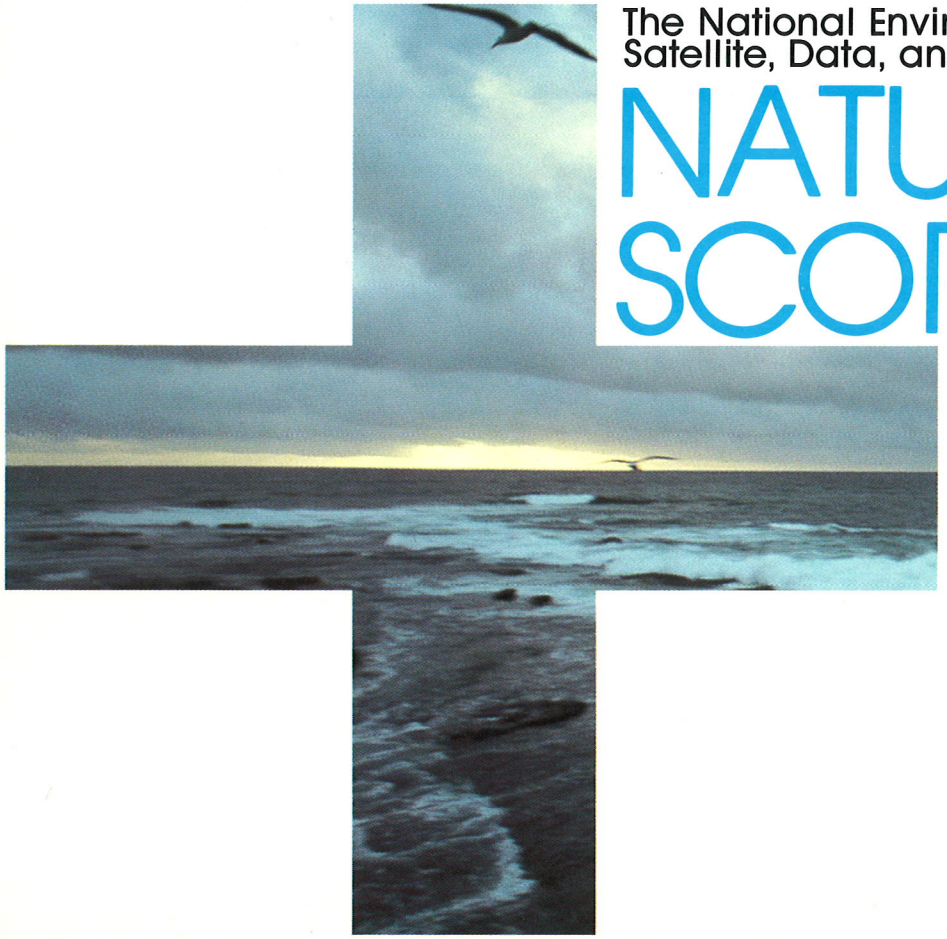
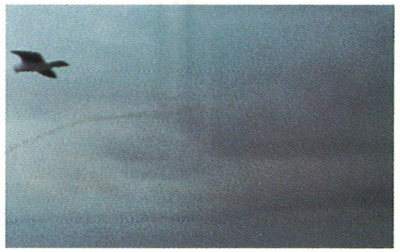
U.S. DEPARTMENT OF COMMERCE
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data,
and Information Service

The National Environmental
Satellite, Data, and Information Service

NATURE'S SCOREKEEPERS





National Environmental Satellite, Data, and Information Service

ASSESSMENT AND INFORMATION SERVICES CENTER (AISC)
Page Building 2, Room 288
3300 Whitehaven Street, N.W.
Washington, D.C. 20235
202/634-7251

NATIONAL CLIMATIC DATA CENTER (NCDC)
Federal Building
Asheville, N.C. 28801
704/259-0682

NATIONAL GEOPHYSICAL DATA CENTER (NGDC)
Mail—325 Broadway
Boulder, Colorado 80303
location—3100 Marine Street
303/497-6215

NATIONAL OCEANOGRAPHIC DATA CENTER (NODC)
Page Building 1, Room 428
2001 Wisconsin Avenue, N.W.
Washington, D.C. 20235
202/634-7500

Leon LaPorte

NOAA

NOAA

Nature provides the world with crisp blue skied days, intricate snow flakes, colorful displays of rainbows and northern lights, and aqua blue lagoons. Occasionally, though, too much sunshine, rain, or snow results in droughts, floods, or immobilization which have a great impact on the economy and the world. How much did the drought cost, how much rain fell, how deep is the ocean—are typical questions that the National Oceanic and Atmospheric Administration (NOAA) receives. The National Environmental Satellite, Data, & Information Service (NESDIS), through its four centers keeps the scorecard of nature's ever changing ways by collecting, compiling, and archiving environmental data and information from around the world. Through this vast resource of environmental data, NESDIS provides answers to questions such as these:

QUESTIONS WE ASK

1. What solar event put more nuclear radiation into the atmosphere at jet flight levels than the Three Mile Island nuclear reactor breakdown?
2. Chicago is known as the "Windy City"; is it the windiest city in the contiguous United States?
3. Where is the deepest part of the world's ocean?
4. How expensive was the severe winter weather of 1982 to the U.S.?
5. Where did the greatest measured one-minute rainfall occur? How much rain fell?
6. What is the fastest swimming fish?
7. When and where was the most equatorward sighting of aurora (northern or southern lights) ever reported?
8. On fair, sunny days, I feel good. Does the weather really have any influence on my health?
9. If all the Earth's current land ice melted, what effect would the melting have on sea level?
10. What serious contagious disease is possibly correlated to sunspot activity? Where is it found?

11. What is the largest temperature fall recorded in a 24 hour period?

12. Why is the sky blue?

13. In what ocean was the highest wave observed? How high was it?

14. How much of the Earth's fresh water is stored as ice?

15. What is the world's highest temperature? Lowest temperature?

16. What precious metals are found in the ocean?

17. Have there been any other volcanic eruptions in the United States other than Mount St. Helens in 1980, during the past few hundred years?

18. What effect did the pumping of brine (salt water) from the salt caverns of the National Petroleum Reserve have on fish in the Gulf of Mexico?

19. Does the compass always point in the same direction at a particular point?

20. The news director of a station in Medford, Oregon called the Director of the Solar-Terrestrial Physics Division to tape an interview. What was she hoping to help her listeners do on the night of April 26, 1984?

KEEPING SCORE — THE BENEFITS

A wealth of environmental data and information resides within the four centers of NESDIS: AISC, NCDC, NGDC, NODC. These data have been used by a wide variety of clientele concerned with such diverse problems as controlling mosquitos, settling insurance claims, designing structures or ports, forecasting avalanches, growing shrimp, solving radio communications noise difficulties, and documenting the weather for a number of historical events. Examination of environmental normals and extremes provide valuable information to America's industries, and frequently save thousands of dollars that would be expended in design, manufacture or customer costs. Listed below are just a few examples of the use of our data.

Underwater Cable—A communications cable company obtained bottom temperature data for the Gulf of Mexico from NODC to use in deciding on the type of insulation they would need for cable they were laying. If the bottom temperatures were greater than a certain value, they could use less insulation and save up to $500,000.

Nose Gear Steering Problem—NCDC provided an explanation of methods used to calculate crosswind frequencies at various threshold speeds. These methods, along with wind summaries for several airports, will help an aircraft manufacturer establish the maximum allowable failure rate of the nose gear steering system. The steering system is crucial when aircraft land under extreme crosswind situations.

Summer Fashions Photographed—Average climate data for selected worldwide locations were provided by NCDC to a business engaged in fashion photography to use to determine the best locations for photographing women's summer fashions during April and May.

NOAA

Whale Population and Tsunamis—A researcher in Seattle requested a search of the NGDC Pacific Tsunami File for events near Alaska. He is correlating whale population fluctuations with Tsunami occurrences.

Utility Assistance Program—A staff member of the Department of Housing and Urban Development was assisted by the NOAA/AISC Seattle library in locating heating degree data for Washington state. This information was used for adjustment of the subsidy calculations for low-income individuals in public housing programs.

NOAA

Art and Climate—Ten sets of climate publications on South Carolina weather were provided the South Carolina Arts Commission's Film Office to aid in convincing a TV network to choose Chester, SC, for a TV mini-series entitled "Chiefs". This could mean a $3 million boost to the local economy.

Hawaii OTEC Planning—NODC provided a Tucson, Arizona company with water temperature, salinity, and surface current data summaries for an Ocean Thermal Energy Conversion (OTEC) test site off Hawaii.

River Algae Problems—The Virginia Water Control Board was provided data by the AISC regarding the Washington, D.C. area rainfall anomalies in 1983. A wet spring and dry summer that year may have contributed to the algae problems of the Potomac River.

Climate and Bicycling—Nationwide climate statistics were provided by NCDC to the League of American Wheelmen for use in a bicyclers' almanac under preparation. The almanac will have separate state sections with data on cycling paths, laws, climate, etc.

Pre-coolers for Air Conditioners—NCDC provided climate data required to project air conditioning cost reductions possible through use of a pre-cooler. The pre-cooler uses a sealed evaporative cooling system that adds no moisture to the air. Substantial savings can be shown, especially in areas where utilities use peak load pricing.

Oil Operations Support—A large oil company was provided sea temperature data for a large area off the U.S. west coast. Their oil production platforms are served by five specialized tankers that keep this very heavy crude oil warmed with steam heating coils during transport. The NODC data were used to determine the average sea temperature that the cargo would be exposed to and how far the oil could be transported in case a back up tanker without heating coils needed to be used. The oil must be at least 80°F for pumping.

Popping Lids in the Chemical Business—NCDC provided relative humidity, precipitation, and temperature data to a manufacturer of isocyanate resins. This chemical is used on aircraft and steel structures as a protective coating. Any exposure to moisture during manufacture produces a delayed

chemical reaction that results in container lids popping off. The lids have been popping and the company wants to know where the moisture is coming from.

Tire Chain Testing—A company that tests tire chains consulted the NGDC for information on the difference between natural lake ice and artificial rink ice for planning and evaluating test results.

Protecting the Vineyards—Information concerning cloud seeding was provided to an organization in Florida that is helping a French winemaker who wants to protect his vineyards from recurring crop damage due to unpredictable weather patterns. AISC provided the group with several reports on cloud seeding experiments.

Frigid Tests—Nationwide average low temperature data was provided to a major truck manufacturer to use for site selection for the testing of truck engine performance in below zero temperatures.

Paleontological Research—The National Museum of Natural History, Smithsonian Institution, Washington, D.C. was provided NODC oceanographic station data containing near bottom oxygen concentrations at 15 locations in the Atlantic ocean to support a paleontological research project.

Power Plant Site Study—A Waltham, Mass, company obtained Lake Erie aerial photos for a power plant siting study from the NGDC archive.

Assistance to Haiti—A representative of the U.S. AID Mission in Haiti requested assistance for the Haitian government in improving early warning and drought preparedness. AISC prepared a special climate impact assessment on potential food shortages in Haiti caused by the persistent 1982/83 drought.

Frances Holt

Radio Communications Noise—An engineering company in the Washington, D.C. area called about problems in its radio communications with field personnel locally as well as over continental and transcontinental links. NGDC analyzed their problems as due to the use of a communications satellite that was affected by local high-latitude geomagnetic activity.

Road Signs in Flight—Wind data from NCDC was provided to an insurance investigator for evidence in a claim being processed concerning a four-foot square traffic sign that blew

off a truck and into a bystander, injuring his neck. It is alleged that gusty winds were responsible.

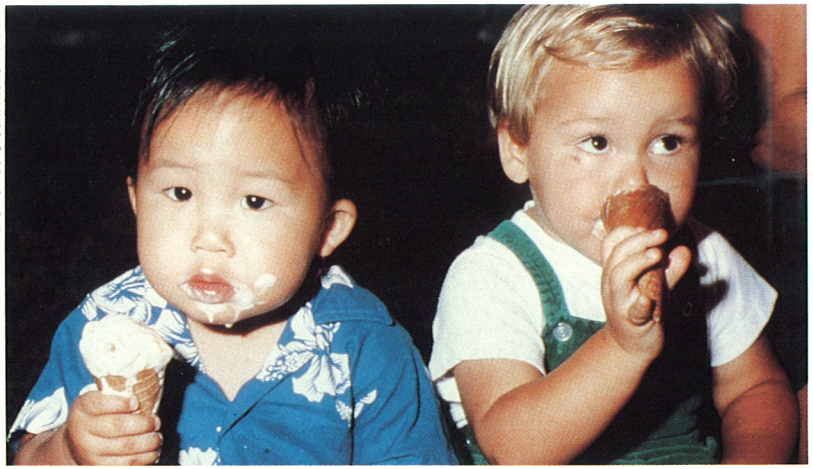
PEPCO – Les Henig

Salty Fog Sought to Test Power Line Repair Process—Two years of daily fog records for a west coast city were provided to a manufacturer of a heat shrinking device used to repair outdoor power lines. In coastal regions where salty fog is found, ionization causes arcing and scintillation, leading to failure of the heat shrink coating and eventual erosion of the polymer surface. NCDC data will be used to locate a test site on the California coast.

Mosquitos and Climate—NCDC provided daily temperature and rainfall statistics for the last four years to a Mosquito Abatement District in a California city for use in studies of their pest problem.

Tanker Draft—A New York law firm requested certification of water density data for Tampico Bay, Mexico. The information provided by NODC is for a legal case involving the grounding of a tanker.

Weather and Ice Cream Sales—During February 1983, a major U.S. ice cream store had a promotion campaign in Texas, but sales were disappointing. NCDC provided the company with February 1982 and February 1983 weather data for seven Texas cities for study of the problem.



International Association of Ice Cream Manufacturers

Could information like this be of benefit to you? The following pages describe the data, information and services available.

A NATIONAL DATA RESOURCE

Environmental Data provide a view of the physical world
as it was
as it is
as it will be

Described by the second, the minute, a day, or the year, the view is a composite of individual observations or data.

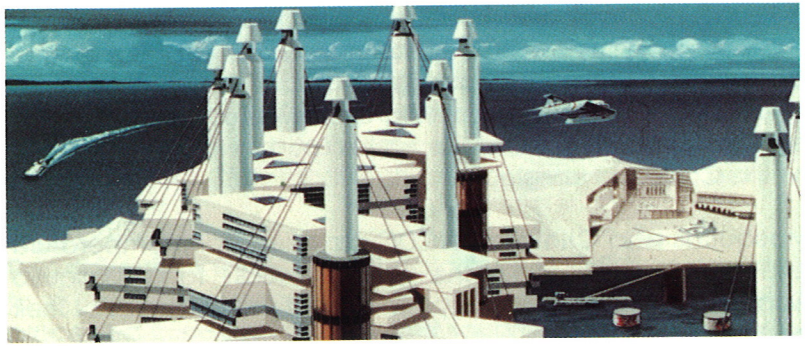
Frances Holt

Frances Holt

The National Oceanic & Atmospheric Administration is the Nation's civil sea-air agency, providing daily weather forecasts and storm warnings, guarding the quality and quantity of marine fish, making the nautical and aeronautical charts that guide ships and planes, and so on. It generates an enormous amount of information that has many residual uses.

NOAA gathers worldwide environmental observational data about the oceans, earth, air, space, and sun and their interactions to describe and predict the state of the physical environment. Other agencies at home and abroad collect similar or related data for their particular needs.

NOAA



After it has served its purpose for NOAA or some other collecting agency, environmental information is passed along to four service centers maintained by NOAA as part of the National Environmental Satellite, Data, and Information Service. The centers are the Assessment and Information Services Center (AISC) and the National Oceanographic Data Center (NODC) in Washington, D.C., the National Climatic Data Center (NCDC) in Asheville, N.C., and the National Geophysical Data Center (NGDC) in Boulder, Colorado. Here, the collected data are analyzed, checked for quality, reformatted, and distributed to users.

Collectively, the NESDIS Data and Information Centers maintain a national environmental data base, that defines and documents the physical environment and its processes. The data base is shared with the military for their use in national defense applications. Beyond that, the data centers develop and carry out national programs required by legislation. Examples include the Principal Thrust of Generation and Dissemination of Climate Information in the National Climate Program, and information dissemination and provision of a National Marine Pollution Information System under the National Ocean Pollution Planning Act of 1978. Additionally, NESDIS operates six World Data Centers that allow users access to international environmental data and information.

A brief description of each of these centers follows:

U.S. Department of Agriculture

NOAA

FINDING THE SCORE—WHERE TO START?

NEDRES-NOAA'S National Environmental Data Referral Service (NEDRES) provides a convenient and economical access to environmental data. It is a publicly available computerized catalog and index that identifies the existence, location, characteristics, and availability of environmental data. It is a national network of Federal, State, and private organizations cooperating to improve access to environmental data for anyone who needs it. This is one of the services of the:

Assessment and Information Services Center (AISC)

The products and services of AISC's staff of environmental scientists, economists, librarians, information specialists, and computer specialists provide analyzed environmental data packages and decision assistance to the nation's resource managers. A major aim of AISC is to assist in improving the nation's economic health by promoting understanding of the effects of weather and marine conditions on the the economy. AISC provides assessments of impacts of environmental variations on food production, energy demand, transportation and communications, recreation and services, water management, health and welfare, commerce, and construction.

Climatic Assessments

Crop Assessment Services

- Weekly early warning reports to U.S. Agency for International Development (AID) planners regarding weather induced problems in developing countries
- Training of personnel in the use of environmental data for crop & area specific yield models
- Weekly weather related impact assessment reports for the major non-U.S. grain producers.

Heating Information

- Monthly and seasonal temperature-based projections of natural gas demands for multistate regions of the country. This information is also summarized in the following publications:
  - Climatic Impact Assessment—United States—monthly and annually
  - Climatic Impact Assessment—Foreign Countries—monthly and annually
  - Special Reports—Economic Analysis of the Drought of — as needed
    —Economic Analysis of the Severe Winter of — as needed

Marine Environmental Assessments

Planning design construction and operations in the wetlands, nearshore and offshore areas requires consideration of planned activities in light of long-term climatology, the fisheries industry and wildlife habitat of the region. Using data synthesis techniques, AISC develops techniques to translate separate marine environmental data bases and studies into consistent information for policy makers. This work is summarized in technical reports and in the following publications:

Marine Environmental Assessments—Chesapeake Bay—monthly & annually
—Gulf of Mexico—monthly & annually

Library and Information Services

AISC coordinates NOAA's library and information services program, as well as NOAA's participation in the national and international network of scientific information centers and libraries. NOAA's information resources deal with atmospheric, earth, and oceanic sciences, as well as related interdisciplinary areas such as energy, pollution, and natural resources management. Both an in-house minicomputer and external computer systems are used to access source materials and information from over 200 bibliographic data bases.

Library and Information Services Locations:

Main Library and Division Office,
WSC-4 Building, 6009 Executive Boulevard,
Rockville, MD 20852
Telephone 301/443-8330

Georgetown Center
Page Building 2,
3300 Whitehaven Street, N.W., Room 193
Washington, D.C. 20235
Telephone 202/634-7346

Camp Springs Center
World Weather Building,
5200 Auth Road, Room 605A
Camp Springs, MD 20233
Telephone 301/763-8266

Miami Center
4301 Rickenbacker Causeway
Miami, FL 33149
Telephone FTS-350-1428 or
305/361-4372

Seattle Center
7600 Sand Point Way, N.E.
Bin C-15700, NOAA Research One,
Seattle, WA 98115
Telephone FTS-446-6241 or
206/527-6215

The extensive collections, over 500,000 volumes, cover a wide spectrum of topics, including aquaculture, cartography, climatology, geodesy, hydrology, marine ecology, marine fisheries, marine geology, marine geophysics, meteorology, ocean engineering , ocean policy, and oceanography. The libraries are all available for on-site use during normal business hours, and interlibrary loans may be arranged. All locations provide computerized information searches on a fee basis.

Aquatic Sciences and Fisheries Information System (ASFIS)—AISC is the contact point for ASFIS, an international cooperative information service involving twelve countries and three United Nations agencies that maintains a computer-searchable bibliographic data base in this discipline.

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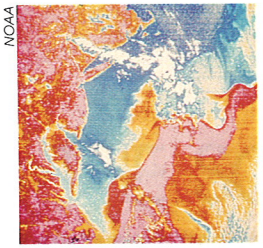

NOAA

NOAA

National Climatic Data Center (NCDC)

The NCDC is the collection center and custodian of all the weather records of the United States including those obtained by NOAA's National Weather Service, the U.S. Air Force and Navy, the Federal Aviation Administration, the Coast Guard and cooperative observers on land, sea and in the air. Additionally, cloud photography, sea surface temperatures, and other data, obtained from environmental satellites are available from this center. NCDC also administers the World Data Center A for Meteorology which provides for international data exchange. It is the largest climatic data center in the world.

Listed below is a sampling of this center's data holdings:

Carbon Dioxide
Ceiling, Sky condition, Sky cover
Cooling Degree Days
Dew Point
Drought
Evaporation
Freeze Data
Heating Degree Days
Hurricanes & Tropical Storms
Lightning
Ocean Waves
Precipitation
Pressure
Radar Observations
Relative Humidity
Satellite Data
Sea Surface Temperature
Snowfall
Soil Temperature
Solar Radiation
Stability
Sunshine
Temperature, surface/upper air
Tornado Data
Turbidity
Vapor Pressure
Visibility
Wind

Special Publications (selected)

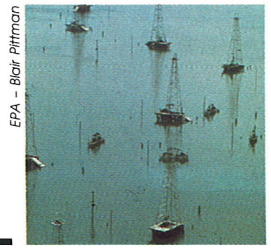
Climatology of the United States, by city, by state
Daily and Monthly Normals
Climates of the World
Tropical Cyclones of the North Atlantic Ocean 1871-1980
Historical Climatology Series
Global Atmospheric Background Monitoring for selected Environmental Parameters
Climatic Atlas of the United States

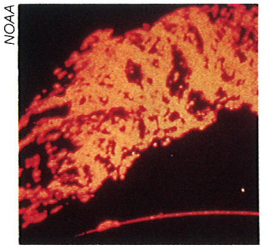
Selected Subscriptions

Local Climatological Data (by city)
Storm Data
Climatological Data (by state)
Hourly Precipitation Data (by state)
Monthly Climatic Data for the World

NCDC Services

- Certification of records and publications for litigation
- Evaluation of various data records for specific analytical requirements (e.g., return periods for heavy rains, historical computation of hours of sunshine, site specific wind, visibility analysis, etc.
- Provision of general atmospheric sciences information
- Probabilities of weather events, snow, rain, tornadoes, hurricanes, etc. based on historical records


EPA – Blair Pittman


NOAA

Alyeska Pipeline

National Geophysical Data Center (NGDC)

The National Geophysical Data Center (NGDC) in Boulder, Colorado, combines in a single center all data activities in the fields of solid earth geophysics, marine geology and geophysics, solar-terrestrial physics, and contracts with the University of Colorado to handle data services for the National Snow and Ice Data Center. Some of these data come from the observation programs of other NOAA activities, but much more result from cooperative arrangements with universities, other government agencies, and foreign organizations. NGDC is principally a national data center, but it also provides data services to the international user community through its four collocated World Data Centers, namely: World Data Center A for Solid Earth Geophysics; World Data Center A for Marine Geology and Geophysics; World Data Center A for Solar-Terrestrial Physics, and World Data Center A for Glaciology (Snow and Ice). Working visits to NGDC by United States and foreign scientists are encouraged.

Data Center Holdings include:

Solid Earth (Land) Geophysics

- Accelerograms
- Aeromagnetic data
- Common depth point seismic-reflection data
- Earthquake epicenter data
- Geochemistry data
- Geophysical/geological data from National Petroleum Reserve-Alaska
- Geothermal well data
- Gravity data
- Heat flow data
- Magnetic secular change data
- Magnetic survey data
- Maps, seismic and geothermal
- Photographs of damage from earthquakes, tsunamis, and volcanoes
- Seismic-reflection data
- Seismograms
- Topographic data
- Tsunami marigrams
- Volcano data

Marine Geology and Geophysics

- Bathymetric data
- Computer graphics and maps
- Core-sample descriptions
- Geochemical data
- Geomagnetic data
- Geotechnical and grain-size data
- Gravimetric data
- Hazards to navigation
- Hydrographic data
- IDOE and OCSEAP program data
- Outer continental shelf lease-sale geophysical data
- Sediment/rock sample descriptions
- Paleontology and age dates data
- Seismic profiles
- Well-log data

Solar-Terrestrial Physics

- Analysis of multi-discipline STP events
- Airglow data
- Auroral data
- Cosmic ray data
- Geomagnetic variation data
- International Magnetospheric Study information
- Ionospheric data
- Middle Atmosphere Program data
- Satellite data (solar X-rays, energetic particles, magnetic fields)
- Spacecraft anomalies
- Solar activity data (sunspot number, flares)
- Solar Maximum Year information

Glaciology (Snow and Ice)

Freshwater and Sea Ice Data (Great Lakes and Multinational)
Snow Cover Data (western U.S.)
Digital Sea Ice Distribution Data
Arctic Ocean Drifting Buoy Data
Glacier Photographs
Microwave Satellite Sea Ice Data
DMSP Satellite imagery (global coverage)
Historical Sea Ice Records

Publications Series

Data Announcement Fliers
Geothermal Energy Resources (individual Western States)
Glaciological Data Reports
Key to Geophysical Records documentation (solid earth, marine)
Marine Geology and Geophysics Reports
Solar-Geophysical Data (monthly)
Solid Earth Geophysics Reports
Technical Memoranda
UAG Reports (solar-terrestrial physics)
International Geophysical Calendar
Solar Indices Bulletin

National Oceanographic Data Center (NODC)

The world's largest collection of oceanographic data is held by NODC. The computerized data bases of this center contain data on the physical and chemical properties and marine life of the coastal zones and the deep ocean. Data from international experiments such as the International Decade of Ocean Exploration (IDOE) and domestic studies such as the Marine Ecosystems Analysis (MESA) program and the Alaskan Outer Continental Shelf Environmental Assessment Program (OCSEAP) are available from NODC. Additionally NODC administers the World Data Center A for Oceanography that provides for international data exchange. Available data include:

Physical Data

Temperature profiles (from oceanographic stations and bathythermograph observations)
Surface current observations
Current meter data
Coastal wave data, including wave spectra
Seawater pressure gauge data

Chemical Data

Salinity
Nutrients, including phosphate, nitrate, silicate, and dissolved oxygen
Marine toxic substances and pollutants such as hydrocarbons, heavy metals, and organochloride pesticides
Chlorophyll

Biological Data

Fish/shellfish surveys
Intertidal organisms & habitats
Phytoplankton and zooplankton

Primary productivity
Benthic organisms
Marine birds and mammals

Tailored Data Products & Services include data inventories; retrieval and output of selected data; data summaries, analyses, and graphic displays (e.g., temperature-depth summary, surface current data summary, mixed layer and thermocline analysis)

Information Products and Services

- NODC Taxonomic Code
- National Marine Pollution Information System (NMPIS) searches and reports
- Ocean Pollution Data and Information Network (OPDIN) referral services
- Marine Data Formats and Codes
- CAS Pollutant Codes List and Synonyms List

Publications

- NODC Annual Report
- NODC Environmental Information Bulletins
- Technical reports, for example, *An Environmental Guide to Ocean Thermal Energy Conversion (OTEC) Operations in the Gulf of Mexico*
- Special data inventories and atlases, for example *Oceanographic Data fo Development of the U.S. Exclusive Economic Zone*
- Coastal marine recreation brochures (jointly with the NOAA Sea Grant Program)
- General marine science publications, for example, *Annotated Acronyms and Abbreviations of Marine Science Related Activities*
- World Data Center A for Oceanography annual report on *Oceanographic Data Exchange,* Change Notices to the *Catalogue of Data,* and Supplements to the Catalogue of *Accessioned Publications*

Regional Liaison Offices—Five NODC liaison offices are available to assist the public in locating and acquiring any of the environmental data described in this booklet. The locations are:

Northeast
McLean Laboratory, WHOI
Woods Hole, MA 02543
617/548-1400 ext. 2497

Southeast
AOML Bldg.
4301 Rickenbacker
Causeway
Miami, FL 33149
305/361-4305

Southwest
8604 La Jolla Shores Drive
Room 308B
P.O. Box 271
La Jolla, CA 92038
619/453-2820

Northwest
Bin C-15700/NOAA Bldg. 1
7600 Sand Point Way, N.E.
Seattle, WA 98115-0070
205/526-6263

Alaska
707 A Street, Room 116
Anchorage, AK 99501
907/279-4523 ext. 46

Whatever your business

aerospace
architecture
agriculture
aviation
banking
communications
construction
consulting and analysis
energy resources
fishing
health
information systems
insurance
legislation
litigation
manufacturing
marketing
planning and siting
product testing
research and development
television or movies
tourism

or pleasure . . .

skiing
gardening
travel
soaring
camping
golfing
boating or sailing
photography
sports
amateur radio

. . . we have the data and information you need to make your decisions.

We invite you to explore the
National Environmental Data and Information Centers
of
NOAA

Dedicated to Serving the
Environmental Data and
Information Needs of the
Nation and the World

NOAA / NESDIS
National Environmental Data and Information Centers
AISC—Assessment and Information Services Center
NCDC—National Climatic Data Center
NGDC— National Geophysical Data Center
NODC—National Oceanographic Data Center

ANSWERS

1. Nuclear radiation from the great August 4, 1972, solar flare and its associated high-energy proton emission has been determined to have exceeded the radiation released in the Three Mile Island event. The effects of this flare are described in scientific report UAG-28, available from NGDC in Boulder, Colorado.

2. Although known as the Windy City, Chicago's average annual wind speed is 10.3 mph while Dodge City, Kansas is 14.0 mph. Climatological data for cities throughout the U.S. is compiled by the NCDC and appears in the publication *Comparative Climatic Data for the United States.*

3. Bathymetry experts at the U.S. Naval Oceanographic Office and at Scripps Institution of Oceanography have determined that the greatest proven and reliable depth (10,915 meters or 35,810 feet) is in the Challenger Deep, at the southern end of the Marianas Trench (11°20′ N, 142°11.8′ E). Information regarding the ocean's greatest depth recordings, who obtained them and how, and the ship used, along with a discussion of ocean depth measurement and accuracy are available from NGDC in Boulder, Colorado.

4. The severe winter weather in early 1982 resulted in direct dollar losses of $8.2 billion dollars. Fourteen percent was attributed to increased energy consumption; 16% to loss of food stuffs, 24% from transportation losses, 24% in property damage and 22% in estimated production losses. Assessments of weather impacts on the economy are products of the AISC, in Washington, D.C.

5. The greatest, measured one-minute rainfall occurred at Unionville, Maryland on July 4, 1956; 1.23″ of rain was measured.

6. Sailfish and sword fish have been observed at speeds of 60 miles/hour. Somewhat slower, but still very fast, marlin, bonito and albacore have been clocked at speeds of 40 to 50 miles/hour.

7. On Sept. 25, 1909, the aurora was seen at Singapore, Malaysia, about one degree north of the Equator. Low-latitude aurorae are usually very red in color and a very infrequent event.

8. Yes. Changes in atmospheric pressure, temperature, and humidity affect the body and your sense of well being. AISC, together with the medical profession, is developing a weather warning system that will alert health interests and the public of weather conditions that pose a threat to health and well being.

9. The average sea level would rise by 77 meters (252.6 feet). Depending upon the distribution of this added water, Auburn, ME, Richmond, VA, Florence, SC, Albany, GA, Shreveport, LA, Lufkin, TX and Santa Maria, CA could become the new coastal cities if this should occur.

10. A scientist from the Center for Disease Control, Ft. Collins, Colorado, is examining a possible correlation between sunspot data and St. Louis Encephalitis, a serious contagious disease. This disease is concentrated mostly west of the Mississippi River and follows a roughly 10 to 11 year recurrence pattern similar to the sunspot cycle. Sunspot data dating back to the early 18th century is available from the NGDC in Boulder, Colorado.

11. The largest temperature fall of 100°F in 24 hours occurred in Browning, Montana. Temperature, wind and precipitation extremes are some examples of data available from the NCDC.

12. The color of the sky is a function of the scattering of light by the particulates present in the atmosphere. Answers to environmental questions, simple or complex, can be found through the library holdings and services of the AISC.

13. The USS RAMAPO reported the highest wave observed with any degree of certainty. While proceeding from Manila to San Diego in 1933, she reported a wave approximately 112 feet high which resulted from winds of 60 to 68 knots blowing for a sustained period over a fetch of several thousand miles in the Pacific.

14. Ice holds 75% of the Earth's surface fresh water. Much data, literature, and photographs concerning the world's ice is archived at the National Snow and Ice Data Center in Boulder, Colorado.

15. The world's highest recorded temperature is 58°C or 136°F, observed at El Azizia, Libya. The lowest is −89°C or −129°F, recorded at Vostok, Antarctica.

16. There are trace amounts of gold, silver and other valuable elements which occur naturally dissolved in sea water. Their concentrations are so small, however, that costs to extract them would exceed their value. There is, for example, not enough gold dissolved in a cubic yard of sea water to cover the period at the end of this sentence.

17. Yes. Although the May 1980 eruption of Mount St. Helens was the most explosive in the United States in the last 200 years, over 350 separate eruptions have occurred. The great majority of recent eruptions (226) have occurred in Alaska. Mauna Loa and Kilauea in Hawaii have been in nearly continuous eruption this century. Most of the 48 eruptions occurring in the conterminous United States have been in the Cascade Range of Oregon and Washington. NGDC in Boulder, Colorado, maintains a global data base depicting volcanic eruptive frequencies.

18. Researchers at the Marine Environmental Assessment Division of AISC found that the bubbling disposal site for the brine was particularly attractive to fish. Schools of fish apparently congregated near the site because of the increased oxygen content resulting from the bubbling disposal method.

19. No. The needle of a magnetic compass points in the direction of the horizontal component of the magnetic field at the compass location. This field varies with time; therefore, the direction to which the compass needle points also varies, from fractions of a degree daily to several degrees in decades. NGDC, Boulder, Colorado, maintains a historical magnetic declination data base, which allows retracing of past survey lines. NGDC also has geomagnetic models to enable short-range predictions of the magnetic field.

20. The News Director hoped their listeners would be able to see a display of the aurora borealis (northern lights) over Oregon that night, following a period of very high solar activity.

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