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# The State Climatologist

## MINUTES OF THE 1992 ANNUAL MEETING AMERICAN ASSOCIATION OF STATE CLIMATOLOGISTS (DRAFT)

Bowling Green, Kentucky  
August 6-7, 1992

### Contents

- 1 Minutes
- 5 Business Meeting
- 6 Proclamation
- 6 Rainfall Event Statistics

Dr. Kenneth Hadeen  
Director, NCDC

Dr. Charles Wax  
President, AASC

John P. Hughes  
Editor, The State  
Climatologist

The American Association of State Climatologists (AASC) held its 1992 Annual Meeting on the campus of Western Kentucky University with Kentucky State Climatologist, Mr. Glenn Conner, serving as the local host. Approximately 40 members and associate members attended with nearly 60% of the current State Climatologists present.

The meeting began with Dr. Robert Haines, Vice President for Academic Affairs at Western Kentucky University, welcoming the AASC to Kentucky. Glenn Conner of the Kentucky Climate Center gave his welcome and provided details of local arrangements.

President Ken Kunkel provided the President's Report that included:

(a) Some 15 to 20 offices of State Climatologist (SC) were active participants in the Centennial Celebration

held during 1991-1992. An additional 19 SC offices indicated they had spent considerable effort in digitizing historical co-op stations in their network.

(b) He has compiled a publication list from each SC office in case anyone is interested.

(c) Automated weather station networks seem to be proliferating across the United States; such networks now operate in portions of most states.

(d) With assistance from the Southeast RCC, Puerto Rico continues to work on developing an office of SC.

(e) A brief overview of the ASOS climate working group was provided, courtesy of Nolen Doeskin from Colorado who attended.

(f) New regulations by the EPA on storm water drainage are now available for \$90 from the EPA. Just call 1-800-523-9654 and request the ESE National Precipitation Data Book.

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*"Myron also reported on efforts to create shallow-lake evaporation maps for Idaho."*

Brief reports from the individual SC offices included:

Myron Molnau (Idaho): The map of average precipitation for Idaho (1961-1990) is finally complete after 8 years of working to digitize the co-op network in Idaho. Myron also reported on efforts to create shallow-lake evaporation maps for Idaho. He plans to move his computer capabilities from a mainframe computer to a network of PCs.

Dave A. Robinson (New Jersey): As the new New Jersey SC (since September of 1991), Dave has focused his research on modelling the weather-related stress on cranberries and on documenting precipitation anomalies due to the urban effect of the Philadelphia/Camden area. He is using the data resources from the Northeast Regional Climate Center (RCC) to develop a high-resolution profile of temperatures in the northeastern U.S. He also has developed data files of significant climate events. He is seeking educational assistance from the media on the various weather extremes of New Jersey (e.g., snowless winters, spring snows, drought occurrences, cool summers, etc.).

Don Jensen (Utah): The mission of the Utah SC Office is a blend of education, research, and service. Currently, 14 automated weather networks exist across Utah and provide climatological data which the SC Office attempts "quality assure" before the data are archived. Active projects include using information from these weather networks in an educational outreach with several middle schools across Utah; a continuation of mean annual precipitation studies; a desert evaporation project; and obtaining a direct read-out of

*"The mission of the Utah SC Office is a blend of education, research, and service."*

satellite information. Gaylen Ashcroft, Associate State Climatologist, serves as the data base manager and has just transitioned the Utah SC Office to a PC-based system.

Alan Robock (Maryland): As the new SC for Maryland, Alan described his first activities on the job and asked for guidance from other SCs.

Wayne Wendland (Illinois): The Illinois SC just completed digitizing all co-op data back to the 1900s. He then spoke on the response of plants to available soil moisture.

Hal Klieforth (Nevada): Hal noted that his budget had been cut 20% since the last AASC meeting. He then provided a brief overview of activities in Nevada.

Pam Knox (Wisconsin): A recent dry spell that lasted two months led to the re-activation of the State's drought task force. She is working to develop curricula for science teachers that makes use of climate data. Finally, she has plans to update a publication that details the Wisconsin tornado climatology.

Charlie Wax (Mississippi): The primary focus in Mississippi is work on a 5-year grant to integrate the activities of related disciplines that are on the campus of Mississippi State University.

Allen Dutcher (Nebraska): Allen reported that the current corn crop was 10 to 17 days behind its normal maturity, in spite of the fact that the crop was planted on time. The culprit: growing degree days were below seasonal normals. The Nebraska SC routinely runs a soil moisture model. They also digitized data from

99 co-op stations, extending those digital records back to 1900.

D. J. Smith (Southeast Regional Climate Center): D. J. spoke of several software plots that his office uses to monitor the on-going climate variability in each climate division under the SE RCC. His office prepares a weekly climate summary and has plans to precisely locate each co-op site (using the new GPS technology) to update the information on all B-44s.

John Zeitler (South Carolina): The SC office is in the process of taking an inventory of all soil monitoring networks with an aim to identifying sites for near real-time dissemination of soil data. The office has its climate retrieval system now operating on a SUN IPX workstation. The office averages some 60 user contacts per month.

George Taylor (Oregon): As a relatively new SC, George reviewed the current activities of his office in Oregon.

Howard Johnson and Ken Crawford (Oklahoma): Howard and Ken provided a quick overview of activities at the Oklahoma Climatological Survey, including funding, user-contacts, and staffing. A quick status report was provided regarding the Oklahoma Mesonet.

The first major topic on the agenda concerned the Coop Network Modernization. Kelly Redmond reviewed the historical problems of the co-op data network and plans to upgrade this network. Phase I of the upgrade will set general requirements for the network, find out what networks currently exist, and set the standards for instrumentation in a climate net-

work. Phase II is represented by an RFP to develop a prototype upgrade with deployment expected by the end of FY 96. Cost would be about \$4,000 per station (times 10,000 stations = a price tag of \$40 million for the co-op upgrade). The question arose as to whether the AASC should issue a statement of support—but the question was never resolved.

Hal Bogin provided an ASOS Update by reviewing the mission, goals, interagency programs and capabilities of the ASOS network. He also cited some of the benefits of an ASOS upgrade (current equipment aging, observations become available around-the-clock producing better nighttime observations, etc.). A summary of the program to date included the fact that 868 units had been "ordered" with another 800 to be purchased, producing an ASOS network of some 1,600 sites operating within the next 5 years. Quality assurance plans include using the on-site observer and the ASOS software itself.

Nolen Doeskin joined the discussion and pointed out that ASOS is not a climate network, but rather, it is an aviation observing network—pure and simple. [The national aviation program is doing climatology a favor by measuring precipitation with a heated tipping bucket rain gauge.] Furthermore, ASOS handles a number of issues correctly, is stymied because a few parameters are impractical to automate, and has left room to improve on the ASOS solution when it comes to measuring certain other parameters. On the plus side, all sites will have "uniform equipment," better siting, advanced telecommunications, and data availability 24 hours per day. While no rain gauge is perfect, the heated tipping bucket will provide

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poor data for use in monitoring the local climate. Finally, Nolen presented the AASC with a three-page draft summary of concepts for consideration during the Business Meeting of the AASC.

Tom Reek spoke on the quality control activities for data about to enter the archives at NCDC. He noted the standard operating procedures that, today, correct many of the errors/quirks that appeared in the co-op data sets in years gone by.

Dave Phillips provided an overview of activities underway at the Canadian Climate Centre.

Stan Changnon spoke on relationships between NOAA and the University community. In Stan's view, much improved opportunities exist for interaction with NOAA officials (including the NWS' new Science and Operations Officers whose duties include a major focus on research). As a result, a real opportunity for real cooperation via the various cooperative institutes has now emerged. On another subject, Stan recommended that a future focus of SC activities should include more work on the impacts of climate.

Ken Hadeen provided the NCDC Report. He noted that the much improved quality control procedures now ensure the quality of data from the co-op network (by double keying the data). Furthermore, a new GEA routine (geographical edit and analysis) is operational and is stable. The purpose of GEA is to correct bad data in a more scientifically correct fashion. The HCN data set (1,200 sites) is considered to be a very good homogeneous data set. Tom Karl has

found no effective warming in the July-December data sets but has found limited warming to occur in the January-July subset. NCDC also has standardized documentation on the co-op sites which are available via an interactive PC. The Global Historical Climate Network is now available for users. Thomas Peterson is the project leader. A marine/ocean atmospheric data set is now being compiled. Currently, NCDC digitizes around 7.5 million data sets per year. The 1961-1990 standard normals are now available along with CLIM81/CLIM84/CLIM85/CLIM20 and a 16-page mini-climate atlas. User contacts at NCDC average 350 per day. To ease the burden of meeting user needs, an on-line access and service information system is now available via Internet. The contact is Tom Ross or Neal Lott. In addition, an OMNET mailbox will permit users to leave a message with a return response coming via Internet. Call 704-259-0286 and speak to Doug McElreath regarding system access. NCDC has finished its portion of the drought atlas (some 1119 HCN stations were used). John Hughes, SC Liaison at NCDC, reviewed the status of stations in the Centennial Network and efforts to incorporate these data into the HCN. He also noted that the SC exchange program was considered quite successful. Over the years, some 28 SC offices have participated.

Jim Laver from CAC spoke on various aspects of NWS modernization, emphasizing the opportunities to provide 7 to 14 days forecasts. He also provided a detailed review of the latest ENSO and the resultant rainfall and temperature patterns. Jim also emphasized that Internet was replacing telephone dialup to CAC.

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*"...improved quality control procedures now ensure the quality of data from the co-op network..."*

Bob Bermowitz provided an overview of the RCC Program. He noted that the various RCC research programs were peer reviewed, that each RCC had developed a 3-year strategic plan, and that the RCC program was fully integrated into the NWS. For FY 94, initiatives include climate services, applied research, database development, and participation in the SOLRAD program.

Joe Friday, Director of the National Weather Service, spoke on the NWS Modernization. He noted that the modernization, which began in 1978, was a good testimony to perseverance. The first dollars for NEXRAD were provided in 1978 while the modernization plan was not approved until 1989. He recounted a recent press conference that highlighted NEXRAD as producing the most significant improvement in short-range forecasting during the past 30+ years. While the NEXRAD hardware made an important contribution, a solid training program was essential to achieve the goals of modernization along with the realization that modernization may require 10 years before the full dividends are realized. Dr. Friday noted that the Probability of Detection in Oklahoma rose from 0.5 to 0.9 in 1991 (national average is 0.4) while the Oklahoma False Alarm Ratio fell from 0.8 (the national average) to 0.3 in 1991. The next two NEXRAD sites (Sterling and Melbourne) also have duplicated the Oklahoma results noted in the Press Conference.

George Cry, Hydrologist in Charge of the River Forecast Center in Slidell, described RFC operations in a modernized and restructured National Weather Service.

In addition, Phil Pasteris spoke on the SCS and its climate mission while Roger Tucker reviewed activities underway with the U.S. Forest Service.

#### *Annual Business Meeting*

The minutes from the 1991 Annual Meeting were approved after minor amendments were discussed and the Treasurer's report was accepted and approved.

Discussion moved to a proposed article for the Bulletin of the American Meteorological Society regarding the Centennial celebration. The group agreed that a summary article should be tabled for the time being.

On the matter of "official policy statements," discussion began on the matter of endorsing the concept of modernizing the co-operative observer network and on endorsing ASOS. After much discussion, the group agreed to prepare a draft narrative of the proposed "statements," send them to the Executive Committee for corrections before transmitting to any professional society. In addition, it was agreed that NOAA Administrator Knauss should receive both statements and that the ASOS statement should be sent to the FAA as well. The question then arose regarding the input of SCs who were not at the Annual Meeting. The question was not resolved.

The Helmet Landsberg Award, given twice before, was approved for presentation to Tom Karl at the 1993 Annual Meeting (in the form of a plaque).

The Committee on Rules presented several amendments to the current constitution. All five amendments

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*"...a set of 26 statistics which met selected criteria for 3,225 stations was developed for the project."*

submitted were approved by a voice vote.

The site of the 1993 Annual Meeting was chosen to be in Idaho with Idaho SC Myron Molnau serving as the local host.

Kelly Redmond noted that he will represent the AASC at an upcoming meeting of Agricultural Engineers.

New Associate Members that were approved: Howard Johnson, Jeff Andreson, Arthur DeGaetano, Greg Johnson, Bert Tanner, and Gregory Faiers.

As a final action, the AASC membership extended a special thanks to Kentucky SC Glenn Conner when it approved the Executive Order below:

#### *Proclamation*

Whereas our host has acted like a Kentucky Gentleman and has maintained his composure for three days in the face of contemptuous climatologists;

Whereas he recognized the age and vitality of the senior members of the group by holding the Annual Meeting in a great place;

Whereas he showed extreme sensitivity to our waist lines by arranging record levels of cholesterol and calories; and

Whereas he arranged for cool, cloudy weather to "cover up" the effects of the dew point in Kentucky in August, now therefore,

The AASC extends its special thanks to Glenn Conner, Kentucky

State Climatologist, for hosting the 1992 Annual Meeting.

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### *Storm Water Permit Applications And Rainfall Event Statistics*

The phone is answered in the State Climatologist office and the question is asked: "How can I get data for a storm water permit application for EPA?" If this scenario sounds familiar and you need to find a quick answer for your customer, The Rainfall Event Statistics data set available from the National Climatic Data Center (NCDC) can help you.

#### **Origins**

A set of statistics summarizing nationwide hourly precipitation data was prepared by Pete Steurer of the NCDC in 1986 under a contract with the U.S. Environmental Protection Agency. The results were summarized in a report, "Climatic Data Summaries." A computer program which extracted data from NCDC's hourly precipitation magnetic tapes (TD-3240) and computed a set of 26 statistics which met selected criteria for 3,225 stations was developed for the project. The criteria required a station to have at least ten years of data for each set of monthly statistics.

There are two types of hourly reporting rain gauges. Each records different measurement resolutions. One type is the weighing or recording gauge which records to the nearest hundredth of an inch. The second type is the Fischer-Porter gauge which records to the nearest tenth of an inch. Since the 1960s many of

the weighing type gauges have at various times been replaced by Fischer-Porter gauges. Separate statistics were produced for the period of time when each gauge type was in operation, and a combined gauge statistic was also generated. This resulted in many gauges having three sets of statistics.

*"Storm events were defined by total accumulation combined with rate or duration requirements."*

Storm events were defined by total accumulation combined with rate or duration requirements. The general storm description required a total accumulation of at least 0.1 inch together with rates averaging at least 0.01 inch per hour. Rainfall events began in an hour when at least 0.01 was recorded. Subsequent hours were considered as part of the same event so long as the rate remained greater than 0.01 inch per hour on the average. Implementation of this rule required a 10-hour moving window for averaging purposes. The event ended when the average fell below 0.01 inch per hour and the ending hour was identified as the last hour with recorded rain.

*"On November 16, 1990, EPA requirements for storm water discharge applications were published in the "Federal Register"..."*

### **Storm Water Discharge Applications**

On November 16, 1990, EPA requirements for storm water discharge applications were published in the "Federal Register" ("National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges; Final Rule"). As part of the application, applicants are required to sample a storm event that is typical for the area in terms of duration and severity. In establishing values for a typical storm event, EPA used the 1986 "Climatic Data Summaries" report prepared by NCDC, and generated averages for different climatic regions of the U.S.

Bill Switlik of EPA approved the use of site-specific data contained in the original 1986 report (hereafter referred to as Rainfall Event Statistics data) as being suitable for storm water applications. Customers may now choose to use data from the HPD station closest to their site for use in their application. The data can also be used for various hydrological research projects. The Rainfall Event Statistics (RES) data differ from the EPA-generated data in that the EPA data provide only one overall annual value, whereas the RES data provide 12 monthly values which need to be averaged to obtain an annual value to compare with the EPA data. Only two statistics out of the 26 available in the RES are pertinent to the EPA storm water applications. These are Equation 2 (Monthly Mean of the Average Storm Duration (hours)) and Equation 4 (Monthly Mean of the Average Storm Depth (inches)). However, all of the original 26 sets of statistics are provided in the RES so that the data can be used for other purposes.

### **Data Available From NCDC**

NCDC provides Rain Event Statistics on microfiche, paper copies, diskettes, and magnetic tape (TD-9651). A set of 26 monthly statistics for all HPD stations having at least 10 years of data (through 1986) is available on microfiche. The 19 microfiche contain the station statistics grouped alphabetically in a state/station sort. Each of the 3,225 stations can be printed from microfiche on a single sheet of paper (three sheets for those stations having combined weighing - Fischer-Porter statistics).

*"In almost all cases, customers need only the merged data set..."*

Three sets of diskette files are available: 1) nine diskettes containing only weighing gauge data, 2) five diskettes containing only Fischer-Porter gauge data, and 3) nine diskettes containing one set of combined statistics for each station (weighing gauge-only, or Fischer-Porter gauge-only, or a merged set of statistics for those stations which existed as a weighing and Fischer-Porter gauge at various times of their existence). Thus statistics from each HPD station appear on at least two of the diskette files. In almost all cases, customers need only the merged data set (number 3 above). Only if the difference between the weighing gauge and the Fischer-Porter gauge data at the same site location need to be examined will all data sets be needed.

One magnetic tape contains the complete set of statistics described as being available on diskettes above.

Each data record contains 96 characters and there are 50 records per block. Either ASCII or EBCDIC mode is available.

In addition to providing data for storm water permits, the RES can be used for many other purposes. The statistics include data concerning wet and dry day counts, storm frequencies, depths, and durations. These statistics are useful background for prediction of infiltration, runoff, and leaching events; however, these data should not be considered as representative of maxima over periods of record for purposes such as flood prediction, nor should the dry day counts be assumed to provide data concerning drought periods.

Sam McCown  
Chief, Climate Services Division

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