–1993 is presented in this CD atlas. Data are recorded in a form designed for use in electronic spreadsheets and/or databases. Monthly maps defining the station distributions are given for every year. Monthly mean fields of temperature and salinity distribution are plotted using objective analysis techniques. This atlas was issued jointly by the Murmansk Marine Biological Institute (Russia) and NODC.

Coral Reef Information Management System
NODC established important links with NOAA and other groups studying coral reefs, including the U.S. Coral Reef Task Force. A Coral Reef Data Management and Monitoring Initiative was included in the FY2001 NOAA Strategic Plan. An NODC Web site for coral reef, sea grass, and mangrove forests is under development, and lists of coral reef locations and coral reef related species are being compiled.

Coral reef at Florida Keys National Marine Sanctuary. This Marine Sanctuary also has abundant mangrove forests and sea grass beds.

NOAA Marine Environmental Buoy Data
This CD contains meteorological and oceanographic data collected from moored buoys and shore stations operated by NOAA's National Data Buoy Center (NDBC). The set includes 16.5 gigabytes of coastal buoy data through December 1997. This is viewable using a Web browser. Links on the discs provide direct access to real-time data, and time series plots available on the NODC Web site.

Time Series Database
The Coastal Ocean Time Series Data Base prototype includes all of the current meter mooring data at NODC (over 10,000 stations). It is available through NODC's Web site. The Web-based interface permits graphical selection of region and time period of interest, and various graphical displays of the data. It features time-series data analysis and display techniques to aid users in deciding which data they need to download.

B.5.4 NOAA Library

The NOAA Library and Information Services Division is administered as part of NODC. The Central Library is located at NOAA's main campus in Silver Spring, Maryland, with regional libraries in Seattle and Miami. The division coordinates a network of 28 other NOAA field libraries by managing a NOAA-wide on-line library catalog, journal subscriptions, and on-line databases.

The NOAA Central Library is the oldest and largest oceanic and atmospheric library in the Western hemisphere. The collection consists of more than 1.5 million volumes and spans five centuries. The library houses a unique Special Collection of historical publications on meteorology, oceanography, fisheries, and geodesy from 1485 to present-day limited editions. Approximately one third of the 3725 volumes from the Special Collection have been preserved, and are in usable condition.

Upon the creation of NOAA in 1970, the original publications of the U.S. Weather Bureau, the Coast and Geodetic Survey, and the U.S.

Coast and Geodetic Survey steamer Blake*, in service 1874–1905. The* Blake *conducted classic Gulf Stream studies under J.E. Pillsbury. There were many innovations on this ship, including steel cable for deep-sea dredging. This old photograph is one of many historic images from the NOAA Library's on-line Photo Library.*

Bureau of Fisheries were transferred. Approximately 135,000 of these disparate documents remain to be merged and cataloged with full on-line bibliographic access.

NOAA's photo collection of 18,000 images were added to the library in October 1995. An additional 15,000 have been digitized and can be viewed through the library's Web site. The availability of NOAA images has generated another 15 million accesses to the library's on-line usage statistics. Photos from the Library have been published in newspapers and magazines around the world.

Digitization of 19th Century meteorological data from Third World and developing countries has been completed for 500,000 pages of information. These records are being linked to the on-line records for desktop retrieval, and will augment the full text of 686 NOAA and related documents already on-line. It is the library's goal to provide on-line access to NOAA publications and data. At present, this goal is less than 10% a reality.

The NOAA Central Library coordinated desktop access to 48 electronic journals for NOAA staff in Silver Spring, Miami, and Seattle. Titles include the *Bulletin of Environmental Contamination and Toxicology, Climate Dynamics, International Journal of Biometeorology, Marine Biology,* and *Proceedings of the National Academy of Sciences.*

The library's role in providing access to scientific information has greatly expanded since the creation of its Web site in 1995. During July 2000, the number of accesses to the NOAA Library Web site exceeded 1 million (a record number). The number of accesses is expected to exceed 10 million during FY2000.

In 1999, the NOAA Central Library received Federal Library of the Year Award. This award is granted by the Federal Library/ Information Center Committee, established by the Library of Congress more than thirty years ago. The Library was recognized for energetic, creative leadership in enhancing Library collections and services; supporting NOAA's multidimensional environmental assessment, prediction, and stewardship mission; fostering a high level of professional competency in the field of information services; and developing innovative, high quality products and customer services.

B.5.5 Office of Satellite Data Processing and Distribution (OSDPD)

The NESDIS Office of Satellite Data Processing and Distribution (OSDPD) manages and directs the operation of the central ground facilities which ingest, process, and distribute environmental satellite data and derived products to domestic and foreign users. OSDPD serves as the primary operating level interface with civil sector users of data from operational environmental satellites. OSDPD provides interpretive and consultative services to those users and is responsible for the transmission of data products to remote receiving stations. OSDPD provides for the collection of environmental data from remote platforms using NOAA satellites.

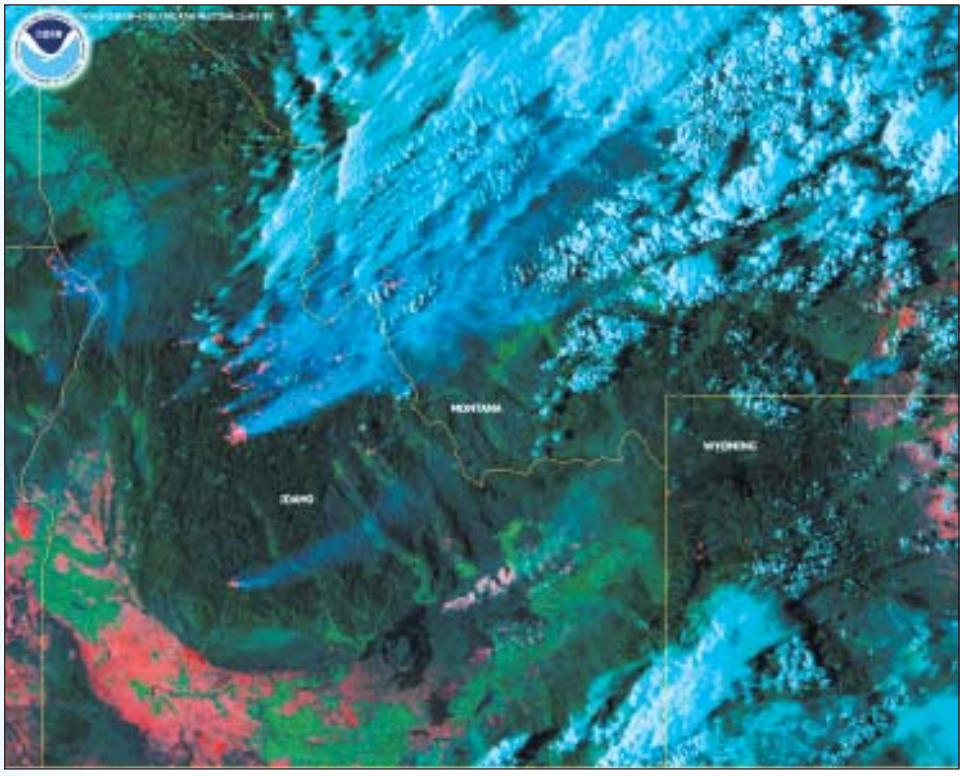
Each day, OSDPD's Information Processing Division (IPD) ingests and manages approximately 23.9 gigabytes (GB) of Geostationary Operational Environmental Satellite (GOES) data, 6.42 GB of Polar-Orbiting Operational Environmental Satellite (POES) data, 0.77 GB of Defense Meteorological Satellite Program (DMSP) data, 3 GB of METOSAT data, 1.33 GB of RADARSAT data, and 500 megabytes of INDOEX data. OSDPD supports a wide range of customers including domestic, foreign, military, Federal and State government agencies, academia, and industry. OSDPD provides data and products to support many domestic and foreign programs such as CoastWatch, the National Ice Center, the Committee on Earth Observation Satellites Disaster Management Support Group, and the Hazards Support System.

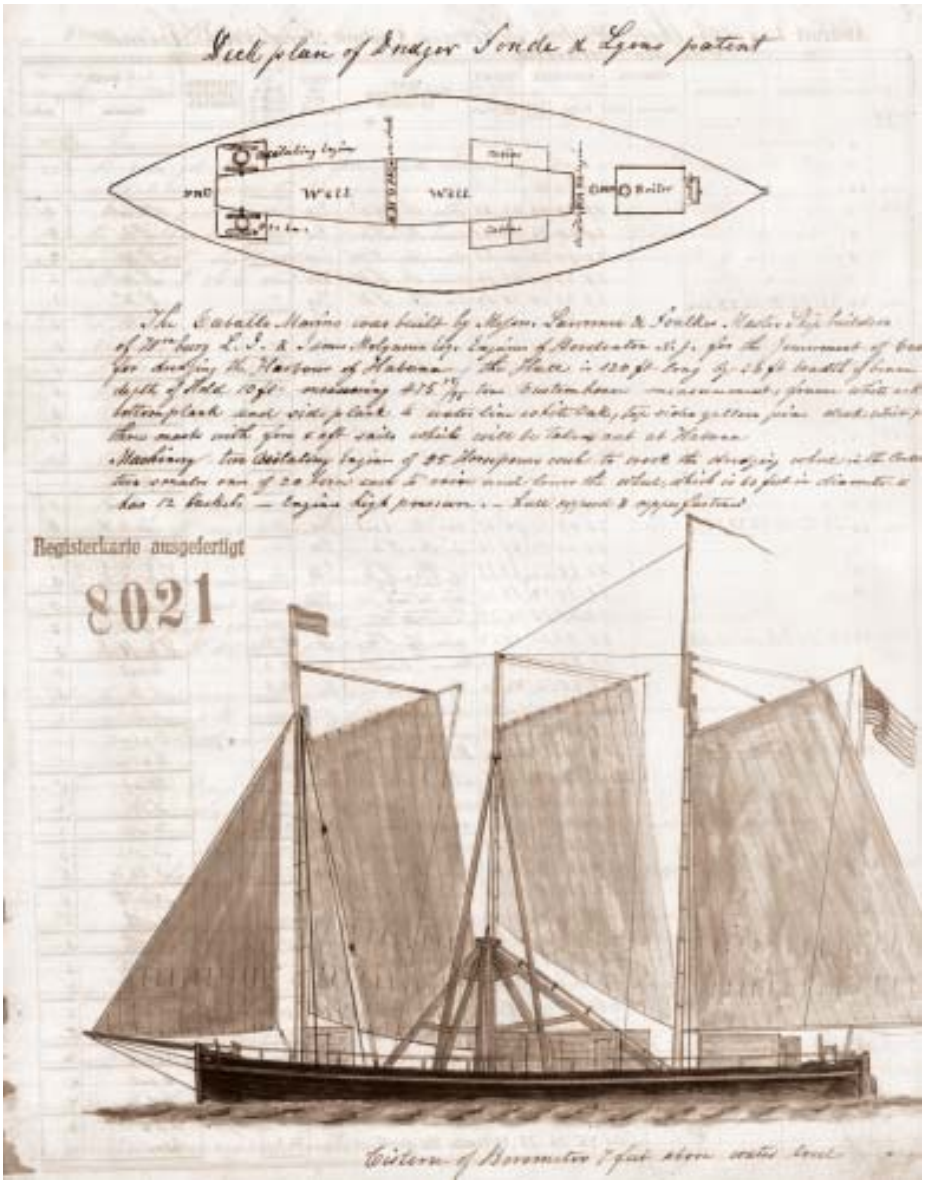
IPD operates and maintains the NOAA Satellite Active Archive (SAA) which provides an on-line facility for the distribution of NOAA and U.S. Department of Defense (DoD) POES data and derived data products. The SAA, established as a demonstration prototype for electronic distribution of POES data in 1994, became operational in July 1995. During that first month, 379 Advanced Very High Resolution Radiometer Level 1b data sets were distributed to 27 customers via the emerging Internet.

In five years since that first operational distribution, average monthly volume has increased to over 40,000 data sets and the SAA customer base stands at more than 8,400 registered customers. The active archive has been expanded during that period to include Television Infrared Observational Satellite Operational Vertical Sounder data, DMSP data, Radarsat Synthetic Aperture Radar imagery, operational (near-term) satellite-derived products, and climatic (time series) satellite-derived products.

The SAA now provides on-line access to more than 83 percent of the available NOAA POES and DMSP data from 1978 to present. In addition, SAA distributes of prototype satellite derived products, such as NOAA's GOES Sea Surface Temperature. In 1999, SAA electronically distributed over 5 terabytes of polar-orbiting satellite data and derived data products to its customers.

Heat signature (red) and smoke (blue-gray) from fires in Idaho, Montana, Wyoming, and Oregon during August, 2000. Large, duller reddish areas are due to solar heating of the ground. Image created with thermal data from NOAA's Polar Orbiting Environmental Satellite NOAA-12.





Page from the 1859 abstract log of the Caballo Marino. *NOAA is digitally capturing paper documents and scientific records, such as these, before their ultimate deterioration.*

Morally & Spiritually I have read with wonder & look up to him who holds the winds in his fists & the sea in the hollow of his hand.

November, 1860. Correspondence from Andrew Mearns, Captain of the British ship *Peerless*, to Matthew Fontaine Maury, explorer and oceanographer.