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The State Climatologist

WISCONSIN INS AND OUTS

Contents

The AASC is happy to introduce the newest SC, Pam Naber, who will officially take over the Wisconsin SC office on September 1. Pam replaces Doug Clark, the SC for Wisconsin for the past 6 years.

Doug left the SC office to take a new job with COWIConsult, an engineering consulting firm located in Copenhagen, Denmark. Doug has been on leave in Denmark since July 1989; during this time he tackled several short projects on a variety of topics, including CO_2 fertilization of plants, the effects of land use changes on runoff, and air pollution. He was offered a permanent position in late February and has been busy since then taking lessons in technical Danish as well as tying up loose ends in the SC office. He is now one of two meteorologists in a company of 1,600 engineers, and is working primarily with air quality monitoring. He currently has projects in Greenland, Spain, and France. He and his Danish wife, Helle, are building a new house and are expecting their first child on January 1st. AASC wishes him all the best in his new endeavor.

Pam comes into the Wisconsin SC office with a wide background in climatology. Originally a physics and math major, she entered the graduate school at the University of Wisconsin in 1980 and got her masters degree in meteorology in 1982 under the direction of Dr. Verner Suomi. Her thesis discussed temperature effects of looking at fields of cumulus clouds from different viewing angles (cloud sides and tops have different temperatures).

Following her Master's, Pam taught physics, astronomy, and meteorology for 3 semesters at Calvin College in Grand Rapids, Michigan. During her summer off, she also interned for the National Weather Service in the Southern Regional headquarters in Fort Worth, Texas, serving in the Scientific Services office. Her major work during that time was assessing the accuracy of probability of precipitation (POP) forecasting by company POP forecasts to radar echo composites of areal rainfall coverage.

In 1984, Pam moved to NWS headquarters to take a job with the Office of Hydrology in the Water

Dr. Kenneth D. Hadeen
Director, NCDC

Dr. Mark D. Shulman
President, AASC

Steve Doty
Editor, The State Climatologist

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

NATIONAL CLIMATIC DATA CENTER IN COOPERATION WITH
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Management Information Division. In addition to preparing case studies of flood events in Missouri and Texas, she collected and prepared data for probable maximum precipitation (PMP) studies along the continental divide and in the Pacific Northwest and tabulated antecedent rainfall statistics for the Central Arizona Project.

Pam returned to Wisconsin in 1986 to pursue her PhD in the computer simulation of the Ice Age Atlantic Ocean circulation. However, when Doug Clark looked for an acting SC to take his place for a year, she jumped at the chance and has been running the office since. She says that her PhD plans are on hold for the moment because she hasn't found the ocean modeling satisfying compared to the fun (and occasional excitement) of working with real people in the SC office, but won't make any predictions for the future.

. . .fun (and occasional excitement) of working with real people in the SC office. . .

For the next year, Pam will be settling into her new job and trying to finish up her major project of the last year, a historical monthly precipitation data base of all available data from 200 stations around Wisconsin. These data have been checked for errors and include flags to indicate missing and estimated values. She is currently preparing documentation and running statistics on the stations. A station history file for each station has also been prepared.

His experience includes over 20 years. . .with Air Force, NOAA, and, most recently, WMO.

Pam also hopes to expand the educational component of the office. She is looking into the preparation of a *"Climate of Wisconsin"* slide set for use in Wisconsin schools. She is also considering teaching a short class on the history of Wisconsin weather observations and serving as a "consulting scientist" to a local earth science class. In addition, she is also actively involved with the Madison AMS chapter's Education Committee, aimed at improving weather education in local primary and secondary schools.

The AASC certainly welcomes Pam to the ranks of the State Climatologists.

Ken Davidson -- New Deputy Director at NCDC

Ken Davidson has taken up his new position as the Deputy Director at the National Climatic Data Center (NCDC). His experience includes over 20 years of meteorological/ climatological experience with the Air Force, NOAA, and most recently, WMO. Ken is returning to NOAA and NCDC from his position as Director of the World Climate Data Programme of the WMO in Geneva, Switzerland. The work at WMO involved coordinating global programs in Climate System Monitoring, Climate Change Detection, CLICOM, Infoclima, construction of global baseline data sets and in assisting developing countries implement national climate programs.

Ken's career includes 10 years of work in satellite operations and data management. He was a satellite data acquisition site commander in the Air Force and for NOAA he served as the satellite data and product quality control manager prior to moving to NCDC in 1980. At NCDC, Ken was the

Chief of the Systems Integration and Planning Staff, responsible for the development and implementation of systems at the Center.

Ken was born in Pittsburgh, Pennsylvania, educated at Indiana University of Pennsylvania, Texas A&M, and the University of Maryland. He has many years of project management, data management, and climatological experience. This, combined with his many national and international contacts and activities, should greatly benefit the NCDC and assist us in moving forward into the 1990s.

WELCOME BACK KEN!

Bob Money Named Chief, CSD

Dr. Kenneth D. Hadeen, Director of the National Climatic Data Center (NCDC), recently announced the selection of Robert L. Money as Chief, Climate Services Division (CSD). The division is responsible for responding to customer requests for climate data and information. It consists of three branches: the Climate Services Branch (telephone and subscription services), the Climate Applications Branch (digital services and services for the research community), and the Data Dissemination Branch (non-digital services).

Bob did his undergraduate work at Clemson University where he received his B.S. in Electrical and Computer Engineering in 1972. He attended graduate school at the University of Maryland in Computer Science from 1972-1974. Bob worked as a graduate research assistant at NASA Goddard from 1973-1974. In 1975 he went to work for the NOAA's National Environmental Satellite Service (NESS) in Suitland, Maryland, as a systems analyst. Bob's work centered primarily on the implementation and operation of the polar orbiting TIROS-N satellite ground system. In 1980 he went to work for the National Climatic Data Center's Satellite Data Services Division as Chief of their Applications Branch. The Branch, located in Suitland, Maryland, was responsible for archiving and disseminating meteorological satellite data. In 1982 he transferred to NCDC Asheville where he served as the Chief of the User Services Branch until his recent selection.

Profiler Update

We are pleased to announce an agreement between the Environmental Research Laboratories (ERL) and the National Climatic Data Center (NCDC) for the management of data from the Wind Profiler Demonstration Network. A Memorandum of Understanding was fashioned between ERL and NCDC in May 1990 describing the data management roles of NCDC and particularly ERL's Forecast Systems Laboratory (FSL). In the next two years, NCDC will be working with FSL to implement a high quality, reliable, easily accessible data management system for wind profiler data.

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Background

During the past decade, ERL in Boulder, Colorado, has developed

radar-based technology for unattended remote sensing of wind profiles in the atmosphere. During the period 1985 through 1992, the Profiler Program Office (PPO) of FSL has been funded to develop, deploy, operate, and assess this technology in a system of 30 stations, designated the Wind Profiler Demonstration Network (WPDN), located primarily in the mid-continental United States. In addition to ERL, the WPDN program involves the National Weather Service, other government agencies, the university research community, and interested private sector firms in critical evaluation of this new technology and the data which it produces.

. . .there should be tremendous interest in the scientific community. . .

The wind profiler is an upward pointing Doppler radar which can measure turbulence (which is converted to wind motions) in the atmosphere through the use of an electromagnetic wave transmitter, receiver, and sophisticated algorithms. Wind profiler radars reflect their energy off fluctuations in the radio refractive index, created by atmospheric turbulence. By using Doppler shift principles, and assuming the wind carries along fluctuations in the index, the radar system can detect the motions of these fluctuations. The instruments will allow forecasters and researchers to see the structure of the atmosphere in great detail.

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These data will be used to aid in the detection and analysis of numerous atmospheric features and characteristics (e.g. Jet Streams, fronts and troughs, air masses, vertical motions, severe storm structures).

Nearly continuous wind observations with such excellent vertical resolution have never existed before and the need to learn how to utilize these unique data makes distribution to meteorologists paramount.

Because the instrument is a new observational tool and is still considered experimental, there should be tremendous interest in the scientific community concerning assessment of these data in a retrospective sense. The research community will use these data to assess the effectiveness of the observing system. Research will proceed for years after system deployment and the feedback from this work will lead to improved future system development.

Data Descriptions

There are two basic resolutions of wind profiler data, 60-minute and 6-minute. The 60-minute data streams include winds and quality control information, radial velocities, engineering data, and, for some sites, surface data. The 6-minute data includes radial velocities, engineering data, diagnostic spectrum information, and surface information. There will possibly be another "housekeeping" data stream sent which will give information on station configuration and instrument characteristics and changes.

An extensive amount of quality control will take place at FSL. This is in conjunction with NOAA policy on new observing systems to establish quality control procedures as close to the observing site as possible. Hourly profiles which fail consensus averaging QC will be designated as missing. The QC employs first guess fields and

checks, and vertical consistency checks using different portions of the data spectrum. ERL WP Training Manual Number Two explains quality control features in great detail.

Communications

The data will originally be sent to the NCDC via the Internet communications system. The capacity of this line is presently 9.6K baud, but the plan is to increase this to 56K baud. The communications system will be thoroughly studied to ensure it's adequacy. An upgrade to this communications scenario will be one of the considerations for future system enhancement.

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The agreement calls for FSL to send the data around the clock, in near-real time. This will be a particular challenge for the NCDC as we have not dealt with the problems associated with real-time data acquisition.

NCDC also receives a 60-minute resolution data stream via AFOS/Service Records Retention System (SRRS) from the National Meteorological Center of the National Weather Service (NWS). NCDC has a suite of software obtained from the NWS which can perform manipulations of data in the SRRS environment. In particular, with AFOS software, NCDC can produce paper copies of time height wind displays, cross sections, and planar views.

. . .NCDC must develop new methodologies and policies regarding data management. . .

Task at Hand

The task ahead of us is to develop an overall operations system which can reliably get all of the wind profiler data to NCDC, process these data of differing resolutions and formats, create output data sets, produce wind profiler summary products, and interface with customers in the research community who will be expected to get the data quickly and cheaply. To accomplish this task, we will marry NCDC's data management expertise with FSL's real-time data handling and exploratory development expertise. We will also take advantage of software that already exists.

NCDC will ensure that data are retained for retrospective use by researchers and the private sector. Establishing a secure archive of profiler data and working with FSL we will meet the many challenges that exist in the implementation of a comprehensive data management system geared to the research community.

The present plan is to ingest, process, and service customers with wind profiler data in the high and low resolutions which were described above. NCDC has no plans to quality control these data either in the high or low resolution formats.

Customer Servicing Environment

To prepare for new observing systems, other future data streams and to posture ourself better for Climate and Global Change activities, the NCDC must develop new methodologies and policies regarding data management, particularly with respect to the research community. Processing wind profiler data may mark the first step in the development of a new methodology for handling data and information which can be more responsive and accessible to the research user community.

We have taken a big first step toward managing data for researchers with the formulation in June 1990 of the Research Customer Servicing Group, which will be the focal point for research inquiries at the Center.

The building of a management system for these data is an exciting challenge. The data are of great interest to a significant segment of the research community and will be transmitted to NCDC in different resolutions from different sites. A system is being created which will accept, decode, and inventory the incoming data streams and have the capability to produce an array of data sets and WP hard copy and digital products. The goal is to perform these functions in near-real-time by the end of 1991.

A centrally produced "master" database. . . distributed simultaneously to all WFOs, makes common sense.

Mike Crowe, NCDC
with personal communication
with Marjorie McGuirk, FSL

NOAAPORT to Provide Information Stream for Meteorological Data and Products

What is NOAAPORT?

. . .NOAAPORT will change over time.

NOAAPORT is the name given to the service planned for distributing meteorological data and products to AWIPS and other environmental data systems beginning in the NWS Modernization era. NOAAPORT was conceived as a mechanism to provide central dissemination of the vast pool of real time NOAA satellite observations, NMC guidance material, and conventional meteorological, hydrological, and oceanographic data and products to forecasters, researchers, and the private sector.

Why now?

Modernized field operations will require the input of a greatly increased volume of satellite images, model output, and observations from new sensing systems (e.g., ASOS, NEXRAD). All WFO's will require data and products that are centrally collected/produced to support the forecasting process. A centrally produced "master" data base (consisting largely of NMC grid-point and graphic data and GOES-Next satellite imagery), distributed simultaneously to all WFO's, makes common sense. The AWIPS/NOAAPORT contractor must be able to collect all data streams centrally and transmit them to all NWS AWIPS sites (WFOs, RFCs National Centers, Regional Headquarters, and NWS Headquarters).

The type and quantity of data broadcast via NOAAPORT will change over time. Initially, the broadcast will include the point-to-multipoint data and products required to support the sites involved in the Modernization and Associated Restructuring Demonstration (MARD). As the AWIPS system is deployed nationwide, more NMC model output data and more data from satellites other than GOES will be added to the NOAAPORT data stream. Imagery from NOAA's polar orbiting satellites and from the European METEOSAT geostationary satellite will be broadcast along with the remapped GOES image data.

NOAAPORT is also planned to carry other environmental data, such as reports from remote data collection platforms and buoys,

Profiler data, and ocean analyses from NOAA's Ocean Service. Data from foreign satellites currently under development, like the Japanese and European Earth Remote Sensing Satellites, may also be routed through NOAAPORT for use by research institutions and private sector entities who could build or purchase NOAAPORT receiving systems and data processing work stations.

NOAAPORT data volume will build gradually. . .

Many universities, commercial meteorological consultants, and weather data marketing firms now use the NWS Family of Services to access meteorological observations and NMC model output. Some augment their operations with satellite data from NOAA's GOES-Tap or through direct readout of GOES imagery. In the near future, both GOES-Tap and Family of Services will continue. Later this decade, however, NOAAPORT will provide real time access to a much broader range of NOAA's meteorological and satellite data.

How Will It Work?

NOAAPORT. . . to begin in early 1992.

GOES satellite data acquired by NOAA NESDIS in Suitland, MD, will be converted in real-time from the geostationary coordinate view into a standard planar perspective (Lambert Conformal for the continental United States and Polar Stereographic for Hemispheric Scale data). The resultant remapped images will be sent as they are produced to the "Port" of NOAAPORT, communications interface device. Here, the AWIPS/NOAAPORT contractor will capture them for immediate transmission via a broadcast communications system to the

and centrally produced forecast guidance, will also be picked up for transmission by the AWIPS/NOAAPORT contractor at Suitland, Maryland.

NOAAPORT data volume will build gradually during the initial deployment, beginning at a level of about 200 kilobytes per second. The bandwidth required after national deployment of AWIPS and two GOES-Next satellites is about two million bits per second. Details of the planned data and product transmission requirements and other technical specifications for the NOAAPORT feed are available through the AWIPS Program Office in NWS.

The AWIPS/NOAAPORT contract is being structured to reserve NOAA all necessary rights to the data and designs. This way, NOAAPORT-related services as well as applicable equipment (receivers, image processors, etc.) will be obtainable from the contractor by any public or private user. In addition, other vendors will not be restricted from marketing compatible equipment and services.

Initial NOAAPORT operational broadcasts are currently scheduled to begin in early 1992. NOAA will continue to share information on NOAAPORT plans and progress with other agencies as much as possible within procurement integrity constraints.

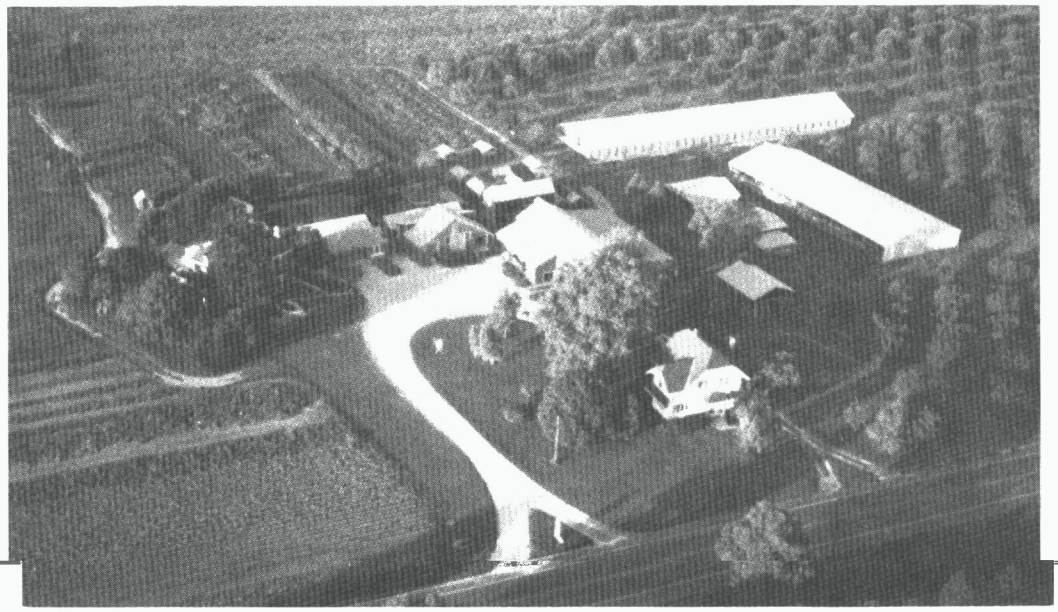
Jamison Hawkins, NESDIS
NOAAPORT Project Manager
(From Critical Path 6/90)

s.
asts,

approximately 125 NWS site
Weather observations, foreca

A CENTENNIAL COOPERATIVE WEATHER STATION
LEE TURKEY FARM, HIGHTSTOWN, NJ

Mr. & Mrs. Dick Lee received one of the first awards as a Centennial Weather Station at the AASC annual meeting. Notice instrument shelter to the right of driveway.



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